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DEPARTMENT OF EDUCATION,  
STATE OF HAWAI'I

BEFORE THE LAND USE COMMISSION  
OF THE STATE OF HAWAI'I

In the Matter of the Petition of

DEPARTMENT OF EDUCATION,  
STATE OF HAWAI'I,

To Amend the Agricultural Land Use  
District Boundaries into the Urban Land  
Use District for Approximately 77.2 acres  
of land at Kihei, Maui, Hawai'i, Maui Tax  
Map Key Nos. 2-2-02: 81 and 83.

DOCKET NO. A11-794

SUPPLEMENTAL EXHIBIT TO  
PETITIONER DEPARTMENT OF  
EDUCATION, STATE OF HAWAII'S  
MOTION TO AMEND THE LAND USE  
COMMISSION'S FINDINGS OF FACT,  
CONCLUSIONS OF LAW AND  
DECISION AND ORDER FILED JULY  
29, 2013; EXHIBIT "38"; CERTIFICATE  
OF SERVICE



**SUPPLEMENTAL EXHIBIT TO PETITIONER DEPARTMENT  
OF EDUCATION, STATE OF HAWAII'S MOTION TO AMEND THE  
LAND USE COMMISSION'S FINDINGS OF FACT, CONCLUSIONS  
OF LAW AND DECISION AND ORDER FILED JULY 29, 2013**

Through counsel and in further support of its Motion to Amend the Land Use  
Commission's Findings of Fact, Conclusions of Law and Decision and Order Filed July 29,  
2013, Petitioner submits the following supplemental exhibit:

Exhibit 38      Traffic Impact Report for Kihei High School prepared September 2011, revised  
April 2012. (Attached as Exhibit G to the Final Environmental Impact  
Statement.)

DATED: Honolulu, Hawai'i, August 31, 2021.

/s/ Stuart N. Fujioka \_\_\_\_\_  
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DEPARTMENT OF EDUCATION,  
STATE OF HAWAII

Traffic Impact Report

Kihei High School



Prepared for:  
Group 70 International, Inc.

Prepared by:  
Wilson Okamoto Corporation

September 2011  
Revised April 2012

***TRAFFIC IMPACT REPORT***

***FOR***

***KIHEI HIGH SCHOOL***

*Prepared for:*

Group 70 International, Inc.  
925 Bethel Street, Fifth Floor  
Honolulu, Hawaii 96813

*Prepared by:*

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September 2011  
Revised April 2012

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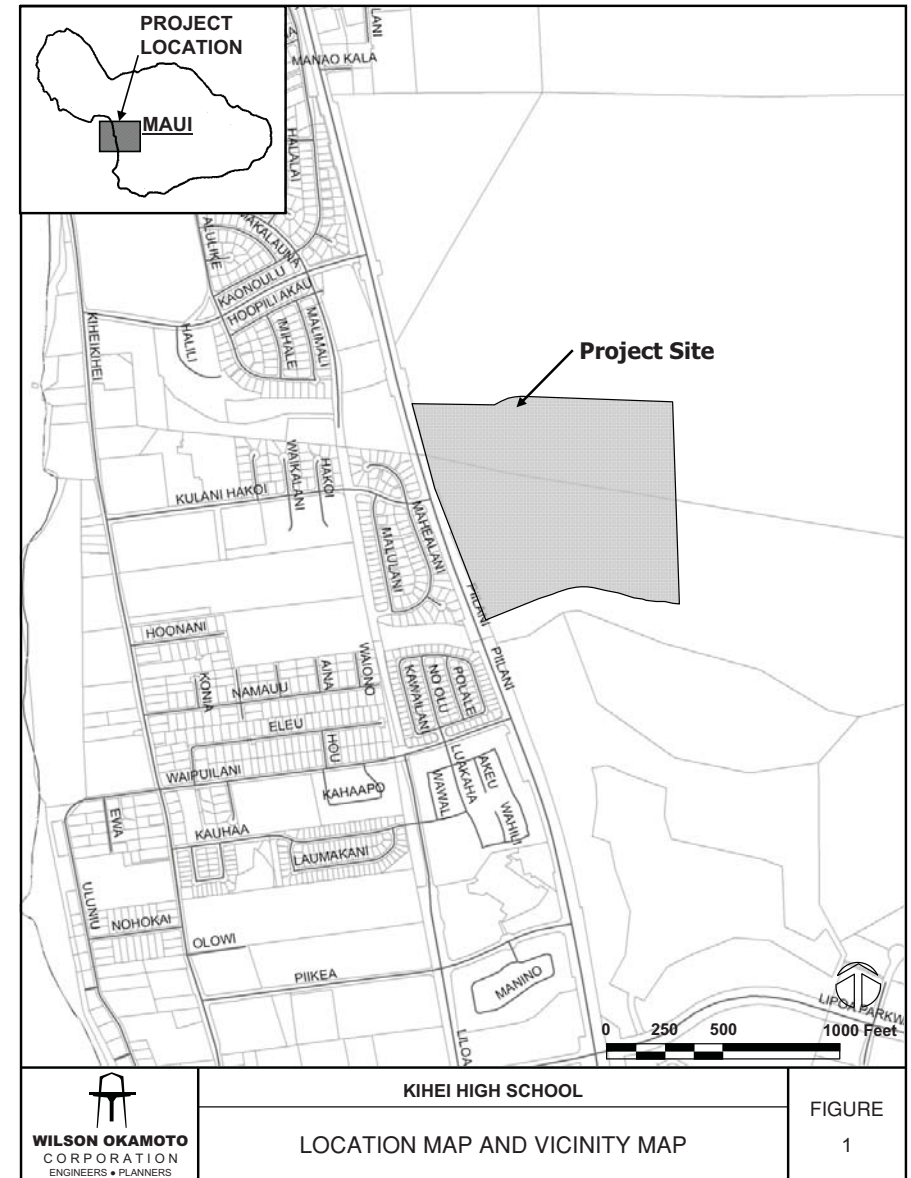
The purpose of this study is to identify and assess the traffic impacts resulting from the proposed Kihei High School in Kihei on the island of Maui. High school students who reside in Kihei currently attend Maui High School in Kahului or Baldwin High School in Wailuku. The proposed school will allow these and future high school students from Kihei to attend a school within their region.

This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

### A. Location

The Kihei High School will be located on an over 70-acre site adjacent to Piilani Highway in Kihei on the island of Maui (see Figure 1). The proposed project site is further identified as Tax Map Keys (TMKs): 2-2-002: 15 (por) and 54 (por). The site is bounded by Piilani Highway to the west and agricultural lands to the north, east, and south. Vehicular access to the proposed school will be provided via a new access roadway off Piilani Highway at the intersection with Kulanihokoi Street.



## B. Project Characteristics

The State of Hawaii Department of Education (DOE) has plans to construct a new high school in Kihei adjacent to Piilani Highway. The proposed high school will include the following:

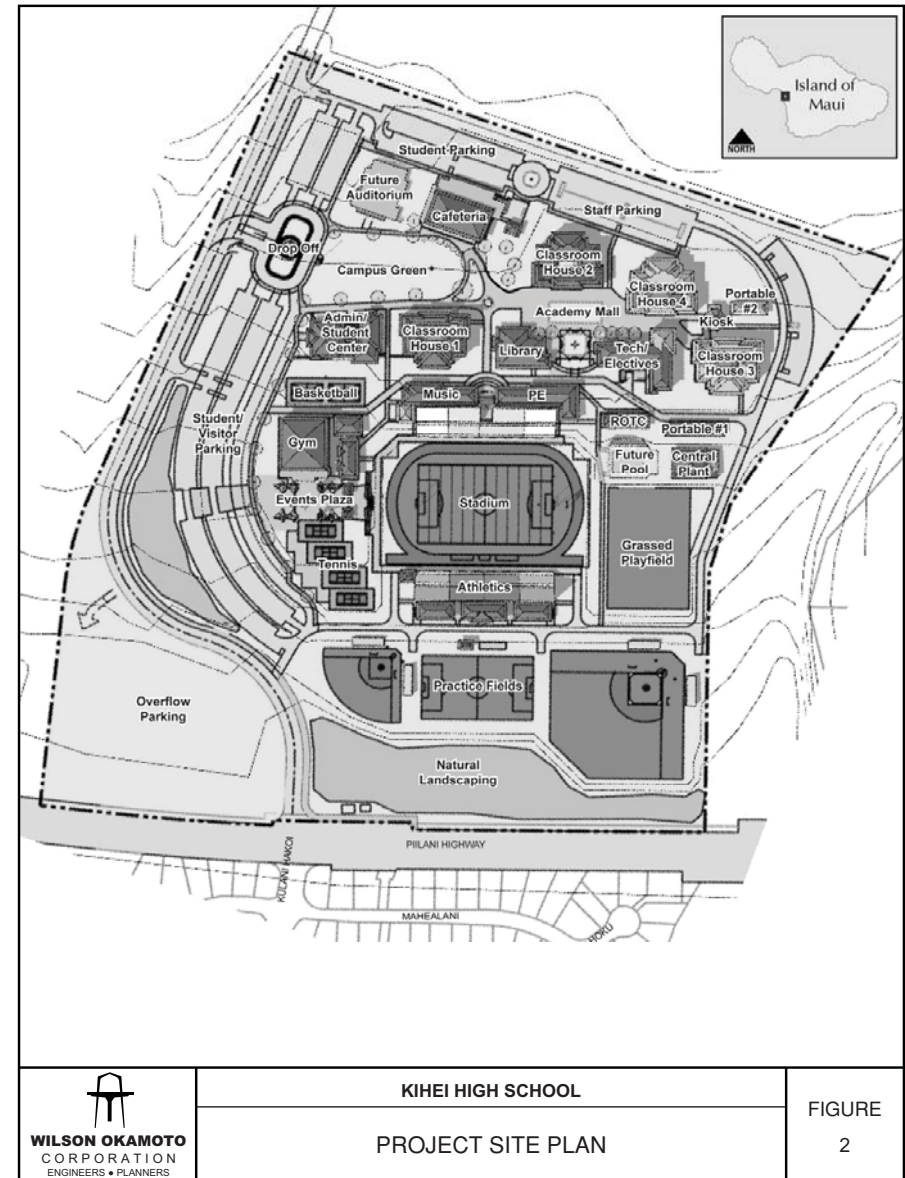
- Classrooms
- Library
- Auditorium
- Cafeteria
- Administration building
- Industrial arts building
- ROTC facility
- PE and athletic buildings
- Gymnasium
- Swimming pool
- Football/track stadium
- Tennis courts
- Grassed playfields
- Track and field appurtenances
- Softball and baseball fields
- Parking areas

Access to the new high school will be provided via a new access roadway off Piilani Highway at the intersection with Kulanihako Street. The majority of the facilities at the high school are expected to be completed when the school opens in the Year 2015. The school is initially expected to accommodate approximately 800 students with a full enrollment of 1,650 students expected by the Year 2025. Figure 2 shows the proposed project site plan.

## III. EXISTING TRAFFIC CONDITIONS

### A. Area Roadway System

In the vicinity of the project, Piilani Highway is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that provides access through Kihei. North of the project site, Piilani Highway intersects Kaonoulu Street. At this unsignalized T-intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kaonoulu Street is generally oriented





in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kaonoulu Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. In addition, a refuge lane is provided within the median along the highway to assist vehicles turning left from Kaonoulu Street.

South of the intersection with Kaonoulu Street, Piilani Highway intersects Kulanihakai Street. At this unsignalized T-intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kulanihakai Street is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kulanihakai Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. In addition, a refuge lane is provided within the median along the highway to assist vehicles turning left from Kulanihakai Street.

Further south, Piilani Highway intersects E. Waipuilani Road. At this unsignalized T-intersection, the northbound approach of the highway has two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. E. Waipuilani Road is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the E. Waipuilani Road approach has one stop-controlled lane that serves right-turn traffic movements only.

At the southern end of the study area, Piilani Highway intersects Piikea Avenue. At this signalized intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Piikea Avenue is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Piikea Avenue approach has exclusive left-turn and right-turn lanes.

West of the intersection with Piilani Highway, Kulanihakai Street intersects South Kihei Road. At this unsignalized T-intersection, the Kulanihakai Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. South Kihei Road runs parallel to Piilani Highway and serves as an alternate north-south route through Kihei. At the intersection with Kulanihakai Street, the northbound approach of South Kihei Road has a shared through and right-turn lane while the southbound approach has an exclusive left-turn lane and one through lane.

## **B. Traffic Volumes and Conditions**

### **1. General**

#### **a. Field Investigation**

Field investigations were conducted on January 26-27, 2011, and consisted of manual turning movement count surveys in the project vicinity. The manual turning movement count surveys were conducted between the morning peak hours of 6:00 AM and 9:00 AM, and the afternoon peak hours of 3:00 PM and 6:00 PM at the following intersections:

- Piilani Highway and Kaonoulu Street
- Piilani Highway and Kulanihakai Street
- Piilani Highway and E. Waipuilani Road
- Piilani Highway and Piikea Avenue
- Kulanihakai Street and South Kihei Road

Appendix A includes the existing traffic count data.

#### **b. Capacity Analysis Methodology**

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS).

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F";

LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

## 2. Existing Peak Hour Traffic

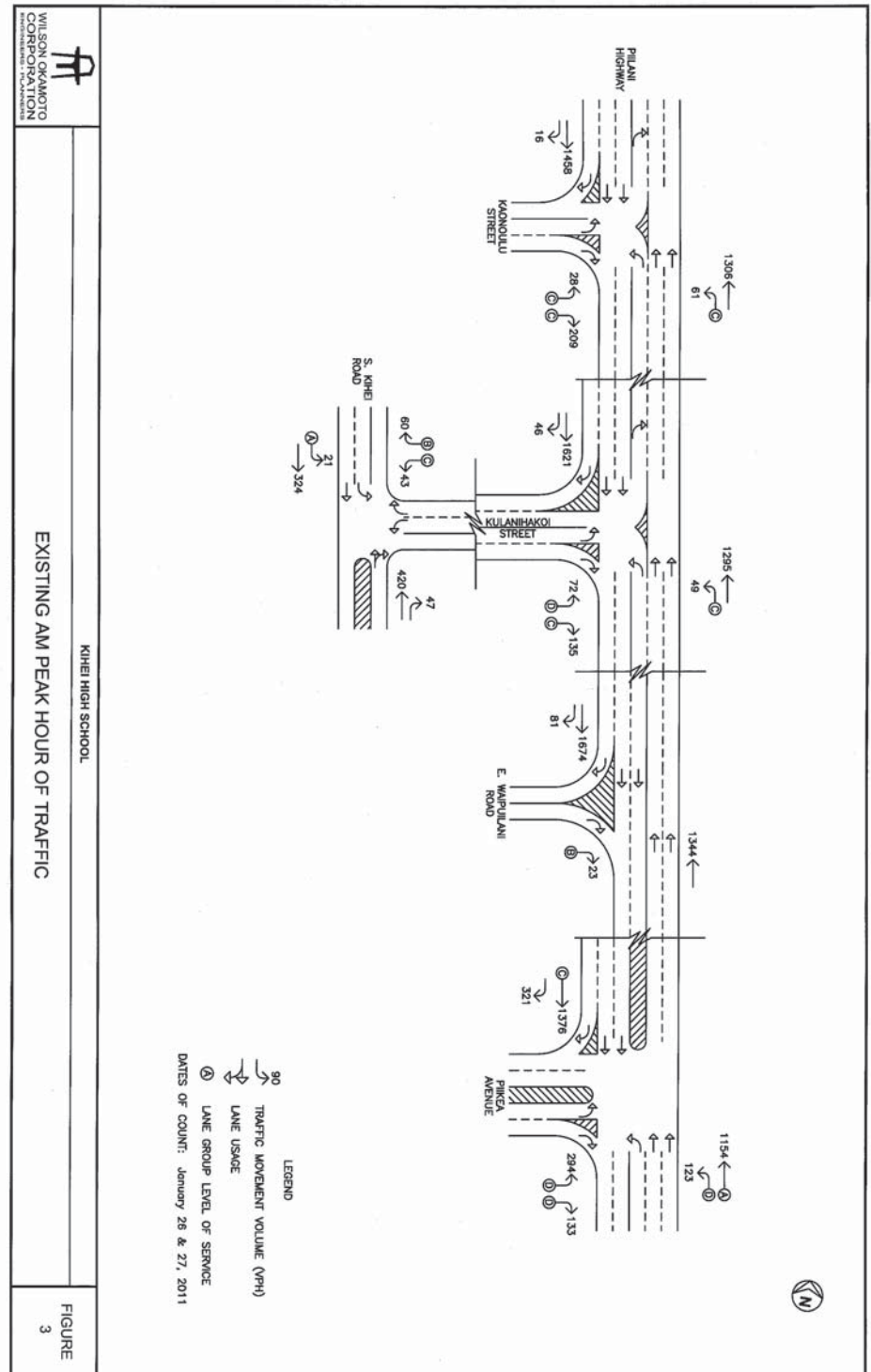
### a. General

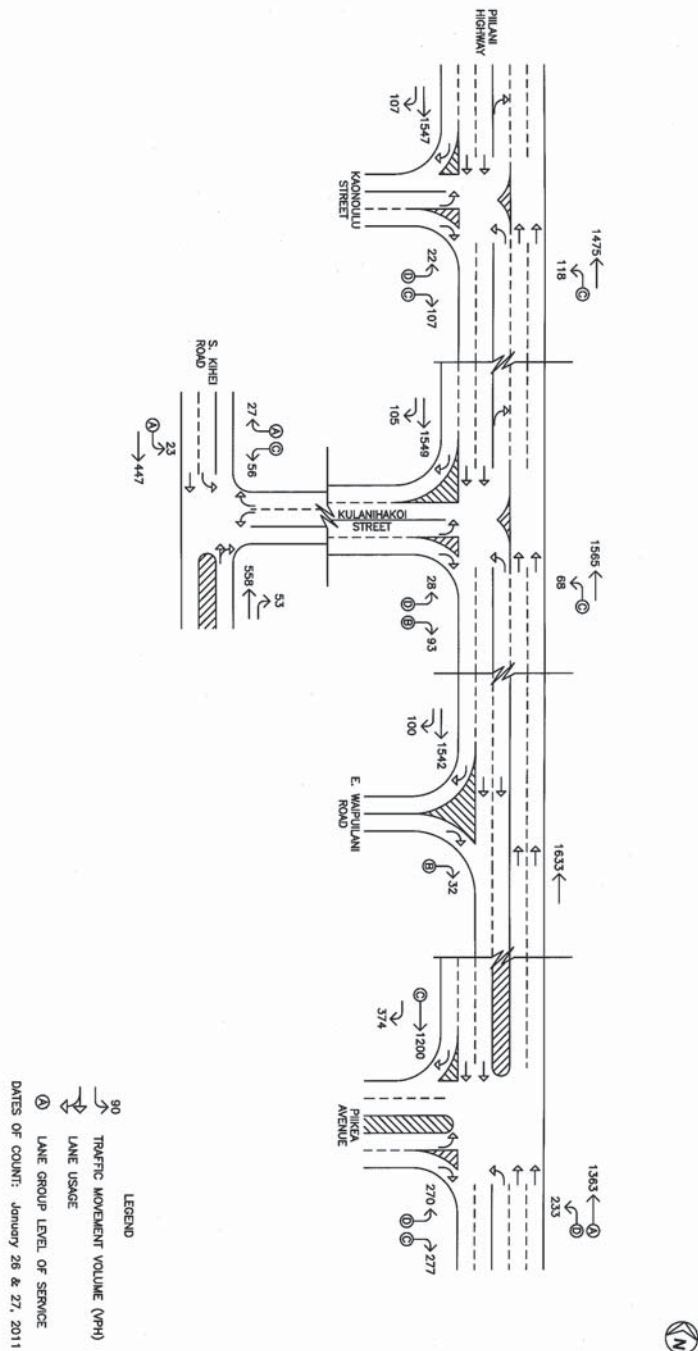
Figures 3 and 4 show the existing AM and PM peak hour traffic volumes and operating traffic conditions. The AM peak hour of traffic generally occurs between the hours of 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

### b. Piilani Highway and Kaonoulu Street

At the intersection with Kaonoulu Street, Piilani Highway carries 1,367 vehicles northbound and 1,474 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 1,593 vehicles traveling northbound and 1,654 vehicles traveling southbound. The critical movement on the highway approaches of the intersection is the northbound left-turn traffic movement which operates at LOS "C" during both peak periods.

The Kaonoulu Street approach of the intersection carries 237 vehicles and 129 vehicles eastbound during the AM and PM peak





### Traffic Impact Report for Kihei High School

periods, respectively. The left-turn traffic movement on this approach operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively, while the right-turn traffic movement operates at LOS "C" during both peak periods. Traffic queues periodically formed on this approach with the average queue lengths of 2-3 vehicles observed during both peak periods.

#### c. Piilani Highway and Kulanihakai Street

At the intersection with Kulanihakai Street, Piilani Highway carries 1,344 vehicles northbound and 1,667 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 1,633 vehicles traveling northbound and 1,654 vehicles traveling southbound. The critical movement on the highway approaches of the intersection is the northbound left-turn traffic movement which operates at LOS "C" during both peak periods.

The Kulanihakai Street approach of the intersection carries 207 vehicles and 121 vehicles eastbound during the AM and PM peak periods, respectively. The left-turn traffic movement on this approach operates at LOS "C" during both peak periods while the right-turn traffic movement operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues periodically formed on this approach with the average queue lengths of 2-4 vehicles observed during both peak periods.

#### d. Piilani Highway and E. Waipuilani Road

At the intersection with E. Waipuilani Road, Piilani Highway carries 1,344 vehicles northbound and 1,755 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 1,633 vehicles traveling northbound and 1,642 vehicles traveling southbound.



The E. Waipuilani Road approach of the intersection carries 23 vehicles and 32 vehicles eastbound during the AM and PM peak periods, respectively. This approach operates at LOS "B" during both peak periods.

**e. Piilani Highway and Piikea Avenue**

At the intersection with Piikea Avenue, Piilani Highway carries 1,277 vehicles northbound and 1,697 vehicles southbound. During the PM peak period, the overall traffic volume is higher with 1,596 vehicles traveling northbound and 1,574 vehicles traveling southbound. The critical movements on the highway approaches of the intersection are the northbound left-turn traffic movement which operates at LOS "D" during both peak periods and the southbound through traffic movement which operates at LOS "C" during both peak periods. Traffic queues periodically formed on the highway approaches of the intersection with the most significant queuing occurring during the PM peak periods. During this period, average queue lengths of 7-9 vehicles were observed on both approaches. These queues were observed to clear the intersection after each traffic signal cycle change.

The Piikea Avenue approach of the intersection carries 427 vehicles and 547 vehicles eastbound during the AM and PM peak periods, respectively. The left-turn traffic movement on this approach operates at LOS "D" during both peak periods while the right-turn traffic movement operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Piikea Avenue approach of the intersection with average queue lengths of 7-9 vehicles observed during both peak periods. Occasionally, queues extended through the upstream intersection with the Piilani Village Shopping Center, but most of these queues were observed to clear the intersection after each traffic signal cycle change.

**f. Kulanihakai Street and South Kihei Road**

At the intersection with South Kihei Road, the Kulanihakai Street approach of the intersection carries 103 vehicles and 83 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on the Kulanihakai Street approach is the left-turn traffic movement which operates at LOS "C" during both peak periods.

The South Kihei Road approaches of the intersection carry 467 vehicles northbound and 342 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 611 vehicles traveling northbound and 470 vehicles traveling southbound. The critical movement on the South Kihei Road approaches of the intersection is the southbound left-turn traffic movement which operates at LOS "A" during both peak periods.

**IV. PROJECTED TRAFFIC CONDITIONS**

**A. Site-Generated Traffic**

**1. Trip Generation Methodology**

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 8<sup>th</sup> Edition," 2008. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per student. As previously stated, high school students from Kihei currently attend high schools in Kahului and Wailuku and these students are expected to transfer to the new high school once it is opened. As provided by the Department of Education (DOE), there are currently 704 students from Kihei attending high schools in other regions. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak hours of traffic to measure the impact resulting from the proposed Kihei High School.



Table 1: Peak Hour Trip Generation

| YEAR 2015                                       |       |                     |
|---|-------|---------------------|
| <b>HIGH SCHOOL (EXISTING STUDENTS)</b>          |       |                     |
| INDEPENDENT VARIABLE: Students = 704 (Existing) |       |                     |
|   |       | PROJECTED TRIP ENDS |
| AM PEAK   | ENTER | 201                 |
|   | EXIT  | 95                  |
|   | TOTAL | 296                 |
| PM PEAK   | ENTER | 43                  |
|   | EXIT  | 49                  |
|   | TOTAL | 92                  |
| <b>HIGH SCHOOL (NEW STUDENTS)</b>               |       |                     |
| INDEPENDENT VARIABLE: Students = 96 (New)       |       |                     |
|   |       | PROJECTED TRIP ENDS |
| AM PEAK   | ENTER | 27                  |
|   | EXIT  | 13                  |
|   | TOTAL | 40                  |
| PM PEAK   | ENTER | 6                   |
|   | EXIT  | 6                   |
|   | TOTAL | 12                  |
| <b>YEAR 2015 SUBTOTAL</b>                       |       |                     |
| INDEPENDENT VARIABLE: Students = 800            |       |                     |
|   |       | PROJECTED TRIP ENDS |
| AM PEAK   | ENTER | 228                 |
|   | EXIT  | 108                 |
|   | TOTAL | 336                 |
| PM PEAK   | ENTER | 49                  |
|   | EXIT  | 55                  |
|   | TOTAL | 104                 |
| <b>YEAR 2025</b>                                |       |                     |
| <b>HIGH SCHOOL (NEW STUDENTS)</b>               |       |                     |
| INDEPENDENT VARIABLE: Students = 850 (New)      |       |                     |
|   |       | PROJECTED TRIP ENDS |
| AM PEAK   | ENTER | 243                 |
|   | EXIT  | 114                 |
|   | TOTAL | 357                 |
| PM PEAK   | ENTER | 52                  |
|   | EXIT  | 59                  |
|   | TOTAL | 111                 |

Table 1: Peak Hour Trip Generation (Cont'd)

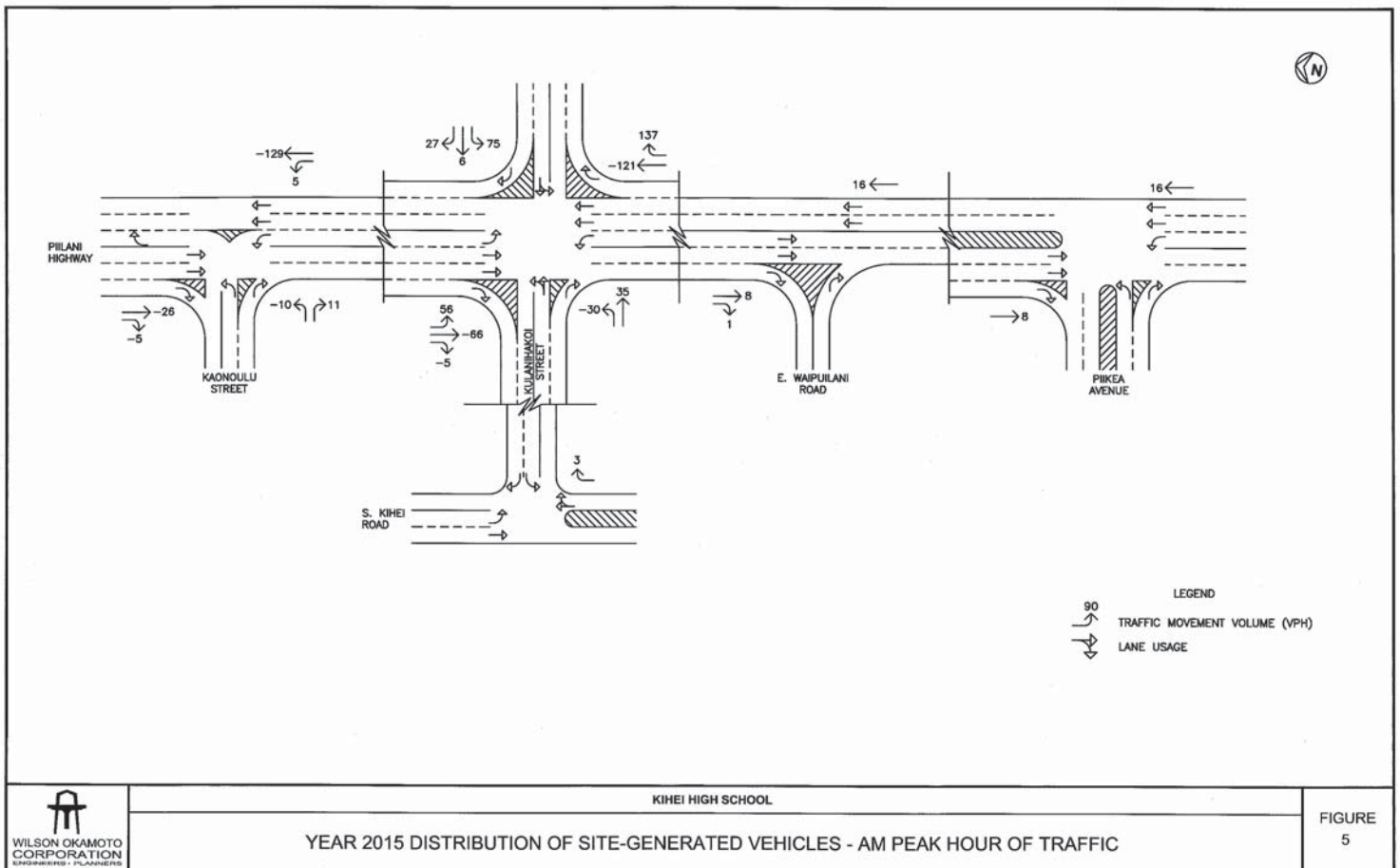
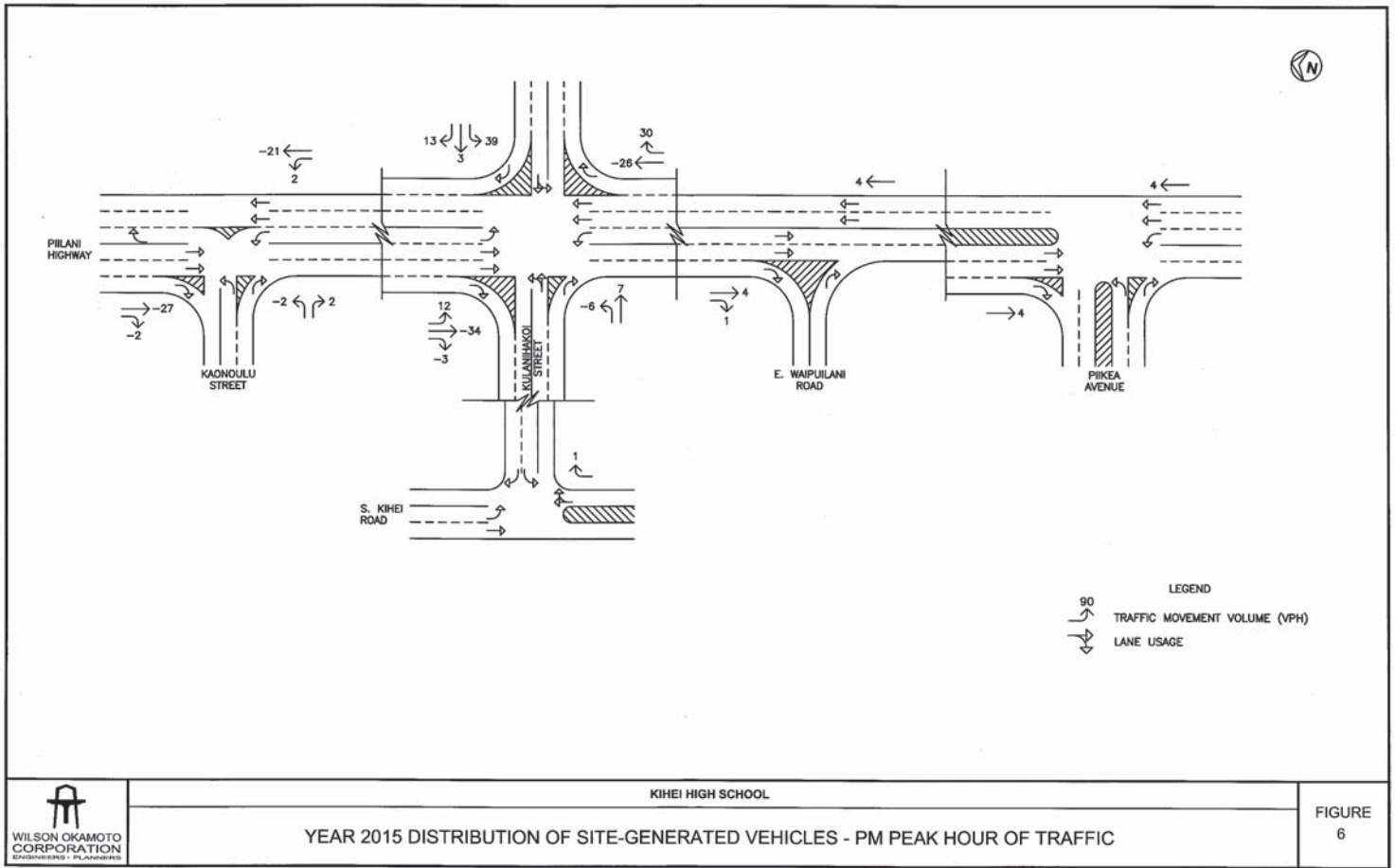
| TOTALS (EXISTING AND NEW STUDENTS) |       |                     |
|------------------------------------|-------|---------------------|
|                                    |       | PROJECTED TRIP ENDS |
| AM PEAK                            | ENTER | 471                 |
|                                    | EXIT  | 222                 |
|                                    | TOTAL | 693                 |
| PM PEAK                            | ENTER | 101                 |
|                                    | EXIT  | 114                 |
|                                    | TOTAL | 215                 |

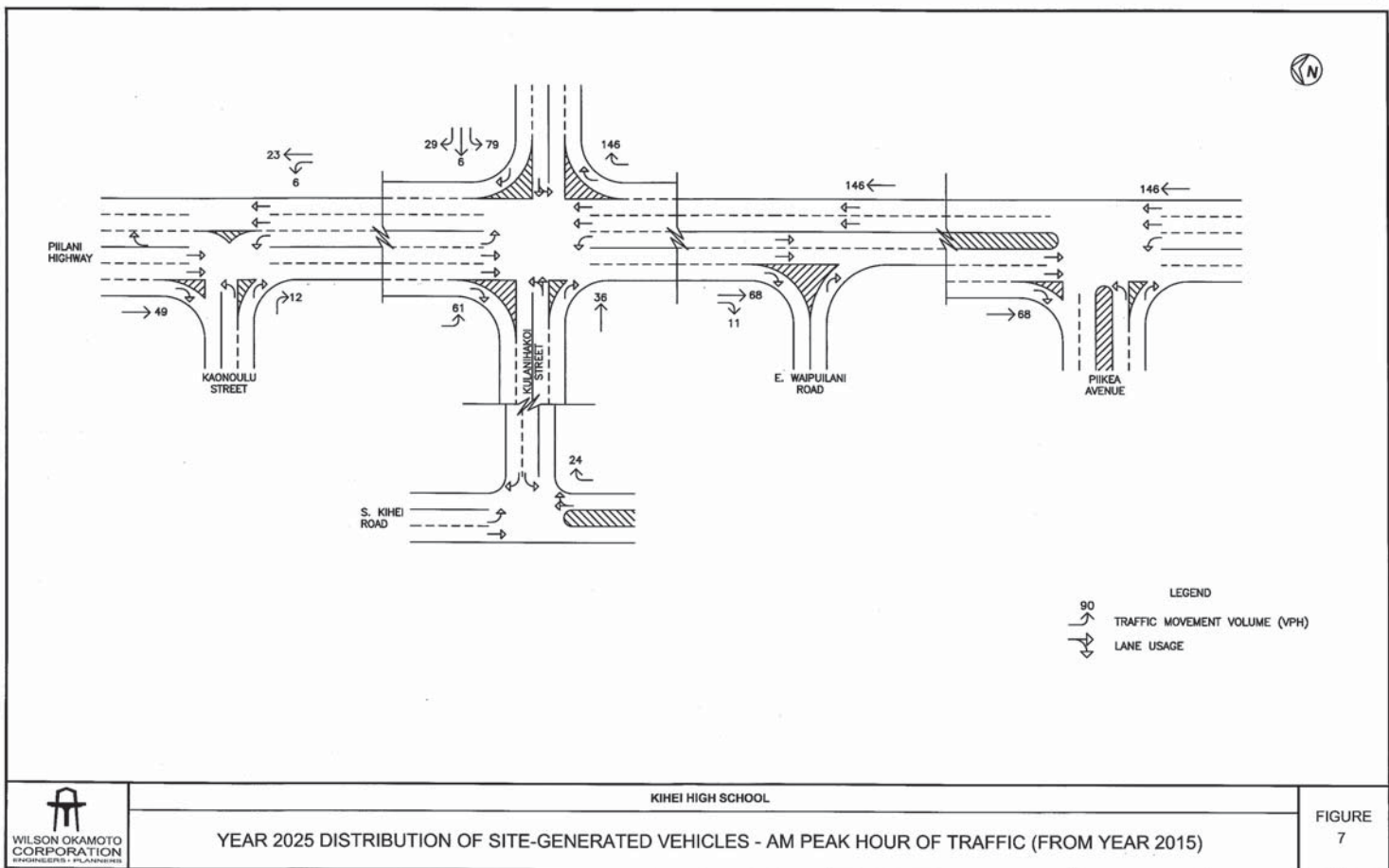
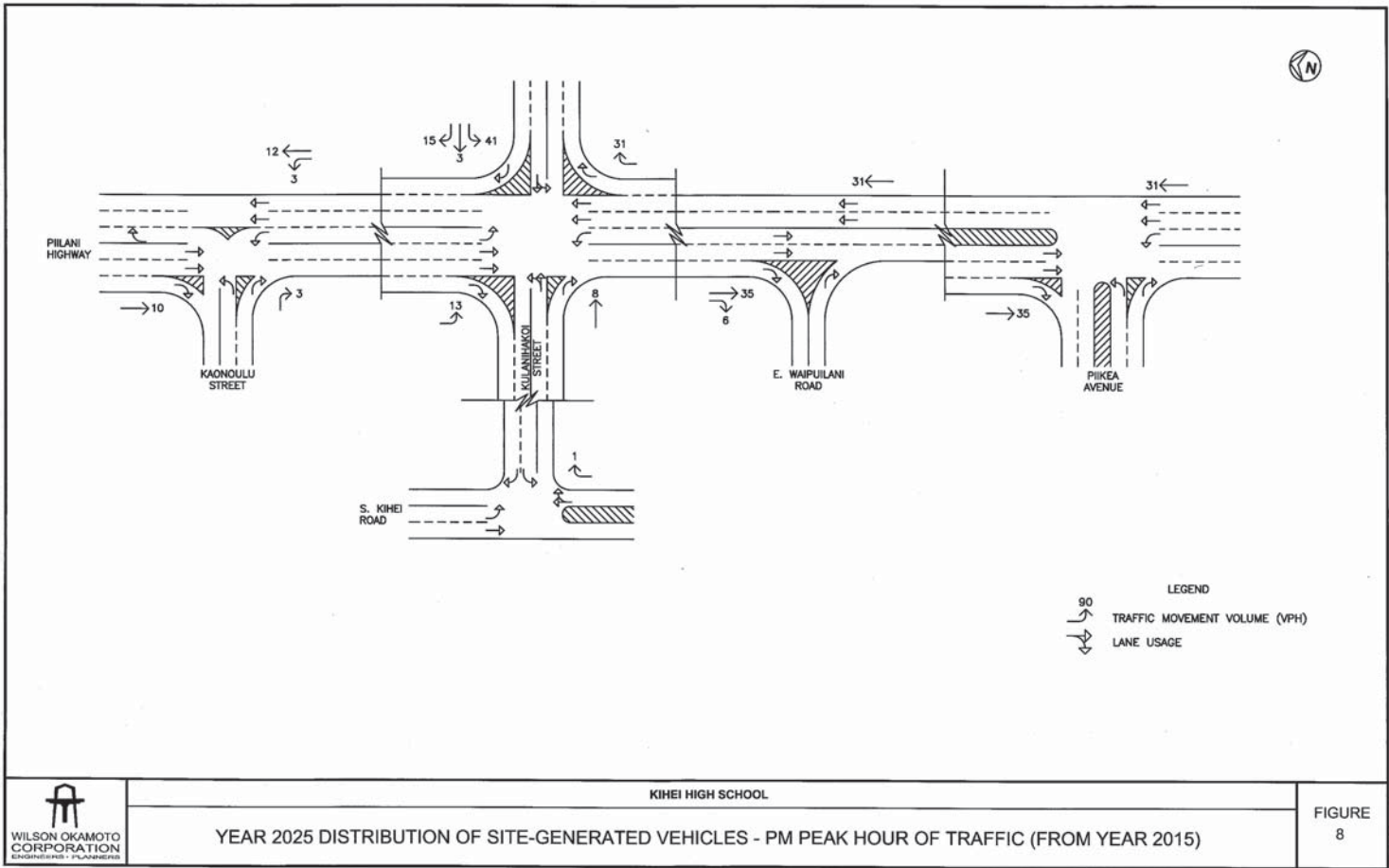
## 2. Trip Distribution

Figures 5 to 8 show the distribution of site-generated vehicular trips at the study intersections during the Year 2015 and Year 2025 AM and PM peak periods. Access to Kihei High School will be provided via new access road off Piilani Highway at the intersection with Kulanihako Street. High School students from Kihei currently attending other schools in Kahului and Wailuku are assumed to already be utilizing Piilani Highway to travel to/from Kihei. As such, trips associated with existing students were reassigned from Piilani Highway to the new high school access. The directional distribution of existing and new trips to/from the high school was based upon the relative distribution of households within the Kihei and Wailea areas and the available routes to/from the new school.

### B. Through Traffic Forecasting Methodology

Historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations in the vicinity of the project site indicates traffic volumes have remained relatively stable and, as such, an annual traffic growth rate of approximately 1.0% per year was conservatively assumed along Piilani Highway and South Kihei Road in the project vicinity. Using 2011 as the Base Year, growth factors of 1.04 and 1.14 were applied to the existing through traffic demands along those roadways to achieve the projected Year 2015 and Year 2025, respectively traffic demands.







### C. Other Considerations

#### 1. Kihei Mauka

The agricultural lands surrounding the project site for the proposed high school are owned by Kaonoulu Ranch and Haleakala Ranch. The ranches have future plans to develop these lands (currently referred to as "Kihei Mauka") that will include residential, commercial, and industrial uses. The project development plan and implementation schedule for this project are not known at this time and, as such, the Kihei Mauka development is not incorporated into projected conditions. It should be noted that the ranches plans currently include connection to the access roadway for the high school. However, once the details of the Kihei Mauka development are known, the ranches should be undertaking a traffic study to assess the development's impact on the surrounding roadways.

#### 2. Piilani Promenade and Maui Outlets Center

The Piilani Promenade and Maui Outlets Center will be located adjacent to Piilani Highway north of the proposed Kihei High School. The two projects are expected to include over 703,000 square feet of retail and restaurant space and include the extension of Kaonoulu Street further east. The project development plan and implementation schedule for these projects are not known at this time and, as such, the Piilani Promenade and Maui Outlets Center are not incorporated into projected conditions. It should be noted once the project details are known, the project developers should be undertaking traffic studies to assess the impact of the projects on the surrounding roadways.

#### 3. Maui Research and Tech Park

The existing Maui Research and Tech Park is located east of Piilani Highway near the intersection with Lipoa Street. The proposed project entails the expansion of the existing tech park, as well as, development of other residential and commercial uses in the surrounding areas. The project development plan and implementation schedule for this project are not known

at this time and, as such, the Maui Research and Tech Park expansion is not incorporated into projected conditions. It should be noted once the project details are known, the project developers should be undertaking traffic studies to assess the impact of the projects on the surrounding roadways.

#### 4. Honua'ula Development

The Honua'ula development will be located on an approximately 670 acre parcel near the end of Piilani Highway. The proposed development will include a maximum of 1,400 residential units (mix of single- and multi-family units), mixed use areas, two golf courses, and a variety of public and private amenities. The project development plan and implementation schedule for this development are not known at this time and, as such, the Honua'ula development is not incorporated into projected conditions.

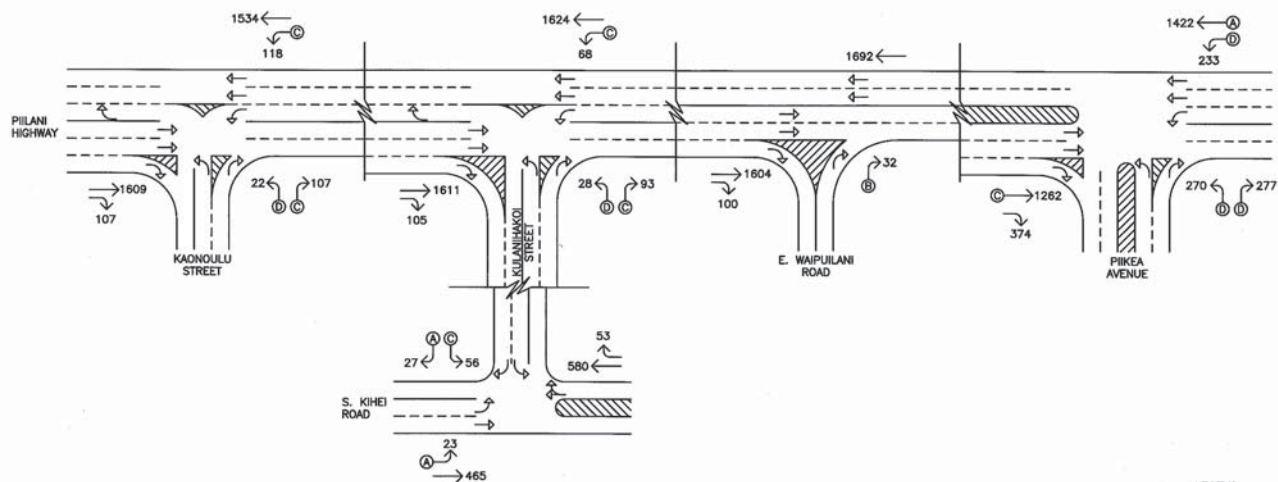
### D. Year 2015 Total Traffic Volumes

#### 1. Without Project

The projected Year 2015 peak hour traffic volumes and operating conditions in the project vicinity without the proposed Kihei High School are shown on Figures 9 and 10, and summarized in Table 2. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

**Table 2: Existing and Projected Year 2015 (Without Project) LOS Traffic Operating Conditions**

| Intersection                 | Critical Traffic Movement/ Approach |    | AM    |                      | PM    |                      |
|------------------------------|-------------------------------------|----|-------|----------------------|-------|----------------------|
|                              |                                     |    | Exist | Year 2015 w/out Proj | Exist | Year 2015 w/out Proj |
| Piilani Hwy/ Kaonoulu St     | Eastbound                           | LT | C     | C                    | D     | D                    |
|                              |                                     | RT | C     | C                    | C     | C                    |
|                              | Northbound                          | LT | C     | C                    | C     | C                    |
| Piilani Hwy/ Kulanihako'i St | Eastbound                           | LT | D     | D                    | D     | D                    |
|                              |                                     | RT | C     | C                    | B     | C                    |
|                              | Northbound                          | LT | C     | C                    | C     | C                    |

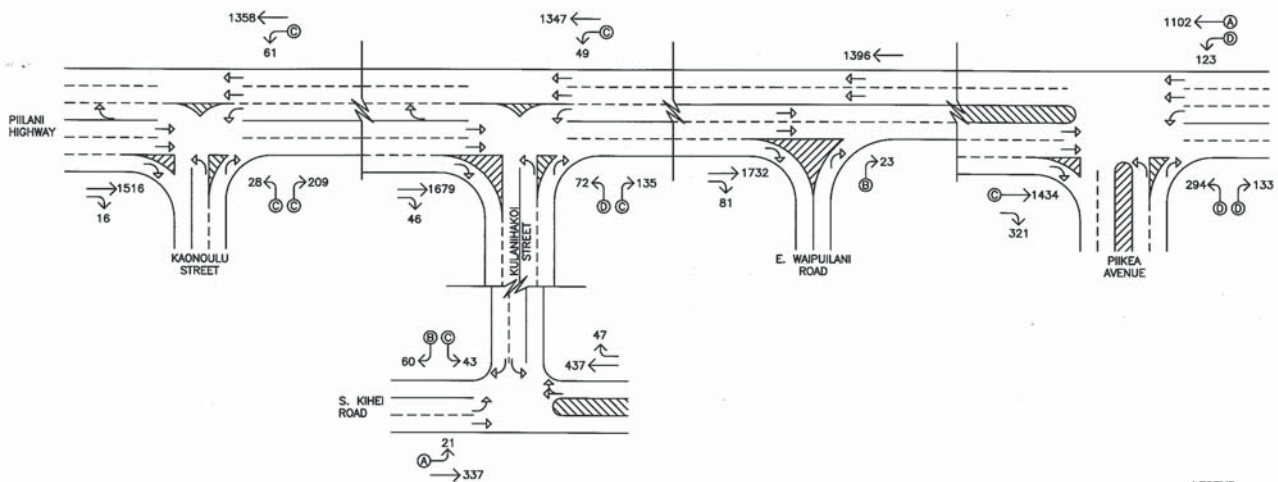


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CORPORATION  
ENGINEERS • PLANNERS

KIHEI HIGH SCHOOL

YEAR 2015 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE  
10



WILSON OKAMOTO  
CORPORATION  
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KIHEI HIGH SCHOOL

YEAR 2015 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE  
9

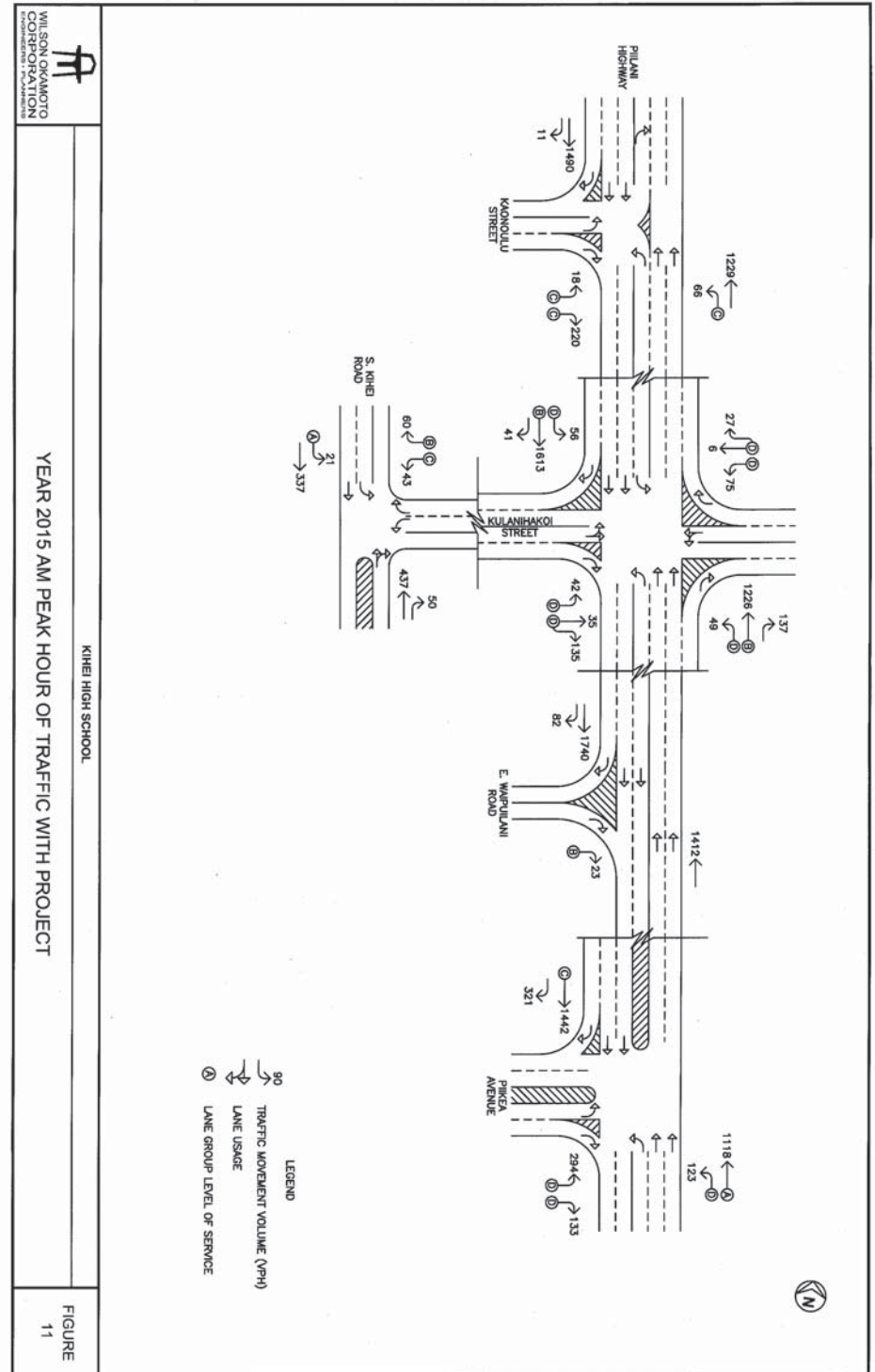
**Table 2: Existing and Projected Year 2015 (Without Project) LOS Traffic Operating Conditions (Cont'd)**

| Intersection                   | Critical Traffic Movement/ Approach |    | AM    |                      | PM    |                      |
|--------------------------------|-------------------------------------|----|-------|----------------------|-------|----------------------|
|                                |                                     |    | Exist | Year 2015 w/out Proj | Exist | Year 2015 w/out Proj |
| Piilani Hwy/ E. Waipuulani Rd  | Eastbound                           | RT | B     | B                    | B     | B                    |
| Piilani Hwy/ Piikea Ave        | Eastbound                           | LT | D     | D                    | D     | D                    |
|                                |                                     | RT | D     | D                    | C     | D                    |
|                                | Northbound                          | LT | D     | D                    | D     | D                    |
|                                | Southbound                          | TH | C     | C                    | C     | C                    |
| Kulanihakoī St/ South Kihei Rd | Westbound                           | LT | C     | C                    | C     | C                    |
|                                | Southbound                          | LT | B     | B                    | A     | A                    |

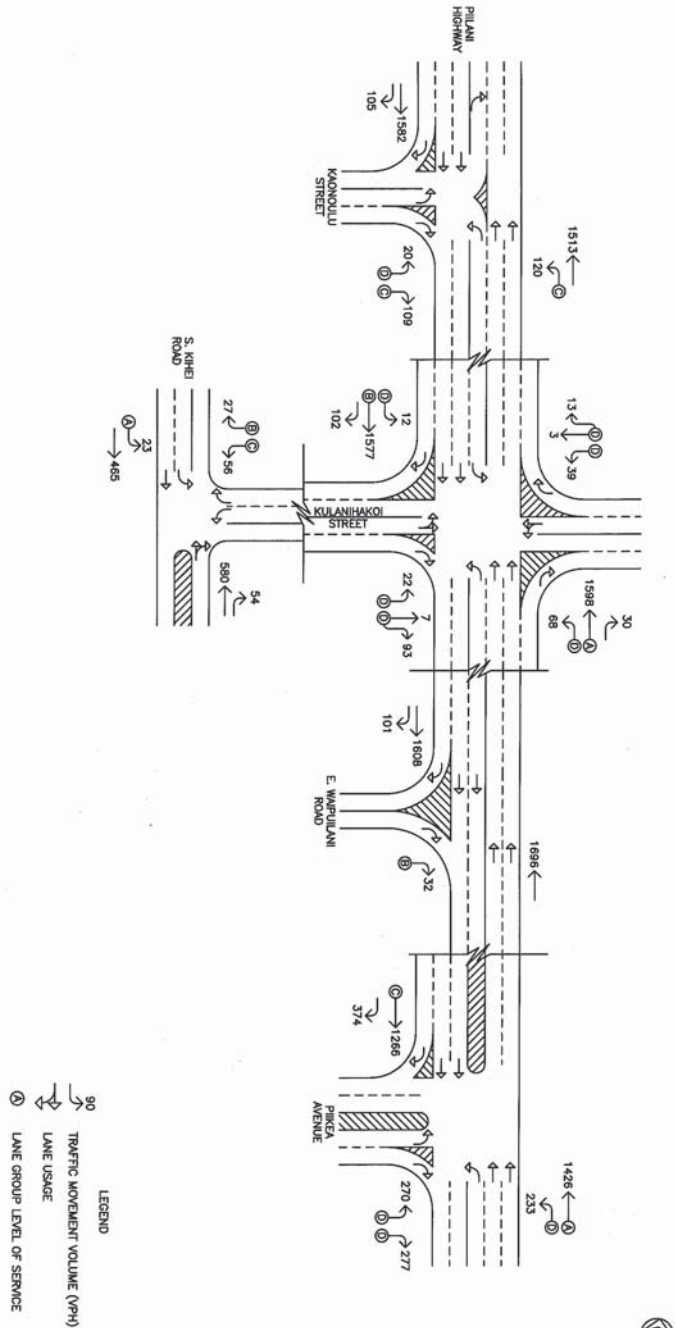
Under Year 2015 without project conditions, traffic operations in the project vicinity are expected to deteriorate slightly from existing conditions due to ambient growth in traffic along the surrounding roadways. The eastbound right-turn traffic movement at the intersection of Piilani Highway and Kulanihakoī Street is expected to deteriorate from LOS "B" to LOS "C" during the PM peak period while the eastbound right-turn traffic movement at the intersection of Piilani Highway and Piikea Avenue is expected to deteriorate from LOS "C" to LOS "D" during the PM peak period. The remaining critical movements at these intersections, as well as, the other study intersections are expected to continue operating at levels of service similar to existing conditions.

## 2. With Project

The Year 2015 cumulative peak hour traffic conditions with the proposed Kihei High School are shown in Figures 11 and 12, and summarized in Table 3. The cumulative volumes consist of site-generated traffic superimposed over Year 2015 projected traffic demands. Due to the anticipated increases in traffic at the intersection of Piilani Highway and







# Traffic Impact Report for Kihei High School

Kulanihakai Street due to ambient growth in traffic and the inclusion of the proposed access for the Kihei High School, a Traffic Signal Warrant Study was undertaken for that intersection (see Appendix E) to determine if a traffic signal system was warranted. Based on existing and projected traffic volumes, the study recommends the installation of a traffic signal system at that intersection. As such, a traffic signal system is assumed to be installed in conjunction with the Kihei High School project by the Year 2015. The projected Year 2015 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 3: Projected Year 2015 (Without and With Project) LOS Traffic Operating Conditions

| Intersection                  | Critical Traffic Movement/ Approach | AM                   |                   | PM                   |                   |
|-------------------------------|-------------------------------------|----------------------|-------------------|----------------------|-------------------|
|                               |                                     | Year 2015 w/out Proj | Year 2015 w/ Proj | Year 2015 w/out Proj | Year 2015 w/ Proj |
| Piilani Hwy/ Kaonoulu St      | Eastbound                           | LT                   | C                 | C                    | D                 |
|                               |                                     | RT                   | C                 | C                    | C                 |
|                               | Northbound                          | LT                   | C                 | C                    | C                 |
| Piilani Hwy/ Kulanihakai St*  | Eastbound                           | LT                   | D                 | D                    | D                 |
|                               |                                     | TH                   | -                 | -                    | -                 |
|                               |                                     | RT                   | C                 | D                    | C                 |
|                               | Westbound                           | LT-TH                | -                 | D                    | -                 |
|                               |                                     | RT                   | -                 | D                    | -                 |
|                               | Northbound                          | LT                   | C                 | D                    | C                 |
|                               |                                     | TH                   | -                 | B                    | -                 |
|                               | Southbound                          | LT                   | -                 | D                    | -                 |
|                               |                                     | TH                   | -                 | B                    | -                 |
| Piilani Hwy/ E. Waipuilani Rd | Eastbound                           | RT                   | B                 | B                    | B                 |

**Table 3: Projected Year 2015 (Without and With Project) LOS Traffic Operating Conditions (Cont'd)**

| Intersection                   | Critical Traffic Movement/ Approach |    | AM                   |                   | PM                   |                   |
|--------------------------------|-------------------------------------|----|----------------------|-------------------|----------------------|-------------------|
|                                |                                     |    | Year 2015 w/out Proj | Year 2015 w/ Proj | Year 2015 w/out Proj | Year 2015 w/ Proj |
| Piilani Hwy/ Piikea Ave        | Eastbound                           | LT | D                    | D                 | D                    | D                 |
|                                |                                     | RT | D                    | D                 | D                    | D                 |
|                                | Northbound                          | LT | D                    | D                 | D                    | D                 |
|                                | Southbound                          | TH | C                    | C                 | C                    | C                 |
| Kulanihakoi St/ South Kihei Rd | Westbound                           | LT | C                    | C                 | C                    | C                 |
|                                | Southbound                          | LT | B                    | B                 | A                    | B                 |

\*Traffic signal system installed in conjunction with the proposed high school.

Under Year 2015 with project conditions, traffic operations in the project vicinity are generally expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Piilani Highway, the critical movements at the intersection with Kaonoulou Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period while those at the intersection and Piikea Avenue are expected to continue operating at LOS "D" during both peak periods. At the intersection of the highway with E. Waipuilani Road, the eastbound approach is expected to continue operating at LOS "B" during both peak periods while the critical movements at the intersection of Kulanihakoi Street and South Kihei Road area expected to continue operating at LOS "C" or better during both peak periods. At the intersection of Piilani Highway and Kulanihakoi Street, the critical movements are expected to operate at LOS "D" or better during both peak periods primarily due to the installation of a traffic signal system at that intersection.

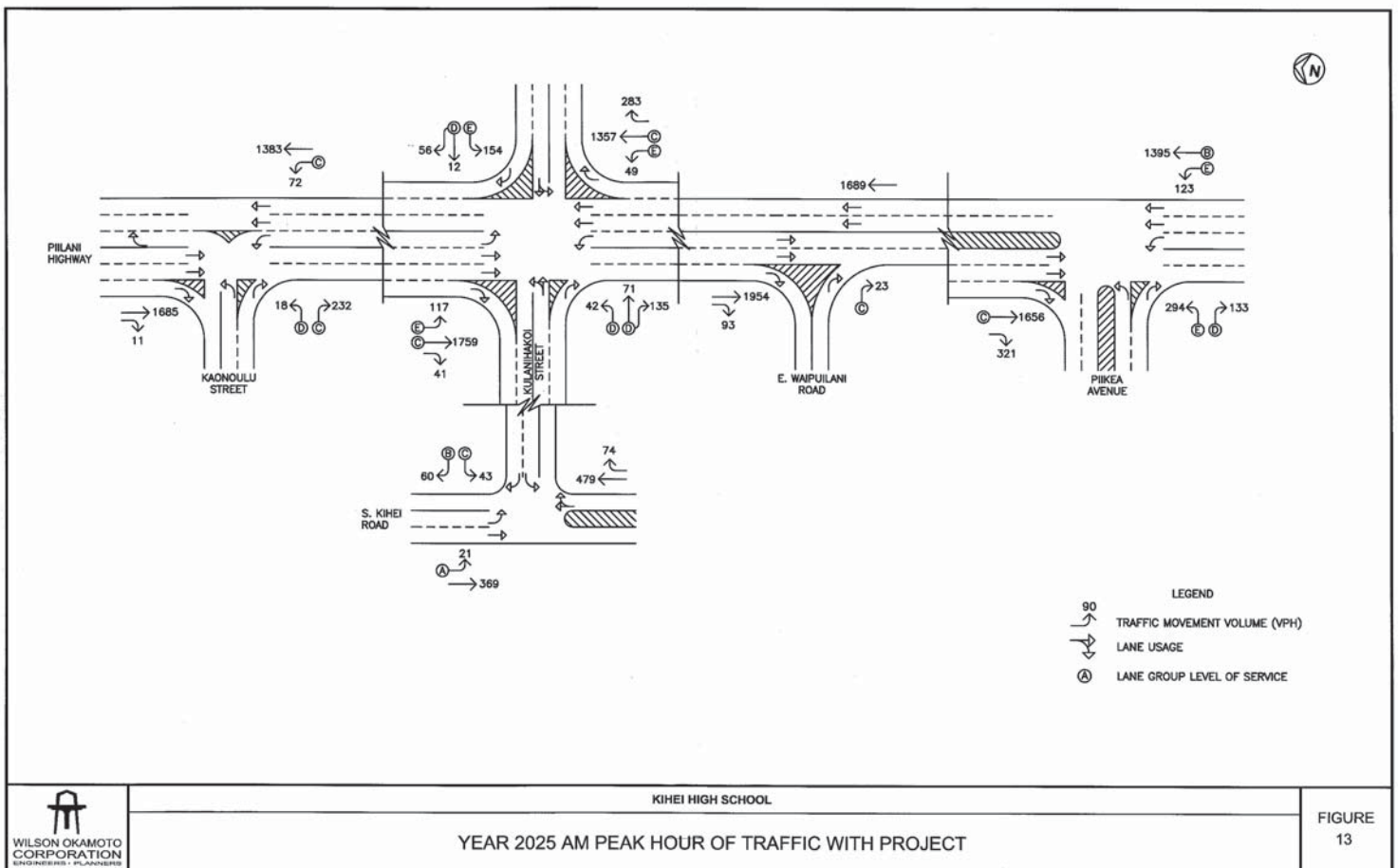
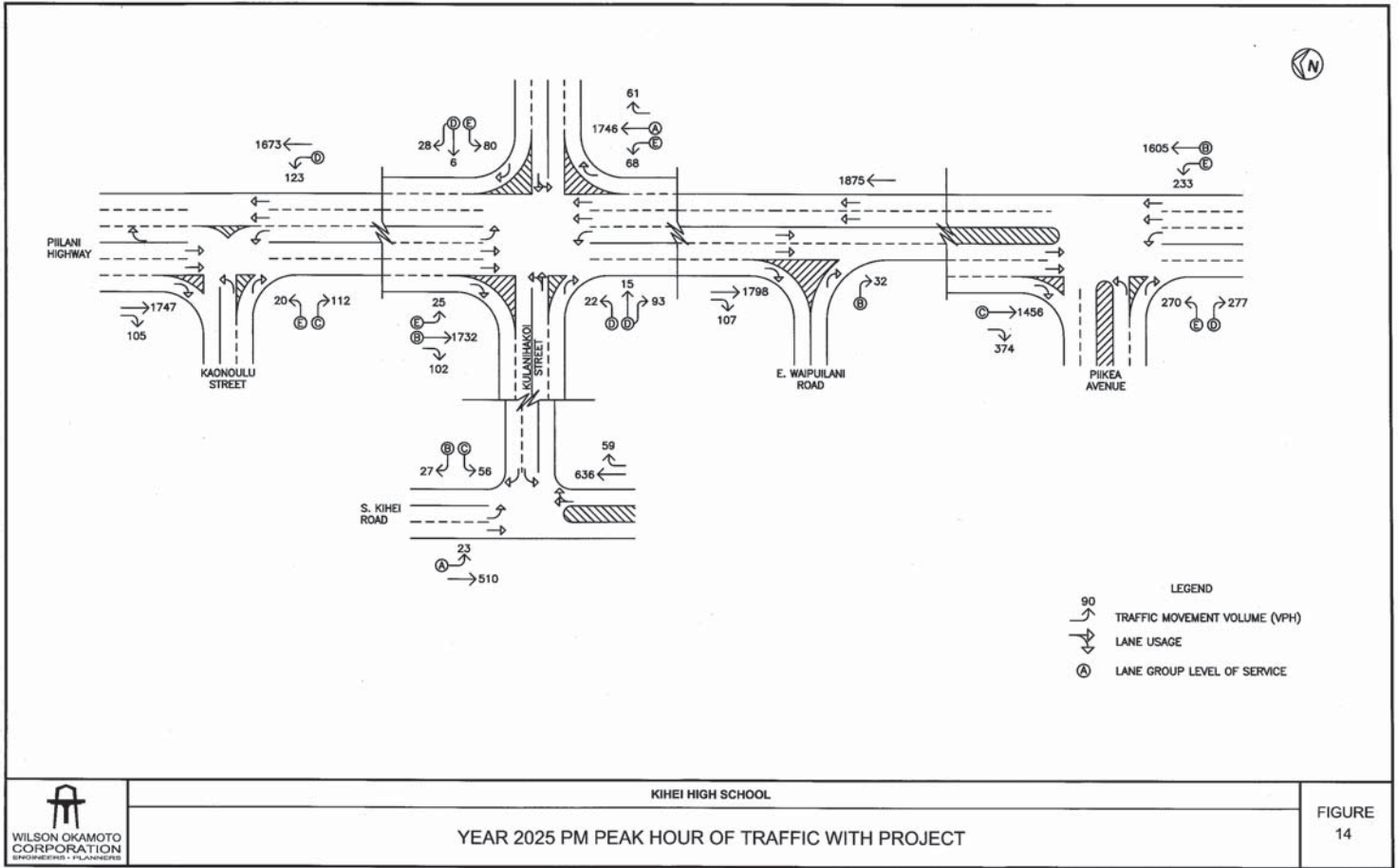
**E. Year 2025 Total Traffic Volumes**

The Year 2025 cumulative peak hour traffic conditions with the proposed Kihei High School are shown in Figures 13 and 14, and summarized in Table 4. The cumulative volumes consist of site-generated traffic superimposed over Year 2025 projected traffic demands. The projected Year 2015 (With Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix G.

**Table 4: Projected Year 2015 (With Project) and Year 2025 (With Project) LOS Traffic Operating Conditions**

| Intersection                  | Critical Traffic Movement/ Approach |       | AM                |                   | PM                |                   |
|-------------------------------|-------------------------------------|-------|-------------------|-------------------|-------------------|-------------------|
|                               |                                     |       | Year 2015 w/ Proj | Year 2025 w/ Proj | Year 2015 w/ Proj | Year 2025 w/ Proj |
| Piilani Hwy/ Kaonoulou St     | Eastbound                           | LT    | C                 | D                 | D                 | E                 |
|                               |                                     | RT    | C                 | C                 | C                 | C                 |
|                               | Northbound                          | LT    | C                 | C                 | C                 | D                 |
| Piilani Hwy/ Kulanihakoi St*  | Eastbound                           | LT-TH | D                 | D                 | D                 | D                 |
|                               |                                     | RT    | D                 | D                 | D                 | D                 |
|                               | Westbound                           | LT-TH | D                 | E                 | D                 | E                 |
|                               |                                     | RT    | D                 | D                 | D                 | D                 |
|                               | Northbound                          | LT    | D                 | E                 | D                 | E                 |
|                               |                                     | TH    | B                 | C                 | A                 | A                 |
|                               | Southbound                          | LT    | D                 | E                 | D                 | E                 |
|                               |                                     | TH    | B                 | C                 | B                 | B                 |
| Piilani Hwy/ E. Waipuilani Rd | Eastbound                           | RT    | B                 | C                 | B                 | B                 |
| Piilani Hwy/ Piikea Ave       | Eastbound                           | LT    | D                 | E                 | D                 | E                 |
|                               |                                     | RT    | D                 | D                 | D                 | D                 |
|                               | Northbound                          | LT    | D                 | E                 | D                 | E                 |
|                               | Southbound                          | TH    | C                 | C                 | C                 | C                 |

\*Traffic signal system installed in conjunction with the proposed high school.





**Table 4: Projected Year 2015 (With Project) and Year 2025 (With Project) LOS Traffic Operating Conditions (Cont'd)**

| Intersection                   | Critical Traffic Movement/ Approach |    | AM                |                   | PM                |                   |
|--------------------------------|-------------------------------------|----|-------------------|-------------------|-------------------|-------------------|
|                                |                                     |    | Year 2015 w/ Proj | Year 2025 w/ Proj | Year 2015 w/ Proj | Year 2025 w/ Proj |
| Kulanihakoi St/ South Kihei Rd | Westbound                           | LT | C                 | C                 | C                 | C                 |
|                                | Southbound                          | LT | B                 | B                 | B                 | B                 |

Under Year 2025 with project conditions, traffic operations in the project vicinity are expected to deteriorate slightly from Year 2015 with project conditions primarily due to ambient growth in traffic along the surrounding roadways. Along Piilani Highway, the critical movements at the intersection with Kaonoulu Street are expected to operate at LOS "D" or better during the AM peak period and LOS "E" or better during the PM peak period while those at the intersections with Kulanihakoi Street and Piikei Avenue are expected to operate at LOS "E" or better during both peak periods. At the intersection of the highway with E. Waipuulani Road, the eastbound approach is expected to operate at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Along South Kihei Road, the critical movements at the intersection with Kulanihakoi Street are expected to operate at LOS "C" or better during both peak periods.

## V. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be implemented prior to the opening of Kihei High School in the Year 2015:

1. Maintain sufficient sight distance for motorists to safely enter and exit all project roadways.
2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

4. Provide sufficient turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
5. Provide an exclusive right-turn lane and shared left-turn and through lane on the access road approach from the high school at the intersection with Piilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
6. Provide a channelized northbound deceleration lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
7. Provide a channelized northbound acceleration lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
8. Provide an exclusive southbound left-turn lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
9. Provide two eastbound departure lanes along the access road for the high school from the intersection with Piilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
10. Modify the eastbound approach of Kulanihakoi Street at the intersection with Piilani Highway and the access road for the high school to provide an exclusive right-turn lane and a shared left-turn and through lane. The layout and dimension of these lanes should be determined during the design phase of the project.
11. Install a traffic signal system at the intersection of Piilani Highway with Kulanihakoi Street and the access road for the high school. The layout, phasing, and timing of this signal system should be determined during the design phase of the project.
12. Prepare a Traffic Management Plan for the high school to minimize the impact of school related vehicles on the surrounding roadways. This plan should address daily school and special event traffic.
13. Consider preparing Traffic Assessment Reports periodically (every 5 years at a minimum) once the high school is opened to verify projected traffic conditions in the vicinity and assess the effectiveness of traffic management strategies implemented by the high school.

## **VI. CONCLUSION**

High school students that reside in Kihei currently have to attend Maui High School in Kahului or Baldwin High School in Wailuku. The proposed Kihei High School will allow these students to attend a high school in their district. The proposed high school will include classrooms, support facilities, and athletic facilities to support an initial enrollment of 800 students with an ultimate enrollment of 1,650 students expected within 10 years. With the development of the proposed high school, traffic operations upon opening are expected to remain similar to without project conditions primarily due to the provision of turning lanes and a traffic signal system at the intersection of Piilani Highway with Kulanihakoi Street and the access road for the high school. By the Year 2025, traffic operations in the vicinity are expected to deteriorate slightly primarily due to ambient growth in traffic along the surrounding roadways. As such, the preparation of a Traffic Management Plan for the high school is recommended to minimize the impact of school related traffic on the surrounding roadways.

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## **APPENDIX A EXISTING TRAFFIC COUNT DATA**

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**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:5671, 5674  
Counted By:DB and DF  
Weather:ClearFile Name : KaopiiPM  
Site Code : 00000006  
Start Date : 1/26/2011  
Page No : 1

## Groups Printed- Unshifted

| Start Time  | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Kainoulu Street Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total |            |
| 02:00 PM    | 0                         | 340  | 13    | 0    | 353        | 0         | 23                        | 328  | 0     | 0    | 351        | 6                         | 0    | 31    | 0    | 37         | 741        |
| 02:15 PM    | 0                         | 312  | 11    | 0    | 323        | 0         | 22                        | 438  | 0     | 0    | 460        | 7                         | 0    | 25    | 0    | 32         | 815        |
| 02:30 PM    | 0                         | 306  | 10    | 0    | 316        | 0         | 28                        | 471  | 0     | 0    | 499        | 3                         | 0    | 37    | 0    | 40         | 855        |
| 02:45 PM    | 0                         | 352  | 9     | 0    | 361        | 0         | 38                        | 393  | 0     | 0    | 431        | 1                         | 0    | 67    | 0    | 68         | 860        |
| Total       | 0                         | 1310 | 43    | 0    | 1353       | 0         | 111                       | 1630 | 0     | 0    | 1741       | 17                        | 0    | 160   | 0    | 177        | 3271       |
| 03:00 PM    | 0                         | 414  | 9     | 0    | 423        | 0         | 17                        | 351  | 0     | 0    | 368        | 3                         | 0    | 27    | 0    | 30         | 821        |
| 03:15 PM    | 0                         | 388  | 12    | 0    | 400        | 0         | 19                        | 387  | 0     | 0    | 406        | 4                         | 0    | 30    | 0    | 34         | 840        |
| 03:30 PM    | 0                         | 393  | 12    | 0    | 405        | 0         | 27                        | 433  | 0     | 0    | 460        | 7                         | 0    | 29    | 0    | 36         | 901        |
| 03:45 PM    | 0                         | 401  | 4     | 0    | 405        | 0         | 36                        | 335  | 0     | 0    | 371        | 5                         | 0    | 33    | 0    | 38         | 814        |
| Total       | 0                         | 1596 | 37    | 0    | 1633       | 0         | 99                        | 1506 | 0     | 0    | 1605       | 19                        | 0    | 119   | 0    | 138        | 3376       |
| 04:00 PM    | 0                         | 456  | 16    | 0    | 472        | 0         | 23                        | 346  | 0     | 0    | 369        | 3                         | 0    | 23    | 0    | 26         | 867        |
| 04:15 PM    | 0                         | 367  | 8     | 0    | 375        | 0         | 28                        | 431  | 0     | 0    | 459        | 8                         | 0    | 19    | 0    | 27         | 861        |
| 04:30 PM    | 0                         | 379  | 11    | 0    | 390        | 0         | 32                        | 371  | 0     | 0    | 403        | 6                         | 0    | 36    | 0    | 42         | 835        |
| 04:45 PM    | 0                         | 395  | 13    | 0    | 408        | 0         | 22                        | 265  | 0     | 0    | 287        | 3                         | 0    | 30    | 0    | 33         | 728        |
| Total       | 0                         | 1597 | 48    | 0    | 1645       | 0         | 105                       | 1413 | 0     | 0    | 1518       | 20                        | 0    | 108   | 0    | 128        | 3291       |
| 05:00 PM    | 0                         | 363  | 12    | 0    | 375        | 0         | 30                        | 320  | 0     | 0    | 350        | 4                         | 0    | 22    | 0    | 26         | 751        |
| 05:15 PM    | 0                         | 369  | 11    | 0    | 380        | 0         | 18                        | 328  | 0     | 0    | 346        | 5                         | 0    | 26    | 0    | 31         | 757        |
| 05:30 PM    | 0                         | 305  | 13    | 0    | 318        | 0         | 22                        | 294  | 0     | 0    | 316        | 7                         | 0    | 30    | 0    | 37         | 671        |
| 05:45 PM    | 0                         | 318  | 10    | 0    | 328        | 0         | 18                        | 223  | 0     | 0    | 241        | 4                         | 0    | 32    | 0    | 36         | 605        |
| Total       | 0                         | 1355 | 46    | 0    | 1401       | 0         | 88                        | 1165 | 0     | 0    | 1253       | 20                        | 0    | 110   | 0    | 130        | 2784       |
| Grand Total | 0                         | 5858 | 174   | 0    | 6032       | 0         | 403                       | 5714 | 0     | 0    | 6117       | 76                        | 0    | 497   | 0    | 573        | 12722      |
| Approch %   | 0                         | 97.1 | 2.9   | 0    |            | 0         | 6.5                       | 93.4 | 0     | 0    |            | 13.3                      | 0    | 86.7  | 0    |            |            |
| Total %     | 0                         | 46   | 1.4   | 0    | 47.4       | 0         | 3.2                       | 44.9 | 0     | 0    | 48.1       | 0.6                       | 0    | 3.9   | 0    | 4.5        |            |

| Start Time   | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Kaonolu Street Eastbound |      |       |      |            | Int. Total |
|--|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|------------|
|  | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1 |                           |      |       |      |            |           |                           |      |       |      |            |                          |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 03:30 PM       |                           |      |       |      |            |           |                           |      |       |      |            |                          |      |       |      |            |            |
| 03:30 PM   | 0                         | 393  | 12    | 0    | 405        | 0         | 27                        | 433  | 0     | 0    | 460        | 7                        | 0    | 29    | 0    | 36         | 901        |
| 03:45 PM   | 0                         | 401  | 4     | 0    | 405        | 0         | 36                        | 335  | 0     | 0    | 371        | 5                        | 0    | 33    | 0    | 38         | 814        |
| 04:00 PM   | 0                         | 456  | 16    | 0    | 472        | 0         | 23                        | 346  | 0     | 0    | 369        | 3                        | 0    | 23    | 0    | 26         | 867        |
| 04:15 PM   | 0                         | 367  | 8     | 0    | 375        | 0         | 28                        | 431  | 0     | 0    | 459        | 8                        | 0    | 19    | 0    | 27         | 861        |
| Total Volume   | 0                         | 1617 | 40    | 0    | 1657       | 0         | 114                       | 1545 | 0     | 0    | 1659       | 23                       | 0    | 104   | 0    | 127        | 3443       |
| % App. Total   | 0                         | 97.6 | 2.4   | 0    |            | 0         | 6.9                       | 93.1 | 0     | 0    |            | 13.1                     | 0    | 81.9  | 0    |            |            |
| PHF  | .000                      | .887 | .625  | .000 | .878       | .000      | .792                      | .892 | .000  | .000 | .902       | .719                     | .000 | .788  | .000 | .836       | .955       |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:5671/5674  
Counted By:DB and DF  
Weather:ClearFile Name : KaopiiAM  
Site Code : 00000006  
Start Date : 1/26/2011  
Page No : 1

## Groups Printed- Unshifted

| Start Time  | Pilihi Highway Southbound |      |       |      |            | Kainoulu Street Westbound |      |       |      |            | Pilihi Highway Northbound |      |       |      |            | Kainoulu Street Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total |            |
| 06:00 AM    | 0                         | 114  | 2     | 0    | 116        | 0                         | 0    | 0     | 0    | 0          | 4                         | 106  | 0     | 0    | 110        | 3                         | 0    | 5     | 0    | 8          | 234        |
| 06:15 AM    | 0                         | 180  | 5     | 0    | 185        | 0                         | 0    | 0     | 0    | 0          | 1                         | 131  | 0     | 0    | 132        | 9                         | 0    | 16    | 0    | 25         | 342        |
| 06:30 AM    | 0                         | 209  | 0     | 0    | 209        | 0                         | 0    | 0     | 0    | 0          | 5                         | 222  | 0     | 0    | 227        | 3                         | 0    | 17    | 0    | 20         | 456        |
| 06:45 AM    | 0                         | 235  | 7     | 0    | 242        | 0                         | 0    | 0     | 0    | 0          | 8                         | 282  | 0     | 0    | 290        | 6                         | 0    | 33    | 0    | 39         | 571        |
| Total       | 0                         | 738  | 14    | 0    | 752        | 0                         | 0    | 0     | 0    | 0          | 18                        | 741  | 0     | 0    | 759        | 21                        | 0    | 71    | 0    | 92         | 1603       |
| 07:00 AM    | 0                         | 268  | 0     | 0    | 268        | 0                         | 0    | 0     | 0    | 0          | 11                        | 292  | 0     | 0    | 303        | 7                         | 0    | 29    | 0    | 36         | 607        |
| 07:15 AM    | 0                         | 393  | 6     | 0    | 399        | 0                         | 0    | 0     | 0    | 0          | 11                        | 328  | 0     | 0    | 339        | 6                         | 0    | 63    | 0    | 69         | 807        |
| 07:30 AM    | 0                         | 403  | 4     | 0    | 407        | 0                         | 0    | 0     | 0    | 0          | 18                        | 341  | 0     | 0    | 359        | 10                        | 0    | 61    | 0    | 71         | 837        |
| 07:45 AM    | 0                         | 327  | 4     | 0    | 331        | 0                         | 0    | 0     | 0    | 0          | 21                        | 335  | 0     | 0    | 356        | 5                         | 0    | 42    | 0    | 47         | 734        |
| Total       | 0                         | 1391 | 14    | 0    | 1405       | 0                         | 0    | 0     | 0    | 0          | 61                        | 1296 | 0     | 0    | 1357       | 28                        | 0    | 195   | 0    | 223        | 2985       |
| 08:00 AM    | 0                         | 345  | 2     | 0    | 347        | 0                         | 0    | 0     | 0    | 0          | 11                        | 299  | 0     | 0    | 310        | 7                         | 0    | 45    | 0    | 52         | 709        |
| 08:15 AM    | 0                         | 286  | 5     | 0    | 291        | 0                         | 0    | 0     | 0    | 0          | 13                        | 258  | 0     | 0    | 271        | 8                         | 0    | 37    | 0    | 45         | 607        |
| 08:30 AM    | 0                         | 270  | 6     | 0    | 276        | 0                         | 0    | 0     | 0    | 0          | 13                        | 329  | 0     | 0    | 342        | 4                         | 0    | 31    | 0    | 35         | 653        |
| 08:45 AM    | 0                         | 267  | 7     | 0    | 274        | 0                         | 0    | 0     | 0    | 0          | 11                        | 296  | 0     | 0    | 307        | 7                         | 0    | 40    | 0    | 47         | 628        |
| Total       | 0                         | 1168 | 20    | 0    | 1188       | 0                         | 0    | 0     | 0    | 0          | 48                        | 1182 | 0     | 0    | 1230       | 26                        | 0    | 153   | 0    | 179        | 2597       |
| Grand Total | 0                         | 3297 | 48    | 0    | 3345       | 0                         | 0    | 0     | 0    | 0          | 127                       | 3219 | 0     | 0    | 3346       | 75                        | 0    | 419   | 0    | 494        | 7185       |
| Approch %   | 0                         | 98.6 | 1.4   | 0    |            | 0                         | 0    | 0     | 0    | 0          | 3.8                       | 96.2 | 0     | 0    |            | 15.2                      | 0    | 84.8  | 0    |            |            |
| Total %     | 0                         | 45.9 | 0.7   | 0    | 46.6       | 0                         | 0    | 0     | 0    | 0          | 1.8                       | 44.8 | 0     | 0    | 46.6       | 1                         | 0    | 5.8   | 0    | 6.9        |            |

|  | Pilihi Highway Southbound |      |       |      |            | Kainoulu Street Westbound |      |       |      |            | Pilihi Highway Northbound |      |       |      |            | Kainoulu Street 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 06:00 AM to 08:45 AM - Peak 1 of 1 |                           |      |       |      |            |                           |      |       |      |            |                           |      |       |      |            |                           |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                           |      |       |      |            |                           |      |       |      |            |                           |      |       |      |            |                           |      |       |      |            |            |
| 07:15 AM   | 0                         | 393  | 6     | 0    | 399        | 0                         | 0    | 0     | 0    | 0          | 11                        | 328  | 0     | 0    | 339        | 6                         | 0    | 63    | 0    | 69         | 807        |
| 07:30 AM   | 0                         | 403  | 4     | 0    | 407        | 0                         | 0    | 0     | 0    | 0          | 18                        | 341  | 0     | 0    | 359        | 10                        | 0    | 61    | 0    | 71         | 837        |
| 07:45 AM   | 0                         | 327  | 4     | 0    | 331        | 0                         | 0    | 0     | 0    | 0          | 21                        | 335  | 0     | 0    | 356        | 5                         | 0    | 42    | 0    | 47         | 734        |
| 08:00 AM   | 0                         | 345  | 2     | 0    | 347        | 0                         | 0    | 0     | 0    | 0          | 11                        | 299  | 0     | 0    | 310        | 7                         | 0    | 45    | 0    | 52         | 709        |
| Total Volume   | 0                         | 1468 | 16    | 0    | 1484       | 0                         | 0    | 0     | 0    | 0          | 61                        | 1303 | 0     | 0    | 1364       | 28                        | 0    | 211   | 0    | 239        | 3087       |
| % App. Total   | 0                         | 98.9 | 1.1   | 0    |            | 0                         | 0    | 0     | 0    | 0          | 4.5                       | 95.5 | 0     | 0    |            | 11.7                      | 0    | 88.3  | 0    |            |            |
| PHF  | .000                      | .911 | .667  | .000 | .912       | .000                      | .000 | .000  | .000 | .000       | .728                      | .955 | .000  | .000 | .950       | .700                      | .000 | .637  | .000 | .842       | .922       |



# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400  
Honolulu, HI 96826

Counter:3890/5675  
Counted By:SH and NH  
Weather:Clear

File Name : KulpilPM  
Site Code : 00000007  
Start Date : 1/26/2011  
Page No : 1

| Groups Printed- Unshifted |      |      |       |      |           |                             |      |       |      |           |                           |      |       |      |           |                             |      |       |      |           |            |  |  |
|---------------------------|------|------|-------|------|-----------|-----------------------------|------|-------|------|-----------|---------------------------|------|-------|------|-----------|-----------------------------|------|-------|------|-----------|------------|--|--|
| Pilihi Highway Southbound |      |      |       |      |           | Kulanihako Street Westbound |      |       |      |           | Pilihi Highway Northbound |      |       |      |           | Kulanihako Street 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 |  |  |
| 02:00 PM                  | 0    | 328  | 24    | 0    | 352       | 0                           | 0    | 0     | 0    | 0         | 11                        | 311  | 0     | 0    | 322       | 30                          | 0    | 21    | 0    | 51        | 725        |  |  |
| 02:15 PM                  | 0    | 387  | 24    | 0    | 411       | 0                           | 0    | 0     | 0    | 0         | 13                        | 403  | 0     | 0    | 416       | 29                          | 0    | 14    | 0    | 43        | 870        |  |  |
| 02:30 PM                  | 0    | 365  | 29    | 0    | 394       | 0                           | 0    | 0     | 0    | 0         | 16                        | 392  | 0     | 0    | 408       | 36                          | 0    | 16    | 0    | 52        | 854        |  |  |
| 02:45 PM                  | 0    | 416  | 30    | 0    | 446       | 0                           | 0    | 0     | 0    | 0         | 10                        | 405  | 0     | 0    | 415       | 39                          | 0    | 37    | 0    | 76        | 937        |  |  |
| Total                     | 0    | 1496 | 107   | 0    | 1603      | 0                           | 0    | 0     | 0    | 0         | 50                        | 1511 | 0     | 0    | 1561      | 134                         | 0    | 88    | 0    | 222       | 3386       |  |  |
| 03:00 PM                  | 0    | 414  | 29    | 0    | 443       | 0                           | 0    | 0     | 0    | 0         | 12                        | 325  | 0     | 0    | 337       | 23                          | 0    | 19    | 0    | 42        | 822        |  |  |
| 03:15 PM                  | 0    | 408  | 20    | 0    | 428       | 0                           | 0    | 0     | 0    | 0         | 16                        | 398  | 0     | 0    | 414       | 7                           | 0    | 19    | 0    | 26        | 868        |  |  |
| 03:30 PM                  | 0    | 393  | 18    | 0    | 411       | 0                           | 0    | 0     | 0    | 0         | 17                        | 413  | 0     | 0    | 430       | 7                           | 0    | 31    | 0    | 38        | 879        |  |  |
| 03:45 PM                  | 0    | 403  | 29    | 0    | 432       | 0                           | 0    | 0     | 0    | 0         | 13                        | 418  | 0     | 0    | 431       | 9                           | 0    | 31    | 0    | 40        | 903        |  |  |
| Total                     | 0    | 1618 | 96    | 0    | 1714      | 0                           | 0    | 0     | 0    | 0         | 58                        | 1554 | 0     | 0    | 1612      | 46                          | 0    | 100   | 0    | 146       | 3472       |  |  |
| 04:00 PM                  | 0    | 469  | 23    | 0    | 492       | 0                           | 0    | 0     | 0    | 0         | 19                        | 344  | 0     | 0    | 363       | 7                           | 0    | 18    | 0    | 25        | 880        |  |  |
| 04:15 PM                  | 0    | 347  | 28    | 0    | 375       | 0                           | 0    | 0     | 0    | 0         | 19                        | 438  | 0     | 0    | 457       | 6                           | 0    | 23    | 0    | 29        | 861        |  |  |
| 04:30 PM                  | 0    | 404  | 25    | 0    | 429       | 0                           | 0    | 0     | 0    | 0         | 17                        | 448  | 0     | 0    | 465       | 6                           | 0    | 21    | 0    | 27        | 921        |  |  |
| 04:45 PM                  | 0    | 376  | 25    | 0    | 401       | 0                           | 0    | 0     | 0    | 0         | 20                        | 310  | 0     | 0    | 330       | 9                           | 0    | 27    | 0    | 36        | 767        |  |  |
| Total                     | 0    | 1596 | 101   | 0    | 1697      | 0                           | 0    | 0     | 0    | 0         | 75                        | 1540 | 0     | 0    | 1615      | 28                          | 0    | 89    | 0    | 117       | 3429       |  |  |
| 05:00 PM                  | 0    | 386  | 22    | 0    | 408       | 0                           | 0    | 0     | 0    | 0         | 10                        | 311  | 0     | 0    | 321       | 9                           | 0    | 18    | 0    | 27        | 756        |  |  |
| 05:15 PM                  | 0    | 390  | 26    | 0    | 416       | 0                           | 0    | 0     | 0    | 0         | 17                        | 363  | 0     | 0    | 380       | 8                           | 0    | 33    | 0    | 41        | 837        |  |  |
| 05:30 PM                  | 0    | 317  | 18    | 0    | 335       | 0                           | 0    | 0     | 0    | 0         | 23                        | 291  | 0     | 0    | 314       | 12                          | 0    | 22    | 0    | 34        | 683        |  |  |
| 05:45 PM                  | 0    | 330  | 27    | 0    | 357       | 0                           | 0    | 0     | 0    | 0         | 27                        | 271  | 0     | 0    | 298       | 7                           | 0    | 23    | 0    | 30        | 685        |  |  |
| Total                     | 0    | 1423 | 93    | 0    | 1516      | 0                           | 0    | 0     | 0    | 0         | 77                        | 1236 | 0     | 0    | 1313      | 36                          | 0    | 96    | 0    | 132       | 2961       |  |  |
| 06:00 PM                  | 0    | 0    | 0     | 0    | 0         | 0                           | 0    | 0     | 0    | 0         | 5                         | 65   | 0     | 0    | 70        | 0                           | 0    | 0     | 0    | 0         | 70         |  |  |
| Grand Total               | 0    | 6133 | 397   | 0    | 6530      | 0                           | 0    | 0     | 0    | 0         | 285                       | 5906 | 0     | 0    | 6171      | 244                         | 0    | 373   | 0    | 617       | 13318      |  |  |
| Approch %                 | 0    | 93.9 | 6.1   | 0    |           | 0                           | 0    | 0     | 0    | 0         | 4.3                       | 95.7 | 0     | 0    |           | 39.5                        | 0    | 60.5  | 0    |           |            |  |  |
| Total %                   | 0    | 46.1 | 3     | 0    | 49        | 0                           | 0    | 0     | 0    | 0         | 2                         | 44.3 | 0     | 0    | 46.3      | 1.8                         | 0    | 2.8   | 0    | 4.6       |            |  |  |

| Pilihi Highway Southbound                                  |      |      |       |      |           | Kulanihako Street Westbound |      |       |      |           | Pilihi Highway Northbound |      |       |      |           |      | Kulanihako Street 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 02:00 PM to 05:30 PM - Peak 1 of 1 |      |      |       |      |           |                             |      |       |      |           |                           |      |       |      |           |      |                             |       |      |           |            |  |  |
| Peak Hour for Entire Intersection Begins at 03:45 PM       |      |      |       |      |           |                             |      |       |      |           |                           |      |       |      |           |      |                             |       |      |           |            |  |  |
| 03:45 PM   | 0    | 403  | 29    | 0    | 432       | 0                           | 0    | 0     | 0    | 0         | 13                        | 418  | 0     | 0    | 431       | 9    | 0                           | 31    | 0    | 40        | 903        |  |  |
| 04:00 PM   | 0    | 469  | 23    | 0    | 492       | 0                           | 0    | 0     | 0    | 0         | 19                        | 344  | 0     | 0    | 363       | 7    | 0                           | 18    | 0    | 25        | 880        |  |  |
| 04:15 PM   | 0    | 347  | 28    | 0    | 375       | 0                           | 0    | 0     | 0    | 0         | 19                        | 438  | 0     | 0    | 457       | 6    | 0                           | 23    | 0    | 29        | 861        |  |  |
| 04:30 PM   | 0    | 404  | 25    | 0    | 429       | 0                           | 0    | 0     | 0    | 0         | 17                        | 448  | 0     | 0    | 465       | 6    | 0                           | 21    | 0    | 27        | 921        |  |  |
| Total Volume   | 0    | 1623 | 105   | 0    | 1728      | 0                           | 0    | 0     | 0    | 0         | 68                        | 1648 | 0     | 0    | 1716      | 28   | 0                           | 93    | 0    | 121       | 3565       |  |  |
| % App. Total   | 0    | 93.9 | 6.1   | 0    |           | 0                           | 0    | 0     | 0    | 0         | 4                         | 96   | 0     | 0    |           | 23.1 | 0                           | 76.9  | 0    |           |            |  |  |
| PHF  | .000 | .865 | .905  | .000 | .878      | .000                        | .000 | .000  | .000 | .000      | .895                      | .920 | .000  | .000 | .923      | .778 | .000                        | .750  | .000 | .756      | .968       |  |  |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400  
Honolulu, HI 96826

Counter:3890/5675  
Counted By:SH and NH  
Weather:Clear

File Name : KulpilAM  
Site Code : 00000007  
Start Date : 1/26/2011  
Page No : 1

| Groups Printed- Unshifted |      |      |       |      |            |                             |      |       |      |            |                           |      |       |      |            |                             |      |       |      |            |            |  |
|---------------------------|------|------|-------|------|------------|-----------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|------------|--|
| Pilihi Highway Southbound |      |      |       |      |            | Kulanihako Street Westbound |      |       |      |            | Pilihi Highway Northbound |      |       |      |            | Kulanihako Street 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 |  |
| 06:00 AM                  | 0    | 104  | 2     | 0    | 106        | 0                           | 0    | 0     | 0    | 0          | 3                         | 100  | 0     | 0    | 103        | 11                          | 0    | 9     | 0    | 20         | 229        |  |
| 06:15 AM                  | 0    | 176  | 4     | 0    | 180        | 0                           | 0    | 0     | 0    | 0          | 2                         | 125  | 0     | 0    | 127        | 8                           | 0    | 14    | 0    | 22         | 329        |  |
| 06:30 AM                  | 0    | 236  | 3     | 0    | 239        | 0                           | 0    | 0     | 0    | 0          | 1                         | 214  | 0     | 0    | 215        | 14                          | 0    | 10    | 0    | 24         | 478        |  |
| 06:45 AM                  | 0    | 239  | 8     | 0    | 247        | 0                           | 0    | 0     | 0    | 0          | 5                         | 263  | 0     | 0    | 268        | 19                          | 0    | 12    | 0    | 31         | 546        |  |
| Total                     | 0    | 755  | 17    | 0    | 772        | 0                           | 0    | 0     | 0    | 0          | 11                        | 702  | 0     | 0    | 713        | 52                          | 0    | 45    | 0    | 97         | 1582       |  |
| 07:00 AM                  | 0    | 264  | 6     | 0    | 270        | 0                           | 0    | 0     | 0    | 0          | 7                         | 296  | 0     | 0    | 303        | 10                          | 0    | 27    | 0    | 37         | 610        |  |
| 07:15 AM                  | 0    | 443  | 6     | 0    | 449        | 0                           | 0    | 0     | 0    | 0          | 8                         | 323  | 0     | 0    | 331        | 19                          | 0    | 38    | 0    | 57         | 837        |  |
| 07:30 AM                  | 0    | 437  | 12    | 0    | 449        | 0                           | 0    | 0     | 0    | 0          | 8                         | 334  | 0     | 0    | 342        | 21                          | 0    | 40    | 0    | 61         | 852        |  |
| 07:45 AM                  | 0    | 390  | 7     | 0    | 397        | 0                           | 0    | 0     | 0    | 0          | 21                        | 330  | 0     | 0    | 351        | 16                          | 0    | 31    | 0    | 47         | 795        |  |
| Total                     | 0    | 1534 | 31    | 0    | 1565       | 0                           | 0    | 0     | 0    | 0          | 44                        | 1283 | 0     | 0    | 1327       | 66                          | 0    | 136   | 0    | 202        | 3094       |  |
| 08:00 AM                  | 0    | 355  | 21    | 0    | 376        | 0                           | 0    | 0     | 0    | 0          | 12                        | 284  | 0     | 0    | 296        | 16                          | 0    | 26    | 0    | 42         | 714        |  |
| 08:15 AM                  | 0    | 344  | 13    | 0    | 357        | 0                           | 0    | 0     | 0    | 0          | 16                        | 250  | 0     | 0    | 266        | 9                           | 0    | 38    | 0    | 47         | 670        |  |
| 08:30 AM                  | 0    | 285  | 11    | 0    | 296        | 0                           | 0    | 0     | 0    | 0          | 11                        | 297  | 0     | 0    | 308        | 22                          | 0    | 28    | 0    | 50         | 654        |  |
| 08:45 AM                  | 0    | 299  | 19    | 0    | 318        | 0                           | 0    | 0     | 0    | 0          | 11                        | 235  | 0     | 0    | 246        | 39                          | 0    | 26    | 0    | 65         | 629        |  |
| Total                     | 0    | 1283 | 64    | 0    | 1347       | 0                           | 0    | 0     | 0    | 0          | 50                        | 1066 | 0     | 0    | 1116       | 86                          | 0    | 118   | 0    | 204        | 2667       |  |
| Grand Total               | 0    | 3572 | 112   | 0    | 3684       | 0                           | 0    | 0     | 0    | 0          | 105                       | 3051 | 0     | 0    | 3156       | 204                         | 0    | 299   | 0    | 503        | 7343       |  |
| Approch %                 | 0    | 97   | 3     | 0    |            | 0                           | 0    | 0     | 0    | 0          | 3.3                       | 96.7 | 0     | 0    |            | 40.6                        | 0    | 59.4  | 0    |            |            |  |
| Total %                   | 0    | 48.6 | 1.5   | 0    | 50.2       | 0                           | 0    | 0     | 0    | 0          | 1.4                       | 41.5 | 0     | 0    | 43         | 2.8                         | 0    | 4.1   | 0    | 6.9        |            |  |

| Pilihi Highway Southbound                                  |      |      |       |      |            | Kulanihako Street Westbound |      |       |      |            | Pilihi Highway Northbound |      |       |      |            | Kulanihako Street 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 06:00 AM to 08:45 AM - Peak 1 of 1 |      |      |       |      |            |                             |      |       |      |            |                           |      |       |      |            |                             |      |       |      |            |            |  |  |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |      |      |       |      |            |                             |      |       |      |            |                           |      |       |      |            |                             |      |       |      |            |            |  |  |
| 07:15 AM   | 0    | 443  | 6     | 0    | 449        | 0                           | 0    | 0     | 0    | 0          | 8                         | 323  | 0     | 0    | 331        | 19                          | 0    | 38    | 0    | 57         | 837        |  |  |
| 07:30 AM   | 0    | 437  | 12    | 0    | 449        | 0                           | 0    | 0     | 0    | 0          | 8                         | 334  | 0     | 0    | 342        | 21                          | 0    | 41    | 0    | 61         | 852        |  |  |
| 07:45 AM   | 0    | 390  | 7     | 0    | 397        | 0                           | 0    | 0     | 0    | 0          | 21                        | 330  | 0     | 0    | 351        | 16                          | 0    | 31    | 0    | 47         | 795        |  |  |
| 08:00 AM   | 0    | 256  | 21    | 0    | 276        | 0                           | 0    | 0     | 0    | 0          | 12                        | 254  | 0     | 0    | 266        | 15                          | 0    | 28    | 0    | 43         | 711        |  |  |
| Total Volume   | 0    | 1625 | 46    | 0    | 1671       | 0                           | 0    | 0     | 0    | 0          | 49                        | 1271 | 0     | 0    | 1320       | 72                          | 0    | 135   | 0    | 207        | 3198       |  |  |
| % App. Total   | 0    | 97.2 | 2.8   | 0    |            | 0                           | 0    | 0     | 0    | 0          | 3.7                       | 96.3 | 0     | 0    |            | 34.8                        | 0    | 65.2  | 0    |            |            |  |  |
| PHF  | .000 | .917 | .548  | .000 | .930       | .000                        | .000 | .000  | .000 | .000       | .583                      | .951 | .000  | .000 | .940       | .857                        | .000 | .844  | .000 | .848       | .938       |  |  |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:5671/5672  
Counted By:JS, TT  
Weather:ClearFile Name : WaipiiPM  
Site Code : 00000009  
Start Date : 1/27/2011  
Page No : 1

Groups Printed- Unshifted

| Start Time  | Pilani Highway Southbound |      |       |      |            | E. Waipulani Road Westbound |      |       |      |            | Pilani Highway Northbound |      |       |      |            | E. Waipulani Road Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|---------------------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total |            |
| 02:00 PM    | 0                         | 314  | 21    | 0    | 335        | 0                           | 0    | 0     | 0    | 0          | 0                         | 381  | 0     | 0    | 381        | 0                           | 0    | 6     | 0    | 6          | 722        |
| 02:15 PM    | 0                         | 355  | 21    | 0    | 376        | 0                           | 0    | 0     | 0    | 0          | 0                         | 547  | 0     | 0    | 547        | 0                           | 0    | 6     | 0    | 6          | 929        |
| 02:30 PM    | 0                         | 363  | 27    | 0    | 390        | 0                           | 0    | 0     | 0    | 0          | 0                         | 697  | 0     | 0    | 697        | 0                           | 0    | 14    | 0    | 14         | 1101       |
| 02:45 PM    | 0                         | 369  | 34    | 0    | 403        | 0                           | 0    | 0     | 0    | 0          | 0                         | 931  | 0     | 0    | 931        | 0                           | 0    | 7     | 0    | 7          | 1341       |
| Total       | 0                         | 1401 | 103   | 0    | 1504       | 0                           | 0    | 0     | 0    | 0          | 0                         | 2556 | 0     | 0    | 2556       | 0                           | 0    | 33    | 0    | 33         | 4093       |
| 03:00 PM    | 0                         | 422  | 29    | 0    | 451        | 0                           | 0    | 0     | 0    | 0          | 0                         | 655  | 0     | 0    | 655        | 0                           | 0    | 6     | 0    | 6          | 1112       |
| 03:15 PM    | 0                         | 385  | 23    | 0    | 408        | 0                           | 0    | 0     | 0    | 0          | 0                         | 515  | 0     | 0    | 515        | 0                           | 0    | 9     | 0    | 9          | 932        |
| 03:30 PM    | 0                         | 403  | 27    | 0    | 430        | 0                           | 0    | 0     | 0    | 0          | 0                         | 616  | 0     | 0    | 616        | 0                           | 0    | 11    | 0    | 11         | 1057       |
| 03:45 PM    | 0                         | 395  | 24    | 0    | 419        | 0                           | 0    | 0     | 0    | 0          | 0                         | 426  | 0     | 0    | 426        | 0                           | 0    | 7     | 0    | 7          | 852        |
| Total       | 0                         | 1605 | 103   | 0    | 1708       | 0                           | 0    | 0     | 0    | 0          | 0                         | 2212 | 0     | 0    | 2212       | 0                           | 0    | 33    | 0    | 33         | 3953       |
| 04:00 PM    | 0                         | 360  | 28    | 0    | 388        | 0                           | 0    | 0     | 0    | 0          | 0                         | 587  | 0     | 0    | 587        | 0                           | 0    | 15    | 0    | 15         | 990        |
| 04:15 PM    | 0                         | 357  | 18    | 0    | 375        | 0                           | 0    | 0     | 0    | 0          | 0                         | 481  | 0     | 0    | 481        | 0                           | 0    | 7     | 0    | 7          | 863        |
| 04:30 PM    | 0                         | 368  | 30    | 0    | 398        | 0                           | 0    | 0     | 0    | 0          | 0                         | 481  | 0     | 0    | 481        | 0                           | 0    | 3     | 0    | 3          | 882        |
| 04:45 PM    | 0                         | 374  | 37    | 0    | 411        | 0                           | 0    | 0     | 0    | 0          | 0                         | 397  | 0     | 0    | 397        | 0                           | 0    | 6     | 0    | 6          | 814        |
| Total       | 0                         | 1459 | 113   | 0    | 1572       | 0                           | 0    | 0     | 0    | 0          | 0                         | 1946 | 0     | 0    | 1946       | 0                           | 0    | 31    | 0    | 31         | 3549       |
| 05:00 PM    | 0                         | 396  | 36    | 0    | 432        | 0                           | 0    | 0     | 0    | 0          | 0                         | 383  | 0     | 0    | 383        | 0                           | 0    | 5     | 0    | 5          | 820        |
| 05:15 PM    | 0                         | 395  | 28    | 0    | 423        | 0                           | 0    | 0     | 0    | 0          | 0                         | 348  | 0     | 0    | 348        | 0                           | 0    | 10    | 0    | 10         | 781        |
| 05:30 PM    | 0                         | 321  | 33    | 0    | 354        | 0                           | 0    | 0     | 0    | 0          | 0                         | 397  | 0     | 0    | 397        | 0                           | 0    | 3     | 0    | 3          | 754        |
| 05:45 PM    | 0                         | 363  | 32    | 0    | 395        | 0                           | 0    | 0     | 0    | 0          | 0                         | 0    | 0     | 0    | 0          | 0                           | 0    | 15    | 0    | 15         | 410        |
| Total       | 0                         | 1475 | 129   | 0    | 1604       | 0                           | 0    | 0     | 0    | 0          | 0                         | 1128 | 0     | 0    | 1128       | 0                           | 0    | 33    | 0    | 33         | 2765       |
| Grand Total | 0                         | 5940 | 448   | 0    | 6388       | 0                           | 0    | 0     | 0    | 0          | 0                         | 7842 | 0     | 0    | 7842       | 0                           | 0    | 130   | 0    | 130        | 14360      |
| Apprch %    | 0                         | 93   | 7     | 0    |            | 0                           | 0    | 0     | 0    | 0          | 0                         | 100  | 0     | 0    |            | 0                           | 0    | 100   | 0    |            |            |
| Total %     | 0                         | 41.4 | 3.1   | 0    | 44.5       | 0                           | 0    | 0     | 0    | 0          | 0                         | 54.6 | 0     | 0    | 54.6       | 0                           | 0    | 0.9   | 0    | 0.9        |            |

|  | Pilani Highway Southbound |      |       |      |            | E. Waipulani Road Westbound |      |       |      |            | Pilani Highway Northbound |      |       |      |            | E. Waipulani Road 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 02:00 PM to 05:45 PM - Peak 1 of 1 |                           |      |       |      |            |                             |      |       |      |            |                           |      |       |      |            |                             |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 02:30 PM       |                           |      |       |      |            |                             |      |       |      |            |                           |      |       |      |            |                             |      |       |      |            |            |
| 02:30 PM   | 0                         | 363  | 27    | 0    | 390        | 0                           | 0    | 0     | 0    | 0          | 0                         | 697  | 0     | 0    | 697        | 0                           | 0    | 14    | 0    | 14         | 1101       |
| 02:45 PM   | 0                         | 369  | 34    | 0    | 403        | 0                           | 0    | 0     | 0    | 0          | 0                         | 931  | 0     | 0    | 931        | 0                           | 0    | 7     | 0    | 7          | 1341       |
| 03:00 PM   | 0                         | 422  | 29    | 0    | 451        | 0                           | 0    | 0     | 0    | 0          | 0                         | 655  | 0     | 0    | 655        | 0                           | 0    | 6     | 0    | 6          | 1112       |
| 03:15 PM   | 0                         | 385  | 23    | 0    | 408        | 0                           | 0    | 0     | 0    | 0          | 0                         | 515  | 0     | 0    | 515        | 0                           | 0    | 9     | 0    | 9          | 932        |
| Total Volume   | 0                         | 1539 | 113   | 0    | 1652       | 0                           | 0    | 0     | 0    | 0          | 0                         | 2798 | 0     | 0    | 2798       | 0                           | 0    | 36    | 0    | 36         | 4486       |
| % App. Total   | 0                         | 93.2 | 6.8   | 0    |            | 0                           | 0    | 0     | 0    | 0          | 0                         | 100  | 0     | 0    |            | 0                           | 0    | 100   | 0    |            |            |
| PHF  | .000                      | .912 | .831  | .000 | .916       | .000                        | .000 | .000  | .000 | .000       | .000                      | .751 | .000  | .000 | .751       | .000                        | .000 | .643  | .000 | .643       | .836       |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:D4-5671, D4-5672  
Counted By:JS, TT  
Weather:ClearFile Name : WaipiiAM  
Site Code : 00000009  
Start Date : 1/27/2011  
Page No : 1

Groups Printed- Unshifted

| Start Time  | Pilani Highway Southbound |      |       |      |            | Westbound |      |       |      |            | Northbound |      |       |      |            | E. Waipulani Road Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|------|-------|------|------------|------------|------|-------|------|------------|-----------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total | Left       | Thru | Right | Peds | App. Total | Left                        | Thru | Right | Peds | App. Total |            |
| 06:00 AM    | 0                         | 115  | 2     | 0    | 117        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 4     | 0    | 4          | 121        |
| 06:15 AM    | 0                         | 170  | 2     | 0    | 172        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 3     | 0    | 3          | 175        |
| 06:30 AM    | 0                         | 173  | 5     | 0    | 178        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 6     | 0    | 6          | 184        |
| 06:45 AM    | 0                         | 223  | 5     | 0    | 228        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 5     | 0    | 5          | 233        |
| Total       | 0                         | 681  | 14    | 0    | 695        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 18    | 0    | 18         | 713        |
| 07:00 AM    | 0                         | 295  | 11    | 0    | 306        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 4     | 0    | 4          | 310        |
| 07:15 AM    | 0                         | 427  | 21    | 0    | 448        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 7     | 0    | 7          | 455        |
| 07:30 AM    | 0                         | 418  | 23    | 0    | 441        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 5     | 0    | 5          | 446        |
| 07:45 AM    | 0                         | 390  | 21    | 0    | 411        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 1     | 0    | 1          | 412        |
| Total       | 0                         | 1530 | 76    | 0    | 1606       | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 17    | 0    | 17         | 1623       |
| 08:00 AM    | 0                         | 347  | 16    | 0    | 363        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 10    | 0    | 10         | 373        |
| 08:15 AM    | 0                         | 320  | 18    | 0    | 338        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 5     | 0    | 5          | 343        |
| 08:30 AM    | 0                         | 259  | 9     | 0    | 268        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 15    | 0    | 15         | 283        |
| 08:45 AM    | 0                         | 297  | 18    | 0    | 315        | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 9     | 0    | 9          | 324        |
| Total       | 0                         | 1223 | 61    | 0    | 1284       | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 39    | 0    | 39         | 1323       |
| Grand Total | 0                         | 3434 | 151   | 0    | 3585       | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 74    | 0    | 74         | 3659       |
| Apprch %    | 0                         | 95.8 | 4.2   | 0    |            | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 100   | 0    |            |            |
| Total %     | 0                         | 93.9 | 4.1   | 0    | 98         | 0         | 0    | 0     | 0    | 0          | 0          | 0    | 0     | 0    | 0          | 0                           | 0    | 2     | 0    | 2          |            |

| Start Time   | Pilani Highway Southbound |      |       |  | App. Total | Westbound | App. Total | Northbound |      |      |       | E. Waipulani Road Eastbound |      |  |      | Int. Total |
|--|---------------------------|------|-------|--|------------|-----------|------------|------------|------|------|-------|-----------------------------|------|--|------|------------|
|  | Left                      | Thru | Right |  |            |           |            | App. Total | Left | Thru | Right | App. Total                  |      |  |      |            |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 |                           |      |       |  |            |           |            |            |      |      |       |                             |      |  |      |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                           |      |       |  |            |           |            |            |      |      |       |                             |      |  |      |            |
| 07:15 AM   | 0                         | 427  | 21    |  | 448        | 0         |            | 0          | 0    | 0    | 0     | 0                           | 7    |  | 7    | 455        |
| 07:30 AM   | 0                         | 418  | 23    |  | 441        | 0         |            | 0          | 0    | 0    | 0     | 0                           | 5    |  | 5    | 446        |
| 07:45 AM   | 0                         | 390  | 21    |  | 411        | 0         |            | 0          | 0    | 0    | 0     | 0                           | 1    |  | 1    | 412        |
| 08:00 AM   | 0                         | 347  | 16    |  | 363        | 0         |            | 0          | 0    | 0    | 0     | 0                           | 10   |  | 10   | 373        |
| Total Volume   | 0                         | 1582 | 81    |  | 1663       | 0         |            | 0          | 0    | 0    | 0     | 0                           | 23   |  | 23   | 1686       |
| % App. Total   | 0                         | 95.1 | 4.9   |  |            | 0         |            | 0          | 0    | 0    | 0     | 0                           | 100  |  |      |            |
| PHF  | .000                      | .926 | .880  |  | .928       | .000      |            | .000       | .000 | .000 | .000  | .000                        | .575 |  | .575 | .926       |



**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826

Counter:D4-3889, D4-5674

Counted By:DF, BB

Weather:Clear

File Name : PiipiiPM

Site Code : 00000010

Start Date : 1/27/2011

Page No : 1

Groups Printed- Unshifted

| Start Time  | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Piikea Avenue Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total |            |
| 02:00 PM    | 0                         | 218  | 80    | 0    | 298        | 0         | 65                        | 317  | 0     | 0    | 382        | 83                      | 0    | 68    | 0    | 151        | 831        |
| 02:15 PM    | 0                         | 279  | 103   | 0    | 382        | 0         | 60                        | 342  | 0     | 0    | 402        | 82                      | 0    | 69    | 0    | 151        | 935        |
| 02:30 PM    | 0                         | 325  | 99    | 0    | 424        | 0         | 68                        | 315  | 0     | 0    | 383        | 88                      | 0    | 79    | 0    | 167        | 974        |
| 02:45 PM    | 0                         | 282  | 106   | 0    | 388        | 0         | 85                        | 327  | 0     | 0    | 412        | 87                      | 0    | 69    | 0    | 156        | 956        |
| Total       | 0                         | 1104 | 388   | 0    | 1492       | 0         | 278                       | 1301 | 0     | 0    | 1579       | 340                     | 0    | 285   | 0    | 625        | 3696       |
| 03:00 PM    | 0                         | 330  | 83    | 0    | 413        | 0         | 51                        | 332  | 0     | 0    | 383        | 55                      | 0    | 70    | 0    | 125        | 921        |
| 03:15 PM    | 0                         | 305  | 104   | 0    | 409        | 0         | 64                        | 358  | 0     | 0    | 422        | 76                      | 0    | 75    | 0    | 151        | 982        |
| 03:30 PM    | 0                         | 321  | 90    | 0    | 411        | 0         | 59                        | 355  | 0     | 0    | 414        | 69                      | 0    | 91    | 0    | 160        | 985        |
| 03:45 PM    | 0                         | 299  | 96    | 0    | 395        | 0         | 62                        | 316  | 0     | 0    | 378        | 75                      | 0    | 79    | 0    | 154        | 927        |
| Total       | 0                         | 1255 | 373   | 0    | 1628       | 0         | 236                       | 1361 | 0     | 0    | 1597       | 275                     | 0    | 315   | 0    | 590        | 3615       |
| 04:00 PM    | 0                         | 268  | 97    | 0    | 365        | 0         | 55                        | 354  | 0     | 0    | 409        | 60                      | 0    | 76    | 0    | 136        | 910        |
| 04:15 PM    | 0                         | 308  | 79    | 0    | 387        | 0         | 68                        | 349  | 0     | 0    | 417        | 69                      | 0    | 57    | 0    | 126        | 930        |
| 04:30 PM    | 0                         | 279  | 88    | 0    | 367        | 0         | 48                        | 336  | 0     | 0    | 384        | 65                      | 0    | 65    | 0    | 130        | 881        |
| 04:45 PM    | 0                         | 284  | 94    | 0    | 378        | 0         | 55                        | 232  | 0     | 0    | 287        | 58                      | 0    | 67    | 0    | 125        | 790        |
| Total       | 0                         | 1139 | 358   | 0    | 1497       | 0         | 226                       | 1271 | 0     | 0    | 1497       | 252                     | 0    | 265   | 0    | 517        | 3511       |
| 05:00 PM    | 0                         | 240  | 75    | 0    | 315        | 0         | 46                        | 326  | 0     | 0    | 372        | 55                      | 0    | 78    | 0    | 133        | 820        |
| 05:15 PM    | 0                         | 276  | 124   | 0    | 400        | 0         | 57                        | 256  | 0     | 0    | 313        | 70                      | 0    | 74    | 0    | 144        | 857        |
| 05:30 PM    | 0                         | 244  | 91    | 0    | 335        | 0         | 42                        | 232  | 0     | 0    | 274        | 66                      | 0    | 63    | 0    | 129        | 738        |
| 05:45 PM    | 0                         | 196  | 104   | 0    | 300        | 0         | 0                         | 0    | 0     | 0    | 0          | 60                      | 0    | 66    | 0    | 126        | 426        |
| Total       | 0                         | 956  | 394   | 0    | 1350       | 0         | 145                       | 814  | 0     | 0    | 959        | 251                     | 0    | 281   | 0    | 532        | 2841       |
| Grand Total | 0                         | 4454 | 1513  | 0    | 5967       | 0         | 885                       | 4747 | 0     | 0    | 5632       | 1118                    | 0    | 1146  | 0    | 2264       | 13863      |
| Approch %   | 0                         | 74.6 | 25.4  | 0    |            | 0         | 15.7                      | 84.3 | 0     | 0    |            | 49.4                    | 0    | 50.6  | 0    |            |            |
| Total %     | 0                         | 32.1 | 10.9  | 0    | 43         | 0         | 6.4                       | 34.2 | 0     | 0    | 40.6       | 8.1                     | 0    | 8.3   | 0    | 16.3       |            |

| Start Time   | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Piikea Avenue Eastbound |      |       |      |            | Int. Total |
|--|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
|  | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1 |                           |      |       |      |            |           |                           |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 02:45 PM       |                           |      |       |      |            |           |                           |      |       |      |            |                         |      |       |      |            |            |
| 02:45 PM   | 0                         | 282  | 106   | 0    | 388        | 0         | 85                        | 327  | 0     | 0    | 412        | 87                      | 0    | 69    | 0    | 156        | 956        |
| 03:00 PM   | 0                         | 330  | 83    | 0    | 413        | 0         | 51                        | 332  | 0     | 0    | 383        | 55                      | 0    | 70    | 0    | 125        | 921        |
| 03:15 PM   | 0                         | 305  | 104   | 0    | 409        | 0         | 64                        | 358  | 0     | 0    | 422        | 76                      | 0    | 75    | 0    | 151        | 982        |
| 03:30 PM   | 0                         | 321  | 90    | 0    | 411        | 0         | 59                        | 355  | 0     | 0    | 414        | 69                      | 0    | 91    | 0    | 160        | 985        |
| Total Volume   | 0                         | 1238 | 383   | 0    | 1621       | 0         | 259                       | 1372 | 0     | 0    | 1631       | 287                     | 0    | 305   | 0    | 592        | 3844       |
| % App. Total   | 0                         | 76.4 | 23.6  | 0    |            | 0         | 15.9                      | 84.1 | 0     | 0    |            | 48.5                    | 0    | 51.5  | 0    |            |            |
| PHF  | .000                      | .938 | .903  | .000 | .981       | .000      | .762                      | .958 | .000  | .966 | .825       | .000                    | .838 | .925  | .976 |            |            |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826

Counter:3889/5674

Counted By:DF and BB

Weather:Clear

File Name : PiipiiAM

Site Code : 00000010

Start Date : 1/27/2011

Page No : 1

Groups Printed- Unshifted

| Start Time  | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Piikea Avenue Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total |            |
| 06:00 AM    | 0                         | 80   | 24    | 0    | 104        | 0         | 4                         | 81   | 0     | 0    | 85         | 20                      | 0    | 13    | 0    | 33         | 222        |
| 06:15 AM    | 0                         | 164  | 27    | 0    | 191        | 0         | 14                        | 105  | 0     | 0    | 119        | 26                      | 0    | 5     | 0    | 31         | 341        |
| 06:30 AM    | 0                         | 194  | 29    | 0    | 223        | 0         | 10                        | 167  | 0     | 0    | 177        | 28                      | 0    | 20    | 0    | 48         | 448        |
| 06:45 AM    | 0                         | 210  | 45    | 0    | 255        | 0         | 19                        | 213  | 0     | 0    | 232        | 48                      | 0    | 15    | 0    | 63         | 550        |
| Total       | 0                         | 648  | 125   | 0    | 773        | 0         | 47                        | 566  | 0     | 0    | 613        | 122                     | 0    | 53    | 0    | 175        | 1561       |
| 07:00 AM    | 0                         | 240  | 61    | 0    | 301        | 0         | 19                        | 251  | 0     | 0    | 270        | 43                      | 0    | 19    | 0    | 62         | 633        |
| 07:15 AM    | 0                         | 359  | 72    | 0    | 431        | 0         | 20                        | 314  | 0     | 0    | 334        | 67                      | 0    | 22    | 0    | 89         | 854        |
| 07:30 AM    | 0                         | 365  | 98    | 0    | 463        | 0         | 33                        | 270  | 0     | 0    | 303        | 66                      | 0    | 40    | 0    | 106        | 872        |
| 07:45 AM    | 0                         | 328  | 79    | 0    | 407        | 0         | 33                        | 249  | 0     | 0    | 282        | 89                      | 0    | 30    | 0    | 119        | 808        |
| Total       | 0                         | 1292 | 310   | 0    | 1602       | 0         | 105                       | 1084 | 0     | 0    | 1189       | 265                     | 0    | 111   | 0    | 376        | 3167       |
| 08:00 AM    | 0                         | 310  | 68    | 0    | 378        | 0         | 37                        | 220  | 0     | 0    | 257        | 72                      | 0    | 41    | 0    | 113        | 748        |
| 08:15 AM    | 0                         | 285  | 70    | 0    | 355        | 0         | 34                        | 196  | 0     | 0    | 230        | 68                      | 0    | 40    | 0    | 108        | 693        |
| 08:30 AM    | 0                         | 226  | 65    | 0    | 291        | 0         | 50                        | 218  | 0     | 0    | 268        | 62                      | 0    | 33    | 0    | 95         | 654        |
| 08:45 AM    | 0                         | 238  | 76    | 0    | 314        | 0         | 43                        | 208  | 0     | 0    | 251        | 62                      | 0    | 40    | 0    | 102        | 667        |
| Total       | 0                         | 1059 | 279   | 0    | 1338       | 0         | 164                       | 842  | 0     | 0    | 1006       | 264                     | 0    | 154   | 0    | 418        | 2762       |
| Grand Total | 0                         | 2999 | 714   | 0    | 3713       | 0         | 316                       | 2492 | 0     | 0    | 2808       | 651                     | 0    | 318   | 0    | 969        | 7490       |
| Approch %   | 0                         | 80.8 | 19.2  | 0    |            | 0         | 11.3                      | 88.7 | 0     | 0    |            | 67.2                    | 0    | 32.8  | 0    |            |            |
| Total %     | 0                         | 40   | 9.5   | 0    | 49.6       | 0         | 4.2                       | 33.3 | 0     | 0    | 37.5       | 8.7                     | 0    | 4.2   | 0    | 12.9       |            |

| Start Time   | Pilihi Highway Southbound |      |       |      |            | Westbound | Pilihi Highway Northbound |      |       |      |            | Piikea Avenue Eastbound |      |       |      |            | Int. Total |
|--|---------------------------|------|-------|------|------------|-----------|---------------------------|------|-------|------|------------|-------------------------|------|-------|------|------------|------------|
|  | Left                      | Thru | Right | Peds | App. Total |           | Left                      | Thru | Right | Peds | App. Total | Left                    | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 |                           |      |       |      |            |           |                           |      |       |      |            |                         |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                           |      |       |      |            |           |                           |      |       |      |            |                         |      |       |      |            |            |
| 07:15 AM   | 0                         | 359  | 72    | 0    | 431        | 0         | 20                        | 314  | 0     | 0    | 334        | 67                      | 0    | 22    | 0    | 89         | 854        |
| 07:30 AM   | 0                         | 365  | 98    | 0    | 463        | 0         | 33                        | 270  | 0     | 0    | 303        | 66                      | 0    | 40    | 0    | 106        | 872        |
| 07:45 AM   | 0                         | 328  | 79    | 0    | 407        | 0         | 33                        | 249  | 0     | 0    | 282        | 89                      | 0    | 30    | 0    | 119        | 808        |
| 08:00 AM   | 0                         | 310  | 68    | 0    | 378        | 0         | 37                        | 220  | 0     | 0    | 257        | 72                      | 0    | 41    | 0    | 113        | 748        |
| Total Volume   | 0                         | 1362 | 317   | 0    | 1679       | 0         | 123                       | 1053 | 0     | 0    | 1176       | 284                     | 0    | 133   | 0    | 427        | 3282       |
| % App. Total   | 0                         | 81.1 | 18.9  | 0    |            | 0         | 10.5                      | 89.5 | 0     | 0    |            | 68.9                    | 0    | 31.1  | 0    |            |            |
| PHF  | .000                      | .933 | .809  | .000 | .907       | .000      | .831                      | .838 | .000  | .000 | .880       | .826                    | .000 | .811  | .000 | .897       | .941       |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:5676/5672  
Counted By:BB and LM  
Weather:ClearFile Name : KulkiePM  
Site Code : 00000000  
Start Date : 1/26/2011  
Page No : 1

## Groups Printed- Unshifted

| Start Time  | S. Kihei Road Southbound |      |       |      |            | Kulanihakoi Street Westbound |      |       |      |            | S. Kihei Road Northbound |      |       |      |            | Eastbound d | Int. Total |
|-------------|--------------------------|------|-------|------|------------|------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|-------------|------------|
|             | Left                     | Thru | Right | Peds | App. Total | Left                         | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total |             |            |
| 02:00 PM    | 3                        | 49   | 0     | 0    | 52         | 11                           | 0    | 14    | 4    | 29         | 0                        | 88   | 28    | 3    | 119        | 0           | 200        |
| 02:15 PM    | 8                        | 89   | 0     | 0    | 97         | 12                           | 0    | 10    | 3    | 25         | 0                        | 78   | 21    | 0    | 99         | 0           | 221        |
| 02:30 PM    | 6                        | 78   | 0     | 0    | 84         | 20                           | 0    | 8     | 3    | 31         | 0                        | 100  | 34    | 2    | 136        | 0           | 251        |
| 02:45 PM    | 20                       | 108  | 0     | 0    | 128        | 15                           | 0    | 12    | 1    | 28         | 0                        | 75   | 35    | 3    | 113        | 0           | 269        |
| Total       | 37                       | 324  | 0     | 0    | 361        | 58                           | 0    | 44    | 11   | 113        | 0                        | 341  | 118   | 8    | 467        | 0           | 941        |
| 03:00 PM    | 5                        | 105  | 0     | 0    | 110        | 10                           | 0    | 10    | 7    | 27         | 0                        | 130  | 17    | 3    | 150        | 0           | 287        |
| 03:15 PM    | 6                        | 99   | 0     | 0    | 105        | 7                            | 0    | 15    | 4    | 26         | 0                        | 135  | 10    | 0    | 145        | 0           | 276        |
| 03:30 PM    | 11                       | 108  | 0     | 0    | 119        | 11                           | 0    | 13    | 2    | 26         | 0                        | 158  | 21    | 3    | 182        | 0           | 327        |
| 03:45 PM    | 5                        | 136  | 0     | 0    | 141        | 20                           | 0    | 7     | 2    | 29         | 0                        | 147  | 11    | 0    | 158        | 0           | 328        |
| Total       | 27                       | 448  | 0     | 0    | 475        | 48                           | 0    | 45    | 15   | 108        | 0                        | 570  | 59    | 6    | 635        | 0           | 1218       |
| 04:00 PM    | 7                        | 114  | 0     | 0    | 121        | 7                            | 0    | 4     | 1    | 12         | 0                        | 126  | 12    | 0    | 138        | 0           | 271        |
| 04:15 PM    | 5                        | 89   | 0     | 0    | 94         | 14                           | 0    | 7     | 2    | 23         | 0                        | 142  | 14    | 1    | 157        | 0           | 274        |
| 04:30 PM    | 6                        | 108  | 0     | 0    | 114        | 15                           | 0    | 9     | 2    | 26         | 0                        | 143  | 16    | 1    | 160        | 0           | 300        |
| 04:45 PM    | 7                        | 132  | 0     | 0    | 139        | 13                           | 0    | 14    | 4    | 31         | 0                        | 133  | 17    | 2    | 152        | 0           | 322        |
| Total       | 25                       | 443  | 0     | 0    | 468        | 49                           | 0    | 34    | 9    | 92         | 0                        | 544  | 59    | 4    | 607        | 0           | 1167       |
| 05:00 PM    | 8                        | 125  | 0     | 0    | 133        | 5                            | 0    | 15    | 2    | 22         | 0                        | 145  | 15    | 1    | 161        | 0           | 316        |
| 05:15 PM    | 6                        | 106  | 0     | 0    | 112        | 11                           | 0    | 6     | 9    | 26         | 0                        | 134  | 22    | 8    | 164        | 0           | 302        |
| 05:30 PM    | 10                       | 109  | 0     | 0    | 119        | 13                           | 0    | 8     | 5    | 26         | 0                        | 117  | 20    | 0    | 137        | 0           | 282        |
| 05:45 PM    | 4                        | 94   | 0     | 0    | 98         | 17                           | 0    | 12    | 2    | 31         | 0                        | 128  | 14    | 2    | 144        | 0           | 273        |
| Total       | 28                       | 434  | 0     | 0    | 462        | 46                           | 0    | 41    | 18   | 105        | 0                        | 524  | 71    | 11   | 606        | 0           | 1173       |
| Grand Total | 117                      | 1649 | 0     | 0    | 1766       | 201                          | 0    | 164   | 53   | 418        | 0                        | 1979 | 307   | 29   | 2315       | 0           | 4499       |
| Apprch %    | 6.6                      | 93.4 | 0     | 0    |            | 48.1                         | 0    | 39.2  | 12.7 |            | 0                        | 85.5 | 13.3  | 1.3  |            |             |            |
| Total %     | 2.6                      | 36.7 | 0     | 0    | 39.3       | 4.5                          | 0    | 3.6   | 1.2  | 9.3        | 0                        | 44   | 6.8   | 0.6  | 51.5       | 0           |            |

| Start Time   | S. Kihei Road Southbound |      |       |      |            | Kulanihakoi Street Westbound |      |       |      |            | S. Kihei Road Northbound |      |       |      |            | Eastbound<br>d | Int. Total |
|--|--------------------------|------|-------|------|------------|------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|----------------|------------|
|  | Left                     | Thru | Right | Peds | App. Total | Left                         | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total |                |            |
| Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1 |                          |      |       |      |            |                              |      |       |      |            |                          |      |       |      |            |                |            |
| Peak Hour for Entire Intersection Begins at 04:30 PM       |                          |      |       |      |            |                              |      |       |      |            |                          |      |       |      |            |                |            |
| 04:30 PM   | 6                        | 108  | 0     | 0    | 114        | 15                           | 0    | 9     | 2    | 26         | 0                        | 143  | 16    | 1    | 160        | 0              | 300        |
| 04:45 PM   | 7                        | 132  | 0     | 0    | 139        | 13                           | 0    | 14    | 4    | 31         | 0                        | 133  | 17    | 2    | 152        | 0              | 322        |
| 05:00 PM   | 8                        | 125  | 0     | 0    | 133        | 5                            | 0    | 15    | 2    | 22         | 0                        | 145  | 15    | 1    | 161        | 0              | 316        |
| 05:15 PM   | 6                        | 106  | 0     | 0    | 112        | 11                           | 0    | 6     | 9    | 26         | 0                        | 134  | 22    | 8    | 164        | 0              | 302        |
| Total Volume   | 27                       | 471  | 0     | 0    | 498        | 44                           | 0    | 44    | 17   | 105        | 0                        | 555  | 70    | 12   | 637        | 0              | 1240       |
| % App. Total   | 5.4                      | 94.6 | 0     | 0    |            | 41.9                         | 0    | 41.9  | 16.2 |            | 0                        | 87.1 | 11    | 1.9  |            |                |            |
| PHF  | .844                     | .892 | .000  | .000 | .896       | .733                         | .000 | .733  | .472 | .847       | .000                     | .957 | .795  | .375 | .971       | .000           | .963       |

**Wilson Okamoto Corporation**1907 S. Beretania Street Suite 400  
Honolulu, HI 96826Counter:5676/5672  
Counted By:BB and LM  
Weather:ClearFile Name : KulkieAM  
Site Code : 00000000  
Start Date : 1/26/2011  
Page No : 1

## Groups Printed- Unshifted

| Start Time  | S. Kihei Road Southbound |      |       |      |            | Kulanihakoi Street Westbound |      |       |      |            | S. Kihei Road Northbound |      |       |      |            | Eastbound d | Int. Total |
|-------------|--------------------------|------|-------|------|------------|------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|-------------|------------|
|             | Left                     | Thru | Right | Peds | App. Total | Left                         | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total |             |            |
| 06:00 AM    | 0                        | 17   | 0     | 1    | 18         | 0                            | 0    | 5     | 0    | 5          | 0                        | 38   | 0     | 0    | 38         | 0           | 61         |
| 06:15 AM    | 1                        | 33   | 0     | 1    | 35         | 3                            | 0    | 8     | 0    | 11         | 0                        | 47   | 0     | 0    | 47         | 0           | 93         |
| 06:30 AM    | 1                        | 47   | 0     | 4    | 52         | 3                            | 0    | 5     | 3    | 11         | 0                        | 69   | 5     | 0    | 74         | 0           | 137        |
| 06:45 AM    | 2                        | 66   | 0     | 0    | 68         | 8                            | 0    | 13    | 1    | 22         | 0                        | 89   | 6     | 0    | 95         | 0           | 185        |
| Total       | 4                        | 163  | 0     | 6    | 173        | 14                           | 0    | 31    | 4    | 49         | 0                        | 243  | 11    | 0    | 254        | 0           | 476        |
| 07:00 AM    | 1                        | 46   | 0     | 1    | 48         | 10                           | 0    | 16    | 3    | 29         | 0                        | 98   | 6     | 0    | 104        | 0           | 181        |
| 07:15 AM    | 4                        | 84   | 0     | 0    | 88         | 10                           | 0    | 12    | 4    | 26         | 0                        | 93   | 9     | 0    | 102        | 0           | 216        |
| 07:30 AM    | 4                        | 81   | 0     | 0    | 85         | 11                           | 0    | 18    | 4    | 33         | 0                        | 104  | 10    | 0    | 114        | 0           | 232        |
| 07:45 AM    | 2                        | 83   | 0     | 0    | 85         | 8                            | 0    | 13    | 8    | 29         | 0                        | 111  | 14    | 0    | 125        | 0           | 239        |
| Total       | 11                       | 294  | 0     | 1    | 306        | 39                           | 0    | 59    | 19   | 117        | 0                        | 406  | 39    | 0    | 445        | 0           | 868        |
| 08:00 AM    | 11                       | 76   | 0     | 1    | 88         | 14                           | 0    | 17    | 4    | 35         | 0                        | 112  | 14    | 0    | 126        | 0           | 249        |
| 08:15 AM    | 5                        | 80   | 0     | 0    | 85         | 13                           | 0    | 15    | 6    | 34         | 0                        | 85   | 7     | 2    | 94         | 0           | 213        |
| 08:30 AM    | 13                       | 64   | 0     | 0    | 77         | 10                           | 0    | 15    | 4    | 29         | 0                        | 83   | 13    | 2    | 98         | 0           | 204        |
| 08:45 AM    | 12                       | 60   | 0     | 2    | 74         | 13                           | 0    | 5     | 8    | 26         | 0                        | 70   | 34    | 1    | 105        | 0           | 205        |
| Total       | 41                       | 280  | 0     | 3    | 324        | 50                           | 0    | 52    | 22   | 124        | 0                        | 350  | 68    | 5    | 423        | 0           | 871        |
| Grand Total | 56                       | 737  | 0     | 10   | 803        | 103                          | 0    | 142   | 45   | 290        | 0                        | 999  | 118   | 5    | 1122       | 0           | 2215       |
| Apprch %    | 7                        | 91.8 | 0     | 1.2  |            | 35.5                         | 0    | 49    | 15.5 |            | 0                        | 89   | 10.5  | 0.4  |            |             |            |
| Total %     | 2.5                      | 33.3 | 0     | 0.5  | 36.3       | 4.7                          | 0    | 6.4   | 2    | 13.1       | 0                        | 45.1 | 5.3   | 0.2  | 50.7       | 0           |            |

| Start Time   | S. Kihei Road Southbound |      |       |      |            | Kulanihakoi Street Westbound |      |       |      |            | S. Kihei Road Northbound |      |       |      |            | Eastbound | Int. Total |
|--|--------------------------|------|-------|------|------------|------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|-----------|------------|
|  | Left                     | Thru | Right | Peds | App. Total | Left                         | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total |           |            |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 |                          |      |       |      |            |                              |      |       |      |            |                          |      |       |      |            |           |            |
| Peak Hour for Entire Intersection Begins at 07:15 AM       |                          |      |       |      |            |                              |      |       |      |            |                          |      |       |      |            |           |            |
| 07:15 AM   | 4                        | 84   | 0     | 0    | 88         | 10                           | 0    | 12    | 4    | 26         | 0                        | 93   | 9     | 0    | 102        | 0         | 216        |
| 07:30 AM   | 4                        | 81   | 0     | 0    | 85         | 11                           | 0    | 18    | 4    | 33         | 0                        | 104  | 10    | 0    | 114        | 0         | 232        |
| 07:45 AM   | 2                        | 83   | 0     | 0    | 85         | 8                            | 0    | 13    | 8    | 29         | 0                        | 111  | 14    | 0    | 125        | 0         | 239        |
| 08:00 AM   | 11                       | 76   | 0     | 1    | 88         | 14                           | 0    | 17    | 4    | 35         | 0                        | 112  | 14    | 0    | 126        | 0         | 249        |
| Total Volume   | 21                       | 324  | 0     | 1    | 346        | 43                           | 0    | 60    | 20   | 123        | 0                        | 420  | 47    | 0    | 467        | 0         | 936        |
| % App. Total   | 6.1                      | 93.6 | 0     | 0.3  |            | 35                           | 0    | 48.8  | 16.3 |            | 0                        | 89.9 | 10.1  | 0    |            |           |            |
| PHF  | .477                     | .964 | .000  | .250 | .983       | .768                         | .000 | .833  | .625 | .879       | .000                     | .938 | .839  | .000 | .927       | .000      | .940       |



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**APPENDIX B**  
**LEVEL OF SERVICE DEFINITIONS**

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**LEVEL OF SERVICE DEFINITIONS**

**LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS**

**Level of Service (LOS)** for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

**Table 1: Level-of-Service Criteria for  
Signalized Intersections**

| Level of Service | Control Delay per Vehicle<br>(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 depends 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.

**Level of Service A** describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

**Level of Service B** describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

**Level of Service C** describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**Level of Service D** describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

**Level of Service E** describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

**Level of Service F** describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

## LEVEL OF SERVICE DEFINITIONS

### LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

**Level of Service (LOS)** criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

**Table 1: Level-of-Service Criteria for  
Unsignalized Intersections**

| Level of Service | Average Control Delay<br>(Sec/Veh) |
|------------------|------------------------------------|
| A                | ≤ 10.0                             |
| B                | >10.0 and ≤ 15.0                   |
| C                | >15.0 and ≤ 25.0                   |
| D                | >25.0 and ≤ 35.0                   |
| E                | >35.0 and ≤ 50.0                   |
| F                | >50.0                              |



**APPENDIX C**

**CAPACITY ANALYSIS CALCULATIONS**

**EXISTING PEAK HOUR TRAFFIC ANALYSIS**

**HCM Unsignalized Intersection Capacity Analysis**  
**3: Kaonoulu & Piilani**

5/3/2011

| Movement                          | EBL    | EBR  | NBL  | NBT                  | SBT  | SBR  |      |      |
|-----------------------------------|--------|------|------|----------------------|------|------|------|------|
| Lane Configurations               | ↶      | ↷    | ↶    | ↶↶                   | ↶↶   | ↷    |      |      |
| Volume (veh/h)                    | 28     | 209  | 61   | 1306                 | 1458 | 16   |      |      |
| Sign Control                      | Stop   |      |      | Free                 | Free |      |      |      |
| Grade                             | 0%     |      |      | 0%                   | 0%   |      |      |      |
| Peak Hour Factor                  | 0.84   | 0.84 | 0.95 | 0.95                 | 0.91 | 0.91 |      |      |
| Hourly flow rate (vph)            | 33     | 249  | 64   | 1375                 | 1602 | 18   |      |      |
| Pedestrians                       |        |      |      |                      |      |      |      |      |
| Lane Width (ft)                   |        |      |      |                      |      |      |      |      |
| Walking Speed (ft/s)              |        |      |      |                      |      |      |      |      |
| Percent Blockage                  |        |      |      |                      |      |      |      |      |
| Right turn flare (veh)            |        |      |      |                      |      |      |      |      |
| Median type                       |        |      |      | TWLT                 | TWLT |      |      |      |
| Median storage (veh)              |        |      |      | 2                    | 2    |      |      |      |
| Upstream signal (ft)              |        |      |      |                      |      |      |      |      |
| pX, platoon unblocked             |        |      |      |                      |      |      |      |      |
| vC, conflicting volume            | 2418   | 801  | 1602 |                      |      |      |      |      |
| vC1, stage 1 conf vol             | 1602   |      |      |                      |      |      |      |      |
| vC2, stage 2 conf vol             | 816    |      |      |                      |      |      |      |      |
| vCu, unblocked vol                | 2418   | 801  | 1602 |                      |      |      |      |      |
| tC, single (s)                    | *5.8   | *5.9 | 4.1  |                      |      |      |      |      |
| tC, 2 stage (s)                   | 4.8    |      |      |                      |      |      |      |      |
| tF (s)                            | *2.5   | *2.3 | 2.2  |                      |      |      |      |      |
| p0 queue free %                   | 86     | 54   | 84   |                      |      |      |      |      |
| cM capacity (veh/h)               | 245    | 538  | 404  |                      |      |      |      |      |
| Directional Lane #                | EB 1+2 | EB 2 | NB 1 | NB 2                 | NB 3 | SB 1 | SB 2 | SB 3 |
| Volume Total                      | 33     | 249  | 64   | 687                  | 687  | 801  | 801  | 18   |
| Volume Left                       | 33     | 0    | 64   | 0                    | 0    | 0    | 0    | 0    |
| Volume Right                      | 0      | 249  | 0    | 0                    | 0    | 0    | 0    | 18   |
| cSH                               | 245    | 538  | 404  | 1700                 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.14   | 0.46 | 0.16 | 0.40                 | 0.40 | 0.47 | 0.47 | 0.01 |
| Queue Length 95th (ft)            | 12     | 60   | 14   | 0                    | 0    | 0    | 0    | 0    |
| Control Delay (s)                 | 22.0   | 17.3 | 15.6 | 0.0                  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | C      | C    | C    |                      |      |      |      |      |
| Approach Delay (s)                | 17.9   |      | 0.7  |                      |      | 0.0  |      |      |
| Approach LOS                      | C      |      |      |                      |      |      |      |      |
| Intersection Summary              |        |      |      |                      |      |      |      |      |
| Average Delay                     |        |      |      | 1.8                  |      |      |      |      |
| Intersection Capacity Utilization | 57.9%  |      |      | ICU Level of Service |      |      | B    |      |
| Analysis Period (min)             | 15     |      |      |                      |      |      |      |      |
| * User Entered Value              |        |      |      |                      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/3/2011

| Movement                          | EBL   | EBR  | NBL  | NBT  | SBT  | SEB  |      |      |
|-----------------------------------|-------|------|------|------|------|------|------|------|
| Lane Configurations               | ↰     | ↱    | ↰    | ↕    | ↕    | ↱    |      |      |
| Volume (veh/h)                    | 22    | 107  | 118  | 1475 | 1547 | 107  |      |      |
| Sign Control                      | Stop  |      |      | Free | Free |      |      |      |
| Grade                             | 0%    |      |      | 0%   | 0%   |      |      |      |
| Peak Hour Factor                  | 0.79  | 0.79 | 0.87 | 0.87 | 0.87 | 0.87 |      |      |
| Hourly flow rate (vph)            | 28    | 135  | 136  | 1695 | 1778 | 123  |      |      |
| Pedestrians                       |       |      |      |      |      |      |      |      |
| Lane Width (ft)                   |       |      |      |      |      |      |      |      |
| Walking Speed (ft/s)              |       |      |      |      |      |      |      |      |
| Percent Blockage                  |       |      |      |      |      |      |      |      |
| Right turn flare (veh)            |       |      |      |      |      |      |      |      |
| Median type                       |       |      |      | TWLT | TWLT |      |      |      |
| Median storage (veh)              |       |      |      | 2    | 2    |      |      |      |
| Upstream signal (ft)              |       |      |      |      |      |      |      |      |
| pX, platoon unblocked             |       |      |      |      |      |      |      |      |
| vC, conflicting volume            | 2897  | 889  | 1778 |      |      |      |      |      |
| vC1, stage 1 conf vol             | 1778  |      |      |      |      |      |      |      |
| vC2, stage 2 conf vol             | 1119  |      |      |      |      |      |      |      |
| vCu, unblocked vol                | 2897  | 889  | 1778 |      |      |      |      |      |
| tC, single (s)                    | *5.8  | *5.9 | 4.1  |      |      |      |      |      |
| tC, 2 stage (s)                   | 4.8   |      |      |      |      |      |      |      |
| tF (s)                            | *2.5  | *2.3 | 2.2  |      |      |      |      |      |
| p0 queue free %                   | 84    | 72   | 61   |      |      |      |      |      |
| cM capacity (veh/h)               | 172   | 478  | 345  |      |      |      |      |      |
| Direction/Lane                    | EB1   | EB2  | NB1  | NB2  | NB3  | SB1  | SB2  | SB3  |
| Volume Total                      | 28    | 135  | 136  | 848  | 848  | 889  | 889  | 123  |
| Volume Left                       | 28    | 0    | 136  | 0    | 0    | 0    | 0    | 0    |
| Volume Right                      | 0     | 135  | 0    | 0    | 0    | 0    | 0    | 123  |
| cSH                               | 172   | 478  | 345  | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.16  | 0.28 | 0.39 | 0.50 | 0.50 | 0.52 | 0.52 | 0.07 |
| Queue Length 95th (ft)            | 14    | 29   | 45   | 0    | 0    | 0    | 0    | 0    |
| Control Delay (s)                 | 29.9  | 15.5 | 22.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | D     | C    | C    |      |      |      |      |      |
| Approach Delay (s)                | 17.9  |      | 1.6  |      |      | 0.0  |      |      |
| Approach LOS                      | C     |      |      |      |      |      |      |      |
| Intersection Summary              |       |      |      |      |      |      |      |      |
| Average Delay                     | 1.5   |      |      |      |      |      |      |      |
| Intersection Capacity Utilization | 60.2% |      |      |      |      |      |      |      |
| ICU Level of Service              | B     |      |      |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |      |      |

\* User Entered Value

Existing PM Peak 4/20/2011 Baseline

Synchro 7 - Report  
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# HCM Unsignalized Intersection Capacity Analysis

5: Kulanihikoi & Piilani

5/3/2011

| Movement                          | EBL  | EBR  | NBL   | NBT  | SBT                  | SBR  |      |      |
|-----------------------------------|------|------|-------|------|----------------------|------|------|------|
| Lane Configurations               | ↰    | ↱    | ↰     | ↕    | ↕                    | ↱    |      |      |
| Volume (veh/h)                    | 72   | 135  | 49    | 1295 | 1621                 | 46   |      |      |
| Sign Control                      | Stop |      |       | Free | Free                 |      |      |      |
| Grade                             | 0%   |      |       | 0%   | 0%                   |      |      |      |
| Peak Hour Factor                  | 0.85 | 0.85 | 0.94  | 0.94 | 0.93                 | 0.93 |      |      |
| Hourly flow rate (vph)            | 85   | 159  | 52    | 1378 | 1743                 | 49   |      |      |
| Pedestrians                       |      |      |       |      |                      |      |      |      |
| Lane Width (ft)                   |      |      |       |      |                      |      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |                      |      |      |      |
| Percent Blockage                  |      |      |       |      |                      |      |      |      |
| Right turn flare (veh)            |      |      |       |      |                      |      |      |      |
| Median type                       |      |      |       | None | TWLT                 |      |      |      |
| Median storage (veh)              |      |      |       |      | 2                    |      |      |      |
| Upstream signal (ft)              |      |      |       |      |                      |      |      |      |
| pX, platoon unblocked             |      |      |       |      |                      |      |      |      |
| vC, conflicting volume            | 2536 | 872  | 1743  |      |                      |      |      |      |
| vC1, stage 1 conf vol             | 1743 |      |       |      |                      |      |      |      |
| vC2, stage 2 conf vol             | 793  |      |       |      |                      |      |      |      |
| vCu, unblocked vol                | 2536 | 872  | 1743  |      |                      |      |      |      |
| tC, single (s)                    | *5.8 | *5.9 | 4.1   |      |                      |      |      |      |
| tC, 2 stage (s)                   | 4.8  |      |       |      |                      |      |      |      |
| tF (s)                            | *2.5 | *2.3 | 2.2   |      |                      |      |      |      |
| p0 queue free %                   | 61   | 68   | 85    |      |                      |      |      |      |
| cM capacity (veh/h)               | 218  | 489  | 357   |      |                      |      |      |      |
| Direction/Lane                    | EBL  | EBR  | NBL   | NB2  | NB3                  | SB1  | SB2  | SB3  |
| Volume Total                      | 85   | 159  | 52    | 689  | 689                  | 872  | 872  | 49   |
| Volume Left                       | 85   | 0    | 52    | 0    | 0                    | 0    | 0    | 0    |
| Volume Right                      | 0    | 159  | 0     | 0    | 0                    | 0    | 0    | 49   |
| cSH                               | 218  | 489  | 357   | 1700 | 1700                 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.39 | 0.32 | 0.15  | 0.41 | 0.41                 | 0.51 | 0.51 | 0.03 |
| Queue Length 95th (ft)            | 43   | 35   | 13    | 0    | 0                    | 0    | 0    | 0    |
| Control Delay (s)                 | 31.6 | 15.9 | 16.8  | 0.0  | 0.0                  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | D    | C    | C     |      |                      |      |      |      |
| Approach Delay (s)                | 21.3 |      | 0.6   |      |                      | 0.0  |      |      |
| Approach LOS                      | C    |      |       |      |                      |      |      |      |
| Intersection Summary              |      |      |       |      |                      |      |      |      |
| Average Delay                     |      |      | 1.8   |      |                      |      |      |      |
| Intersection Capacity Utilization |      |      | 57.6% |      | ICU Level of Service |      |      | B    |
| Analysis Period (min)             |      |      | 15    |      |                      |      |      |      |

\* User Entered Value

Existing AM Peak 4/20/2011 Baseline







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# HCM Unsignalized Intersection Capacity Analysis

5: Kulanihikoi & Piilani

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| Movement                          | EBL   | EBR   | NBL   | NBT   | SBT   | SEB   |      |      |
|-----------------------------------|---|---|---|---|---|---|------|------|
| Lane Configurations               |  |  |  |  |  |  |      |      |
| Volume (veh/h)                    | 28  | 93  | 68  | 1565  | 1549  | 105   |      |      |
| Sign Control                      | Stop  |   |   | Free  | Free  |   |      |      |
| Grade                             | 0%  |   |   | 0%  | 0%  |   |      |      |
| Peak Hour Factor                  | 0.76  | 0.76  | 0.92  | 0.92  | 0.88  | 0.88  |      |      |
| Hourly flow rate (vph)            | 37  | 122   | 74  | 1701  | 1760  | 119   |      |      |
| Pedestrians                       |   |   |   |   |   |   |      |      |
| Lane Width (ft)                   |   |   |   |   |   |   |      |      |
| Walking Speed (ft/s)              |   |   |   |   |   |   |      |      |
| Percent Blockage                  |   |   |   |   |   |   |      |      |
| Right turn flare (veh)            |   |   |   |   |   |   |      |      |
| Median type                       |   |   |   | None  | TWLT  |   |      |      |
| Median storage (veh)              |   |   |   |   | 2   |   |      |      |
| Upstream signal (ft)              |   |   |   |   |   |   |      |      |
| pX, platoon unblocked             |   |   |   |   |   |   |      |      |
| vC, conflicting volume            | 2759  | 880   | 1760  |   |   |   |      |      |
| vC1, stage 1 conf vol             | 1760  |   |   |   |   |   |      |      |
| vC2, stage 2 conf vol             | 998   |   |   |   |   |   |      |      |
| vCu, unblocked vol                | 2759  | 880   | 1760  |   |   |   |      |      |
| tC, single (s)                    | *5.8  | *5.9  | 4.1   |   |   |   |      |      |
| tC, 2 stage (s)                   | 4.8   |   |   |   |   |   |      |      |
| tF (s)                            | *2.5  | *2.3  | 2.2   |   |   |   |      |      |
| p0 queue free %                   | 82  | 75  | 79  |   |   |   |      |      |
| cM capacity (veh/h)               | 201   | 484   | 351   |   |   |   |      |      |
| Direction Lane#                   | EB1   | EB2   | NB1   | NB2   | NB3   | SB1   | SB2  | SB3  |
| Volume Total                      | 37  | 122   | 74  | 851   | 851   | 880   | 880  | 119  |
| Volume Left                       | 37  | 0   | 74  | 0   | 0   | 0   | 0    | 0    |
| Volume Right                      | 0   | 122   | 0   | 0   | 0   | 0   | 0    | 119  |
| cSH                               | 201   | 484   | 351   | 1700  | 1700  | 1700  | 1700 | 1700 |
| Volume to Capacity                | 0.18  | 0.25  | 0.21  | 0.50  | 0.50  | 0.52  | 0.52 | 0.07 |
| Queue Length 95th (ft)            | 16  | 25  | 20  | 0   | 0   | 0   | 0    | 0    |
| Control Delay (s)                 | 26.9  | 14.9  | 18.0  | 0.0   | 0.0   | 0.0   | 0.0  | 0.0  |
| Lane LOS                          | D   | B   | C   |   |   |   |      |      |
| Approach Delay (s)                | 17.7  |   | 0.7   |   |   | 0.0   |      |      |
| Approach LOS                      | C   |   |   |   |   |   |      |      |
| Intersection Summary              |   |   |   |   |   |   |      |      |
| Average Delay                     | 1.1   |   |   |   |   |   |      |      |
| Intersection Capacity Utilization | 57.6%   |   |   | ICU Level of Service  |   |   | B    |      |
| Analysis Period (min)             | 15  |   |   |   |   |   |      |      |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/3/2011

| Movement                          | EBL   | EBR  | NBL  | NBT  | SBT  | SEB  |     |
|-----------------------------------|-------|------|------|------|------|------|-----|
| Lane Configurations               |       | ↱    |      | ↱    | ↱    | ↱    |     |
| Volume (veh/h)                    | 0     | 23   | 0    | 1344 | 1674 | 81   |     |
| Sign Control                      | Stop  |      |      | Free | Free |      |     |
| Grade                             | 0%    |      |      | 0%   | 0%   |      |     |
| Peak Hour Factor                  | 0.58  | 0.58 | 0.88 | 0.88 | 0.91 | 0.91 |     |
| Hourly flow rate (vph)            | 0     | 40   | 0    | 1527 | 1840 | 89   |     |
| Pedestrians                       |       |      |      |      |      |      |     |
| Lane Width (ft)                   |       |      |      |      |      |      |     |
| Walking Speed (ft/s)              |       |      |      |      |      |      |     |
| Percent Blockage                  |       |      |      |      |      |      |     |
| Right turn flare (veh)            |       |      |      |      |      |      |     |
| Median type                       |       |      |      | None | None |      |     |
| Median storage (veh)              |       |      |      |      |      |      |     |
| Upstream signal (ft)              |       |      |      |      |      |      |     |
| pX, platoon unblocked             |       |      |      |      |      |      |     |
| vC, conflicting volume            | 2603  | 920  | 1840 |      |      |      |     |
| vC1, stage 1 conf vol             |       |      |      |      |      |      |     |
| vC2, stage 2 conf vol             |       |      |      |      |      |      |     |
| vCu, unblocked vol                | 2603  | 920  | 1840 |      |      |      |     |
| tC, single (s)                    | 6.8   | *5.9 | 4.1  |      |      |      |     |
| tC, 2 stage (s)                   |       |      |      |      |      |      |     |
| tF (s)                            | 3.5   | *2.3 | 2.2  |      |      |      |     |
| p0 queue free %                   | 100   | 91   | 100  |      |      |      |     |
| cM capacity (veh/h)               | 20    | 458  | 327  |      |      |      |     |
| Direction Lane#                   | EB1   | EB2  | NB1  | NB2  | SB1  | SB2  | SB3 |
| Volume Total                      | 40    | 764  | 764  | 920  | 920  | 89   |     |
| Volume Left                       | 0     | 0    | 0    | 0    | 0    | 0    |     |
| Volume Right                      | 40    | 0    | 0    | 0    | 0    | 89   |     |
| cSH                               | 458   | 1700 | 1700 | 1700 | 1700 | 1700 |     |
| Volume to Capacity                | 0.09  | 0.45 | 0.45 | 0.54 | 0.54 | 0.05 |     |
| Queue Length 95th (ft)            | 7     | 0    | 0    | 0    | 0    | 0    |     |
| Control Delay (s)                 | 13.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |     |
| Lane LOS                          | B     |      |      |      |      |      |     |
| Approach Delay (s)                | 13.6  | 0.0  |      | 0.0  |      |      |     |
| Approach LOS                      | B     |      |      |      |      |      |     |
| Intersection Summary              |       |      |      |      |      |      |     |
| Average Delay                     | 0.2   |      |      |      |      |      |     |
| Intersection Capacity Utilization | 54.0% |      |      |      |      |      |     |
| Analysis Period (min)             | 15    |      |      |      |      |      |     |
| ICU Level of Service              | A     |      |      |      |      |      |     |

\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/3/2011







| Movement                          | EBL   | EBR  | NBL                  | NBT  | SBL  | SBR  |
|-----------------------------------|-------|------|----------------------|------|------|------|
| Lane Configurations               |       | ↗    |                      | ↕    | ↕    | ↗    |
| Volume (veh/h)                    | 0     | 32   | 0                    | 1633 | 1542 | 100  |
| Sign Control                      | Stop  |      |                      | Free | Free |      |
| Grade                             | 0%    |      |                      | 0%   | 0%   |      |
| Peak Hour Factor                  | 0.57  | 0.57 | 0.95                 | 0.95 | 0.96 | 0.96 |
| Hourly flow rate (vph)            | 0     | 56   | 0                    | 1719 | 1606 | 104  |
| Pedestrians                       |       |      |                      |      |      |      |
| Lane Width (ft)                   |       |      |                      |      |      |      |
| Walking Speed (ft/s)              |       |      |                      |      |      |      |
| Percent Blockage                  |       |      |                      |      |      |      |
| Right turn flare (veh)            |       |      |                      |      |      |      |
| Median type                       |       |      |                      | None | None |      |
| Median storage (veh)              |       |      |                      |      |      |      |
| Upstream signal (ft)              |       |      |                      |      |      |      |
| pX, platoon unblocked             |       |      |                      |      |      |      |
| vC, conflicting volume            | 2466  | 803  | 1606                 |      |      |      |
| vC1, stage 1 conf vol             |       |      |                      |      |      |      |
| vC2, stage 2 conf vol             |       |      |                      |      |      |      |
| vCu, unblocked vol                | 2466  | 803  | 1606                 |      |      |      |
| tC, single (s)                    | 6.8   | *5.9 | 4.1                  |      |      |      |
| tC, 2 stage (s)                   |       |      |                      |      |      |      |
| tF (s)                            | 3.5   | *2.3 | 2.2                  |      |      |      |
| p0 queue free %                   | 100   | 90   | 100                  |      |      |      |
| cM capacity (veh/h)               | 25    | 537  | 403                  |      |      |      |
| Direction/Lane #                  | EB 1  | EB 1 | NB 1                 | SB 1 | SB 1 | SB 2 |
| Volume Total                      | 56    | 859  | 859                  | 803  | 803  | 104  |
| Volume Left                       | 0     | 0    | 0                    | 0    | 0    | 0    |
| Volume Right                      | 56    | 0    | 0                    | 0    | 0    | 104  |
| cSH                               | 537   | 1700 | 1700                 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.10  | 0.51 | 0.51                 | 0.47 | 0.47 | 0.06 |
| Queue Length 95th (ft)            | 9     | 0    | 0                    | 0    | 0    | 0    |
| Control Delay (s)                 | 12.5  | 0.0  | 0.0                  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | B     |      |                      |      |      |      |
| Approach Delay (s)                | 12.5  | 0.0  |                      | 0.0  |      |      |
| Approach LOS                      | B     |      |                      |      |      |      |
| Intersection Summary              |       |      |                      |      |      |      |
| Average Delay                     | 0.2   |      |                      |      |      |      |
| Intersection Capacity Utilization | 50.5% |      | ICU Level of Service |      | A    |      |
| Analysis Period (min)             | 15    |      |                      |      |      |      |

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/3/2011

| Movement                          | EBL   | EBR   | NBL   | NBT   | SBL   | SBR   |
|-----------------------------------|---|---|---|---|---|---|
| Lane Configurations               |  |  |  |  |  |  |
| Volume (vph)                      | 294   | 133   | 123   | 1050  | 1376  | 321   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000  | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95  | 0.95  | 1.00  |
| Frt                               | 1.00  | 0.85  | 1.00  | 1.00  | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 0.95  | 1.00  | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725  | 3725  | 1667  |
| Flt Permitted                     | 0.95  | 1.00  | 0.95  | 1.00  | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725  | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.90  | 0.90  | 0.88  | 0.88  | 0.91  | 0.91  |
| Adj. Flow (vph)                   | 327   | 148   | 140   | 1193  | 1512  | 353   |
| RTOR Reduction (vph)              | 0   | 113   | 0   | 0   | 0   | 0   |
| Lane Group Flow (vph)             | 327   | 35  | 140   | 1193  | 1512  | 353   |
| Turn Type                         | Perm  |   | Prot  |   | Free  |   |
| Protected Phases                  | 4   |   | 5   |   | 6   |   |
| Permitted Phases                  | 4   |   |   |   | Free  |   |
| Actuated Green, G (s)             | 28.3  | 28.3  | 14.5  | 80.1  | 60.6  | 118.4   |
| Effective Green, g (s)            | 28.3  | 28.3  | 14.5  | 80.1  | 60.6  | 118.4   |
| Actuated g/C Ratio                | 0.24  | 0.24  | 0.12  | 0.68  | 0.51  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |   |
| Lane Grp Cap (vph)                | 423   | 378   | 228   | 2520  | 1907  | 1667  |
| v/s Ratio Prot                    | c0.18   |   | c0.08   | 0.32  | c0.41   |   |
| v/s Ratio Perm                    |   | 0.02  |   |   |   | 0.21  |
| v/c Ratio                         | 0.77  | 0.09  | 0.61  | 0.47  | 0.79  | 0.21  |
| Uniform Delay, d1                 | 42.1  | 35.1  | 49.3  | 9.1   | 23.7  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Incremental Delay, d2             | 8.5   | 0.1   | 4.8   | 0.1   | 2.3   | 0.3   |
| Delay (s)                         | 50.6  | 35.2  | 54.1  | 9.3   | 26.1  | 0.3   |
| Level of Service                  | D   | D   | D   | A   | C   | A   |
| Approach Delay (s)                | 45.8  |   |   | 14.0  | 21.2  |   |
| Approach LOS                      | D   |   |   | B   | C   |   |
| Intersection Summary              |   |   |   |   |   |   |
| HCM Average Control Delay         | 21.8  |   | HCM Level of Service  |   | C   |   |
| HCM Volume to Capacity ratio      | 0.76  |   |   |   |   |   |
| Actuated Cycle Length (s)         | 118.4   |   | Sum of lost time (s)  |   | 15.0  |   |
| Intersection Capacity Utilization | 71.4%   |   | ICU Level of Service  |   | C   |   |
| Analysis Period (min)             | 15  |   |   |   |   |   |
| c Critical Lane Group             |   |   |   |   |   |   |

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# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

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| Movement                          | EBL   | EBR  | NBL   | NBT                  | SBL  | SBR   |
|-----------------------------------|-------|------|-------|----------------------|------|-------|
| Lane Configurations               | ↰     | ↱    | ↰     | ↕                    | ↕    | ↱     |
| Volume (vph)                      | 270   | 277  | 233   | 1363                 | 1200 | 374   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 2000  | 2000                 | 2000 | 2000  |
| Total Lost time (s)               | 5.0   | 5.0  | 5.0   | 5.0                  | 5.0  | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00 | 1.00  | 0.95                 | 0.95 | 1.00  |
| Flt                               | 1.00  | 0.85 | 1.00  | 1.00                 | 1.00 | 0.85  |
| Flt Protected                     | 0.95  | 1.00 | 0.95  | 1.00                 | 1.00 | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583 | 1863  | 3725                 | 3725 | 1667  |
| Flt Permitted                     | 0.95  | 1.00 | 0.95  | 1.00                 | 1.00 | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583 | 1863  | 3725                 | 3725 | 1667  |
| Peak-hour factor, PHF             | 0.89  | 0.89 | 0.95  | 0.95                 | 0.96 | 0.96  |
| Adj. Flow (vph)                   | 303   | 311  | 245   | 1435                 | 1250 | 390   |
| RTOR Reduction (vph)              | 0     | 239  | 0     | 0                    | 0    | 0     |
| Lane Group Flow (vph)             | 303   | 72   | 245   | 1435                 | 1250 | 390   |
| Turn Type                         | Perm  |      | Prot  | Free                 |      |       |
| Protected Phases                  | 4     |      | 5     | 6                    |      |       |
| Permitted Phases                  | 4     |      | Free  |                      |      |       |
| Actuated Green, G (s)             | 25.7  | 25.7 | 20.9  | 75.1                 | 49.2 | 110.8 |
| Effective Green, g (s)            | 25.7  | 25.7 | 20.9  | 75.1                 | 49.2 | 110.8 |
| Actuated g/C Ratio                | 0.23  | 0.23 | 0.19  | 0.68                 | 0.44 | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0  | 5.0   | 5.0                  | 5.0  |       |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0   | 3.0                  | 3.0  |       |
| Lane Grp Cap (vph)                | 411   | 367  | 351   | 2525                 | 1654 | 1667  |
| v/s Ratio Prot                    | c0.17 |      | c0.13 | 0.39 c0.34           |      |       |
| v/s Ratio Perm                    | 0.05  |      | 0.23  |                      |      |       |
| v/c Ratio                         | 0.74  | 0.20 | 0.70  | 0.57                 | 0.76 | 0.23  |
| Uniform Delay, d1                 | 39.4  | 34.2 | 42.0  | 9.4                  | 25.8 | 0.0   |
| Progression Factor                | 1.00  | 1.00 | 1.00  | 1.00                 | 1.00 | 1.00  |
| Incremental Delay, d2             | 6.8   | 0.3  | 6.0   | 0.3                  | 2.0  | 0.3   |
| Delay (s)                         | 46.2  | 34.5 | 48.0  | 9.7                  | 27.8 | 0.3   |
| Level of Service                  | D C   |      | D     | A                    | C    | A     |
| Approach Delay (s)                | 40.3  |      |       | 15.2                 | 21.3 |       |
| Approach LOS                      | D     |      |       | B                    | C    |       |
| Intersection Summary              |       |      |       |                      |      |       |
| HCM Average Control Delay         |       |      | 21.7  | HCM Level of Service |      | C     |
| HCM Volume to Capacity ratio      |       |      | 0.74  |                      |      |       |
| Actuated Cycle Length (s)         |       |      | 110.8 | Sum of lost time (s) |      | 15.0  |
| Intersection Capacity Utilization |       |      | 71.2% | ICU Level of Service |      | C     |
| Analysis Period (min)             |       |      | 15    |                      |      |       |
| c Critical Lane Group             |       |      |       |                      |      |       |

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# HCM Unsignalized Intersection Capacity Analysis

13: Kulanihakai &

5/3/2011

| Movement                          | WBL   | WBR  | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|-------|------|------|----------------------|------|------|
| Lane Configurations               | ↰     | ↱    | ↰    |                      | ↰    | ↱    |
| Volume (veh/h)                    | 43    | 60   | 420  | 47                   | 21   | 324  |
| Sign Control                      | Stop  |      | Free |                      |      | Free |
| Grade                             | 0%    |      | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.83  | 0.83 | 0.93 | 0.93                 | 0.98 | 0.98 |
| Hourly flow rate (vph)            | 52    | 72   | 452  | 51                   | 21   | 331  |
| Pedestrians                       |       |      |      |                      |      |      |
| Lane Width (ft)                   |       |      |      |                      |      |      |
| Walking Speed (ft/s)              |       |      |      |                      |      |      |
| Percent Blockage                  |       |      |      |                      |      |      |
| Right turn flare (veh)            |       |      |      |                      |      |      |
| Median type                       | None  |      |      | None                 |      |      |
| Median storage (veh)              |       |      |      |                      |      |      |
| Upstream signal (ft)              |       |      |      |                      |      |      |
| pX, platoon unblocked             |       |      |      |                      |      |      |
| vC, conflicting volume            | 850   | 477  |      |                      | 502  |      |
| vC1, stage 1 conf vol             |       |      |      |                      |      |      |
| vC2, stage 2 conf vol             |       |      |      |                      |      |      |
| vCu, unblocked vol                | 850   | 477  |      |                      | 502  |      |
| tC, single (s)                    | 6.4   | 6.2  |      |                      | 4.1  |      |
| tC, 2 stage (s)                   |       |      |      |                      |      |      |
| tF (s)                            | 3.5   | 3.3  |      |                      | 2.2  |      |
| p0 queue free %                   | 84    | 88   |      |                      | 98   |      |
| cM capacity (veh/h)               | 324   | 588  |      |                      | 1062 |      |
| Direction, Lane #                 | WB 1  | WB 2 | NB 1 | SB 1                 | SB 2 |      |
| Volume Total                      | 52    | 72   | 502  | 21                   | 331  |      |
| Volume Left                       | 52    | 0    | 0    | 21                   | 0    |      |
| Volume Right                      | 0     | 72   | 51   | 0                    | 0    |      |
| cSH                               | 324   | 588  | 1700 | 1062                 | 1700 |      |
| Volume to Capacity                | 0.16  | 0.12 | 0.30 | 0.02                 | 0.19 |      |
| Queue Length 95th (ft)            | 14    | 10   | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 18.2  | 12.0 | 0.0  | 8.5                  | 0.0  |      |
| Lane LOS                          | C     | B    |      | A                    |      |      |
| Approach Delay (s)                | 14.6  |      | 0.0  | 0.5                  |      |      |
| Approach LOS                      | B     |      |      |                      |      |      |
| Intersection Summary              |       |      |      |                      |      |      |
| Average Delay                     | 2.0   |      |      |                      |      |      |
| Intersection Capacity Utilization | 35.3% |      |      | ICU Level of Service |      | A    |
| Analysis Period (min)             | 15    |      |      |                      |      |      |

Existing AM Peak 4/20/2011 Baseline

Synchro 7 - Report  
Page 5

HCM Unsignalized Intersection Capacity Analysis  
13: Kulanihakoi &

5/3/2011

|                                   | ↖    | ↗     | ↑    | ↘                    | ↙    | ↓    |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Movement                          | WBL  | WBR   | NBS  | NBR                  | SBL  | SBR  |
| Lane Configurations               | ↖    | ↗     | ↑    | ↘                    | ↙    | ↓    |
| Volume (veh/h)                    | 56   | 27    | 558  | 53                   | 23   | 447  |
| Sign Control                      | Stop |       | Free |                      |      | Free |
| Grade                             | 0%   |       | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.96 | 0.96                 | 0.84 | 0.84 |
| Hourly flow rate (vph)            | 72   | 35    | 581  | 55                   | 27   | 532  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      | None  |      | None                 |      |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 1196 | 609   |      | 636                  |      |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 1196 | 609   |      | 636                  |      |      |
| tC, single (s)                    | *5.4 | *5.2  |      | 4.1                  |      |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | *2.5 | *2.3  |      | 2.2                  |      |      |
| p0 queue free %                   | 79   | 96    |      | 97                   |      |      |
| cM capacity (veh/h)               | 342  | 784   |      | 947                  |      |      |
| Direction Lane #                  | WB1  | WB2   | NB1  | SB1                  | SB2  |      |
| Volume Total                      | 72   | 35    | 636  | 27                   | 532  |      |
| Volume Left                       | 72   | 0     | 0    | 27                   | 0    |      |
| Volume Right                      | 0    | 35    | 55   | 0                    | 0    |      |
| cSH                               | 342  | 784   | 1700 | 947                  | 1700 |      |
| Volume to Capacity                | 0.21 | 0.04  | 0.37 | 0.03                 | 0.31 |      |
| Queue Length 95th (ft)            | 19   | 3     | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 18.3 | 9.8   | 0.0  | 8.9                  | 0.0  |      |
| Lane LOS                          | C    | A     |      | A                    |      |      |
| Approach Delay (s)                | 15.5 |       | 0.0  | 0.4                  |      |      |
| Approach LOS                      | C    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.5   |      |                      |      |      |
| Intersection Capacity Utilization |      | 42.6% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

\* User Entered Value

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS  
PROJECTED YEAR 2015 PEAK HOUR TRAFFIC  
ANALYSIS WITHOUT PROJECT



# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/4/2011

|                                   |      |      |       |      |      |                      |      |      |
|-----------------------------------|------|------|-------|------|------|----------------------|------|------|
|                                   |      |      |       |      |      |                      |      |      |
| Movement                          | EBL  | EBH  | NBL   | NBT  | SBT  | SBH                  |      |      |
| Lane Configurations               | ↰    | ↰    | ↰     | ↰    | ↰    | ↰                    |      |      |
| Volume (veh/h)                    | 28   | 209  | 61    | 1358 | 1516 | 16                   |      |      |
| Sign Control                      | Stop |      |       | Free | Free |                      |      |      |
| Grade                             | 0%   |      |       | 0%   | 0%   |                      |      |      |
| Peak Hour Factor                  | 0.84 | 0.84 | 0.95  | 0.95 | 0.91 | 0.91                 |      |      |
| Hourly flow rate (vph)            | 33   | 249  | 64    | 1429 | 1666 | 18                   |      |      |
| Pedestrians                       |      |      |       |      |      |                      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |                      |      |      |
| Percent Blockage                  |      |      |       |      |      |                      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |                      |      |      |
| Median type                       |      |      |       | TWLT | TWLT |                      |      |      |
| Median storage (veh)              |      |      |       | 2    | 2    |                      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |                      |      |      |
| pX, platoon unblocked             |      |      |       |      |      |                      |      |      |
| vC, conflicting volume            | 2509 | 833  | 1666  |      |      |                      |      |      |
| vC1, stage 1 conf vol             | 1666 |      |       |      |      |                      |      |      |
| vC2, stage 2 conf vol             | 843  |      |       |      |      |                      |      |      |
| vCu, unblocked vol                | 2509 | 833  | 1666  |      |      |                      |      |      |
| tC, single (s)                    | *5.8 | *5.9 | 4.1   |      |      |                      |      |      |
| tC, 2 stage (s)                   | 4.8  |      |       |      |      |                      |      |      |
| tF (s)                            | *2.5 | *2.3 | 2.2   |      |      |                      |      |      |
| p0 queue free %                   | 85   | 52   | 83    |      |      |                      |      |      |
| cM capacity (veh/h)               | 230  | 515  | 382   |      |      |                      |      |      |
| Direction Lane #                  | EB1  | EB2  | NB1   | NB2  | NB3  | SB1                  | SB2  | SB3  |
| Volume Total                      | 33   | 249  | 64    | 715  | 715  | 833                  | 833  | 18   |
| Volume Left                       | 33   | 0    | 64    | 0    | 0    | 0                    | 0    | 0    |
| Volume Right                      | 0    | 249  | 0     | 0    | 0    | 0                    | 0    | 18   |
| cSH                               | 230  | 515  | 382   | 1700 | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.15 | 0.48 | 0.17  | 0.42 | 0.42 | 0.49                 | 0.49 | 0.01 |
| Queue Length 95th (ft)            | 12   | 65   | 15    | 0    | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 23.3 | 18.3 | 16.3  | 0.0  | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | C    | C    | C     |      |      |                      |      |      |
| Approach Delay (s)                | 18.9 |      | 0.7   |      |      | 0.0                  |      |      |
| Approach LOS                      | C    |      |       |      |      |                      |      |      |
| Intersection Summary              |      |      |       |      |      |                      |      |      |
| Average Delay                     |      |      | 1.8   |      |      |                      |      |      |
| Intersection Capacity Utilization |      |      | 59.4% |      |      | ICU Level of Service |      | B    |
| Analysis Period (min)             |      |      | 15    |      |      |                      |      |      |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/4/2011

|                                   |      |      |       |      |      |                      |      |      |
|-----------------------------------|------|------|-------|------|------|----------------------|------|------|
|                                   |      |      |       |      |      |                      |      |      |
| Movement                          | EBL  | EBH  | NBL   | NBT  | SBT  | SBH                  |      |      |
| Lane Configurations               | ↰    | ↰    | ↰     | ↰    | ↰    | ↰                    |      |      |
| Volume (veh/h)                    | 22   | 107  | 118   | 1534 | 1609 | 107                  |      |      |
| Sign Control                      | Stop |      |       | Free | Free |                      |      |      |
| Grade                             | 0%   |      |       | 0%   | 0%   |                      |      |      |
| Peak Hour Factor                  | 0.79 | 0.79 | 0.87  | 0.87 | 0.87 | 0.87                 |      |      |
| Hourly flow rate (vph)            | 28   | 135  | 136   | 1763 | 1849 | 123                  |      |      |
| Pedestrians                       |      |      |       |      |      |                      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |                      |      |      |
| Percent Blockage                  |      |      |       |      |      |                      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |                      |      |      |
| Median type                       |      |      |       | TWLT | TWLT |                      |      |      |
| Median storage (veh)              |      |      |       | 2    | 2    |                      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |                      |      |      |
| pX, platoon unblocked             |      |      |       |      |      |                      |      |      |
| vC, conflicting volume            | 3002 | 925  | 1849  |      |      |                      |      |      |
| vC1, stage 1 conf vol             | 1849 |      |       |      |      |                      |      |      |
| vC2, stage 2 conf vol             | 1153 |      |       |      |      |                      |      |      |
| vCu, unblocked vol                | 3002 | 925  | 1849  |      |      |                      |      |      |
| tC, single (s)                    | *5.8 | *5.9 | 4.1   |      |      |                      |      |      |
| tC, 2 stage (s)                   | 4.8  |      |       |      |      |                      |      |      |
| tF (s)                            | *2.5 | *2.3 | 2.2   |      |      |                      |      |      |
| p0 queue free %                   | 82   | 70   | 58    |      |      |                      |      |      |
| cM capacity (veh/h)               | 159  | 455  | 324   |      |      |                      |      |      |
| Direction Lane #                  | EB1  | EB2  | NB1   | NB2  | NB3  | SB1                  | SB2  | SB3  |
| Volume Total                      | 28   | 135  | 136   | 882  | 882  | 925                  | 925  | 123  |
| Volume Left                       | 28   | 0    | 136   | 0    | 0    | 0                    | 0    | 0    |
| Volume Right                      | 0    | 135  | 0     | 0    | 0    | 0                    | 0    | 123  |
| cSH                               | 159  | 455  | 324   | 1700 | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.18 | 0.30 | 0.42  | 0.52 | 0.52 | 0.54                 | 0.54 | 0.07 |
| Queue Length 95th (ft)            | 15   | 31   | 50    | 0    | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 32.4 | 16.2 | 23.9  | 0.0  | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | D    | C    | C     |      |      |                      |      |      |
| Approach Delay (s)                | 19.0 |      | 1.7   |      |      | 0.0                  |      |      |
| Approach LOS                      | C    |      |       |      |      |                      |      |      |
| Intersection Summary              |      |      |       |      |      |                      |      |      |
| Average Delay                     |      |      | 1.6   |      |      |                      |      |      |
| Intersection Capacity Utilization |      |      | 61.8% |      |      | ICU Level of Service |      | B    |
| Analysis Period (min)             |      |      | 15    |      |      |                      |      |      |







\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

5: Kulanihakoi & Piilani

5/4/2011

| Movement                          | EBL   | EBR   | NBL   | NBT   | SBT   | SEB   |      |
|-----------------------------------|---|---|---|---|---|---|------|
| Lane Configurations               |  |  |  |  |  |  |      |
| Volume (veh/h)                    | 72  | 135   | 49  | 1347  | 1679  | 46  |      |
| Sign Control                      | Stop  |   |   | Free  | Free  |   |      |
| Grade                             | 0%  |   |   | 0%  | 0%  |   |      |
| Peak Hour Factor                  | 0.85  | 0.85  | 0.94  | 0.94  | 0.93  | 0.93  |      |
| Hourly flow rate (vph)            | 85  | 159   | 52  | 1433  | 1805  | 49  |      |
| Pedestrians                       |   |   |   |   |   |   |      |
| Lane Width (ft)                   |   |   |   |   |   |   |      |
| Walking Speed (ft/s)              |   |   |   |   |   |   |      |
| Percent Blockage                  |   |   |   |   |   |   |      |
| Right turn flare (veh)            |   |   |   |   |   |   |      |
| Median type                       |   |   |   | None  | TWTL  |   |      |
| Median storage (veh)              |   |   |   |   | 2   |   |      |
| Upstream signal (ft)              |   |   |   |   |   |   |      |
| pX, platoon unblocked             |   |   |   |   |   |   |      |
| vC, conflicting volume            | 2626  | 903   | 1805  |   |   |   |      |
| vC1, stage 1 conf vol             | 1805  |   |   |   |   |   |      |
| vC2, stage 2 conf vol             | 821   |   |   |   |   |   |      |
| vCu, unblocked vol                | 2626  | 903   | 1805  |   |   |   |      |
| tC, single (s)                    | *5.8  | *5.9  | 4.1   |   |   |   |      |
| tC, 2 stage (s)                   | 4.8   |   |   |   |   |   |      |
| tF (s)                            | *2.5  | *2.3  | 2.2   |   |   |   |      |
| p0 queue free %                   | 59  | 66  | 85  |   |   |   |      |
| cM capacity (veh/h)               | 205   | 469   | 337   |   |   |   |      |
| Direction Lane #                  | EBL   | EBR   | NBL   | NBT   | SBT   | SEB   | SB3  |
| Volume Total                      | 85  | 159   | 52  | 716   | 716   | 903   | 49   |
| Volume Left                       | 85  | 0   | 52  | 0   | 0   | 0   | 0    |
| Volume Right                      | 0   | 159   | 0   | 0   | 0   | 0   | 49   |
| cSH                               | 205   | 469   | 337   | 1700  | 1700  | 1700  | 1700 |
| Volume to Capacity                | 0.41  | 0.34  | 0.15  | 0.42  | 0.42  | 0.53  | 0.03 |
| Queue Length 95th (ft)            | 47  | 37  | 14  | 0   | 0   | 0   | 0    |
| Control Delay (s)                 | 34.5  | 16.6  | 17.6  | 0.0   | 0.0   | 0.0   | 0.0  |
| Lane LOS                          | D   | C   | C   |   |   |   |      |
| Approach Delay (s)                | 22.8  |   | 0.6   |   | 0.0   |   |      |
| Approach LOS                      | C   |   |   |   |   |   |      |
| Intersection Summary              |   |   |   |   |   |   |      |
| Average Delay                     |   |   | 1.8   |   |   |   |      |
| Intersection Capacity Utilization |   |   | 59.1%   |   | ICU Level of Service  |   | B    |
| Analysis Period (min)             |   |   | 15  |   |   |   |      |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

5: Kulanihakoi & Piilani

5/4/2011

| Movement                          | EBL                  | EBR  | NBL  | NBT  | SEB  | SEB  |
|-----------------------------------|----------------------|------|------|------|------|------|
| Lane Configurations               | ↖                    | ↗    | ↖    | ↗    | ↗    | ↗    |
| Volume (veh/h)                    | 28                   | 93   | 68   | 1624 | 1611 | 105  |
| Sign Control                      | Stop                 |      |      | Free | Free |      |
| Grade                             | 0%                   |      |      | 0%   | 0%   |      |
| Peak Hour Factor                  | 0.76                 | 0.76 | 0.92 | 0.92 | 0.88 | 0.88 |
| Hourly flow rate (vph)            | 37                   | 122  | 74   | 1765 | 1831 | 119  |
| Pedestrians                       |                      |      |      |      |      |      |
| Lane Width (ft)                   |                      |      |      |      |      |      |
| Walking Speed (ft/s)              |                      |      |      |      |      |      |
| Percent Blockage                  |                      |      |      |      |      |      |
| Right turn flare (veh)            |                      |      |      |      |      |      |
| Median type                       |                      |      | None | TWTL |      |      |
| Median storage veh                |                      |      |      | 2    |      |      |
| Upstream signal (ft)              |                      |      |      |      |      |      |
| pX, platoon unblocked             |                      |      |      |      |      |      |
| vC, conflicting volume            | 2861                 | 915  | 1831 |      |      |      |
| vC1, stage 1 conf vol             | 1831                 |      |      |      |      |      |
| vC2, stage 2 conf vol             | 1030                 |      |      |      |      |      |
| vCu, unblocked vol                | 2861                 | 915  | 1831 |      |      |      |
| tC, single (s)                    | *5.8                 | *5.9 | 4.1  |      |      |      |
| tC, 2 stage (s)                   | 4.8                  |      |      |      |      |      |
| tF (s)                            | *2.5                 | *2.3 | 2.2  |      |      |      |
| p0 queue free %                   | 80                   | 73   | 78   |      |      |      |
| cM capacity (veh/h)               | 187                  | 461  | 330  |      |      |      |
| Direction Lane #                  | EBL                  | EBR  | NBL  | NBT  | SEB  | SEB  |
| Volume Total                      | 37                   | 122  | 74   | 883  | 883  | 915  |
| Volume Left                       | 37                   | 0    | 74   | 0    | 0    | 0    |
| Volume Right                      | 0                    | 122  | 0    | 0    | 0    | 0    |
| cSH                               | 187                  | 461  | 330  | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.20                 | 0.27 | 0.22 | 0.52 | 0.52 | 0.54 |
| Queue Length 95th (ft)            | 18                   | 26   | 21   | 0    | 0    | 0    |
| Control Delay (s)                 | 29.0                 | 15.6 | 19.1 | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | D                    | C    | C    |      |      |      |
| Approach Delay (s)                | 18.7                 |      | 0.8  |      | 0.0  |      |
| Approach LOS                      | C                    |      |      |      |      |      |
| Intersection Summary              |                      |      |      |      |      |      |
| Average Delay                     | 1.1                  |      |      |      |      |      |
| Intersection Capacity Utilization | 59.2%                |      |      |      |      |      |
| Analysis Period (min)             | 15                   |      |      |      |      |      |
|                                   | ICU Level of Service |      |      |      |      |      |
|                                   | B                    |      |      |      |      |      |

\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL   | EBR  | NBL  | NBT                  | SBT  | SBR  |
|-----------------------------------|-------|------|------|----------------------|------|------|
| Lane Configurations               |       | ↑    |      | ↑↑                   | ↑↑   | ↑    |
| Volume (veh/h)                    | 0     | 23   | 0    | 1396                 | 1732 | 81   |
| Sign Control                      | Stop  |      |      | Free                 | Free |      |
| Grade                             | 0%    |      |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.58  | 0.58 | 0.88 | 0.88                 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 0     | 40   | 0    | 1586                 | 1903 | 89   |
| Pedestrians                       |       |      |      |                      |      |      |
| Lane Width (ft)                   |       |      |      |                      |      |      |
| Walking Speed (ft/s)              |       |      |      |                      |      |      |
| Percent Blockage                  |       |      |      |                      |      |      |
| Right turn flare (veh)            |       |      |      |                      |      |      |
| Median type                       |       |      |      | None                 | None |      |
| Median storage (veh)              |       |      |      |                      |      |      |
| Upstream signal (ft)              |       |      |      |                      |      |      |
| pX, platoon unblocked             |       |      |      |                      |      |      |
| vC, conflicting volume            | 2696  | 952  | 1903 |                      |      |      |
| vC1, stage 1 conf vol             |       |      |      |                      |      |      |
| vC2, stage 2 conf vol             |       |      |      |                      |      |      |
| vCu, unblocked vol                | 2696  | 952  | 1903 |                      |      |      |
| tC, single (s)                    | 6.8   | *5.9 | 4.1  |                      |      |      |
| tC, 2 stage (s)                   |       |      |      |                      |      |      |
| tF (s)                            | 3.5   | *2.3 | 2.2  |                      |      |      |
| p0 queue free %                   | 100   | 91   | 100  |                      |      |      |
| cM capacity (veh/h)               | 17    | 439  | 309  |                      |      |      |
| Direction/Lane #                  | EBL   | EBR  | NBL  | NBT                  | SBT  | SBR  |
| Volume Total                      | 40    | 793  | 793  | 952                  | 952  | 89   |
| Volume Left                       | 0     | 0    | 0    | 0                    | 0    | 0    |
| Volume Right                      | 40    | 0    | 0    | 0                    | 0    | 89   |
| cSH                               | 439   | 1700 | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.09  | 0.47 | 0.47 | 0.56                 | 0.56 | 0.05 |
| Queue Length 95th (ft)            | 7     | 0    | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 14.0  | 0.0  | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | B     |      |      |                      |      |      |
| Approach Delay (s)                | 14.0  | 0.0  |      | 0.0                  |      |      |
| Approach LOS                      | B     |      |      |                      |      |      |
| Intersection Summary              |       |      |      |                      |      |      |
| Average Delay                     | 0.2   |      |      |                      |      |      |
| Intersection Capacity Utilization | 55.5% |      |      |                      |      |      |
| Analysis Period (min)             | 15    |      |      |                      |      |      |
|                                   |       |      |      | ICU Level of Service |      |      |
|                                   |       |      |      | B                    |      |      |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL   | EBR  | NBL  | NBT  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|------|------|
| Lane Configurations               |       | ↗    |      | ↕    | ↕    | ↗    |
| Volume (veh/h)                    | 0     | 32   | 0    | 1692 | 1604 | 100  |
| Sign Control                      | Stop  |      |      | Free | Free |      |
| Grade                             | 0%    |      |      | 0%   | 0%   |      |
| Peak Hour Factor                  | 0.57  | 0.57 | 0.95 | 0.95 | 0.96 | 0.96 |
| Hourly flow rate (vph)            | 0     | 56   | 0    | 1781 | 1671 | 104  |
| Pedestrians                       |       |      |      |      |      |      |
| Lane Width (ft)                   |       |      |      |      |      |      |
| Walking Speed (ft/s)              |       |      |      |      |      |      |
| Percent Blockage                  |       |      |      |      |      |      |
| Right turn flare (veh)            |       |      |      |      |      |      |
| Median type                       |       |      |      | None | None |      |
| Median storage (veh)              |       |      |      |      |      |      |
| Upstream signal (ft)              |       |      |      |      |      |      |
| pX, platoon unblocked             |       |      |      |      |      |      |
| vC, conflicting volume            | 2561  | 835  | 1671 |      |      |      |
| vC1, stage 1 conf vol             |       |      |      |      |      |      |
| vC2, stage 2 conf vol             |       |      |      |      |      |      |
| vCu, unblocked vol                | 2561  | 835  | 1671 |      |      |      |
| tC, single (s)                    | 6.8   | *5.9 | 4.1  |      |      |      |
| tC, 2 stage (s)                   |       |      |      |      |      |      |
| tF (s)                            | 3.5   | *2.3 | 2.2  |      |      |      |
| p0 queue free %                   | 100   | 89   | 100  |      |      |      |
| cM capacity (veh/h)               | 21    | 514  | 380  |      |      |      |
| Direction/Lane #                  | EBL   | EBR  | NBL  | NBT  | SBT  | SBR  |
| Volume Total                      | 56    | 891  | 891  | 835  | 835  | 104  |
| Volume Left                       | 0     | 0    | 0    | 0    | 0    | 0    |
| Volume Right                      | 56    | 0    | 0    | 0    | 0    | 104  |
| cSH                               | 514   | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.11  | 0.52 | 0.52 | 0.49 | 0.49 | 0.06 |
| Queue Length 95th (ft)            | 9     | 0    | 0    | 0    | 0    | 0    |
| Control Delay (s)                 | 12.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | B     |      |      |      |      |      |
| Approach Delay (s)                | 12.9  | 0.0  |      | 0.0  |      |      |
| Approach LOS                      | B     |      |      |      |      |      |
| Intersection Summary              |       |      |      |      |      |      |
| Average Delay                     | 0.2   |      |      |      |      |      |
| Intersection Capacity Utilization | 52.1% |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |
| ICU Level of Service A            |       |      |      |      |      |      |

\* User Entered Value



# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

|                                   | EBL   | EBR   | NBL   | NBT                  | SBT   | SEB   |
|-----------------------------------|-------|-------|-------|----------------------|-------|-------|
| Movement                          | ←     | →     | ←     | ↑                    | ↑     | ↘     |
| Lane Configurations               | ↰     | ↱     | ↰     | ↱                    | ↱     | ↱     |
| Volume (vph)                      | 294   | 133   | 123   | 1102                 | 1434  | 321   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95                 | 0.95  | 1.00  |
| Fit                               | 1.00  | 0.85  | 1.00  | 1.00                 | 1.00  | 0.85  |
| Fit Protected                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Fit Permitted                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.90  | 0.90  | 0.88  | 0.88                 | 0.91  | 0.91  |
| Adj. Flow (vph)                   | 327   | 148   | 140   | 1252                 | 1576  | 353   |
| RTOR Reduction (vph)              | 0     | 113   | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 327   | 35    | 140   | 1252                 | 1576  | 353   |
| Turn Type                         | Perm  |       | Prot  | Free                 |       | Free  |
| Protected Phases                  | 4     |       | 5     | 2                    |       | 6     |
| Permitted Phases                  | 4     |       | Free  |                      | Free  |       |
| Actuated Green, G (s)             | 28.6  | 28.6  | 15.0  | 82.8                 | 62.8  | 121.4 |
| Effective Green, g (s)            | 28.6  | 28.6  | 15.0  | 82.8                 | 62.8  | 121.4 |
| Actuated g/C Ratio                | 0.24  | 0.24  | 0.12  | 0.68                 | 0.52  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 417   | 373   | 230   | 2541                 | 1927  | 1667  |
| v/s Ratio Prot                    | c0.18 |       | c0.08 | 0.34                 | c0.42 |       |
| v/s Ratio Perm                    |       | 0.02  |       |                      | 0.21  |       |
| v/c Ratio                         | 0.78  | 0.09  | 0.61  | 0.49                 | 0.82  | 0.21  |
| Uniform Delay, d1                 | 43.5  | 36.3  | 50.4  | 9.2                  | 24.5  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 9.3   | 0.1   | 4.5   | 0.2                  | 2.8   | 0.3   |
| Delay (s)                         | 52.8  | 36.4  | 54.9  | 9.4                  | 27.3  | 0.3   |
| Level of Service                  | D     | D     | D     | A                    | C     | A     |
| Approach Delay (s)                | 47.7  |       |       | 14.0                 | 22.4  |       |
| Approach LOS                      | D     |       |       | B                    | C     |       |
| Intersection Summary              |       |       |       |                      |       |       |
| HCM Average Control Delay         |       | 22.5  |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      |       | 0.78  |       |                      |       |       |
| Actuated Cycle Length (s)         |       | 121.4 |       | Sum of lost time (s) | 15.0  |       |
| Intersection Capacity Utilization |       | 72.9% |       | ICU Level of Service |       | C     |
| Analysis Period (min)             |       | 15    |       |                      |       |       |
| c Critical Lane Group             |       |       |       |                      |       |       |

# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

|                                   | EBL   | EBR   | NBL   | NBT                  | SBT   | SEB   |
|-----------------------------------|-------|-------|-------|----------------------|-------|-------|
| Movement                          | ←     | →     | ←     | ↑                    | ↑     | ↘     |
| Lane Configurations               | ↰     | ↱     | ↰     | ↱                    | ↱     | ↱     |
| Volume (vph)                      | 270   | 277   | 233   | 1422                 | 1262  | 374   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95                 | 0.95  | 1.00  |
| Fit                               | 1.00  | 0.85  | 1.00  | 1.00                 | 1.00  | 0.85  |
| Fit Protected                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Fit Permitted                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.89  | 0.89  | 0.95  | 0.95                 | 0.96  | 0.96  |
| Adj. Flow (vph)                   | 303   | 311   | 245   | 1497                 | 1315  | 390   |
| RTOR Reduction (vph)              | 0     | 240   | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 303   | 71    | 245   | 1497                 | 1315  | 390   |
| Turn Type                         | Perm  |       | Prot  | Free                 |       | Free  |
| Protected Phases                  | 4     |       | 5     | 2                    |       | 6     |
| Permitted Phases                  | 4     |       | Free  |                      | Free  |       |
| Actuated Green, G (s)             | 26.3  | 26.3  | 21.4  | 78.3                 | 51.9  | 114.6 |
| Effective Green, g (s)            | 26.3  | 26.3  | 21.4  | 78.3                 | 51.9  | 114.6 |
| Actuated g/C Ratio                | 0.23  | 0.23  | 0.19  | 0.68                 | 0.45  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 406   | 363   | 348   | 2545                 | 1687  | 1667  |
| v/s Ratio Prot                    | c0.17 |       | c0.13 | 0.40                 | c0.35 |       |
| v/s Ratio Perm                    |       | 0.05  |       |                      | 0.23  |       |
| v/c Ratio                         | 0.75  | 0.20  | 0.70  | 0.59                 | 0.78  | 0.23  |
| Uniform Delay, d1                 | 41.0  | 35.6  | 43.6  | 9.6                  | 26.5  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 7.3   | 0.3   | 6.3   | 0.4                  | 2.4   | 0.3   |
| Delay (s)                         | 48.4  | 35.9  | 50.0  | 10.0                 | 28.9  | 0.3   |
| Level of Service                  | D     | D     | D     | A                    | C     | A     |
| Approach Delay (s)                | 42.0  |       |       | 15.6                 | 22.3  |       |
| Approach LOS                      | D     |       |       | B                    | C     |       |
| Intersection Summary              |       |       |       |                      |       |       |
| HCM Average Control Delay         |       | 22.4  |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      |       | 0.75  |       |                      |       |       |
| Actuated Cycle Length (s)         |       | 114.6 |       | Sum of lost time (s) | 15.0  |       |
| Intersection Capacity Utilization |       | 72.9% |       | ICU Level of Service |       | C     |
| Analysis Period (min)             |       | 15    |       |                      |       |       |
| c Critical Lane Group             |       |       |       |                      |       |       |



# HCM Unsignalized Intersection Capacity Analysis 13: Kulanihakai &

5/4/2011

| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↰    | ↱     | ↰    | ↱                    | ↰    | ↱    |
| Volume (veh/h)                    | 43   | 60    | 437  | 47                   | 21   | 337  |
| Sign Control                      | Stop |       | Free |                      |      | Free |
| Grade                             | 0%   |       | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.83 | 0.83  | 0.93 | 0.93                 | 0.98 | 0.98 |
| Hourly flow rate (vph)            | 52   | 72    | 470  | 51                   | 21   | 344  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      |       | None |                      | None |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 882  | 495   |      |                      | 520  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 882  | 495   |      |                      | 520  |      |
| tC, single (s)                    | 6.4  | 6.2   |      |                      | 4.1  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | 3.5  | 3.3   |      |                      | 2.2  |      |
| p0 queue free %                   | 83   | 87    |      |                      | 98   |      |
| cM capacity (veh/h)               | 310  | 574   |      |                      | 1046 |      |
| Direction Lane #                  | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Volume Total                      | 52   | 72    | 520  | 21                   | 344  |      |
| Volume Left                       | 52   | 0     | 0    | 21                   | 0    |      |
| Volume Right                      | 0    | 72    | 51   | 0                    | 0    |      |
| cSH                               | 310  | 574   | 1700 | 1046                 | 1700 |      |
| Volume to Capacity                | 0.17 | 0.13  | 0.31 | 0.02                 | 0.20 |      |
| Queue Length 95th (ft)            | 15   | 11    | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 18.9 | 12.2  | 0.0  | 8.5                  | 0.0  |      |
| Lane LOS                          | C    | B     |      | A                    |      |      |
| Approach Delay (s)                | 15.0 |       | 0.0  | 0.5                  |      |      |
| Approach LOS                      | B    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 2.0   |      |                      |      |      |
| Intersection Capacity Utilization |      | 36.2% |      | ICU Level of Service | A    |      |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 13: Kulanihakai &

5/4/2011

| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↰    | ↱     | ↰    | ↱                    | ↰    | ↱    |
| Volume (veh/h)                    | 56   | 27    | 580  | 53                   | 23   | 465  |
| Sign Control                      | Stop |       | Free |                      |      | Free |
| Grade                             | 0%   |       | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.96 | 0.96                 | 0.84 | 0.84 |
| Hourly flow rate (vph)            | 72   | 35    | 604  | 55                   | 27   | 554  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      |       | None |                      | None |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 1240 | 632   |      |                      | 659  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 1240 | 632   |      |                      | 659  |      |
| tC, single (s)                    | *5.4 | *5.2  |      |                      | 4.1  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | *2.5 | *2.3  |      |                      | 2.2  |      |
| p0 queue free %                   | 78   | 95    |      |                      | 97   |      |
| cM capacity (veh/h)               | 324  | 764   |      |                      | 929  |      |
| Direction Lane #                  | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Volume Total                      | 72   | 35    | 659  | 27                   | 554  |      |
| Volume Left                       | 72   | 0     | 0    | 27                   | 0    |      |
| Volume Right                      | 0    | 35    | 55   | 0                    | 0    |      |
| cSH                               | 324  | 764   | 1700 | 929                  | 1700 |      |
| Volume to Capacity                | 0.22 | 0.05  | 0.39 | 0.03                 | 0.33 |      |
| Queue Length 95th (ft)            | 21   | 4     | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 19.2 | 9.9   | 0.0  | 9.0                  | 0.0  |      |
| Lane LOS                          | C    | A     |      | A                    |      |      |
| Approach Delay (s)                | 16.2 |       | 0.0  | 0.4                  |      |      |
| Approach LOS                      | C    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.5   |      |                      |      |      |
| Intersection Capacity Utilization |      | 43.7% |      | ICU Level of Service | A    |      |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

\* User Entered Value

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APPENDIX E

TRAFFIC SIGNAL WARRANT STUDY  
FOR THE INTERSECTION OF PIILANI HIGHWAY  
AND KULANIHAKOI STREET

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Traffic Signal Warrant Study

*Piilani Highway and Kulanihakoi Street*



Prepared for:  
Group 70 International, Inc.

Prepared by:  
Wilson Okamoto Corporation

May 2010



**TRAFFIC SIGNAL WARRANT STUDY**  
**FOR THE INTERSECTION OF**  
**PIILANI HIGHWAY AND KULANIHAKOI STREET**

*Prepared for:*  
Group 70 International, Inc.  
925 Bethel Street, 5<sup>th</sup> Floor  
Honolulu, HI 96813

*Prepared by:*  
Wilson Okamoto Corporation  
1907 S. Beretania Street, Suite 400  
Honolulu, Hawaii 96826  
WOC Ref. #7854-02

May 2011

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*Traffic Signal Warrant Study for the Intersection of  
Piilani Highway and Kulanihakoi Street*

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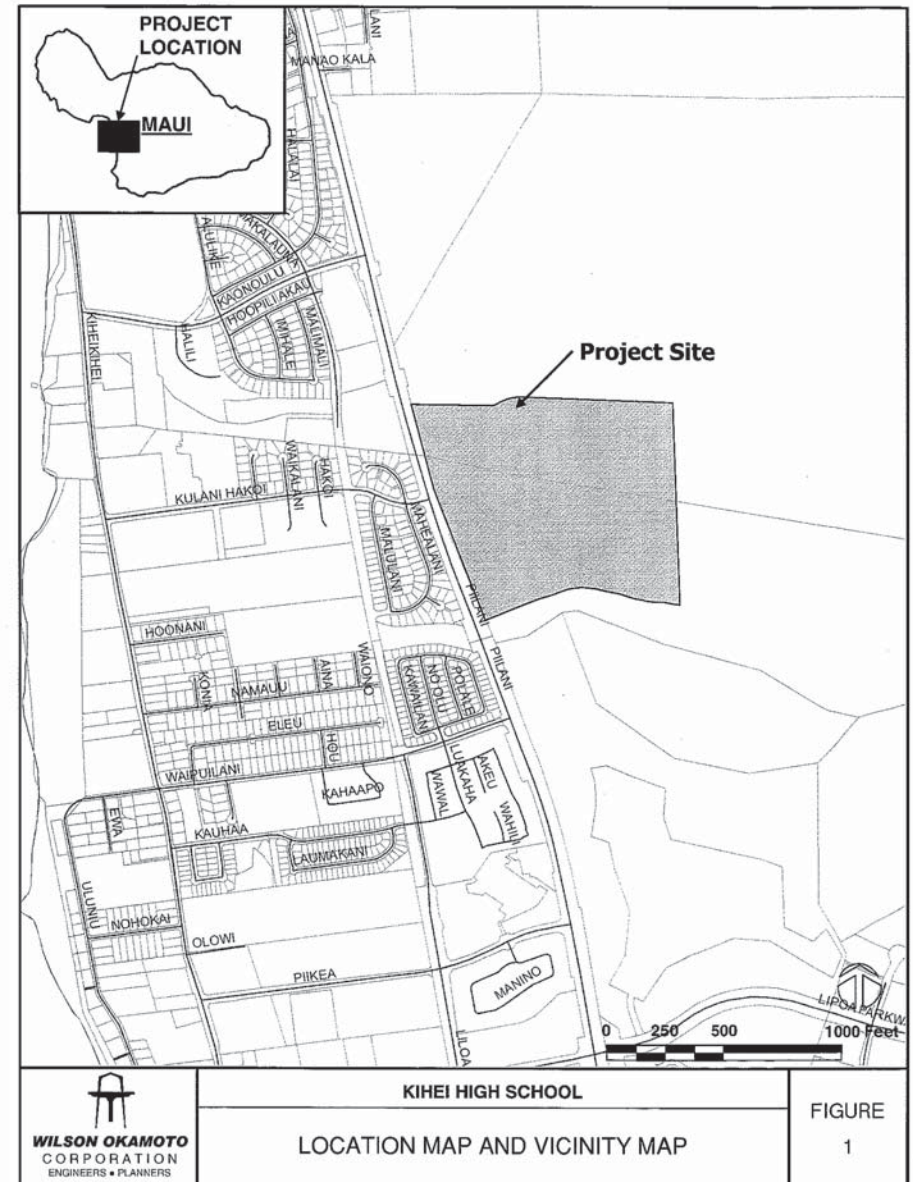
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## II. EXISTING TRAFFIC CONDITIONS

In the vicinity of the intersection with Kulanihakai Street, Piilani Highway is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that provides access through Kihei. At the intersection with Kulanihakai Street, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kulanihakai Street is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kulanihakai Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements.

The access roadway for the proposed Kihei High School will connect to the east side of the intersection creating a four-way intersection. After the connection is completed, the westbound approach of the access road is expected to have two westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition, northbound deceleration and acceleration lanes are expected to be constructed along Piilani Highway to facilitate entering and exiting traffic at the school's access.



## **B. Traffic Volumes and Conditions**

Field investigations were conducted on January 24-27, 2011 at the intersection of Piilani Highway and Kulanihakai Street. The investigations consisted of manual turning movement count surveys conducted during the morning peak hours of 6:00 AM to 9:00 AM and the afternoon peak hours of 3:00 PM and 6:00 PM. In addition, 24-hour mechanical count surveys were conducted along Piilani Highway and Kulanihakai Street for all approaches of the intersection. Appendix A includes the existing traffic count data.

## **III. TRAFFIC SIGNAL WARRANTS**

### **A. General**

The installation of a traffic signal at an intersection may be justified by one or more of the nine warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," 2009 Edition (MUTCD). These warrants take into account factors such as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), other characteristics of the roadway network (Warrant 8), and the presence of railroad crossings (Warrant 9). The applicable Warrants 1, 2, and 3 are assessed in this study to determine if a traffic signal system is warranted at the intersection of Piilani Highway and Kulanihakai Street.

### **B. Warrant 1**

Warrant 1, the "Eight-Hour Volume Warrant," consists of two conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during any eight hours of an average day. The first condition is the "Minimum Vehicular Volume Condition" and the second is the "Interruption of Continuous Traffic Condition." Warrant 1 can be satisfied either by meeting the thresholds shown in the 100% columns of either condition of Table 4C-1 of the MUTCD or by meeting the thresholds shown in the 80% columns for both conditions of Table 4C-1 of the

MUTCD. Under existing conditions, the traffic volumes entering the intersection of Piilani Highway and Kulanihakai Street meet the thresholds during any eight hours of the day and, as such, satisfy Warrant 1 for minor street approaches with two lanes for high traffic volumes on the major street (see Appendix B). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 1.

### **C. Warrant 2**

Warrant 2, the "Four-Hour Volume Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during any four hours of an average day. One of the conditions is based upon the relationship between the traffic volumes along the major and minor street. If the traffic volumes along the minor street exceed the thresholds shown in Figure 4C-1 of the MUTCD, a traffic signal system may be warranted. Under existing conditions, the traffic volumes entering the intersection of Piilani Highway and Kulanihakai Street meet the thresholds during any four hours of the day and, as such, satisfy Warrant 2 for minor street approaches with two lanes for high traffic volumes on the major street (see Appendix C). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 2.

### **D. Warrant 3**

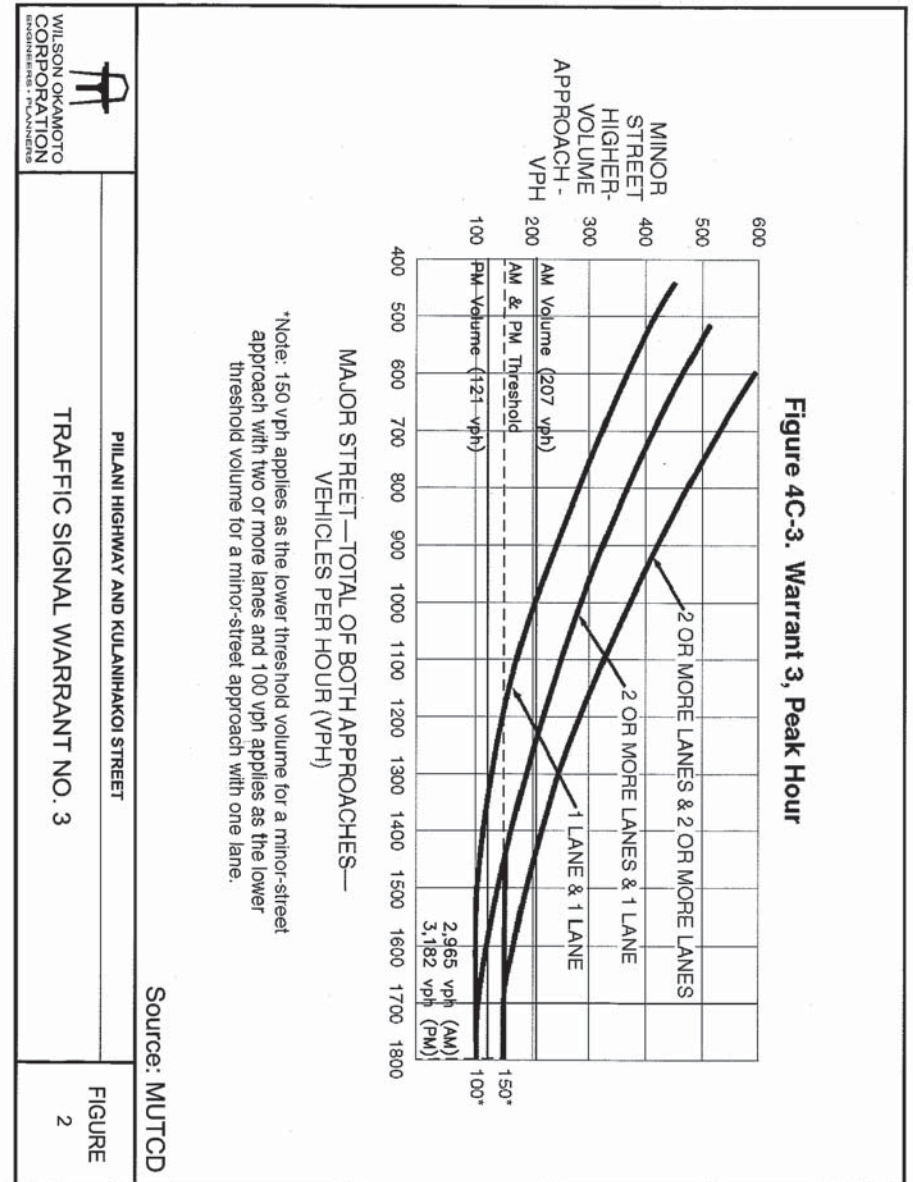
Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor streets. If the traffic volumes along the minor street exceed the thresholds shown in Figure 4C-3 of the MUTCD, a traffic signal system may be warranted. Under existing conditions, the traffic volumes entering the



intersection of Piilani Highway and Kulanihakai Street meet the thresholds during the AM peak hour of traffic and, as such, satisfy Warrant 3 for minor street approaches with two lanes for high traffic volumes on the major street (see Figure 2). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 3.

#### IV. CONCLUSION

The proposed Kihei High School will be located adjacent to Piilani Highway with access provided at the intersection with Kulanihakai Street. As such, existing traffic conditions at the intersection of Piilani Highway and Kulanihakai Street were assessed to determine if a traffic signal system is warranted at that intersection as outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," 2009 Edition (MUTCD). The existing traffic volumes at the that intersection are currently high enough to satisfy the Eight-Hour Volume Warrant (Warrant 1), Four-Hour Volume Warrant (Warrant 2), and the Peak Hour Warrant (Warrant 3). In addition, the construction of the proposed Kihei High School, as well as, other projects in the vicinity is expected to increase traffic volumes at this intersection thereby more than adequately satisfying the warrant conditions. As such, a traffic signal system is recommended at the intersection of Piilani Highway and Kulanihakai Street.



**APPENDIX A**  
**EXISTING TRAFFIC COUNT DATA**

**Wilson Okamoto Corporation**

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Page 1

Pilani Hwy. South of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time | 24-Jan-11 Mon | NB      |           | Hour Totals |           | SB      |           | Hour Totals |           | Combined Totals |           |
|------------|---------------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            |               | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |               |         |           |             |           |         |           |             |           |                 |           |
| 12:15      |               |         |           |             |           |         |           |             |           |                 |           |
| 12:30      |               |         |           |             |           |         |           |             |           |                 |           |
| 12:45      |               |         |           | 0           | 0         |         |           | 0           | 0         | 0               | 0         |
| 01:00      |               |         |           |             |           |         |           |             |           |                 |           |
| 01:15      |               |         |           |             |           |         |           |             |           |                 |           |
| 01:30      |               |         |           |             |           |         |           |             |           |                 |           |
| 01:45      |               |         |           | 0           | 0         |         |           | 0           | 0         | 0               | 0         |
| 02:00      |               |         |           |             |           |         |           |             |           |                 |           |
| 02:15      |               |         |           |             |           |         |           |             |           |                 |           |
| 02:30      |               |         |           |             |           |         |           |             |           |                 |           |
| 02:45      |               |         |           | 0           | 0         |         |           | 0           | 0         | 0               | 0         |
| 03:00      |               |         | 263       |             |           |         | 54        |             |           |                 |           |
| 03:15      |               |         | 262       |             |           |         | 61        |             |           |                 |           |
| 03:30      |               |         | 256       |             |           |         | 53        |             |           |                 |           |
| 03:45      |               |         | 292       | 0           | 1073      |         | 58        | 0           | 226       | 0               | 1299      |
| 04:00      |               |         | 275       |             |           |         | 58        |             |           |                 |           |
| 04:15      |               |         | 296       |             |           |         | 57        |             |           |                 |           |
| 04:30      |               |         | 291       |             |           |         | 56        |             |           |                 |           |
| 04:45      |               |         | 252       | 0           | 1114      |         | 56        | 0           | 227       | 0               | 1341      |
| 05:00      |               |         | 242       |             |           |         | 53        |             |           |                 |           |
| 05:15      |               |         | 243       |             |           |         | 54        |             |           |                 |           |
| 05:30      |               |         | 270       |             |           |         | 49        |             |           |                 |           |
| 05:45      |               |         | 248       | 0           | 1003      |         | 37        | 0           | 193       | 0               | 1196      |
| 06:00      |               |         | 223       |             |           |         | 42        |             |           |                 |           |
| 06:15      |               |         | 212       |             |           |         | 29        |             |           |                 |           |
| 06:30      |               |         | 220       |             |           |         | 31        |             |           |                 |           |
| 06:45      |               |         | 195       | 0           | 850       |         | 32        | 0           | 134       | 0               | 984       |
| 07:00      |               |         | 187       |             |           |         | 21        |             |           |                 |           |
| 07:15      |               |         | 196       |             |           |         | 32        |             |           |                 |           |
| 07:30      |               |         | 169       |             |           |         | 18        |             |           |                 |           |
| 07:45      |               |         | 168       | 0           | 720       |         | 9         | 0           | 80        | 0               | 800       |
| 08:00      |               |         | 171       |             |           |         | 20        |             |           |                 |           |
| 08:15      |               |         | 156       |             |           |         | 16        |             |           |                 |           |
| 08:30      |               |         | 154       |             |           |         | 7         |             |           |                 |           |
| 08:45      |               |         | 157       | 0           | 638       |         | 19        | 0           | 62        | 0               | 700       |
| 09:00      |               |         | 176       |             |           |         | 12        |             |           |                 |           |
| 09:15      |               |         | 173       |             |           |         | 31        |             |           |                 |           |
| 09:30      |               |         | 157       |             |           |         | 11        |             |           |                 |           |
| 09:45      |               |         | 147       | 0           | 653       |         | 6         | 0           | 60        | 0               | 713       |
| 10:00      |               |         | 131       |             |           |         | 9         |             |           |                 |           |
| 10:15      |               |         | 126       |             |           |         | 17        |             |           |                 |           |
| 10:30      |               |         | 102       |             |           |         | 6         |             |           |                 |           |
| 10:45      |               |         | 96        | 0           | 455       |         | 2         | 0           | 34        | 0               | 489       |
| 11:00      |               |         | 84        |             |           |         | 4         |             |           |                 |           |
| 11:15      |               |         | 84        |             |           |         | 3         |             |           |                 |           |
| 11:30      |               |         | 68        |             |           |         | 3         |             |           |                 |           |
| 11:45      |               |         | 56        | 0           | 292       |         | 1         | 0           | 11        | 0               | 303       |
| Total      |               | 0       | 6798      |             |           | 0       | 1027      |             |           | 0               | 7825      |
| Percent    |               | 0.0%    | 100.0%    |             |           | 0.0%    | 100.0%    |             |           | 0.0%            | 100.0%    |

# Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

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Pilani Hwy. South of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0° 0.000 Undefined

| Start Time | 25-Jan-11 Tue | NB      |           | Hour Totals |           | SB      |           | Hour Totals |           | Combined Totals |           |
|------------|---------------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            |               | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |               | 52      | 209       |             |           | 3       | 55        |             |           |                 |           |
| 12:15      |               | 52      | 221       |             |           | 1       | 53        |             |           |                 |           |
| 12:30      |               | 24      | 225       |             |           | 2       | 44        |             |           |                 |           |
| 12:45      |               | 23      | 218       | 151         | 873       | 0       | 63        | 6           | 215       | 157             | 1088      |
| 01:00      |               | 20      | 236       |             |           | 0       | 47        |             |           |                 |           |
| 01:15      |               | 17      | 210       |             |           | 0       | 61        |             |           |                 |           |
| 01:30      |               | 20      | 229       |             |           | 2       | 40        |             |           |                 |           |
| 01:45      |               | 16      | 230       | 73          | 905       | 0       | 46        | 2           | 194       | 75              | 1099      |
| 02:00      |               | 25      | 239       |             |           | 0       | 49        |             |           |                 |           |
| 02:15      |               | 9       | 263       |             |           | 1       | 61        |             |           |                 |           |
| 02:30      |               | 17      | 247       |             |           | 0       | 57        |             |           |                 |           |
| 02:45      |               | 16      | 227       | 67          | 976       | 0       | 57        | 1           | 224       | 68              | 1200      |
| 03:00      |               | 14      | 238       |             |           | 0       | 51        |             |           |                 |           |
| 03:15      |               | 20      | 234       |             |           | 1       | 67        |             |           |                 |           |
| 03:30      |               | 29      | 255       |             |           | 0       | 66        |             |           |                 |           |
| 03:45      |               | 26      | 274       | 89          | 1001      | 1       | 58        | 2           | 242       | 91              | 1243      |
| 04:00      |               | 51      | 246       |             |           | 3       | 66        |             |           |                 |           |
| 04:15      |               | 39      | 263       |             |           | 2       | 67        |             |           |                 |           |
| 04:30      |               | 54      | 226       |             |           | 3       | 74        |             |           |                 |           |
| 04:45      |               | 52      | 224       | 196         | 959       | 2       | 60        | 10          | 267       | 206             | 1226      |
| 05:00      |               | 74      | 240       |             |           | 8       | 59        |             |           |                 |           |
| 05:15      |               | 74      | 211       |             |           | 5       | 57        |             |           |                 |           |
| 05:30      |               | 108     | 204       |             |           | 8       | 65        |             |           |                 |           |
| 05:45      |               | 113     | 206       | 369         | 861       | 4       | 65        | 25          | 246       | 394             | 1107      |
| 06:00      |               | 129     | 208       |             |           | 13      | 39        |             |           |                 |           |
| 06:15      |               | 193     | 199       |             |           | 20      | 59        |             |           |                 |           |
| 06:30      |               | 215     | 207       |             |           | 23      | 45        |             |           |                 |           |
| 06:45      |               | 246     | 223       | 783         | 837       | 39      | 43        | 95          | 186       | 878             | 1023      |
| 07:00      |               | 253     | 176       |             |           | 39      | 30        |             |           |                 |           |
| 07:15      |               | 245     | 179       |             |           | 54      | 28        |             |           |                 |           |
| 07:30      |               | 238     | 178       |             |           | 59      | 27        |             |           |                 |           |
| 07:45      |               | 268     | 172       | 1004        | 705       | 41      | 21        | 193         | 106       | 1197            | 811       |
| 08:00      |               | 242     | 176       |             |           | 44      | 23        |             |           |                 |           |
| 08:15      |               | 252     | 184       |             |           | 45      | 18        |             |           |                 |           |
| 08:30      |               | 245     | 148       |             |           | 47      | 16        |             |           |                 |           |
| 08:45      |               | 202     | 146       | 941         | 654       | 34      | 16        | 170         | 73        | 1111            | 727       |
| 09:00      |               | 206     | 158       |             |           | 47      | 19        |             |           |                 |           |
| 09:15      |               | 214     | 150       |             |           | 35      | 19        |             |           |                 |           |
| 09:30      |               | 212     | 159       |             |           | 51      | 27        |             |           |                 |           |
| 09:45      |               | 211     | 151       | 943         | 618       | 59      | 20        | 192         | 85        | 1035            | 703       |
| 10:00      |               | 213     | 162       |             |           | 58      | 17        |             |           |                 |           |
| 10:15      |               | 223     | 157       |             |           | 53      | 18        |             |           |                 |           |
| 10:30      |               | 228     | 120       |             |           | 42      | 8         |             |           |                 |           |
| 10:45      |               | 227     | 102       | 891         | 541       | 46      | 6         | 199         | 49        | 1090            | 590       |
| 11:00      |               | 223     | 98        |             |           | 50      | 9         |             |           |                 |           |
| 11:15      |               | 239     | 99        |             |           | 46      | 13        |             |           |                 |           |
| 11:30      |               | 215     | 66        |             |           | 51      | 5         |             |           |                 |           |
| 11:45      |               | 223     | 65        | 900         | 328       | 59      | 4         | 206         | 31        | 1106            | 359       |
| Total      |               | 6307    | 9258      |             |           | 1101    | 1918      |             |           | 7408            | 11176     |
| Percent    |               | 40.5%   | 59.5%     |             |           | 36.5%   | 63.5%     |             |           | 39.9%           | 60.1%     |

# Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

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Pilani Hwy. South of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0° 0.000 Undefined

| Start Time | 26-Jan-11 Wed | NB      |           | Hour Totals |           | SB      |           | Hour Totals |           | Combined Totals |           |
|------------|---------------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            |               | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |               | 48      | 203       |             |           | 1       | 66        |             |           |                 |           |
| 12:15      |               | 60      | 220       |             |           | 1       | 94        |             |           |                 |           |
| 12:30      |               | 31      | 240       |             |           | 1       | 65        |             |           |                 |           |
| 12:45      |               | 35      | 225       | 172         | 888       | 1       | 82        | 4           | 307       | 176             | 1195      |
| 01:00      |               | 34      | 264       |             |           | 0       | 69        |             |           |                 |           |
| 01:15      |               | 29      | 226       |             |           | 3       | 78        |             |           |                 |           |
| 01:30      |               | 17      | 249       |             |           | 0       | 65        |             |           |                 |           |
| 01:45      |               | 15      | 238       | 95          | 977       | 0       | 65        | 3           | 277       | 98              | 1254      |
| 02:00      |               | 24      | 227       |             |           | 0       | 69        |             |           |                 |           |
| 02:15      |               | 13      | 241       |             |           | 0       | 64        |             |           |                 |           |
| 02:30      |               | 22      | 244       |             |           | 0       | 74        |             |           |                 |           |
| 02:45      |               | 15      | 248       | 74          | 960       | 1       | 71        | 1           | 278       | 75              | 1238      |
| 03:00      |               | 19      | 238       |             |           | 1       | 60        |             |           |                 |           |
| 03:15      |               | 22      | 236       |             |           | 1       | 92        |             |           |                 |           |
| 03:30      |               | 22      | 218       |             |           | 0       | 80        |             |           |                 |           |
| 03:45      |               | 27      | 208       | 90          | 900       | 2       | 97        | 4           | 319       | 94              | 1219      |
| 04:00      |               | 42      | 218       |             |           | 2       | 88        |             |           |                 |           |
| 04:15      |               | 39      | 223       |             |           | 4       | 97        |             |           |                 |           |
| 04:30      |               | 62      | 212       |             |           | 7       | 108       |             |           |                 |           |
| 04:45      |               | 60      | 216       | 203         | 869       | 0       | 79        | 13          | 372       | 216             | 1241      |
| 05:00      |               | 68      | 219       |             |           | 5       | 80        |             |           |                 |           |
| 05:15      |               | 86      | 205       |             |           | 5       | 97        |             |           |                 |           |
| 05:30      |               | 106     | 195       |             |           | 22      | 98        |             |           |                 |           |
| 05:45      |               | 105     | 185       | 365         | 804       | 20      | 96        | 52          | 371       | 417             | 1175      |
| 06:00      |               | 138     | 159       |             |           | 11      | 77        |             |           |                 |           |
| 06:15      |               | 157     | 190       |             |           | 27      | 92        |             |           |                 |           |
| 06:30      |               | 195     | 181       |             |           | 36      | 56        |             |           |                 |           |
| 06:45      |               | 223     | 175       | 713         | 705       | 44      | 74        | 118         | 299       | 831             | 1004      |
| 07:00      |               | 190     | 176       |             |           | 74      | 58        |             |           |                 |           |
| 07:15      |               | 189     | 158       |             |           | 56      | 56        |             |           |                 |           |
| 07:30      |               | 212     | 157       |             |           | 47      | 39        |             |           |                 |           |
| 07:45      |               | 221     | 167       | 812         | 658       | 75      | 47        | 252         | 199       | 1064            | 857       |
| 08:00      |               | 219     | 149       |             |           | 62      | 42        |             |           |                 |           |
| 08:15      |               | 236     | 143       |             |           | 63      | 32        |             |           |                 |           |
| 08:30      |               | 218     | 137       |             |           | 57      | 53        |             |           |                 |           |
| 08:45      |               | 245     | 134       | 918         | 563       | 52      | 42        | 234         | 169       | 1152            | 732       |
| 09:00      |               | 204     | 150       |             |           | 66      | 35        |             |           |                 |           |
| 09:15      |               | 181     | 151       |             |           | 75      | 68        |             |           |                 |           |
| 09:30      |               | 191     | 147       |             |           | 61      | 18        |             |           |                 |           |
| 09:45      |               | 222     | 137       | 798         | 585       | 55      | 24        | 257         | 145       | 1055            | 730       |
| 10:00      |               | 211     | 129       |             |           | 63      | 24        |             |           |                 |           |
| 10:15      |               | 219     | 124       |             |           | 65      | 30        |             |           |                 |           |
| 10:30      |               | 227     | 111       |             |           | 60      | 18        |             |           |                 |           |
| 10:45      |               | 211     | 90        | 868         | 454       | 42      | 11        | 230         | 83        | 1098            | 537       |
| 11:00      |               | 218     | 74        |             |           | 57      | 5         |             |           |                 |           |
| 11:15      |               | 217     | 110       |             |           | 63      | 9         |             |           |                 |           |
| 11:30      |               | 222     | 65        |             |           | 66      | 8         |             |           |                 |           |
| 11:45      |               | 226     | 69        | 883         | 318       | 62      | 8         | 248         | 30        | 1131            | 348       |
| Total      |               | 5991    | 8681      |             |           | 1416    | 2649      |             |           | 7407            | 11530     |
| Percent    |               | 40.8%   | 59.2%     |             |           | 33.2%   | 66.8%     |             |           | 39.1%           | 60.9%     |



# Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

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Pili'ani Hwy. South of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time  | 27-Jan-11<br>Thu | NB         |           | Hour Totals |           | SB         |           | Hour Totals |           | Combined Totals |           |
|-------------|------------------|------------|-----------|-------------|-----------|------------|-----------|-------------|-----------|-----------------|-----------|
|             |                  | Morning    | Afternoon | Morning     | Afternoon | Morning    | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00       |                  | 48         | *         |             |           | 5          | *         |             |           |                 |           |
| 12:15       |                  | 36         | *         |             |           | 0          | *         |             |           |                 |           |
| 12:30       |                  | 19         | *         |             |           | 0          | *         |             |           |                 |           |
| 12:45       |                  | 21         | *         |             | 124       | 2          | *         | 7           | 0         | 131             | 0         |
| 01:00       |                  | 16         | *         |             |           | 1          | *         |             |           |                 |           |
| 01:15       |                  | 20         | *         |             |           | 2          | *         |             |           |                 |           |
| 01:30       |                  | 14         | *         |             |           | 4          | *         |             |           |                 |           |
| 01:45       |                  | 23         | *         |             | 73        | 1          | *         | 8           | 0         | 81              | 0         |
| 02:00       |                  | 25         | *         |             |           | 2          | *         |             |           |                 |           |
| 02:15       |                  | 24         | *         |             |           | 6          | *         |             |           |                 |           |
| 02:30       |                  | 18         | *         |             |           | 3          | *         |             |           |                 |           |
| 02:45       |                  | 11         | *         |             | 78        | 3          | *         | 14          | 0         | 92              | 0         |
| 03:00       |                  | 18         | *         |             |           | 7          | *         |             |           |                 |           |
| 03:15       |                  | 17         | *         |             |           | 9          | *         |             |           |                 |           |
| 03:30       |                  | 20         | *         |             |           | 9          | *         |             |           |                 |           |
| 03:45       |                  | 25         | *         |             | 80        | 8          | *         | 33          | 0         | 113             | 0         |
| 04:00       |                  | 36         | *         |             |           | 13         | *         |             |           |                 |           |
| 04:15       |                  | 35         | *         |             |           | 14         | *         |             |           |                 |           |
| 04:30       |                  | 64         | *         |             |           | 17         | *         |             |           |                 |           |
| 04:45       |                  | 50         | *         |             | 185       | 15         | *         | 59          | 0         | 244             | 0         |
| 05:00       |                  | 63         | *         |             |           | 13         | *         |             |           |                 |           |
| 05:15       |                  | 78         | *         |             |           | 27         | *         |             |           |                 |           |
| 05:30       |                  | 108        | *         |             |           | 27         | *         |             |           |                 |           |
| 05:45       |                  | 124        | *         |             | 373       | 15         | *         | 82          | 0         | 455             | 0         |
| 06:00       |                  | 136        | *         |             |           | 15         | *         |             |           |                 |           |
| 06:15       |                  | 165        | *         |             |           | 23         | *         |             |           |                 |           |
| 06:30       |                  | 174        | *         |             |           | 60         | *         |             |           |                 |           |
| 06:45       |                  | 171        | *         |             | 646       | 66         | *         | 164         | 0         | 810             | 0         |
| 07:00       |                  | 207        | *         |             |           | 70         | *         |             |           |                 |           |
| 07:15       |                  | 196        | *         |             |           | 80         | *         |             |           |                 |           |
| 07:30       |                  | 168        | *         |             |           | 83         | *         |             |           |                 |           |
| 07:45       |                  | 205        | *         |             | 776       | 70         | *         | 303         | 0         | 1079            | 0         |
| 08:00       |                  | 191        | *         |             |           | 99         | *         |             |           |                 |           |
| 08:15       |                  | 212        | *         |             |           | 56         | *         |             |           |                 |           |
| 08:30       |                  | 196        | *         |             |           | 52         | *         |             |           |                 |           |
| 08:45       |                  | 238        | *         |             | 837       | 48         | *         | 255         | 0         | 1092            | 0         |
| 09:00       |                  | 209        | *         |             |           | 84         | *         |             |           |                 |           |
| 09:15       |                  | 211        | *         |             |           | 55         | *         |             |           |                 |           |
| 09:30       |                  | 221        | *         |             |           | 77         | *         |             |           |                 |           |
| 09:45       |                  | 220        | *         |             | 861       | 62         | *         | 278         | 0         | 1139            | 0         |
| 10:00       |                  | 196        | *         |             |           | 56         | *         |             |           |                 |           |
| 10:15       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 10:30       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 10:45       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 11:00       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 11:15       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 11:30       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| 11:45       |                  | *          | *         | *           | *         | *          | *         | *           | *         | *               | *         |
| Total       |                  | 4229       | 0         |             |           | 1259       | 0         |             |           | 5236            | 0         |
| Percent     |                  | 100.0%     | 0.0%      |             |           | 100.0%     | 0.0%      |             |           | 100.0%          | 0.0%      |
| Grand Total |                  | 16527      | 24737     |             |           | 3776       | 5794      |             |           | 20051           | 30531     |
| Percent     |                  | 40.1%      | 59.9%     |             |           | 39.5%      | 60.5%     |             |           | 39.6%           | 60.4%     |
| ADT         |                  | ADT 18,760 |           |             |           | ADT 18,760 |           |             |           |                 |           |

# Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Page 1

Pili'ani Hwy. North of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time | 24-Jan-11 | SB      |           | Hour Totals |           | NB      |           | Hour Totals |           | Combined Totals |           |
|------------|-----------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            | Mon       | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 12:15      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 12:30      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 12:45      |           | *       | *         | 0           | 0         | *       | *         | 0           | 0         | 0               | 0         |
| 01:00      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 01:15      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 01:30      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 01:45      |           | *       | *         | 0           | 0         | *       | *         | 0           | 0         | 0               | 0         |
| 02:00      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 02:15      |           | *       | *         |             |           | *       | *         |             |           |                 |           |
| 02:30      |           | *       | 309       |             |           | *       | 120       |             |           |                 |           |
| 02:45      |           | *       | 310       | 0           | 619       | *       | 152       | 0           | 272       | 0               | 891       |
| 03:00      |           | *       | 337       |             |           | *       | 123       |             |           |                 |           |
| 03:15      |           | *       | 285       |             |           | *       | 159       |             |           |                 |           |
| 03:30      |           | *       | 310       |             |           | *       | 140       |             |           |                 |           |
| 03:45      |           | *       | 320       | 0           | 1252      | *       | 128       | 0           | 550       | 0               | 1802      |
| 04:00      |           | *       | 367       |             |           | *       | 107       |             |           |                 |           |
| 04:15      |           | *       | 296       |             |           | *       | 150       |             |           |                 |           |
| 04:30      |           | *       | 390       |             |           | *       | 132       |             |           |                 |           |
| 04:45      |           | *       | 375       | 0           | 1428      | *       | 112       | 0           | 501       | 0               | 1929      |
| 05:00      |           | *       | 364       |             |           | *       | 98        |             |           |                 |           |
| 05:15      |           | *       | 353       |             |           | *       | 127       |             |           |                 |           |
| 05:30      |           | *       | 310       |             |           | *       | 101       |             |           |                 |           |
| 05:45      |           | *       | 292       | 0           | 1319      | *       | 126       | 0           | 452       | 0               | 1771      |
| 06:00      |           | *       | 289       |             |           | *       | 85        |             |           |                 |           |
| 06:15      |           | *       | 288       |             |           | *       | 86        |             |           |                 |           |
| 06:30      |           | *       | 260       |             |           | *       | 85        |             |           |                 |           |
| 06:45      |           | *       | 221       | 0           | 1058      | *       | 79        | 0           | 335       | 0               | 1393      |
| 07:00      |           | *       | 212       |             |           | *       | 80        |             |           |                 |           |
| 07:15      |           | *       | 212       |             |           | *       | 74        |             |           |                 |           |
| 07:30      |           | *       | 175       |             |           | *       | 63        |             |           |                 |           |
| 07:45      |           | *       | 173       | 0           | 772       | *       | 57        | 0           | 274       | 0               | 1046      |
| 08:00      |           | *       | 141       |             |           | *       | 57        |             |           |                 |           |
| 08:15      |           | *       | 146       |             |           | *       | 70        |             |           |                 |           |
| 08:30      |           | *       | 146       |             |           | *       | 53        |             |           |                 |           |
| 08:45      |           | *       | 164       | 0           | 597       | *       | 55        | 0           | 235       | 0               | 832       |
| 09:00      |           | *       | 151       |             |           | *       | 76        |             |           |                 |           |
| 09:15      |           | *       | 122       |             |           | *       | 74        |             |           |                 |           |
| 09:30      |           | *       | 141       |             |           | *       | 58        |             |           |                 |           |
| 09:45      |           | *       | 92        | 0           | 506       | *       | 69        | 0           | 277       | 0               | 783       |
| 10:00      |           | *       | 104       |             |           | *       | 58        |             |           |                 |           |
| 10:15      |           | *       | 86        |             |           | *       | 62        |             |           |                 |           |
| 10:30      |           | *       | 87        |             |           | *       | 41        |             |           |                 |           |
| 10:45      |           | *       | 68        | 0           | 345       | *       | 35        | 0           | 196       | 0               | 541       |
| 11:00      |           | *       | 56        |             |           | *       | 37        |             |           |                 |           |
| 11:15      |           | *       | 48        |             |           | *       | 39        |             |           |                 |           |
| 11:30      |           | *       | 41        |             |           | *       | 30        |             |           |                 |           |
| 11:45      |           | *       | 40        | 0           | 185       | *       | 25        | 0           | 131       | 0               | 316       |
| Total      |           | 0       | 8081      |             |           | 0       | 3223      |             |           | 0               | 11304     |
| Percent    |           | 0.0%    | 100.0%    |             |           | 0.0%    | 100.0%    |             |           | 0.0%            | 100.0%    |

**Wilson Okamoto Corporation**1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Page 2

Pilani Hwy. North of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time | 25-Jan-11 Tue | SB      |           | Hour Totals |           | NB      |           | Hour Totals |           | Combined Totals |           |
|------------|---------------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            |               | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |               | 37      | 199       |             |           | 17      | 230       |             |           |                 |           |
| 12:15      |               | 25      | 244       |             |           | 26      | 155       |             |           |                 |           |
| 12:30      |               | 27      | 276       |             |           | 7       | 163       |             |           |                 |           |
| 12:45      |               | 18      | 263       | 107         | 982       | 5       | 175       | 55          | 723       | 162             | 1705      |
| 01:00      |               | 10      | 267       |             |           | 8       | 196       |             |           |                 |           |
| 01:15      |               | 9       | 311       |             |           | 5       | 183       |             |           |                 |           |
| 01:30      |               | 12      | 293       |             |           | 7       | 202       |             |           |                 |           |
| 01:45      |               | 10      | 306       | 41          | 1177      | 7       | 189       | 27          | 770       | 68              | 1947      |
| 02:00      |               | 10      | 300       |             |           | 14      | 168       |             |           |                 |           |
| 02:15      |               | 11      | 316       |             |           | 4       | 184       |             |           |                 |           |
| 02:30      |               | 10      | 299       |             |           | 6       | 188       |             |           |                 |           |
| 02:45      |               | 14      | 318       | 45          | 1233      | 5       | 163       | 29          | 703       | 74              | 1936      |
| 03:00      |               | 10      | 305       |             |           | 5       | 197       |             |           |                 |           |
| 03:15      |               | 17      | 362       |             |           | 8       | 164       |             |           |                 |           |
| 03:30      |               | 29      | 351       |             |           | 6       | 202       |             |           |                 |           |
| 03:45      |               | 24      | 323       | 80          | 1341      | 14      | 201       | 33          | 764       | 113             | 2105      |
| 04:00      |               | 51      | 337       |             |           | 9       | 158       |             |           |                 |           |
| 04:15      |               | 43      | 341       |             |           | 15      | 209       |             |           |                 |           |
| 04:30      |               | 63      | 284       |             |           | 18      | 169       |             |           |                 |           |
| 04:45      |               | 49      | 306       | 206         | 1268      | 16      | 173       | 58          | 709       | 264             | 1977      |
| 05:00      |               | 61      | 317       |             |           | 31      | 180       |             |           |                 |           |
| 05:15      |               | 79      | 313       |             |           | 28      | 181       |             |           |                 |           |
| 05:30      |               | 96      | 286       |             |           | 46      | 164       |             |           |                 |           |
| 05:45      |               | 99      | 310       | 335         | 1226      | 51      | 131       | 156         | 656       | 491             | 1882      |
| 06:00      |               | 114     | 276       |             |           | 62      | 142       |             |           |                 |           |
| 06:15      |               | 154     | 264       |             |           | 102     | 142       |             |           |                 |           |
| 06:30      |               | 216     | 238       |             |           | 124     | 185       |             |           |                 |           |
| 06:45      |               | 217     | 210       | 701         | 988       | 153     | 155       | 441         | 624       | 1142            | 1612      |
| 07:00      |               | 288     | 216       |             |           | 150     | 130       |             |           |                 |           |
| 07:15      |               | 352     | 208       |             |           | 187     | 115       |             |           |                 |           |
| 07:30      |               | 366     | 175       |             |           | 158     | 117       |             |           |                 |           |
| 07:45      |               | 324     | 207       | 1330        | 806       | 146     | 95        | 641         | 457       | 1971            | 1263      |
| 08:00      |               | 259     | 168       |             |           | 152     | 103       |             |           |                 |           |
| 08:15      |               | 281     | 160       |             |           | 133     | 112       |             |           |                 |           |
| 08:30      |               | 232     | 155       |             |           | 166     | 89        |             |           |                 |           |
| 08:45      |               | 261     | 150       | 1033        | 633       | 119     | 85        | 570         | 389       | 1603            | 1022      |
| 09:00      |               | 258     | 161       |             |           | 115     | 77        |             |           |                 |           |
| 09:15      |               | 248     | 166       |             |           | 162     | 111       |             |           |                 |           |
| 09:30      |               | 223     | 177       |             |           | 147     | 97        |             |           |                 |           |
| 09:45      |               | 229     | 172       | 958         | 676       | 185     | 93        | 609         | 378       | 1567            | 1054      |
| 10:00      |               | 181     | 148       |             |           | 184     | 88        |             |           |                 |           |
| 10:15      |               | 217     | 116       |             |           | 188     | 98        |             |           |                 |           |
| 10:30      |               | 233     | 92        |             |           | 178     | 82        |             |           |                 |           |
| 10:45      |               | 238     | 63        | 869         | 419       | 166     | 64        | 716         | 332       | 1585            | 751       |
| 11:00      |               | 208     | 68        |             |           | 204     | 72        |             |           |                 |           |
| 11:15      |               | 234     | 54        |             |           | 183     | 66        |             |           |                 |           |
| 11:30      |               | 268     | 48        |             |           | 190     | 40        |             |           |                 |           |
| 11:45      |               | 273     | 39        | 983         | 209       | 161     | 40        | 738         | 218       | 1721            | 427       |
| Total      |               | 6688    | 10958     |             |           | 4073    | 6723      |             |           | 10761           | 17681     |
| Percent    |               | 37.9%   | 62.1%     |             |           | 37.7%   | 62.3%     |             |           | 37.8%           | 62.2%     |

**Wilson Okamoto Corporation**1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

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Pilani Hwy. North of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time | 26-Jan-11 Wed | SB      |           | Hour Totals |           | NB      |           | Hour Totals |           | Combined Totals |           |
|------------|---------------|---------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|            |               | Morning | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00      |               | 29      | 315       |             |           | 27      | 181       |             |           |                 |           |
| 12:15      |               | 21      | 339       |             |           | 37      | 237       |             |           |                 |           |
| 12:30      |               | 17      | 325       |             |           | 22      | 221       |             |           |                 |           |
| 12:45      |               | 9       | 295       | 76          | 1274      | 31      | 251       | 117         | 890       | 193             | 2164      |
| 01:00      |               | 14      | 313       |             |           | 23      | 289       |             |           |                 |           |
| 01:15      |               | 19      | 329       |             |           | 19      | 218       |             |           |                 |           |
| 01:30      |               | 13      | 317       |             |           | 9       | 248       |             |           |                 |           |
| 01:45      |               | 15      | 312       | 61          | 1271      | 12      | 228       | 63          | 983       | 124             | 2254      |
| 02:00      |               | 5       | 282       |             |           | 21      | 224       |             |           |                 |           |
| 02:15      |               | 8       | 347       |             |           | 8       | 219       |             |           |                 |           |
| 02:30      |               | 10      | 322       |             |           | 11      | 229       |             |           |                 |           |
| 02:45      |               | 18      | 361       | 41          | 1312      | 4       | 249       | 44          | 921       | 85              | 2233      |
| 03:00      |               | 15      | 342       |             |           | 4       | 196       |             |           |                 |           |
| 03:15      |               | 17      | 343       |             |           | 9       | 217       |             |           |                 |           |
| 03:30      |               | 17      | 341       |             |           | 11      | 223       |             |           |                 |           |
| 03:45      |               | 28      | 345       | 77          | 1371      | 14      | 190       | 38          | 826       | 115             | 2197      |
| 04:00      |               | 43      | 368       |             |           | 19      | 186       |             |           |                 |           |
| 04:15      |               | 44      | 311       |             |           | 12      | 253       |             |           |                 |           |
| 04:30      |               | 71      | 325       |             |           | 29      | 178       |             |           |                 |           |
| 04:45      |               | 42      | 347       | 200         | 1351      | 30      | 195       | 90          | 810       | 290             | 2161      |
| 05:00      |               | 54      | 320       |             |           | 37      | 198       |             |           |                 |           |
| 05:15      |               | 84      | 350       |             |           | 39      | 192       |             |           |                 |           |
| 05:30      |               | 100     | 299       |             |           | 56      | 183       |             |           |                 |           |
| 05:45      |               | 105     | 303       | 343         | 1272      | 65      | 141       | 197         | 714       | 540             | 1986      |
| 06:00      |               | 108     | 290       |             |           | 91      | 141       |             |           |                 |           |
| 06:15      |               | 174     | 286       |             |           | 100     | 163       |             |           |                 |           |
| 06:30      |               | 189     | 232       |             |           | 169     | 141       |             |           |                 |           |
| 06:45      |               | 219     | 271       | 690         | 1079      | 167     | 128       | 527         | 573       | 1217            | 1652      |
| 07:00      |               | 253     | 218       |             |           | 171     | 140       |             |           |                 |           |
| 07:15      |               | 320     | 195       |             |           | 153     | 126       |             |           |                 |           |
| 07:30      |               | 347     | 197       |             |           | 146     | 117       |             |           |                 |           |
| 07:45      |               | 273     | 198       | 1193        | 808       | 191     | 121       | 661         | 504       | 1854            | 1312      |
| 08:00      |               | 346     | 167       |             |           | 152     | 105       |             |           |                 |           |
| 08:15      |               | 295     | 164       |             |           | 159     | 110       |             |           |                 |           |
| 08:30      |               | 259     | 153       |             |           | 167     | 117       |             |           |                 |           |
| 08:45      |               | 272     | 170       | 1172        | 654       | 175     | 102       | 653         | 434       | 1825            | 1088      |
| 09:00      |               | 238     | 162       |             |           | 181     | 99        |             |           |                 |           |
| 09:15      |               | 233     | 173       |             |           | 177     | 128       |             |           |                 |           |
| 09:30      |               | 221     | 148       |             |           | 192     | 96        |             |           |                 |           |
| 09:45      |               | 228     | 141       | 920         | 624       | 202     | 97        | 752         | 420       | 1672            | 1044      |
| 10:00      |               | 235     | 112       |             |           | 198     | 85        |             |           |                 |           |
| 10:15      |               | 251     | 102       |             |           | 200     | 90        |             |           |                 |           |
| 10:30      |               | 224     | 108       |             |           | 198     | 68        |             |           |                 |           |
| 10:45      |               | 277     | 70        | 987         | 392       | 188     | 61        | 784         | 304       | 1771            | 696       |
| 11:00      |               | 255     | 38        |             |           | 221     | 56        |             |           |                 |           |
| 11:15      |               | 251     | 37        |             |           | 240     | 78        |             |           |                 |           |
| 11:30      |               | 301     | 41        |             |           | 215     | 45        |             |           |                 |           |
| 11:45      |               | 335     | 41        | 1142        | 157       | 106     | 48        | 782         | 227       | 1924            | 384       |
| Total      |               | 6902    | 11565     |             |           | 4708    | 7606      |             |           | 11610           | 19171     |
| Percent    |               | 37.4%   | 62.6%     |             |           | 38.2%   | 61.8%     |             |           | 37.7%           | 62.3%     |



# **Wilson Okamoto Corporation**

1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

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Piliari Hwy. North of Kulanihakai Street  
Site Code:  
Station ID:

Latitude: 0' 0.000 Undefined

| Start Time  | 27-Jan-11<br>Thu | SB         |           | Hour Totals |           | NB      |           | Hour Totals |           | Combined Totals |           |
|-------------|------------------|------------|-----------|-------------|-----------|---------|-----------|-------------|-----------|-----------------|-----------|
|             |                  | Morning    | Afternoon | Morning     | Afternoon | Morning | Afternoon | Morning     | Afternoon | Morning         | Afternoon |
| 12:00       |                  | 23         | *         |             |           | 31      | *         |             |           |                 |           |
| 12:15       |                  | 14         | *         |             |           | 25      | *         |             |           |                 |           |
| 12:30       |                  | 16         | *         |             |           | 11      | *         |             |           |                 |           |
| 12:45       |                  | 15         | *         | 68          | 0         | 12      | *         | 79          | 0         | 147             | 0         |
| 01:00       |                  | 5          | *         |             |           | 11      | *         |             |           |                 |           |
| 01:15       |                  | 9          | *         |             |           | 12      | *         |             |           |                 |           |
| 01:30       |                  | 11         | *         |             |           | 9       | *         |             |           |                 |           |
| 01:45       |                  | 12         | *         | 37          | 0         | 18      | *         | 50          | 0         | 87              | 0         |
| 02:00       |                  | 15         | *         |             |           | 17      | *         |             |           |                 |           |
| 02:15       |                  | 14         | *         |             |           | 14      | *         |             |           |                 |           |
| 02:30       |                  | 13         | *         |             |           | 11      | *         |             |           |                 |           |
| 02:45       |                  | 11         | *         | 53          | 0         | 4       | *         | 46          | 0         | 99              | 0         |
| 03:00       |                  | 18         | *         |             |           | 8       | *         |             |           |                 |           |
| 03:15       |                  | 24         | *         |             |           | 6       | *         |             |           |                 |           |
| 03:30       |                  | 28         | *         |             |           | 7       | *         |             |           |                 |           |
| 03:45       |                  | 28         | *         | 98          | 0         | 14      | *         | 35          | 0         | 133             | 0         |
| 04:00       |                  | 42         | *         |             |           | 15      | *         |             |           |                 |           |
| 04:15       |                  | 46         | *         |             |           | 13      | *         |             |           |                 |           |
| 04:30       |                  | 71         | *         |             |           | 25      | *         |             |           |                 |           |
| 04:45       |                  | 54         | *         | 213         | 0         | 28      | *         | 81          | 0         | 294             | 0         |
| 05:00       |                  | 53         | *         |             |           | 34      | *         |             |           |                 |           |
| 05:15       |                  | 91         | *         |             |           | 39      | *         |             |           |                 |           |
| 05:30       |                  | 89         | *         |             |           | 63      | *         |             |           |                 |           |
| 05:45       |                  | 105        | *         | 338         | 0         | 72      | *         | 208         | 0         | 546             | 0         |
| 06:00       |                  | 107        | *         |             |           | 79      | *         |             |           |                 |           |
| 06:15       |                  | 151        | *         |             |           | 119     | *         |             |           |                 |           |
| 06:30       |                  | 209        | *         |             |           | 137     | *         |             |           |                 |           |
| 06:45       |                  | 213        | *         | 680         | 0         | 172     | *         | 507         | 0         | 1187            | 0         |
| 07:00       |                  | 256        | *         |             |           | 179     | *         |             |           |                 |           |
| 07:15       |                  | 288        | *         |             |           | 188     | *         |             |           |                 |           |
| 07:30       |                  | 346        | *         |             |           | 173     | *         |             |           |                 |           |
| 07:45       |                  | 298        | *         | 1188        | 0         | 196     | *         | 736         | 0         | 1924            | 0         |
| 08:00       |                  | 298        | *         |             |           | 169     | *         |             |           |                 |           |
| 08:15       |                  | 293        | *         |             |           | 125     | *         |             |           |                 |           |
| 08:30       |                  | 268        | *         |             |           | 133     | *         |             |           |                 |           |
| 08:45       |                  | 261        | *         | 1120        | 0         | 165     | *         | 592         | 0         | 1712            | 0         |
| 09:00       |                  | 250        | *         |             |           | 180     | *         |             |           |                 |           |
| 09:15       |                  | 254        | *         |             |           | 166     | *         |             |           |                 |           |
| 09:30       |                  | 232        | *         |             |           | 216     | *         |             |           |                 |           |
| 09:45       |                  | 129        | *         | 865         | 0         | 79      | *         | 641         | 0         | 1506            | 0         |
| 10:00       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 10:15       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 10:30       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 10:45       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 11:00       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 11:15       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 11:30       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| 11:45       |                  | *          | *         | *           | *         | *       | *         | *           | *         | *               | *         |
| Total       |                  | 4660       | 0         |             |           | 2975    | 0         |             |           | 7635            | 0         |
| Percent     |                  | 100.0%     | 0.0%      |             |           | 100.0%  | 0.0%      |             |           | 100.0%          | 0.0%      |
| Grand Total |                  | 18250      | 30604     |             |           | 11756   | 17552     |             |           | 30006           | 48156     |
| Percent     |                  | 37.4%      | 62.6%     |             |           | 40.1%   | 59.9%     |             |           | 38.4%           | 61.6%     |
| ADT         |                  | ADT 29,612 |           | AADT 29,612 |           |         |           |             |           |                 |           |

| Description 1:<br>Description 2:<br>Description 3: | Kihel High School<br>Kulanihakai Street | Wilson Okamoto Corporation<br>1907 S. Beretania St., Suite 400<br>Honolulu, HI 96826 |          | Date:<br><br>1/24/2011<br>Monday |
|--|---|--|----------|----------------------------------|
|  |   | EB   | WB       |                                  |
| 12:00 AM   | EB                                      | WB   | Combined | Daily Volume                     |
| 12:15 AM   | EB                                      | WB   | Combined | 12:00 PM                         |
| 12:30 AM   | EB                                      | WB   | Combined | 12:15 PM                         |
| 12:45 AM   | EB                                      | WB   | Combined | 12:30 PM                         |
| 1:00 AM  | EB                                      | WB   | Combined | 12:45 PM                         |
| 1:15 AM  | EB                                      | WB   | Combined | 1:00 PM                          |
| 1:30 AM  | EB                                      | WB   | Combined | 1:15 PM                          |
| 1:45 AM  | EB                                      | WB   | Combined | 1:30 PM                          |
| 2:00 AM  | EB                                      | WB   | Combined | 1:45 PM                          |
| 2:15 AM  | EB                                      | WB   | Combined | 2:00 PM                          |
| 2:30 AM  | EB                                      | WB   | Combined | 2:15 PM                          |
| 2:45 AM  | EB                                      | WB   | Combined | 2:30 PM                          |
| 3:00 AM  | EB                                      | WB   | Combined | 2:45 PM                          |
| 3:15 AM  | EB                                      | WB   | Combined | 3:00 PM                          |
| 3:30 AM  | EB                                      | WB   | Combined | 3:15 PM                          |
| 3:45 AM  | EB                                      | WB   | Combined | 3:30 PM                          |
| 4:00 AM  | EB                                      | WB   | Combined | 3:45 PM                          |
| 4:15 AM  | EB                                      | WB   | Combined | 4:00 PM                          |
| 4:30 AM  | EB                                      | WB   | Combined | 4:15 PM                          |
| 4:45 AM  | EB                                      | WB   | Combined | 4:30 PM                          |
| 5:00 AM  | EB                                      | WB   | Combined | 4:45 PM                          |
| 5:15 AM  | EB                                      | WB   | Combined | 5:00 PM                          |
| 5:30 AM  | EB                                      | WB   | Combined | 5:15 PM                          |
| 5:45 AM  | EB                                      | WB   | Combined | 5:30 PM                          |
| 6:00 AM  | EB                                      | WB   | Combined | 5:45 PM                          |
| 6:15 AM  | EB                                      | WB   | Combined | 6:00 PM                          |
| 6:30 AM  | EB                                      | WB   | Combined | 6:15 PM                          |
| 6:45 AM  | EB                                      | WB   | Combined | 6:30 PM                          |
| 7:00 AM  | EB                                      | WB   | Combined | 6:45 PM                          |
| 7:15 AM  | EB                                      | WB   | Combined | 7:00 PM                          |
| 7:30 AM  | EB                                      | WB   | Combined | 7:15 PM                          |
| 7:45 AM  | EB                                      | WB   | Combined | 7:30 PM                          |
| 8:00 AM  | EB                                      | WB   | Combined | 7:45 PM                          |
| 8:15 AM  | EB                                      | WB   | Combined | 8:00 PM                          |
| 8:30 AM  | EB                                      | WB   | Combined | 8:15 PM                          |
| 8:45 AM  | EB                                      | WB   | Combined | 8:30 PM                          |
| 9:00 AM  | EB                                      | WB   | Combined | 8:45 PM                          |
| 9:15 AM  | EB                                      | WB   | Combined | 9:00 PM                          |
| 9:30 AM  | EB                                      | WB   | Combined | 9:15 PM                          |
| 9:45 AM  | EB                                      | WB   | Combined | 9:30 PM                          |
| 10:00 AM   | EB                                      | WB   | Combined | 9:45 PM                          |
| 10:15 AM   | EB                                      | WB   | Combined | 10:00 PM                         |
| 10:30 AM   | EB                                      | WB   | Combined | 10:15 PM                         |
| 10:45 AM   | EB                                      | WB   | Combined | 10:30 PM                         |
| 11:00 AM   | EB                                      | WB   | Combined | 10:45 PM                         |
| 11:15 AM   | EB                                      | WB   | Combined | 11:00 PM                         |
| 11:30 AM   | EB                                      | WB   | Combined | 11:15 PM                         |
| 11:45 AM   | EB                                      | WB   | Combined | 11:30 PM                         |
| 12:00 PM   | EB                                      | WB   | Combined | 12:00 PM                         |
| 12:15 PM   | EB                                      | WB   | Combined | 12:15 PM                         |
| 12:30 PM   | EB                                      | WB   | Combined | 12:30 PM                         |
| 12:45 PM   | EB                                      | WB   | Combined | 12:45 PM                         |
| 1:00 PM  | EB                                      | WB   | Combined | 1:00 PM                          |
| 1:15 PM  | EB                                      | WB   | Combined | 1:15 PM                          |
| 1:30 PM  | EB                                      | WB   | Combined | 1:30 PM                          |
| 1:45 PM  | EB                                      | WB   | Combined | 1:45 PM                          |
| 2:00 PM  | EB                                      | WB   | Combined | 2:00 PM                          |
| 2:15 PM  | EB                                      | WB   | Combined | 2:15 PM                          |
| 2:30 PM  | EB                                      | WB   | Combined | 2:30 PM                          |
| 2:45 PM  | EB                                      | WB   | Combined | 2:45 PM                          |
| 3:00 PM  | EB                                      | WB   | Combined | 3:00 PM                          |
| 3:15 PM  | EB                                      | WB   | Combined | 3:15 PM                          |
| 3:30 PM  | EB                                      | WB   | Combined | 3:30 PM                          |
| 3:45 PM  | EB                                      | WB   | Combined | 3:45 PM                          |
| 4:00 PM  | EB                                      | WB   | Combined | 4:00 PM                          |
| 4:15 PM  | EB                                      | WB   | Combined | 4:15 PM                          |
| 4:30 PM  | EB                                      | WB   | Combined | 4:30 PM                          |
| 4:45 PM  | EB                                      | WB   | Combined | 4:45 PM                          |
| 5:00 PM  | EB                                      | WB   | Combined | 5:00 PM                          |
| 5:15 PM  | EB                                      | WB   | Combined | 5:15 PM                          |
| 5:30 PM  | EB                                      | WB   | Combined | 5:30 PM                          |
| 5:45 PM  | EB                                      | WB   | Combined | 5:45 PM                          |
| 6:00 PM  | EB                                      | WB   | Combined | 6:00 PM                          |
| 6:15 PM  | EB                                      | WB   | Combined | 6:15 PM                          |
| 6:30 PM  | EB                                      | WB   | Combined | 6:30 PM                          |
| 6:45 PM  | EB                                      | WB   | Combined | 6:45 PM                          |
| 7:00 PM  | EB                                      | WB   | Combined | 7:00 PM                          |
| 7:15 PM  | EB                                      | WB   | Combined | 7:15 PM                          |
| 7:30 PM  | EB                                      | WB   | Combined | 7:30 PM                          |
| 7:45 PM  | EB                                      | WB   | Combined | 7:45 PM                          |
| 8:00 PM  | EB                                      | WB   | Combined | 8:00 PM                          |
| 8:15 PM  | EB                                      | WB   | Combined | 8:15 PM                          |
| 8:30 PM  | EB                                      | WB   | Combined | 8:30 PM                          |
| 8:45 PM  | EB                                      | WB   | Combined | 8:45 PM                          |
| 9:00 PM  | EB                                      | WB   | Combined | 9:00 PM                          |
| 9:15 PM  | EB                                      | WB   | Combined | 9:15 PM                          |
| 9:30 PM  | EB                                      | WB   | Combined | 9:30 PM                          |
| 9:45 PM  | EB                                      | WB   | Combined | 9:45 PM                          |
| 10:00 PM   | EB                                      | WB   | Combined | 10:00 PM                         |
| 10:15 PM   | EB                                      | WB   | Combined | 10:15 PM                         |
| 10:30 PM   | EB                                      | WB   | Combined | 10:30 PM                         |
| 10:45 PM   | EB                                      | WB   | Combined | 10:45 PM                         |
| 11:00 PM   | EB                                      | WB   | Combined | 11:00 PM                         |
| 11:15 PM   | EB                                      | WB   | Combined | 11:15 PM                         |
| 11:30 PM   | EB                                      | WB   | Combined | 11:30 PM                         |
| 11:45 PM   | EB                                      | WB   | Combined | 11:45 PM                         |
| 12:00 AM   | EB                                      | WB   | Combined | 12:00 AM                         |
| 12:15 AM   | EB                                      | WB   | Combined | 12:15 AM                         |
| 12:30 AM   | EB                                      | WB   | Combined | 12:30 AM                         |
| 12:45 AM   | EB                                      | WB   | Combined | 12:45 AM                         |
| 1:00 AM  | EB                                      | WB   | Combined | 1:00 AM                          |
| 1:15 AM  | EB                                      | WB   | Combined | 1:15 AM                          |
| 1:30 AM  | EB                                      | WB   | Combined | 1:30 AM                          |
| 1:45 AM  | EB                                      | WB   | Combined | 1:45 AM                          |
| 2:00 AM  | EB                                      | WB   | Combined | 2:00 AM                          |
| 2:15 AM  | EB                                      | WB   | Combined | 2:15 AM                          |
| 2:30 AM  | EB                                      | WB   | Combined | 2:30 AM                          |
| 2:45 AM  | EB                                      | WB   | Combined | 2:45 AM                          |
| 3:00 AM  | EB                                      | WB   | Combined | 3:00 AM                          |
| 3:15 AM  | EB                                      | WB   | Combined | 3:15 AM                          |
| 3:30 AM  | EB                                      | WB   | Combined | 3:30 AM                          |
| 3:45 AM  | EB                                      | WB   | Combined | 3:45 AM                          |
| 4:00 AM  | EB                                      | WB   | Combined | 4:00 AM                          |
| 4:15 AM  | EB                                      | WB   | Combined | 4:15 AM                          |
| 4:30 AM  | EB                                      | WB   | Combined | 4:30 AM                          |
| 4:45 AM  | EB                                      | WB   | Combined | 4:45 AM                          |
| 5:00 AM  | EB                                      | WB   | Combined | 5:00 AM                          |
| 5:15 AM  | EB                                      | WB   | Combined | 5:15 AM                          |
| 5:30 AM  | EB                                      | WB   | Combined | 5:30 AM                          |
| 5:45 AM  | EB                                      | WB   | Combined | 5:45 AM                          |
| 6:00 AM  | EB                                      | WB   | Combined | 6:00 AM                          |
| 6:15 AM  | EB                                      | WB   | Combined | 6:15 AM                          |
| 6:30 AM  | EB                                      | WB   | Combined | 6:30 AM                          |
| 6:45 AM  | EB                                      | WB   | Combined | 6:45 AM                          |
| 7:00 AM  | EB                                      | WB   | Combined | 7:00 AM                          |
| 7:15 AM  | EB                                      | WB   | Combined | 7:15 AM                          |
| 7:30 AM  | EB                                      | WB   | Combined | 7:30 AM                          |
| 7:45 AM  | EB                                      | WB   | Combined | 7:45 AM                          |
| 8:00 AM  | EB                                      | WB   | Combined | 8:00 AM                          |
| 8:15 AM  | EB                                      | WB   | Combined | 8:15 AM                          |
| 8:30 AM  | EB                                      | WB   | Combined | 8:30 AM                          |
| 8:45 AM  | EB                                      | WB   | Combined | 8:45 AM                          |
| 9:00 AM  | EB                                      | WB   | Combined | 9:00 AM                          |
| 9:15 AM  | EB                                      | WB   | Combined | 9:15 AM                          |
| 9:30 AM  | EB                                      | WB   | Combined | 9:30 AM                          |
| 9:45 AM  | EB                                      | WB   | Combined | 9:45 AM                          |
| 10:00 AM   | EB                                      | WB   | Combined | 10:00 AM                         |
| 10:15 AM   | EB                                      | WB   | Combined | 10:15 AM                         |
| 10:30 AM   | EB                                      | WB   | Combined | 10:30 AM                         |
| 10:45 AM   | EB                                      | WB   | Combined | 10:45 AM                         |
| 11:00 AM   | EB                                      | WB   | Combined | 11:00 AM                         |
| 11:15 AM   | EB                                      | WB   | Combined | 11:15 AM                         |
| 11:30 AM   | EB                                      | WB   | Combined | 11:30 AM                         |
| 11:45 AM   | EB                                      | WB   | Combined | 11:45 AM                         |
| 12:00 PM   | EB                                      | WB   | Combined | 12:00 PM                         |
| 12:15 PM   | EB                                      | WB   | Combined | 12:15 PM                         |
| 12:30 PM   | EB                                      | WB   | Combined | 12:30 PM                         |
| 12:45 PM   | EB                                      | WB   | Combined | 12:45 PM                         |
| 1:00 PM  | EB                                      | WB   | Combined | 1:00 PM                          |
| 1:15 PM  | EB                                      | WB   | Combined | 1:15 PM                          |
| 1:30 PM  | EB                                      | WB   | Combined | 1:30 PM                          |
| 1:45 PM  | EB                                      | WB   | Combined | 1:45 PM                          |
| 2:00 PM  | EB                                      | WB   | Combined | 2:00 PM                          |
| 2:15 PM  | EB                                      | WB   | Combined | 2:15 PM                          |
| 2:30 PM  | EB                                      | WB   | Combined | 2:30 PM                          |
| 2:45 PM  | EB                                      | WB   | Combined | 2:45 PM                          |
| 3:00 PM  | EB                                      | WB   | Combined | 3:00 PM                          |
| 3:15 PM  | EB                                      | WB   | Combined | 3:15 PM                          |
| 3:30 PM  | EB                                      | WB   | Combined | 3:30 PM                          |
| 3:45 PM  | EB                                      | WB   | Combined | 3:45 PM                          |
| 4:00 PM  | EB                                      | WB   | Combined | 4:00 PM                          |
| 4:15 PM  | EB                                      | WB   | Combined | 4:15 PM                          |
| 4:30 PM  | EB                                      | WB   | Combined | 4:30 PM                          |
| 4:45 PM  | EB                                      | WB   | Combined | 4:45 PM                          |
| 5:00 PM  | EB                                      | WB   | Combined | 5:00 PM                          |
| 5:15 PM  | EB                                      | WB   | Combined | 5:15 PM                          |
| 5:30 PM  | EB                                      | WB   | Combined | 5:30 PM                          |
| 5:45 PM  | EB                                      | WB   | Combined | 5:45 PM                          |
| 6:00 PM  | EB                                      | WB   | Combined | 6:00 PM                          |
| 6:15 PM  | EB                                      | WB   | Combined | 6:15 PM                          |
| 6:30 PM  | EB                                      | WB   | Combined | 6:30 PM                          |
| 6:45 PM  | EB                                      | WB   | Combined | 6:45 PM                          |
| 7:00 PM  | EB                                      | WB   | Combined | 7:00 PM                          |
| 7:15 PM  | EB                                      | WB   | Combined | 7:15 PM                          |
| 7:30 PM  | EB                                      | WB   | Combined | 7:30 PM                          |
| 7:45 PM  | EB                                      | WB   | Combined | 7:4                              |

Wilson Okamoto Corporation  
1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Description 1: Kihel High School  
Description 2: Kulanihakai Street  
Description 3:

Date: 1/26/2011  
Wednesday

| Daily Volume   |          |         |          |    |              |              |          |                     |     |          |          |          |     |     |
|----------------|----------|---------|----------|----|--------------|--------------|----------|---------------------|-----|----------|----------|----------|-----|-----|
|                | Begin    | EB      |          | WB | Combined     |              | Begin    | EB                  |     | WB       | Combined |          |     |     |
|                | 12:00 AM | 3       | 25       | 6  | 26           | 9            | 51       | 12:00 PM            | 68  | 370      | 49       | 142      | 117 | 512 |
|                | 12:15 AM | 4       |          | 11 |              | 15           |          | 12:15 PM            | 98  |          | 35       |          | 133 |     |
|                | 12:30 AM | 3       |          | 6  |              | 9            |          | 12:30 PM            | 111 |          | 35       |          | 146 |     |
|                | 12:45 AM | 15      |          | 3  |              | 18           |          | 12:45 PM            | 93  |          | 23       |          | 116 |     |
|                | 1:00 AM  | 2       | 4        | 5  | 21           | 7            | 25       | 1:00 PM             | 106 | 289      | 24       | 155      | 130 | 444 |
|                | 1:15 AM  | 0       |          | 4  |              | 4            |          | 1:15 PM             | 71  |          | 39       |          | 110 |     |
|                | 1:30 AM  | 0       |          | 3  |              | 3            |          | 1:30 PM             | 54  |          | 41       |          | 95  |     |
|                | 1:45 AM  | 2       |          | 9  |              | 11           |          | 1:45 PM             | 58  |          | 51       |          | 109 |     |
|                | 2:00 AM  | 4       | 12       | 2  | 5            | 6            | 17       | 2:00 PM             | 60  | 288      | 25       | 142      | 85  | 430 |
|                | 2:15 AM  | 3       |          | 1  |              | 4            |          | 2:15 PM             | 71  |          | 47       |          | 118 |     |
|                | 2:30 AM  | 5       |          | 2  |              | 7            |          | 2:30 PM             | 63  |          | 42       |          | 105 |     |
|                | 2:45 AM  | 0       |          | 0  |              | 0            |          | 2:45 PM             | 94  |          | 28       |          | 122 |     |
|                | 3:00 AM  | 0       | 13       | 0  | 8            | 0            | 21       | 3:00 PM             | 75  | 204      | 36       | 160      | 111 | 364 |
|                | 3:15 AM  | 2       |          | 4  |              | 6            |          | 3:15 PM             | 35  |          | 45       |          | 80  |     |
|                | 3:30 AM  | 1       |          | 1  |              | 2            |          | 3:30 PM             | 37  |          | 38       |          | 75  |     |
|                | 3:45 AM  | 10      |          | 3  |              | 13           |          | 3:45 PM             | 57  |          | 41       |          | 98  |     |
|                | 4:00 AM  | 2       | 23       | 0  | 10           | 2            | 33       | 4:00 PM             | 41  | 173      | 41       | 190      | 82  | 363 |
|                | 4:15 AM  | 3       |          | 1  |              | 4            |          | 4:15 PM             | 32  |          | 54       |          | 86  |     |
|                | 4:30 AM  | 9       |          | 4  |              | 13           |          | 4:30 PM             | 38  |          | 41       |          | 79  |     |
|                | 4:45 AM  | 9       |          | 5  |              | 14           |          | 4:45 PM             | 62  |          | 54       |          | 116 |     |
|                | 5:00 AM  | 6       | 55       | 5  | 28           | 11           | 83       | 5:00 PM             | 32  | 168      | 41       | 203      | 73  | 371 |
|                | 5:15 AM  | 6       |          | 4  |              | 10           |          | 5:15 PM             | 44  |          | 49       |          | 93  |     |
|                | 5:30 AM  | 21      |          | 8  |              | 29           |          | 5:30 PM             | 54  |          | 53       |          | 107 |     |
|                | 5:45 AM  | 22      |          | 11 |              | 33           |          | 5:45 PM             | 38  |          | 60       |          | 98  |     |
|                | 6:00 AM  | 30      | 134      | 10 | 57           | 40           | 191      | 6:00 PM             | 39  | 172      | 51       | 186      | 90  | 358 |
|                | 6:15 AM  | 36      |          | 10 |              | 46           |          | 6:15 PM             | 62  |          | 59       |          | 121 |     |
|                | 6:30 AM  | 31      |          | 9  |              | 40           |          | 6:30 PM             | 34  |          | 41       |          | 75  |     |
|                | 6:45 AM  | 37      |          | 28 |              | 65           |          | 6:45 PM             | 37  |          | 35       |          | 72  |     |
|                | 7:00 AM  | 56      | 291      | 20 | 115          | 76           | 406      | 7:00 PM             | 27  | 101      | 33       | 125      | 60  | 226 |
|                | 7:15 AM  | 73      |          | 29 |              | 102          |          | 7:15 PM             | 25  |          | 26       |          | 51  |     |
|                | 7:30 AM  | 92      |          | 29 |              | 121          |          | 7:30 PM             | 27  |          | 36       |          | 63  |     |
|                | 7:45 AM  | 70      |          | 37 |              | 107          |          | 7:45 PM             | 22  |          | 30       |          | 52  |     |
|                | 8:00 AM  | 50      | 256      | 37 | 174          | 87           | 430      | 8:00 PM             | 19  | 95       | 23       | 119      | 42  | 214 |
|                | 8:15 AM  | 56      |          | 45 |              | 101          |          | 8:15 PM             | 23  |          | 32       |          | 55  |     |
|                | 8:30 AM  | 74      |          | 38 |              | 112          |          | 8:30 PM             | 24  |          | 32       |          | 56  |     |
|                | 8:45 AM  | 76      |          | 54 |              | 130          |          | 8:45 PM             | 29  |          | 32       |          | 61  |     |
|                | 9:00 AM  | 97      | 286      | 18 | 133          | 115          | 419      | 9:00 PM             | 12  | 73       | 33       | 117      | 45  | 190 |
|                | 9:15 AM  | 47      |          | 44 |              | 91           |          | 9:15 PM             | 19  |          | 25       |          | 44  |     |
|                | 9:30 AM  | 83      |          | 30 |              | 113          |          | 9:30 PM             | 23  |          | 42       |          | 65  |     |
|                | 9:45 AM  | 59      |          | 41 |              | 100          |          | 9:45 PM             | 19  |          | 17       |          | 36  |     |
|                | 10:00 AM | 67      | 222      | 33 | 131          | 100          | 353      | 10:00 PM            | 17  | 47       | 21       | 73       | 38  | 120 |
|                | 10:15 AM | 56      |          | 30 |              | 86           |          | 10:15 PM            | 14  |          | 15       |          | 29  |     |
|                | 10:30 AM | 38      |          | 29 |              | 67           |          | 10:30 PM            | 10  |          | 18       |          | 28  |     |
|                | 10:45 AM | 61      |          | 39 |              | 100          |          | 10:45 PM            | 6   |          | 19       |          | 25  |     |
|                | 11:00 AM | 44      | 180      | 44 | 170          | 88           | 350      | 11:00 PM            | 9   | 27       | 8        | 35       | 17  | 62  |
|                | 11:15 AM | 38      |          | 46 |              | 84           |          | 11:15 PM            | 3   |          | 9        |          | 12  |     |
|                | 11:30 AM | 49      |          | 37 |              | 86           |          | 11:30 PM            | 9   |          | 13       |          | 22  |     |
|                | 11:45 AM | 49      |          | 43 |              | 92           |          | 11:45 PM            | 6   |          | 5        |          | 11  |     |
| 24 Hour Volume |          |         |          |    | EB           | WB           | Combined | 12:00 PM - 12:00 AM |     |          |          |          |     |     |
|                |          |         |          |    | 3508 (58.1%) | 2525 (41.9%) | 6033     |                     |     |          |          |          |     |     |
| Count          | EB       | WB      | Combined |    |              |              |          |                     |     | EB       | WB       | Combined |     |     |
|                | 1501     | 678     | 2379     |    |              |              |          |                     |     | 2007     | 1647     | 3654     |     |     |
| Peak Hour      | 63.1 %   | 36.9 %  |          |    |              |              |          |                     |     | 54.9 %   | 45.1 %   |          |     |     |
| Volume         | 8:15 AM  | 8:00 AM | 8:15 AM  |    |              |              |          |                     |     | 12:15 PM | 5:30 PM  | 12:15 PM |     |     |
| Factor         | 0.78     | 0.81    | 0.88     |    |              |              |          |                     |     | 0.92     | 0.93     | 0.90     |     |     |

Wilson Okamoto Corporation  
1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Description 1: Kihel High School  
Description 2: Kulanihakai Street  
Description 3:

Date: 1/25/2011  
Tuesday

| Daily Volume        |         |          |          |     |     |              |                     |         |          |    |     |     |          |          |
|---------------------|---------|----------|----------|-----|-----|--------------|---------------------|---------|----------|----|-----|-----|----------|----------|
| Begin               |         |          |          | EB  | WB  | Combined     | Begin               |         |          |    | EB  | WB  | Combined |          |
| 12:00 AM            | 3       | 15       | 5        | 23  | 8   | 38           | 12:00 PM            | 32      | 142      | 33 | 120 | 65  | 262      |          |
| 12:15 AM            | 4       |          | 8        |     | 12  |              | 12:15 PM            | 33      |          | 27 |     | 60  |          |          |
| 12:30 AM            | 6       |          | 7        |     | 13  |              | 12:30 PM            | 45      |          | 34 |     | 79  |          |          |
| 12:45 AM            | 2       |          | 3        |     | 5   |              | 12:45 PM            | 32      |          | 26 |     | 58  |          |          |
| 1:00 AM             | 6       | 9        | 4        | 13  | 10  | 22           | 1:00 PM             | 23      | 147      | 20 | 107 | 43  | 254      |          |
| 1:15 AM             | 1       |          | 3        |     | 4   |              | 1:15 PM             | 27      |          | 30 |     | 57  |          |          |
| 1:30 AM             | 1       |          | 1        |     | 2   |              | 1:30 PM             | 37      |          | 22 |     | 59  |          |          |
| 1:45 AM             | 1       |          | 5        |     | 6   |              | 1:45 PM             | 60      |          | 35 |     | 95  |          |          |
| 2:00 AM             | 2       | 12       | 4        | 11  | 6   | 23           | 2:00 PM             | 48      | 193      | 32 | 141 | 80  | 334      |          |
| 2:15 AM             | 3       |          | 6        |     | 9   |              | 2:15 PM             | 21      |          | 34 |     | 55  |          |          |
| 2:30 AM             | 6       |          | 0        |     | 6   |              | 2:30 PM             | 65      |          | 33 |     | 98  |          |          |
| 2:45 AM             | 1       |          | 1        |     | 2   |              | 2:45 PM             | 59      |          | 42 |     | 101 |          |          |
| 3:00 AM             | 2       | 22       | 2        | 7   | 4   | 29           | 3:00 PM             | 40      | 159      | 42 | 169 | 82  | 328      |          |
| 3:15 AM             | 9       |          | 3        |     | 12  |              | 3:15 PM             | 34      |          | 52 |     | 86  |          |          |
| 3:30 AM             | 1       |          | 1        |     | 2   |              | 3:30 PM             | 47      |          | 34 |     | 81  |          |          |
| 3:45 AM             | 10      |          | 1        |     | 11  |              | 3:45 PM             | 38      |          | 41 |     | 79  |          |          |
| 4:00 AM             | 5       | 27       | 4        | 13  | 9   | 40           | 4:00 PM             | 34      | 145      | 35 | 146 | 69  | 291      |          |
| 4:15 AM             | 4       |          | 4        |     | 8   |              | 4:15 PM             | 30      |          | 42 |     | 72  |          |          |
| 4:30 AM             | 11      |          | 2        |     | 13  |              | 4:30 PM             | 44      |          | 33 |     | 77  |          |          |
| 4:45 AM             | 7       |          | 3        |     | 10  |              | 4:45 PM             | 37      |          | 36 |     | 73  |          |          |
| 5:00 AM             | 10      | 71       | 4        | 11  | 14  | 82           | 5:00 PM             | 37      | 156      | 41 | 152 | 78  | 308      |          |
| 5:15 AM             | 23      |          | 1        |     | 24  |              | 5:15 PM             | 36      |          | 27 |     | 63  |          |          |
| 5:30 AM             | 15      |          | 2        |     | 17  |              | 5:30 PM             | 48      |          | 43 |     | 91  |          |          |
| 5:45 AM             | 23      |          | 4        |     | 27  |              | 5:45 PM             | 35      |          | 41 |     | 76  |          |          |
| 6:00 AM             | 29      | 134      | 3        | 52  | 32  | 186          | 6:00 PM             | 39      | 137      | 48 | 171 | 87  | 308      |          |
| 6:15 AM             | 23      |          | 9        |     | 32  |              | 6:15 PM             | 32      |          | 48 |     | 80  |          |          |
| 6:30 AM             | 41      |          | 23       |     | 64  |              | 6:30 PM             | 40      |          | 44 |     | 84  |          |          |
| 6:45 AM             | 41      |          | 17       |     | 58  |              | 6:45 PM             | 26      |          | 31 |     | 57  |          |          |
| 7:00 AM             | 52      | 266      | 24       | 87  | 76  | 353          | 7:00 PM             | 29      | 87       | 37 | 115 | 66  | 202      |          |
| 7:15 AM             | 73      |          | 23       |     | 96  |              | 7:15 PM             | 22      |          | 32 |     | 54  |          |          |
| 7:30 AM             | 76      |          | 14       |     | 90  |              | 7:30 PM             | 19      |          | 21 |     | 40  |          |          |
| 7:45 AM             | 65      |          | 26       |     | 91  |              | 7:45 PM             | 17      |          | 25 |     | 42  |          |          |
| 8:00 AM             | 54      | 192      | 29       | 119 | 83  | 311          | 8:00 PM             | 23      | 74       | 30 | 102 | 53  | 176      |          |
| 8:15 AM             | 52      |          | 37       |     | 89  |              | 8:15 PM             | 9       |          | 24 |     | 33  |          |          |
| 8:30 AM             | 56      |          | 28       |     | 84  |              | 8:30 PM             | 19      |          | 30 |     | 49  |          |          |
| 8:45 AM             | 30      |          | 25       |     | 55  |              | 8:45 PM             | 23      |          | 18 |     | 41  |          |          |
| 9:00 AM             | 39      | 187      | 22       | 80  | 61  | 267          | 9:00 PM             | 19      | 65       | 20 | 87  | 39  | 152      |          |
| 9:15 AM             | 40      |          | 15       |     | 55  |              | 9:15 PM             | 16      |          | 26 |     | 42  |          |          |
| 9:30 AM             | 46      |          | 16       |     | 62  |              | 9:30 PM             | 18      |          | 24 |     | 42  |          |          |
| 9:45 AM             | 62      |          | 27       |     | 89  |              | 9:45 PM             | 12      |          | 17 |     | 29  |          |          |
| 10:00 AM            | 60      | 186      | 21       | 115 | 81  | 301          | 10:00 PM            | 11      | 50       | 22 | 72  | 33  | 122      |          |
| 10:15 AM            | 46      |          | 37       |     | 83  |              | 10:15 PM            | 22      |          | 24 |     | 46  |          |          |
| 10:30 AM            | 44      |          | 24       |     | 68  |              | 10:30 PM            | 7       |          | 10 |     | 17  |          |          |
| 10:45 AM            | 36      |          | 33       |     | 69  |              | 10:45 PM            | 10      |          | 16 |     | 26  |          |          |
| 11:00 AM            | 47      | 184      | 30       | 122 | 77  | 306          | 11:00 PM            | 12      | 20       | 8  | 28  | 20  | 48       |          |
| 11:15 AM            | 43      |          | 20       |     | 63  |              | 11:15 PM            | 1       |          | 9  |     | 10  |          |          |
| 11:30 AM            | 59      |          | 45       |     | 104 |              | 11:30 PM            | 5       |          | 9  |     | 14  |          |          |
| 11:45 AM            | 35      |          | 27       |     | 62  |              | 11:45 PM            | 2       |          | 2  |     | 4   |          |          |
| 24 Hour Volume      |         |          |          |     |     | 4743         | 12:00 PM - 12:00 AM |         |          |    |     |     | Combined |          |
| EB                  |         |          |          |     |     | WB           | EB                  |         |          |    |     |     | WB       | Combined |
| 2680 (56.5%)        |         |          |          |     |     | 2063 (43.5%) | 1375                |         |          |    |     |     | 1410     | 2785     |
| 12:00 AM - 12:00 PM |         |          |          |     |     |              | 49.4 %              |         |          |    |     |     | 50.6 %   |          |
| Count               | EB      | WB       | Combined |     |     |              | EB                  | WB      | Combined |    |     |     |          |          |
|                     | 1305    | 653      | 1958     |     |     |              | 1375                | 1410    | 2785     |    |     |     |          |          |
| Peak Hour           | 66.6 %  | 33.4 %   |          |     |     |              | 49.4 %              | 50.6 %  |          |    |     |     |          |          |
| Volume              | 7:15 AM | 10:45 AM | 7:15 AM  |     |     |              | 2:30 PM             | 5:45 PM | 2:30 PM  |    |     |     |          |          |
| Factor              | 0.88    | 0.71     | 0.94     |     |     |              | 0.76                | 0.94    | 0.91     |    |     |     |          |          |



**APPENDIX B**  
**WARRANT 1**  
**EIGHT HOUR VOLUME WARRANT**

Wilson Okamoto Corporation  
1907 S. Beretania St., Suite 400  
Honolulu, HI 96826

Description 1: Kinohi High School  
Description 2: Kulamihaki Street  
Description 3:

Date: 1/27/2011  
Thursday

| Daily Volume |     |     |          |       |     |     |          |  |  |
|--------------|-----|-----|----------|-------|-----|-----|----------|--|--|
| Begin        | EB  | WB  | Combined | Begin | EB  | WB  | Combined |  |  |
| 12:00 AM     | 4   | 18  | 5        | 17    | 9   | 18  | 35       |  |  |
| 12:15 AM     | 13  | 5   | 3        |       |     | 4   |          |  |  |
| 12:30 AM     | 1   | 3   |          |       |     |     |          |  |  |
| 12:45 AM     | 0   | 4   |          |       |     |     |          |  |  |
| 1:00 AM      | 0   | 5   | 2        | 9     | 3   |     | 14       |  |  |
| 1:15 AM      | 0   | 3   | 0        |       |     |     |          |  |  |
| 1:30 AM      | 0   | 0   | 0        |       |     |     |          |  |  |
| 1:45 AM      | 4   | 4   | 8        |       |     |     |          |  |  |
| 2:00 AM      | 5   | 5   | 22       | 10    | 8   |     | 41       |  |  |
| 2:15 AM      | 3   | 10  | 13       |       |     |     |          |  |  |
| 2:30 AM      | 8   | 4   | 12       |       |     |     |          |  |  |
| 2:45 AM      | 3   | 2   | 5        | 9     | 3   |     | 10       |  |  |
| 3:00 AM      | 1   | 2   | 0        |       |     |     |          |  |  |
| 3:15 AM      | 0   | 0   | 2        |       |     |     |          |  |  |
| 3:30 AM      | 0   | 2   | 2        |       |     |     |          |  |  |
| 3:45 AM      | 4   | 1   | 5        |       |     |     |          |  |  |
| 4:00 AM      | 3   | 3   | 9        | 6     | 25  |     |          |  |  |
| 4:15 AM      | 2   | 0   | 2        |       |     |     |          |  |  |
| 4:30 AM      | 4   | 4   | 13       |       |     |     |          |  |  |
| 4:45 AM      | 9   | 4   | 17       | 13    | 100 |     |          |  |  |
| 5:00 AM      | 13  | 70  | 8        | 30    |     |     |          |  |  |
| 5:15 AM      | 8   | 5   | 13       |       |     |     |          |  |  |
| 5:30 AM      | 22  | 11  | 33       |       |     |     |          |  |  |
| 5:45 AM      | 27  | 10  | 37       |       |     |     |          |  |  |
| 6:00 AM      | 40  | 12  | 52       | 32    | 192 |     |          |  |  |
| 6:15 AM      | 19  | 13  | 32       |       |     |     |          |  |  |
| 6:30 AM      | 40  | 29  | 69       |       |     |     |          |  |  |
| 6:45 AM      | 40  | 29  | 69       |       |     |     |          |  |  |
| 7:00 AM      | 53  | 309 | 19       | 104   | 72  | 413 |          |  |  |
| 7:15 AM      | 106 | 23  | 129      |       |     |     |          |  |  |
| 7:30 AM      | 77  | 29  | 106      |       |     |     |          |  |  |
| 7:45 AM      | 73  | 33  | 106      |       |     |     |          |  |  |
| 8:00 AM      | 53  | 220 | 183      | 106   | 403 |     |          |  |  |
| 8:15 AM      | 53  | 45  | 98       |       |     |     |          |  |  |
| 8:30 AM      | 52  | 50  | 102      |       |     |     |          |  |  |
| 8:45 AM      | 62  | 33  | 95       |       |     |     |          |  |  |
| 9:00 AM      | 59  | 182 | 27       | 127   | 66  | 309 |          |  |  |
| 9:15 AM      | 52  | 40  | 92       |       |     |     |          |  |  |
| 9:30 AM      | 35  | 27  | 62       |       |     |     |          |  |  |
| 9:45 AM      | 35  | 27  | 62       |       |     |     |          |  |  |
| 10:00 AM     | 27  | 27  | 38       | 38    | 65  | 65  |          |  |  |

| 24 Hour Volume |       |      |          |  | Combined |       |      |          |  |
|----------------|-------|------|----------|--|----------|-------|------|----------|--|
| Count          | EB    | WB   | Combined |  | Count    | EB    | WB   | Combined |  |
| 1003           | 608   | 1611 |          |  | 1003     | 608   | 1611 |          |  |
| 62.3%          | 37.7% |      |          |  | 62.3%    | 37.7% |      |          |  |
| Peak Hour      | 309   | 183  | 449      |  | 309      | 183   | 449  |          |  |
| Volume         |       |      |          |  | Volume   |       |      |          |  |
| Factor         | 0.73  | 0.83 | 0.87     |  | Factor   | 0.73  | 0.83 | 0.87     |  |

| Time  | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|-------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 8:00  | 488          | 1922         | 54             | 192          | 0           | 1           | 1           | 1           |
| 8:15  | 519          | 1885         | 52             | 177          |             |             |             |             |
| 8:30  | 485          | 1816         | 56             | 165          |             |             |             |             |
| 8:45  | 450          | 1775         | 30             | 155          |             |             |             |             |
| 9:00  | 451          | 1754         | 39             | 187          | 0           | 1           | 1           | 1           |
| 9:15  | 450          | 1688         | 40             | 208          |             |             |             |             |
| 9:30  | 424          | 1667         | 46             | 214          |             |             |             |             |
| 9:45  | 429          | 1692         | 62             | 212          |             |             |             |             |
| 10:00 | 385          | 1716         | 60             | 186          | 0           | 1           | 1           | 1           |
| 10:15 | 429          | 1752         | 46             | 173          |             |             |             |             |
| 10:30 | 449          | 1784         | 44             | 170          |             |             |             |             |
| 10:45 | 453          | 1805         | 36             | 185          |             |             |             |             |
| 11:00 | 421          | 1837         | 47             | 184          | 0           | 1           | 1           | 1           |
| 11:15 | 461          | 1814         | 43             | 169          |             |             |             |             |
| 11:30 | 470          | 1806         | 59             | 159          |             |             |             |             |
| 11:45 | 485          | 1823         | 35             | 145          |             |             |             |             |
| 12:00 | 398          | 1806         | 32             | 142          | 0           | 1           | 0           | 1           |
| 12:15 | 453          | 1898         | 33             | 133          |             |             |             |             |
| 12:30 | 487          | 1950         | 45             | 127          |             |             |             |             |
| 12:45 | 468          | 1970         | 32             | 119          |             |             |             |             |
| 13:00 | 490          | 2023         | 23             | 147          | 0           | 1           | 0           | 1           |
| 13:15 | 505          | 2057         | 27             | 172          |             |             |             |             |
| 13:30 | 507          | 2115         | 37             | 166          |             |             |             |             |
| 13:45 | 521          | 2139         | 60             | 194          |             |             |             |             |
| 14:00 | 524          | 2147         | 48             | 193          | 0           | 1           | 1           | 1           |
| 14:15 | 563          | 2151         | 21             | 185          |             |             |             |             |
| 14:30 | 531          | 2166         | 65             | 198          |             |             |             |             |
| 14:45 | 529          | 2223         | 59             | 180          |             |             |             |             |
| 15:00 | 528          | 2275         | 40             | 159          | 0           | 1           | 0           | 1           |
| 15:15 | 578          | 2313         | 34             | 153          |             |             |             |             |
| 15:30 | 588          | 2322         | 47             | 149          |             |             |             |             |
| 15:45 | 581          | 2230         | 38             | 146          |             |             |             |             |
| 16:00 | 566          | 2164         | 34             | 145          | 0           | 1           | 0           | 1           |
| 16:15 | 587          | 2139         | 30             | 148          |             |             |             |             |
| 16:30 | 496          | 2060         | 44             | 154          |             |             |             |             |

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**Warrant 1**  
**8-Hour Volumes (:00)**

| Time | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|      | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 0:00 | 87           | 253          | 3              | 15           | 0           | 0           | 0           | 0           |
| 0:15 | 76           | 196          | 4              | 18           |             |             |             |             |
| 0:30 | 50           | 146          | 6              | 15           |             |             |             |             |
| 0:45 | 40           | 127          | 2              | 10           |             |             |             |             |
| 1:00 | 30           | 113          | 6              | 9            | 0           | 0           | 0           | 0           |
| 1:15 | 26           | 118          | 1              | 5            |             |             |             |             |
| 1:30 | 31           | 111          | 1              | 7            |             |             |             |             |
| 1:45 | 26           | 107          | 1              | 12           |             |             |             |             |
| 2:00 | 35           | 110          | 2              | 12           | 0           | 0           | 0           | 0           |
| 2:15 | 19           | 99           | 3              | 12           |             |             |             |             |
| 2:30 | 27           | 116          | 6              | 18           |             |             |             |             |
| 2:45 | 29           | 146          | 1              | 13           |             |             |             |             |
| 3:00 | 24           | 166          | 2              | 22           | 0           | 0           | 0           | 0           |
| 3:15 | 36           | 241          | 9              | 25           |             |             |             |             |
| 3:30 | 57           | 285          | 1              | 20           |             |             |             |             |
| 3:45 | 49           | 342          | 10             | 30           |             |             |             |             |
| 4:00 | 99           | 392          | 5              | 27           | 0           | 0           | 0           | 0           |
| 4:15 | 80           | 425          | 4              | 32           |             |             |             |             |
| 4:30 | 114          | 494          | 11             | 51           |             |             |             |             |
| 4:45 | 99           | 579          | 7              | 55           |             |             |             |             |
| 5:00 | 132          | 687          | 10             | 71           | 0           | 0           | 0           | 0           |
| 5:15 | 149          | 792          | 23             | 90           |             |             |             |             |
| 5:30 | 199          | 982          | 15             | 90           |             |             |             |             |
| 5:45 | 207          | 1203         | 23             | 116          |             |             |             |             |
| 6:00 | 237          | 1448         | 29             | 134          | 0           | 1           | 0           | 1           |
| 6:15 | 339          | 1738         | 23             | 157          |             |             |             |             |
| 6:30 | 420          | 1978         | 41             | 207          |             |             |             |             |
| 6:45 | 452          | 2144         | 41             | 242          |             |             |             |             |
| 7:00 | 527          | 2268         | 52             | 266          | 1           | 1           | 1           | 1           |
| 7:15 | 579          | 2229         | 73             | 268          |             |             |             |             |
| 7:30 | 586          | 2169         | 76             | 247          |             |             |             |             |
| 7:45 | 576          | 2048         | 65             | 227          |             |             |             |             |

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**Warrant 1  
8-Hour Volumes (:15)**

| Time | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|      | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 0:00 | 87           | 253          | 3              | 15           |             |             |             |             |
| 0:15 | 76           | 196          | 4              | 18           | 0           | 0           | 0           | 0           |
| 0:30 | 50           | 146          | 6              | 15           |             |             |             |             |
| 0:45 | 40           | 127          | 2              | 10           |             |             |             |             |
| 1:00 | 30           | 113          | 6              | 9            |             |             |             |             |
| 1:15 | 26           | 118          | 1              | 5            | 0           | 0           | 0           | 0           |
| 1:30 | 31           | 111          | 1              | 7            |             |             |             |             |
| 1:45 | 26           | 107          | 1              | 12           |             |             |             |             |
| 2:00 | 35           | 110          | 2              | 12           |             |             |             |             |
| 2:15 | 19           | 99           | 3              | 12           | 0           | 0           | 0           | 0           |
| 2:30 | 27           | 116          | 6              | 18           |             |             |             |             |
| 2:45 | 29           | 146          | 1              | 13           |             |             |             |             |
| 3:00 | 24           | 166          | 2              | 22           |             |             |             |             |
| 3:15 | 36           | 241          | 9              | 25           | 0           | 0           | 0           | 0           |
| 3:30 | 57           | 285          | 1              | 20           |             |             |             |             |
| 3:45 | 49           | 342          | 10             | 30           |             |             |             |             |
| 4:00 | 99           | 392          | 5              | 27           |             |             |             |             |
| 4:15 | 80           | 425          | 4              | 32           | 0           | 0           | 0           | 0           |
| 4:30 | 114          | 494          | 11             | 51           |             |             |             |             |
| 4:45 | 99           | 579          | 7              | 55           |             |             |             |             |
| 5:00 | 132          | 687          | 10             | 71           |             |             |             |             |
| 5:15 | 149          | 792          | 23             | 90           | 0           | 0           | 0           | 1           |
| 5:30 | 199          | 982          | 15             | 90           |             |             |             |             |
| 5:45 | 207          | 1203         | 23             | 116          |             |             |             |             |
| 6:00 | 237          | 1448         | 29             | 134          |             |             |             |             |
| 6:15 | 339          | 1738         | 23             | 157          | 0           | 1           | 0           | 1           |
| 6:30 | 420          | 1978         | 41             | 207          |             |             |             |             |
| 6:45 | 452          | 2144         | 41             | 242          |             |             |             |             |
| 7:00 | 527          | 2268         | 52             | 266          |             |             |             |             |
| 7:15 | 579          | 2229         | 73             | 268          | 1           | 1           | 1           | 1           |
| 7:30 | 586          | 2169         | 76             | 247          |             |             |             |             |
| 7:45 | 576          | 2048         | 65             | 227          |             |             |             |             |

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| Time                           | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|--------------------------------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|                                | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 16:45                          | 515          | 2040         | 37             | 158          |             |             |             |             |
| 17:00                          | 541          | 2026         | 37             | 156          | 0           | 1           | 0           | 1           |
| 17:15                          | 508          | 1955         | 36             | 158          |             |             |             |             |
| 17:30                          | 476          | 1897         | 48             | 154          |             |             |             |             |
| 17:45                          | 501          | 1854         | 35             | 146          |             |             |             |             |
| 18:00                          | 470          | 1776         | 39             | 137          | 0           | 1           | 0           | 1           |
| 18:15                          | 450          | 1687         | 32             | 127          |             |             |             |             |
| 18:30                          | 433          | 1614         | 40             | 117          |             |             |             |             |
| 18:45                          | 423          | 1525         | 26             | 96           |             |             |             |             |
| 19:00                          | 381          | 1471         | 29             | 87           | 0           | 0           | 0           | 1           |
| 19:15                          | 377          | 1426         | 22             | 81           |             |             |             |             |
| 19:30                          | 344          | 1385         | 19             | 68           |             |             |             |             |
| 19:45                          | 369          | 1336         | 17             | 68           |             |             |             |             |
| 20:00                          | 336          | 1256         | 23             | 74           | 0           | 0           | 0           | 0           |
| 20:15                          | 336          | 1231         | 9              | 70           |             |             |             |             |
| 20:30                          | 295          | 1203         | 19             | 77           |             |             |             |             |
| 20:45                          | 289          | 1235         | 23             | 76           |             |             |             |             |
| 21:00                          | 311          | 1260         | 19             | 65           | 0           | 0           | 0           | 0           |
| 21:15                          | 308          | 1252         | 16             | 57           |             |             |             |             |
| 21:30                          | 327          | 1211         | 18             | 63           |             |             |             |             |
| 21:45                          | 314          | 1091         | 12             | 52           |             |             |             |             |
| 22:00                          | 303          | 939          | 11             | 50           | 0           | 0           | 0           | 0           |
| 22:15                          | 267          | 799          | 22             | 51           |             |             |             |             |
| 22:30                          | 207          | 682          | 7              | 30           |             |             |             |             |
| 22:45                          | 162          | 587          | 10             | 28           |             |             |             |             |
| 23:00                          | 163          | 527          | 12             | 20           | 0           | 0           | 0           | 0           |
| 23:15                          | 150          | 364          | 1              | 8            |             |             |             |             |
| 23:30                          | 112          | 214          | 5              | 7            |             |             |             |             |
| 23:45                          | 102          | 102          | 2              | 2            |             |             |             |             |
| # of Periods Warrant Satisfied |              |              |                |              | 1           | 13          | 6           | 14          |

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| Time                           | Pilihi Hwy   |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|--------------------------------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|                                | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 16:45                          | 515          | 2040         | 37             | 158          |             |             |             |             |
| 17:00                          | 541          | 2026         | 37             | 156          |             |             |             |             |
| 17:15                          | 508          | 1955         | 36             | 158          | 0           | 1           | 0           | 1           |
| 17:30                          | 476          | 1897         | 48             | 154          |             |             |             |             |
| 17:45                          | 501          | 1854         | 35             | 146          |             |             |             |             |
| 18:00                          | 470          | 1776         | 39             | 137          |             |             |             |             |
| 18:15                          | 450          | 1687         | 32             | 127          | 0           | 1           | 0           | 1           |
| 18:30                          | 433          | 1614         | 40             | 117          |             |             |             |             |
| 18:45                          | 423          | 1525         | 26             | 96           |             |             |             |             |
| 19:00                          | 381          | 1471         | 29             | 87           |             |             |             |             |
| 19:15                          | 377          | 1426         | 22             | 81           | 0           | 0           | 0           | 1           |
| 19:30                          | 344          | 1385         | 19             | 68           |             |             |             |             |
| 19:45                          | 369          | 1336         | 17             | 68           |             |             |             |             |
| 20:00                          | 336          | 1256         | 23             | 74           |             |             |             |             |
| 20:15                          | 336          | 1231         | 9              | 70           | 0           | 0           | 0           | 0           |
| 20:30                          | 295          | 1203         | 19             | 77           |             |             |             |             |
| 20:45                          | 289          | 1235         | 23             | 76           |             |             |             |             |
| 21:00                          | 311          | 1260         | 19             | 65           |             |             |             |             |
| 21:15                          | 308          | 1252         | 16             | 57           | 0           | 0           | 0           | 0           |
| 21:30                          | 327          | 1211         | 18             | 63           |             |             |             |             |
| 21:45                          | 314          | 1091         | 12             | 52           |             |             |             |             |
| 22:00                          | 303          | 939          | 11             | 50           |             |             |             |             |
| 22:15                          | 267          | 799          | 22             | 51           | 0           | 0           | 0           | 0           |
| 22:30                          | 207          | 682          | 7              | 30           |             |             |             |             |
| 22:45                          | 162          | 587          | 10             | 28           |             |             |             |             |
| 23:00                          | 163          | 527          | 12             | 20           |             |             |             |             |
| 23:15                          | 150          | 364          | 1              | 8            |             |             |             |             |
| 23:30                          | 112          | 214          | 5              | 7            |             |             |             |             |
| 23:45                          | 102          | 102          | 2              | 2            |             |             |             |             |
| # of Periods Warrant Satisfied |              |              |                |              | 2           | 13          | 7           | 15          |

| Time  | Pilihi Hwy   |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|-------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 8:00  | 488          | 1922         | 54             | 192          |             |             |             |             |
| 8:15  | 519          | 1885         | 52             | 177          | 0           | 1           | 1           | 1           |
| 8:30  | 465          | 1816         | 56             | 165          |             |             |             |             |
| 8:45  | 450          | 1775         | 30             | 155          |             |             |             |             |
| 9:00  | 451          | 1754         | 39             | 187          |             |             |             |             |
| 9:15  | 450          | 1688         | 40             | 208          | 1           | 1           | 1           | 1           |
| 9:30  | 424          | 1667         | 46             | 214          |             |             |             |             |
| 9:45  | 429          | 1692         | 62             | 212          |             |             |             |             |
| 10:00 | 385          | 1716         | 60             | 186          |             |             |             |             |
| 10:15 | 429          | 1752         | 46             | 173          | 0           | 1           | 1           | 1           |
| 10:30 | 449          | 1784         | 44             | 170          |             |             |             |             |
| 10:45 | 453          | 1805         | 36             | 185          |             |             |             |             |
| 11:00 | 421          | 1837         | 47             | 184          |             |             |             |             |
| 11:15 | 461          | 1814         | 43             | 169          | 0           | 1           | 1           | 1           |
| 11:30 | 470          | 1806         | 59             | 159          |             |             |             |             |
| 11:45 | 485          | 1823         | 35             | 145          |             |             |             |             |
| 12:00 | 398          | 1806         | 32             | 142          |             |             |             |             |
| 12:15 | 453          | 1898         | 33             | 133          | 0           | 1           | 0           | 1           |
| 12:30 | 487          | 1950         | 45             | 127          |             |             |             |             |
| 12:45 | 468          | 1970         | 32             | 119          |             |             |             |             |
| 13:00 | 490          | 2023         | 23             | 147          |             |             |             |             |
| 13:15 | 505          | 2057         | 27             | 172          | 0           | 1           | 1           | 1           |
| 13:30 | 507          | 2115         | 37             | 166          |             |             |             |             |
| 13:45 | 521          | 2139         | 60             | 194          |             |             |             |             |
| 14:00 | 524          | 2147         | 48             | 193          |             |             |             |             |
| 14:15 | 563          | 2151         | 21             | 185          | 0           | 1           | 1           | 1           |
| 14:30 | 531          | 2166         | 65             | 198          |             |             |             |             |
| 14:45 | 529          | 2223         | 59             | 180          |             |             |             |             |
| 15:00 | 528          | 2275         | 40             | 159          |             |             |             |             |
| 15:15 | 578          | 2313         | 34             | 153          | 0           | 1           | 0           | 1           |
| 15:30 | 588          | 2322         | 47             | 149          |             |             |             |             |
| 15:45 | 581          | 2230         | 38             | 146          |             |             |             |             |
| 16:00 | 566          | 2164         | 34             | 145          |             |             |             |             |
| 16:15 | 587          | 2139         | 30             | 148          | 0           | 1           | 0           | 1           |
| 16:30 | 496          | 2060         | 44             | 154          |             |             |             |             |



| Time  | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|-------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 8:00  | 488          | 1922         | 54             | 192          |             |             |             |             |
| 8:15  | 519          | 1885         | 52             | 177          |             |             |             |             |
| 8:30  | 465          | 1816         | 56             | 165          | 0           | 1           | 1           | 1           |
| 8:45  | 450          | 1775         | 30             | 155          |             |             |             |             |
| 9:00  | 451          | 1754         | 39             | 187          |             |             |             |             |
| 9:15  | 450          | 1688         | 40             | 208          |             |             |             |             |
| 9:30  | 424          | 1667         | 46             | 214          | 1           | 1           | 1           | 1           |
| 9:45  | 429          | 1692         | 62             | 212          |             |             |             |             |
| 10:00 | 385          | 1716         | 60             | 186          |             |             |             |             |
| 10:15 | 429          | 1752         | 46             | 173          |             |             |             |             |
| 10:30 | 449          | 1784         | 44             | 170          | 0           | 1           | 1           | 1           |
| 10:45 | 453          | 1805         | 36             | 185          |             |             |             |             |
| 11:00 | 421          | 1837         | 47             | 184          |             |             |             |             |
| 11:15 | 461          | 1814         | 43             | 169          |             |             |             |             |
| 11:30 | 470          | 1806         | 59             | 159          | 0           | 1           | 0           | 1           |
| 11:45 | 485          | 1823         | 35             | 145          |             |             |             |             |
| 12:00 | 398          | 1806         | 32             | 142          |             |             |             |             |
| 12:15 | 453          | 1898         | 33             | 133          |             |             |             |             |
| 12:30 | 487          | 1950         | 45             | 127          | 0           | 1           | 0           | 1           |
| 12:45 | 468          | 1970         | 32             | 119          |             |             |             |             |
| 13:00 | 490          | 2023         | 23             | 147          |             |             |             |             |
| 13:15 | 505          | 2057         | 27             | 172          |             |             |             |             |
| 13:30 | 507          | 2115         | 37             | 166          | 0           | 1           | 1           | 1           |
| 13:45 | 521          | 2139         | 60             | 194          |             |             |             |             |
| 14:00 | 524          | 2147         | 48             | 193          |             |             |             |             |
| 14:15 | 563          | 2151         | 21             | 185          |             |             |             |             |
| 14:30 | 531          | 2166         | 65             | 198          | 0           | 1           | 1           | 1           |
| 14:45 | 529          | 2223         | 59             | 180          |             |             |             |             |
| 15:00 | 528          | 2275         | 40             | 159          |             |             |             |             |
| 15:15 | 578          | 2313         | 34             | 153          |             |             |             |             |
| 15:30 | 588          | 2322         | 47             | 149          | 0           | 1           | 0           | 1           |
| 15:45 | 581          | 2230         | 38             | 146          |             |             |             |             |
| 16:00 | 566          | 2164         | 34             | 145          |             |             |             |             |
| 16:15 | 587          | 2139         | 30             | 148          |             |             |             |             |
| 16:30 | 496          | 2060         | 44             | 154          | 0           | 1           | 0           | 1           |

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**Warrant 1  
8-Hour Volumes (:30)**

| Time | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|      | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 0:00 | 87           | 253          | 3              | 15           |             |             |             |             |
| 0:15 | 76           | 196          | 4              | 18           |             |             |             |             |
| 0:30 | 50           | 146          | 6              | 15           | 0           | 0           | 0           | 0           |
| 0:45 | 40           | 127          | 2              | 10           |             |             |             |             |
| 1:00 | 30           | 113          | 6              | 9            |             |             |             |             |
| 1:15 | 26           | 118          | 1              | 5            |             |             |             |             |
| 1:30 | 31           | 111          | 1              | 7            | 0           | 0           | 0           | 0           |
| 1:45 | 26           | 107          | 1              | 12           |             |             |             |             |
| 2:00 | 35           | 110          | 2              | 12           |             |             |             |             |
| 2:15 | 19           | 99           | 3              | 12           |             |             |             |             |
| 2:30 | 27           | 116          | 6              | 18           | 0           | 0           | 0           | 0           |
| 2:45 | 29           | 146          | 1              | 13           |             |             |             |             |
| 3:00 | 24           | 166          | 2              | 22           |             |             |             |             |
| 3:15 | 36           | 241          | 9              | 25           |             |             |             |             |
| 3:30 | 57           | 285          | 1              | 20           | 0           | 0           | 0           | 0           |
| 3:45 | 49           | 342          | 10             | 30           |             |             |             |             |
| 4:00 | 99           | 392          | 5              | 27           |             |             |             |             |
| 4:15 | 80           | 425          | 4              | 32           |             |             |             |             |
| 4:30 | 114          | 494          | 11             | 51           | 0           | 0           | 0           | 0           |
| 4:45 | 99           | 579          | 7              | 55           |             |             |             |             |
| 5:00 | 132          | 687          | 10             | 71           |             |             |             |             |
| 5:15 | 149          | 792          | 23             | 90           |             |             |             |             |
| 5:30 | 199          | 982          | 15             | 90           | 0           | 0           | 0           | 1           |
| 5:45 | 207          | 1203         | 23             | 116          |             |             |             |             |
| 6:00 | 237          | 1448         | 29             | 134          |             |             |             |             |
| 6:15 | 339          | 1738         | 23             | 157          |             |             |             |             |
| 6:30 | 420          | 1978         | 41             | 207          | 1           | 1           | 1           | 1           |
| 6:45 | 452          | 2144         | 41             | 242          |             |             |             |             |
| 7:00 | 527          | 2268         | 52             | 266          |             |             |             |             |
| 7:15 | 579          | 2229         | 73             | 268          |             |             |             |             |
| 7:30 | 586          | 2169         | 76             | 247          | 1           | 1           | 1           | 1           |
| 7:45 | 576          | 2048         | 65             | 227          |             |             |             |             |

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**Warrant 1  
8-Hour Volumes (:45)**

| Time | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|      | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 0:00 | 87           | 253          | 3              | 15           |             |             |             |             |
| 0:15 | 76           | 196          | 4              | 18           |             |             |             |             |
| 0:30 | 50           | 146          | 6              | 15           |             |             |             |             |
| 0:45 | 40           | 127          | 2              | 10           | 0           | 0           | 0           | 0           |
| 1:00 | 30           | 113          | 6              | 9            |             |             |             |             |
| 1:15 | 26           | 118          | 1              | 5            |             |             |             |             |
| 1:30 | 31           | 111          | 1              | 7            |             |             |             |             |
| 1:45 | 26           | 107          | 1              | 12           | 0           | 0           | 0           | 0           |
| 2:00 | 35           | 110          | 2              | 12           |             |             |             |             |
| 2:15 | 19           | 99           | 3              | 12           |             |             |             |             |
| 2:30 | 27           | 116          | 6              | 18           |             |             |             |             |
| 2:45 | 29           | 146          | 1              | 13           | 0           | 0           | 0           | 0           |
| 3:00 | 24           | 166          | 2              | 22           |             |             |             |             |
| 3:15 | 36           | 241          | 9              | 25           |             |             |             |             |
| 3:30 | 57           | 285          | 1              | 20           |             |             |             |             |
| 3:45 | 49           | 342          | 10             | 30           | 0           | 0           | 0           | 0           |
| 4:00 | 99           | 392          | 5              | 27           |             |             |             |             |
| 4:15 | 80           | 425          | 4              | 32           |             |             |             |             |
| 4:30 | 114          | 494          | 11             | 51           |             |             |             |             |
| 4:45 | 99           | 579          | 7              | 55           | 0           | 0           | 0           | 0           |
| 5:00 | 132          | 687          | 10             | 71           |             |             |             |             |
| 5:15 | 149          | 792          | 23             | 90           |             |             |             |             |
| 5:30 | 199          | 982          | 15             | 90           |             |             |             |             |
| 5:45 | 207          | 1203         | 23             | 116          | 0           | 1           | 0           | 1           |
| 6:00 | 237          | 1448         | 29             | 134          |             |             |             |             |
| 6:15 | 339          | 1738         | 23             | 157          |             |             |             |             |
| 6:30 | 420          | 1978         | 41             | 207          |             |             |             |             |
| 6:45 | 452          | 2144         | 41             | 242          | 1           | 1           | 1           | 1           |
| 7:00 | 527          | 2268         | 52             | 266          |             |             |             |             |
| 7:15 | 579          | 2229         | 73             | 268          |             |             |             |             |
| 7:30 | 586          | 2169         | 76             | 247          |             |             |             |             |
| 7:45 | 576          | 2048         | 65             | 227          | 1           | 1           | 1           | 1           |

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| Time                           | Piilani Hwy  |              | Kulanihakoi St |              | 100%        |             | 80%         |             |
|--------------------------------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|                                | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 16:45                          | 515          | 2040         | 37             | 158          |             |             |             |             |
| 17:00                          | 541          | 2026         | 37             | 156          |             |             |             |             |
| 17:15                          | 508          | 1955         | 36             | 158          |             |             |             |             |
| 17:30                          | 476          | 1897         | 48             | 154          | 0           | 1           | 0           | 1           |
| 17:45                          | 501          | 1854         | 35             | 146          |             |             |             |             |
| 18:00                          | 470          | 1776         | 39             | 137          |             |             |             |             |
| 18:15                          | 450          | 1687         | 32             | 127          |             |             |             |             |
| 18:30                          | 433          | 1614         | 40             | 117          | 0           | 1           | 0           | 1           |
| 18:45                          | 423          | 1525         | 26             | 96           |             |             |             |             |
| 19:00                          | 381          | 1471         | 29             | 87           |             |             |             |             |
| 19:15                          | 377          | 1426         | 22             | 81           |             |             |             |             |
| 19:30                          | 344          | 1385         | 19             | 68           | 0           | 0           | 0           | 0           |
| 19:45                          | 369          | 1336         | 17             | 68           |             |             |             |             |
| 20:00                          | 336          | 1256         | 23             | 74           |             |             |             |             |
| 20:15                          | 336          | 1231         | 9              | 70           |             |             |             |             |
| 20:30                          | 295          | 1203         | 19             | 77           | 0           | 0           | 0           | 0           |
| 20:45                          | 289          | 1235         | 23             | 76           |             |             |             |             |
| 21:00                          | 311          | 1260         | 19             | 65           |             |             |             |             |
| 21:15                          | 308          | 1252         | 16             | 57           |             |             |             |             |
| 21:30                          | 327          | 1211         | 18             | 63           | 0           | 0           | 0           | 0           |
| 21:45                          | 314          | 1091         | 12             | 52           |             |             |             |             |
| 22:00                          | 303          | 939          | 11             | 50           |             |             |             |             |
| 22:15                          | 267          | 799          | 22             | 51           |             |             |             |             |
| 22:30                          | 207          | 682          | 7              | 30           | 0           | 0           | 0           | 0           |
| 22:45                          | 162          | 587          | 10             | 28           |             |             |             |             |
| 23:00                          | 163          | 527          | 12             | 20           |             |             |             |             |
| 23:15                          | 150          | 364          | 1              | 8            |             |             |             |             |
| 23:30                          | 112          | 214          | 5              | 7            |             |             |             |             |
| 23:45                          | 102          | 102          | 2              | 2            |             |             |             |             |
| # of Periods Warrant Satisfied |              |              |                |              | 3           | 13          | 7           | 14          |

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| Time                           | Piilani Hwy  |              | Kulanihakai St |              | 100%        |             | 80%         |             |
|--------------------------------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|                                | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 16:45                          | 515          | 2040         | 37             | 158          | 0           | 1           | 0           | 1           |
| 17:00                          | 541          | 2026         | 37             | 156          |             |             |             |             |
| 17:15                          | 508          | 1955         | 36             | 158          |             |             |             |             |
| 17:30                          | 476          | 1897         | 48             | 154          |             |             |             |             |
| 17:45                          | 501          | 1854         | 35             | 146          | 0           | 1           | 0           | 1           |
| 18:00                          | 470          | 1776         | 39             | 137          |             |             |             |             |
| 18:15                          | 450          | 1687         | 32             | 127          |             |             |             |             |
| 18:30                          | 433          | 1614         | 40             | 117          |             |             |             |             |
| 18:45                          | 423          | 1525         | 26             | 96           | 0           | 0           | 0           | 1           |
| 19:00                          | 381          | 1471         | 29             | 87           |             |             |             |             |
| 19:15                          | 377          | 1426         | 22             | 81           |             |             |             |             |
| 19:30                          | 344          | 1385         | 19             | 68           |             |             |             |             |
| 19:45                          | 369          | 1336         | 17             | 68           | 0           | 0           | 0           | 0           |
| 20:00                          | 336          | 1256         | 23             | 74           |             |             |             |             |
| 20:15                          | 336          | 1231         | 9              | 70           |             |             |             |             |
| 20:30                          | 295          | 1203         | 19             | 77           |             |             |             |             |
| 20:45                          | 289          | 1235         | 23             | 76           | 0           | 0           | 0           | 0           |
| 21:00                          | 311          | 1260         | 19             | 65           |             |             |             |             |
| 21:15                          | 308          | 1252         | 16             | 57           |             |             |             |             |
| 21:30                          | 327          | 1211         | 18             | 63           |             |             |             |             |
| 21:45                          | 314          | 1091         | 12             | 52           | 0           | 0           | 0           | 0           |
| 22:00                          | 303          | 939          | 11             | 50           |             |             |             |             |
| 22:15                          | 267          | 799          | 22             | 51           |             |             |             |             |
| 22:30                          | 207          | 682          | 7              | 30           |             |             |             |             |
| 22:45                          | 162          | 587          | 10             | 28           | 0           | 0           | 0           | 0           |
| 23:00                          | 163          | 527          | 12             | 20           |             |             |             |             |
| 23:15                          | 150          | 364          | 1              | 8            |             |             |             |             |
| 23:30                          | 112          | 214          | 5              | 7            |             |             |             |             |
| 23:45                          | 102          | 102          | 2              | 2            |             |             |             |             |
| # of Periods Warrant Satisfied |              |              |                |              | 3           | 13          | 6           | 14          |

| Time  | Piilani Hwy  |              | Kulanihakai St |              | 100%        |             | 80%         |             |
|-------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Condition A | Condition B | Condition A | Condition B |
| 8:00  | 488          | 1922         | 54             | 192          |             |             |             |             |
| 8:15  | 519          | 1885         | 52             | 177          |             |             |             |             |
| 8:30  | 465          | 1816         | 56             | 165          |             |             |             |             |
| 8:45  | 450          | 1775         | 30             | 155          | 0           | 1           | 0           | 1           |
| 9:00  | 451          | 1754         | 39             | 187          |             |             |             |             |
| 9:15  | 450          | 1688         | 40             | 208          |             |             |             |             |
| 9:30  | 424          | 1667         | 46             | 214          |             |             |             |             |
| 9:45  | 429          | 1692         | 62             | 212          | 1           | 1           | 1           | 1           |
| 10:00 | 385          | 1716         | 60             | 186          |             |             |             |             |
| 10:15 | 429          | 1752         | 46             | 173          |             |             |             |             |
| 10:30 | 449          | 1784         | 44             | 170          |             |             |             |             |
| 10:45 | 453          | 1805         | 36             | 185          | 0           | 1           | 1           | 1           |
| 11:00 | 421          | 1837         | 47             | 184          |             |             |             |             |
| 11:15 | 461          | 1814         | 43             | 169          |             |             |             |             |
| 11:30 | 470          | 1806         | 59             | 159          |             |             |             |             |
| 11:45 | 485          | 1823         | 35             | 145          | 0           | 1           | 0           | 1           |
| 12:00 | 398          | 1806         | 32             | 142          |             |             |             |             |
| 12:15 | 453          | 1898         | 33             | 133          |             |             |             |             |
| 12:30 | 487          | 1950         | 45             | 127          |             |             |             |             |
| 12:45 | 468          | 1970         | 32             | 119          | 0           | 1           | 0           | 1           |
| 13:00 | 490          | 2023         | 23             | 147          |             |             |             |             |
| 13:15 | 505          | 2057         | 27             | 172          |             |             |             |             |
| 13:30 | 507          | 2115         | 37             | 166          |             |             |             |             |
| 13:45 | 521          | 2139         | 60             | 194          | 0           | 1           | 1           | 1           |
| 14:00 | 524          | 2147         | 48             | 193          |             |             |             |             |
| 14:15 | 563          | 2151         | 21             | 185          |             |             |             |             |
| 14:30 | 531          | 2166         | 65             | 198          |             |             |             |             |
| 14:45 | 529          | 2223         | 59             | 180          | 0           | 1           | 1           | 1           |
| 15:00 | 528          | 2275         | 40             | 159          |             |             |             |             |
| 15:15 | 578          | 2313         | 34             | 153          |             |             |             |             |
| 15:30 | 588          | 2322         | 47             | 149          |             |             |             |             |
| 15:45 | 581          | 2230         | 38             | 146          | 0           | 1           | 0           | 1           |
| 16:00 | 566          | 2164         | 34             | 145          |             |             |             |             |
| 16:15 | 587          | 2139         | 30             | 148          |             |             |             |             |
| 16:30 | 496          | 2060         | 44             | 154          |             |             |             |             |

**APPENDIX C**  
**WARRANT 2**  
**FOUR HOUR VOLUME WARRANT**

**Warrant 2**  
**4-Hour Volumes (:00)**

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 0:00  | 87           | 253          | 3              | 15           | 0         |                   |
| 0:15  | 76           | 196          | 4              | 18           | 0         |                   |
| 0:30  | 50           | 146          | 6              | 15           | 0         |                   |
| 0:45  | 40           | 127          | 2              | 10           | 0         |                   |
| 1:00  | 30           | 113          | 6              | 9            | 0         |                   |
| 1:15  | 26           | 118          | 1              | 5            | 0         |                   |
| 1:30  | 31           | 111          | 1              | 7            | 0         |                   |
| 1:45  | 26           | 107          | 1              | 12           | 0         |                   |
| 2:00  | 35           | 110          | 2              | 12           | 0         |                   |
| 2:15  | 19           | 99           | 3              | 12           | 0         |                   |
| 2:30  | 27           | 116          | 6              | 18           | 0         |                   |
| 2:45  | 29           | 146          | 1              | 13           | 0         |                   |
| 3:00  | 24           | 166          | 2              | 22           | 0         |                   |
| 3:15  | 36           | 241          | 9              | 25           | 0         |                   |
| 3:30  | 57           | 285          | 1              | 20           | 0         |                   |
| 3:45  | 49           | 342          | 10             | 30           | 0         |                   |
| 4:00  | 99           | 392          | 5              | 27           | 0         |                   |
| 4:15  | 80           | 425          | 4              | 32           | 0         |                   |
| 4:30  | 114          | 494          | 11             | 51           | 0         |                   |
| 4:45  | 99           | 579          | 7              | 55           | 0         |                   |
| 5:00  | 132          | 687          | 10             | 71           | 0         |                   |
| 5:15  | 149          | 792          | 23             | 90           | 0         |                   |
| 5:30  | 199          | 982          | 15             | 90           | 0         |                   |
| 5:45  | 207          | 1203         | 23             | 116          | 1         |                   |
| 6:00  | 237          | 1448         | 29             | 134          | 1         | 1                 |
| 6:15  | 339          | 1738         | 23             | 157          | 1         |                   |
| 6:30  | 420          | 1978         | 41             | 207          | 1         |                   |
| 6:45  | 452          | 2144         | 41             | 242          | 1         |                   |
| 7:00  | 527          | 2268         | 52             | 266          | 1         | 1                 |
| 7:15  | 579          | 2229         | 73             | 268          | 1         |                   |
| 7:30  | 586          | 2169         | 76             | 247          | 1         |                   |
| 7:45  | 576          | 2048         | 65             | 227          | 1         |                   |
| 8:00  | 488          | 1922         | 54             | 192          | 1         | 1                 |
| 8:15  | 519          | 1885         | 52             | 177          | 1         |                   |
| 8:30  | 465          | 1816         | 56             | 165          | 1         |                   |
| 8:45  | 450          | 1775         | 30             | 155          | 1         |                   |
| 9:00  | 451          | 1754         | 39             | 187          | 1         | 1                 |
| 9:15  | 450          | 1688         | 40             | 208          | 1         |                   |
| 9:30  | 424          | 1667         | 46             | 214          | 1         |                   |
| 9:45  | 429          | 1692         | 62             | 212          | 1         |                   |
| 10:00 | 385          | 1716         | 60             | 186          | 1         | 1                 |
| 10:15 | 429          | 1752         | 46             | 173          | 1         |                   |
| 10:30 | 449          | 1784         | 44             | 170          | 1         |                   |
| 10:45 | 453          | 1805         | 36             | 185          | 1         |                   |
| 11:00 | 421          | 1837         | 47             | 184          | 1         | 1                 |
| 11:15 | 461          | 1814         | 43             | 169          | 1         |                   |
| 11:30 | 470          | 1806         | 59             | 159          | 1         |                   |



| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 11:45 | 485          | 1823         | 35             | 145          | 1         |                   |
| 12:00 | 398          | 1806         | 32             | 142          | 1         | 1                 |
| 12:15 | 453          | 1898         | 33             | 133          | 1         |                   |
| 12:30 | 487          | 1950         | 45             | 127          | 1         |                   |
| 12:45 | 468          | 1970         | 32             | 119          | 1         |                   |
| 13:00 | 490          | 2023         | 23             | 147          | 1         | 1                 |
| 13:15 | 505          | 2057         | 27             | 172          | 1         |                   |
| 13:30 | 507          | 2115         | 37             | 166          | 1         |                   |
| 13:45 | 521          | 2139         | 60             | 194          | 1         |                   |
| 14:00 | 524          | 2147         | 48             | 193          | 1         | 1                 |
| 14:15 | 563          | 2151         | 21             | 185          | 1         |                   |
| 14:30 | 531          | 2166         | 65             | 198          | 1         |                   |
| 14:45 | 529          | 2223         | 59             | 180          | 1         |                   |
| 15:00 | 528          | 2275         | 40             | 159          | 1         | 1                 |
| 15:15 | 578          | 2313         | 34             | 153          | 1         |                   |
| 15:30 | 588          | 2322         | 47             | 149          | 1         |                   |
| 15:45 | 581          | 2230         | 38             | 146          | 1         |                   |
| 16:00 | 566          | 2164         | 34             | 145          | 1         | 1                 |
| 16:15 | 587          | 2139         | 30             | 148          | 1         |                   |
| 16:30 | 496          | 2060         | 44             | 154          | 1         |                   |
| 16:45 | 515          | 2040         | 37             | 158          | 1         |                   |
| 17:00 | 541          | 2026         | 37             | 156          | 1         | 1                 |
| 17:15 | 508          | 1955         | 36             | 158          | 1         |                   |
| 17:30 | 476          | 1897         | 48             | 154          | 1         |                   |
| 17:45 | 501          | 1854         | 35             | 146          | 1         |                   |
| 18:00 | 470          | 1776         | 39             | 137          | 1         | 1                 |
| 18:15 | 450          | 1687         | 32             | 127          | 1         |                   |
| 18:30 | 433          | 1614         | 40             | 117          | 1         |                   |
| 18:45 | 423          | 1525         | 26             | 96           | 0         |                   |
| 19:00 | 381          | 1471         | 29             | 87           | 0         |                   |
| 19:15 | 377          | 1426         | 22             | 81           | 0         |                   |
| 19:30 | 344          | 1385         | 19             | 68           | 0         |                   |
| 19:45 | 369          | 1336         | 17             | 68           | 0         |                   |
| 20:00 | 336          | 1256         | 23             | 74           | 0         |                   |
| 20:15 | 336          | 1231         | 9              | 70           | 0         |                   |
| 20:30 | 295          | 1203         | 19             | 77           | 0         |                   |
| 20:45 | 289          | 1235         | 23             | 76           | 0         |                   |
| 21:00 | 311          | 1260         | 19             | 65           | 0         |                   |
| 21:15 | 308          | 1252         | 16             | 57           | 0         |                   |
| 21:30 | 327          | 1211         | 18             | 63           | 0         |                   |
| 21:45 | 314          | 1091         | 12             | 52           | 0         |                   |
| 22:00 | 303          | 939          | 11             | 50           | 0         |                   |
| 22:15 | 267          | 799          | 22             | 51           | 0         |                   |
| 22:30 | 207          | 682          | 7              | 30           | 0         |                   |
| 22:45 | 162          | 587          | 10             | 28           | 0         |                   |
| 23:00 | 163          | 527          | 12             | 20           | 0         |                   |
| 23:15 | 150          | 364          | 1              | 8            | 0         |                   |
| 23:30 | 112          | 214          | 5              | 7            | 0         |                   |
| 23:45 | 102          | 102          | 2              | 2            | 0         |                   |

# of Periods Warrant Satisfied 13

## Warrant 2 4-Hour Volumes (:15)

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 0:00  | 87           | 253          | 3              | 15           | 0         |                   |
| 0:15  | 76           | 196          | 4              | 18           | 0         |                   |
| 0:30  | 50           | 146          | 6              | 15           | 0         |                   |
| 0:45  | 40           | 127          | 2              | 10           | 0         |                   |
| 1:00  | 30           | 113          | 6              | 9            | 0         |                   |
| 1:15  | 26           | 118          | 1              | 5            | 0         |                   |
| 1:30  | 31           | 111          | 1              | 7            | 0         |                   |
| 1:45  | 26           | 107          | 1              | 12           | 0         |                   |
| 2:00  | 35           | 110          | 2              | 12           | 0         |                   |
| 2:15  | 19           | 99           | 3              | 12           | 0         |                   |
| 2:30  | 27           | 116          | 6              | 18           | 0         |                   |
| 2:45  | 29           | 146          | 1              | 13           | 0         |                   |
| 3:00  | 24           | 166          | 2              | 22           | 0         |                   |
| 3:15  | 36           | 241          | 9              | 25           | 0         |                   |
| 3:30  | 57           | 285          | 1              | 20           | 0         |                   |
| 3:45  | 49           | 342          | 10             | 30           | 0         |                   |
| 4:00  | 99           | 392          | 5              | 27           | 0         |                   |
| 4:15  | 80           | 425          | 4              | 32           | 0         |                   |
| 4:30  | 114          | 494          | 11             | 51           | 0         |                   |
| 4:45  | 99           | 579          | 7              | 55           | 0         |                   |
| 5:00  | 132          | 687          | 10             | 71           | 0         |                   |
| 5:15  | 149          | 792          | 23             | 90           | 0         |                   |
| 5:30  | 199          | 982          | 15             | 90           | 0         |                   |
| 5:45  | 207          | 1203         | 23             | 116          | 1         |                   |
| 6:00  | 237          | 1448         | 29             | 134          | 1         |                   |
| 6:15  | 339          | 1738         | 23             | 157          | 1         | 1                 |
| 6:30  | 420          | 1978         | 41             | 207          | 1         |                   |
| 6:45  | 452          | 2144         | 41             | 242          | 1         |                   |
| 7:00  | 527          | 2268         | 52             | 266          | 1         |                   |
| 7:15  | 579          | 2229         | 73             | 268          | 1         | 1                 |
| 7:30  | 586          | 2169         | 76             | 247          | 1         |                   |
| 7:45  | 576          | 2048         | 65             | 227          | 1         |                   |
| 8:00  | 488          | 1922         | 54             | 192          | 1         |                   |
| 8:15  | 519          | 1885         | 52             | 177          | 1         | 1                 |
| 8:30  | 465          | 1816         | 56             | 165          | 1         |                   |
| 8:45  | 450          | 1775         | 30             | 155          | 1         |                   |
| 9:00  | 451          | 1754         | 39             | 187          | 1         |                   |
| 9:15  | 450          | 1688         | 40             | 208          | 1         | 1                 |
| 9:30  | 424          | 1667         | 46             | 214          | 1         |                   |
| 9:45  | 429          | 1692         | 62             | 212          | 1         |                   |
| 10:00 | 385          | 1716         | 60             | 186          | 1         |                   |
| 10:15 | 429          | 1752         | 46             | 173          | 1         | 1                 |
| 10:30 | 449          | 1784         | 44             | 170          | 1         |                   |
| 10:45 | 453          | 1805         | 36             | 185          | 1         |                   |
| 11:00 | 421          | 1837         | 47             | 184          | 1         |                   |
| 11:15 | 461          | 1814         | 43             | 169          | 1         | 1                 |
| 11:30 | 470          | 1806         | 59             | 159          | 1         |                   |

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 11:45 | 485          | 1823         | 35             | 145          | 1         |                   |
| 12:00 | 398          | 1806         | 32             | 142          | 1         |                   |
| 12:15 | 453          | 1898         | 33             | 133          | 1         | 1                 |
| 12:30 | 487          | 1950         | 45             | 127          | 1         |                   |
| 12:45 | 468          | 1970         | 32             | 119          | 1         |                   |
| 13:00 | 490          | 2023         | 23             | 147          | 1         |                   |
| 13:15 | 505          | 2057         | 27             | 172          | 1         | 1                 |
| 13:30 | 507          | 2115         | 37             | 166          | 1         |                   |
| 13:45 | 521          | 2139         | 60             | 194          | 1         |                   |
| 14:00 | 524          | 2147         | 48             | 193          | 1         |                   |
| 14:15 | 563          | 2151         | 21             | 185          | 1         | 1                 |
| 14:30 | 531          | 2166         | 65             | 198          | 1         |                   |
| 14:45 | 529          | 2223         | 59             | 180          | 1         |                   |
| 15:00 | 528          | 2275         | 40             | 159          | 1         |                   |
| 15:15 | 578          | 2313         | 34             | 153          | 1         | 1                 |
| 15:30 | 588          | 2322         | 47             | 149          | 1         |                   |
| 15:45 | 581          | 2230         | 38             | 146          | 1         |                   |
| 16:00 | 566          | 2164         | 34             | 145          | 1         |                   |
| 16:15 | 587          | 2139         | 30             | 148          | 1         | 1                 |
| 16:30 | 496          | 2060         | 44             | 154          | 1         |                   |
| 16:45 | 515          | 2040         | 37             | 158          | 1         |                   |
| 17:00 | 541          | 2026         | 37             | 156          | 1         |                   |
| 17:15 | 508          | 1955         | 36             | 158          | 1         | 1                 |
| 17:30 | 476          | 1897         | 48             | 154          | 1         |                   |
| 17:45 | 501          | 1854         | 35             | 146          | 1         |                   |
| 18:00 | 470          | 1776         | 39             | 137          | 1         |                   |
| 18:15 | 450          | 1687         | 32             | 127          | 1         | 1                 |
| 18:30 | 433          | 1614         | 40             | 117          | 1         |                   |
| 18:45 | 423          | 1525         | 26             | 96           | 0         |                   |
| 19:00 | 381          | 1471         | 29             | 87           | 0         |                   |
| 19:15 | 377          | 1426         | 22             | 81           | 0         |                   |
| 19:30 | 344          | 1385         | 19             | 68           | 0         |                   |
| 19:45 | 369          | 1336         | 17             | 68           | 0         |                   |
| 20:00 | 336          | 1256         | 23             | 74           | 0         |                   |
| 20:15 | 336          | 1231         | 9              | 70           | 0         |                   |
| 20:30 | 295          | 1203         | 19             | 77           | 0         |                   |
| 20:45 | 289          | 1235         | 23             | 76           | 0         |                   |
| 21:00 | 311          | 1260         | 19             | 65           | 0         |                   |
| 21:15 | 308          | 1252         | 16             | 57           | 0         |                   |
| 21:30 | 327          | 1211         | 18             | 63           | 0         |                   |
| 21:45 | 314          | 1091         | 12             | 52           | 0         |                   |
| 22:00 | 303          | 939          | 11             | 50           | 0         |                   |
| 22:15 | 267          | 799          | 22             | 51           | 0         |                   |
| 22:30 | 207          | 682          | 7              | 30           | 0         |                   |
| 22:45 | 162          | 587          | 10             | 28           | 0         |                   |
| 23:00 | 163          | 527          | 12             | 20           | 0         |                   |
| 23:15 | 150          | 364          | 1              | 8            | 0         |                   |
| 23:30 | 112          | 214          | 5              | 7            | 0         |                   |
| 23:45 | 102          | 102          | 2              | 2            | 0         |                   |

# of Periods Warrant Satisfied 13

## Warrant 2 4-Hour Volumes (:30)

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 0:00  | 87           | 253          | 3              | 15           | 0         |                   |
| 0:15  | 76           | 196          | 4              | 18           | 0         |                   |
| 0:30  | 50           | 146          | 6              | 15           | 0         |                   |
| 0:45  | 40           | 127          | 2              | 10           | 0         |                   |
| 1:00  | 30           | 113          | 6              | 9            | 0         |                   |
| 1:15  | 26           | 118          | 1              | 5            | 0         |                   |
| 1:30  | 31           | 111          | 1              | 7            | 0         |                   |
| 1:45  | 26           | 107          | 1              | 12           | 0         |                   |
| 2:00  | 35           | 110          | 2              | 12           | 0         |                   |
| 2:15  | 19           | 99           | 3              | 12           | 0         |                   |
| 2:30  | 27           | 116          | 6              | 18           | 0         |                   |
| 2:45  | 29           | 146          | 1              | 13           | 0         |                   |
| 3:00  | 24           | 166          | 2              | 22           | 0         |                   |
| 3:15  | 36           | 241          | 9              | 25           | 0         |                   |
| 3:30  | 57           | 285          | 1              | 20           | 0         |                   |
| 3:45  | 49           | 342          | 10             | 30           | 0         |                   |
| 4:00  | 99           | 392          | 5              | 27           | 0         |                   |
| 4:15  | 80           | 425          | 4              | 32           | 0         |                   |
| 4:30  | 114          | 494          | 11             | 51           | 0         |                   |
| 4:45  | 99           | 579          | 7              | 55           | 0         |                   |
| 5:00  | 132          | 687          | 10             | 71           | 0         |                   |
| 5:15  | 149          | 792          | 23             | 90           | 0         |                   |
| 5:30  | 199          | 982          | 15             | 90           | 0         |                   |
| 5:45  | 207          | 1203         | 23             | 116          | 1         |                   |
| 6:00  | 237          | 1448         | 29             | 134          | 1         |                   |
| 6:15  | 339          | 1738         | 23             | 157          | 1         |                   |
| 6:30  | 420          | 1978         | 41             | 207          | 1         | 1                 |
| 6:45  | 452          | 2144         | 41             | 242          | 1         |                   |
| 7:00  | 527          | 2268         | 52             | 266          | 1         |                   |
| 7:15  | 579          | 2229         | 73             | 268          | 1         |                   |
| 7:30  | 586          | 2169         | 76             | 247          | 1         | 1                 |
| 7:45  | 576          | 2048         | 65             | 227          | 1         |                   |
| 8:00  | 488          | 1922         | 54             | 192          | 1         |                   |
| 8:15  | 519          | 1885         | 52             | 177          | 1         |                   |
| 8:30  | 465          | 1816         | 56             | 165          | 1         | 1                 |
| 8:45  | 450          | 1775         | 30             | 155          | 1         |                   |
| 9:00  | 451          | 1754         | 39             | 187          | 1         |                   |
| 9:15  | 450          | 1688         | 40             | 208          | 1         |                   |
| 9:30  | 424          | 1667         | 46             | 214          | 1         | 1                 |
| 9:45  | 429          | 1692         | 62             | 212          | 1         |                   |
| 10:00 | 385          | 1716         | 60             | 186          | 1         |                   |
| 10:15 | 429          | 1752         | 46             | 173          | 1         |                   |
| 10:30 | 449          | 1784         | 44             | 170          | 1         | 1                 |
| 10:45 | 453          | 1805         | 36             | 185          | 1         |                   |
| 11:00 | 421          | 1837         | 47             | 184          | 1         |                   |
| 11:15 | 461          | 1814         | 43             | 169          | 1         |                   |
| 11:30 | 470          | 1806         | 59             | 159          | 1         | 1                 |



| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 11:45 | 485          | 1823         | 35             | 145          | 1         |                   |
| 12:00 | 398          | 1806         | 32             | 142          | 1         |                   |
| 12:15 | 453          | 1898         | 33             | 133          | 1         |                   |
| 12:30 | 487          | 1950         | 45             | 127          | 1         | 1                 |
| 12:45 | 468          | 1970         | 32             | 119          | 1         |                   |
| 13:00 | 490          | 2023         | 23             | 147          | 1         |                   |
| 13:15 | 505          | 2057         | 27             | 172          | 1         |                   |
| 13:30 | 507          | 2115         | 37             | 166          | 1         | 1                 |
| 13:45 | 521          | 2139         | 60             | 194          | 1         |                   |
| 14:00 | 524          | 2147         | 48             | 193          | 1         |                   |
| 14:15 | 563          | 2151         | 21             | 185          | 1         |                   |
| 14:30 | 531          | 2166         | 65             | 198          | 1         | 1                 |
| 14:45 | 529          | 2223         | 59             | 180          | 1         |                   |
| 15:00 | 528          | 2275         | 40             | 159          | 1         |                   |
| 15:15 | 578          | 2313         | 34             | 153          | 1         |                   |
| 15:30 | 588          | 2322         | 47             | 149          | 1         | 1                 |
| 15:45 | 581          | 2230         | 38             | 146          | 1         |                   |
| 16:00 | 566          | 2164         | 34             | 145          | 1         |                   |
| 16:15 | 587          | 2139         | 30             | 148          | 1         |                   |
| 16:30 | 496          | 2060         | 44             | 154          | 1         | 1                 |
| 16:45 | 515          | 2040         | 37             | 158          | 1         |                   |
| 17:00 | 541          | 2026         | 37             | 156          | 1         |                   |
| 17:15 | 508          | 1955         | 36             | 158          | 1         |                   |
| 17:30 | 476          | 1897         | 48             | 154          | 1         | 1                 |
| 17:45 | 501          | 1854         | 35             | 146          | 1         |                   |
| 18:00 | 470          | 1776         | 39             | 137          | 1         |                   |
| 18:15 | 450          | 1687         | 32             | 127          | 1         |                   |
| 18:30 | 433          | 1614         | 40             | 117          | 1         | 1                 |
| 18:45 | 423          | 1525         | 26             | 96           | 0         |                   |
| 19:00 | 381          | 1471         | 29             | 87           | 0         |                   |
| 19:15 | 377          | 1426         | 22             | 81           | 0         |                   |
| 19:30 | 344          | 1385         | 19             | 68           | 0         |                   |
| 19:45 | 369          | 1336         | 17             | 68           | 0         |                   |
| 20:00 | 336          | 1256         | 23             | 74           | 0         |                   |
| 20:15 | 336          | 1231         | 9              | 70           | 0         |                   |
| 20:30 | 295          | 1203         | 19             | 77           | 0         |                   |
| 20:45 | 289          | 1235         | 23             | 76           | 0         |                   |
| 21:00 | 311          | 1260         | 19             | 65           | 0         |                   |
| 21:15 | 308          | 1252         | 16             | 57           | 0         |                   |
| 21:30 | 327          | 1211         | 18             | 63           | 0         |                   |
| 21:45 | 314          | 1091         | 12             | 52           | 0         |                   |
| 22:00 | 303          | 939          | 11             | 50           | 0         |                   |
| 22:15 | 267          | 799          | 22             | 51           | 0         |                   |
| 22:30 | 207          | 682          | 7              | 30           | 0         |                   |
| 22:45 | 162          | 587          | 10             | 28           | 0         |                   |
| 23:00 | 163          | 527          | 12             | 20           | 0         |                   |
| 23:15 | 150          | 364          | 1              | 8            | 0         |                   |
| 23:30 | 112          | 214          | 5              | 7            | 0         |                   |
| 23:45 | 102          | 102          | 2              | 2            | 0         |                   |

# of Periods Warrant Satisfied 13

## Warrant 2 4-Hour Volumes (:45)

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 0:00  | 87           | 253          | 3              | 15           | 0         |                   |
| 0:15  | 76           | 196          | 4              | 18           | 0         |                   |
| 0:30  | 50           | 146          | 6              | 15           | 0         |                   |
| 0:45  | 40           | 127          | 2              | 10           | 0         |                   |
| 1:00  | 30           | 113          | 6              | 9            | 0         |                   |
| 1:15  | 26           | 118          | 1              | 5            | 0         |                   |
| 1:30  | 31           | 111          | 1              | 7            | 0         |                   |
| 1:45  | 26           | 107          | 1              | 12           | 0         |                   |
| 2:00  | 35           | 110          | 2              | 12           | 0         |                   |
| 2:15  | 19           | 99           | 3              | 12           | 0         |                   |
| 2:30  | 27           | 116          | 6              | 18           | 0         |                   |
| 2:45  | 29           | 146          | 1              | 13           | 0         |                   |
| 3:00  | 24           | 166          | 2              | 22           | 0         |                   |
| 3:15  | 36           | 241          | 9              | 25           | 0         |                   |
| 3:30  | 57           | 285          | 1              | 20           | 0         |                   |
| 3:45  | 49           | 342          | 10             | 30           | 0         |                   |
| 4:00  | 99           | 392          | 5              | 27           | 0         |                   |
| 4:15  | 80           | 425          | 4              | 32           | 0         |                   |
| 4:30  | 114          | 494          | 11             | 51           | 0         |                   |
| 4:45  | 99           | 579          | 7              | 55           | 0         |                   |
| 5:00  | 132          | 687          | 10             | 71           | 0         |                   |
| 5:15  | 149          | 792          | 23             | 90           | 0         |                   |
| 5:30  | 199          | 982          | 15             | 90           | 0         |                   |
| 5:45  | 207          | 1203         | 23             | 116          | 1         |                   |
| 6:00  | 237          | 1448         | 29             | 134          | 1         |                   |
| 6:15  | 339          | 1738         | 23             | 157          | 1         |                   |
| 6:30  | 420          | 1978         | 41             | 207          | 1         |                   |
| 6:45  | 452          | 2144         | 41             | 242          | 1         | 1                 |
| 7:00  | 527          | 2268         | 52             | 266          | 1         |                   |
| 7:15  | 579          | 2229         | 73             | 268          | 1         |                   |
| 7:30  | 586          | 2169         | 76             | 247          | 1         |                   |
| 7:45  | 576          | 2048         | 65             | 227          | 1         | 1                 |
| 8:00  | 488          | 1922         | 54             | 192          | 1         |                   |
| 8:15  | 519          | 1885         | 52             | 177          | 1         |                   |
| 8:30  | 465          | 1816         | 56             | 165          | 1         |                   |
| 8:45  | 450          | 1775         | 30             | 155          | 1         | 1                 |
| 9:00  | 451          | 1754         | 39             | 187          | 1         |                   |
| 9:15  | 450          | 1688         | 40             | 208          | 1         |                   |
| 9:30  | 424          | 1667         | 46             | 214          | 1         |                   |
| 9:45  | 429          | 1692         | 62             | 212          | 1         | 1                 |
| 10:00 | 385          | 1716         | 60             | 186          | 1         |                   |
| 10:15 | 429          | 1752         | 46             | 173          | 1         |                   |
| 10:30 | 449          | 1784         | 44             | 170          | 1         |                   |
| 10:45 | 453          | 1805         | 36             | 185          | 1         | 1                 |
| 11:00 | 421          | 1837         | 47             | 184          | 1         |                   |
| 11:15 | 461          | 1814         | 43             | 169          | 1         |                   |
| 11:30 | 470          | 1806         | 59             | 159          | 1         |                   |

| Time  | Piilani Hwy  |              | Kulanihakoi St |              |           | Warrant Satisfied |
|-------|--------------|--------------|----------------|--------------|-----------|-------------------|
|       | 15 Min Count | Hourly Total | 15 Min Count   | Hourly Total | Above Min |                   |
| 11:45 | 485          | 1823         | 35             | 145          | 1         | 1                 |
| 12:00 | 398          | 1806         | 32             | 142          | 1         |                   |
| 12:15 | 453          | 1898         | 33             | 133          | 1         |                   |
| 12:30 | 487          | 1950         | 45             | 127          | 1         |                   |
| 12:45 | 468          | 1970         | 32             | 119          | 1         | 1                 |
| 13:00 | 490          | 2023         | 23             | 147          | 1         |                   |
| 13:15 | 505          | 2057         | 27             | 172          | 1         |                   |
| 13:30 | 507          | 2115         | 37             | 166          | 1         |                   |
| 13:45 | 521          | 2139         | 60             | 194          | 1         | 1                 |
| 14:00 | 524          | 2147         | 48             | 193          | 1         |                   |
| 14:15 | 563          | 2151         | 21             | 185          | 1         |                   |
| 14:30 | 531          | 2166         | 65             | 198          | 1         |                   |
| 14:45 | 529          | 2223         | 59             | 180          | 1         | 1                 |
| 15:00 | 528          | 2275         | 40             | 159          | 1         |                   |
| 15:15 | 578          | 2313         | 34             | 153          | 1         |                   |
| 15:30 | 588          | 2322         | 47             | 149          | 1         |                   |
| 15:45 | 581          | 2230         | 38             | 146          | 1         | 1                 |
| 16:00 | 566          | 2164         | 34             | 145          | 1         |                   |
| 16:15 | 587          | 2139         | 30             | 148          | 1         |                   |
| 16:30 | 496          | 2060         | 44             | 154          | 1         |                   |
| 16:45 | 515          | 2040         | 37             | 158          | 1         | 1                 |
| 17:00 | 541          | 2026         | 37             | 156          | 1         |                   |
| 17:15 | 508          | 1955         | 36             | 158          | 1         |                   |
| 17:30 | 476          | 1897         | 48             | 154          | 1         |                   |
| 17:45 | 501          | 1854         | 35             | 146          | 1         | 1                 |
| 18:00 | 470          | 1776         | 39             | 137          | 1         |                   |
| 18:15 | 450          | 1687         | 32             | 127          | 1         |                   |
| 18:30 | 433          | 1614         | 40             | 117          | 1         |                   |
| 18:45 | 423          | 1525         | 26             | 96           | 0         |                   |
| 19:00 | 381          | 1471         | 29             | 87           | 0         |                   |
| 19:15 | 377          | 1426         | 22             | 81           | 0         |                   |
| 19:30 | 344          | 1385         | 19             | 68           | 0         |                   |
| 19:45 | 369          | 1336         | 17             | 68           | 0         |                   |
| 20:00 | 336          | 1256         | 23             | 74           | 0         |                   |
| 20:15 | 336          | 1231         | 9              | 70           | 0         |                   |
| 20:30 | 295          | 1203         | 19             | 77           | 0         |                   |
| 20:45 | 289          | 1235         | 23             | 76           | 0         |                   |
| 21:00 | 311          | 1260         | 19             | 65           | 0         |                   |
| 21:15 | 308          | 1252         | 16             | 57           | 0         |                   |
| 21:30 | 327          | 1211         | 18             | 63           | 0         |                   |
| 21:45 | 314          | 1091         | 12             | 52           | 0         |                   |
| 22:00 | 303          | 939          | 11             | 50           | 0         |                   |
| 22:15 | 267          | 799          | 22             | 51           | 0         |                   |
| 22:30 | 207          | 682          | 7              | 30           | 0         |                   |
| 22:45 | 162          | 587          | 10             | 28           | 0         |                   |
| 23:00 | 163          | 527          | 12             | 20           | 0         |                   |
| 23:15 | 150          | 364          | 1              | 8            | 0         |                   |
| 23:30 | 112          | 214          | 5              | 7            | 0         |                   |
| 23:45 | 102          | 102          | 2              | 2            | 0         |                   |

# of Periods Warrant Satisfied 12

## APPENDIX F

### CAPACITY ANALYSIS CALCULATIONS PROJECTED YEAR 2015 PEAK HOUR TRAFFIC ANALYSIS WITH PROJECT



# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/4/2011

| Movement               | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|------------------------|------|------|------|------|------|------|
| Lane Configurations    | ↰    | ↱    | ↰    | ↱    | ↱    | ↰    |
| Volume (veh/h)         | 18   | 220  | 66   | 1229 | 1490 | 11   |
| Sign Control           | Stop |      |      | Free | Free |      |
| Grade                  | 0%   |      |      | 0%   | 0%   |      |
| Peak Hour Factor       | 0.84 | 0.84 | 0.95 | 0.95 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 21   | 262  | 69   | 1294 | 1637 | 12   |
| Pedestrians            |      |      |      |      |      |      |
| Lane Width (ft)        |      |      |      |      |      |      |
| Walking Speed (ft/s)   |      |      |      |      |      |      |
| Percent Blockage       |      |      |      |      |      |      |
| Right turn flare (veh) |      |      |      |      |      |      |
| Median type            |      |      | TWLT | TWLT |      |      |
| Median storage (veh)   |      |      | 2    | 2    |      |      |
| Upstream signal (ft)   |      |      |      |      |      |      |
| pX, platoon unblocked  |      |      |      |      |      |      |
| vC, conflicting volume | 2423 | 819  | 1637 |      |      |      |
| vC1, stage 1 conf vol  | 1637 |      |      |      |      |      |
| vC2, stage 2 conf vol  | 786  |      |      |      |      |      |
| vCu, unblocked vol     | 2423 | 819  | 1637 |      |      |      |
| tC, single (s)         | *5.8 | *5.9 | 4.1  |      |      |      |
| tC, 2 stage (s)        | 4.8  |      |      |      |      |      |
| tF (s)                 | *2.5 | *2.3 | 2.2  |      |      |      |
| p0 queue free %        | 91   | 50   | 82   |      |      |      |
| cM capacity (veh/h)    | 238  | 525  | 392  |      |      |      |

| Direction/Lane #       | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|------|------|------|------|------|------|
| Volume Total           | 21   | 262  | 69   | 647  | 647  | 819  | 819  | 12   |
| Volume Left            | 21   | 0    | 69   | 0    | 0    | 0    | 0    | 0    |
| Volume Right           | 0    | 262  | 0    | 0    | 0    | 0    | 0    | 12   |
| cSH                    | 238  | 525  | 392  | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity     | 0.09 | 0.50 | 0.18 | 0.38 | 0.38 | 0.48 | 0.48 | 0.01 |
| Queue Length 95th (ft) | 7    | 69   | 16   | 0    | 0    | 0    | 0    | 0    |
| Control Delay (s)      | 21.6 | 18.5 | 16.2 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS               | C    | C    | C    |      |      |      |      |      |
| Approach Delay (s)     | 18.7 |      | 0.8  |      |      | 0.0  |      |      |
| Approach LOS           | C    |      |      |      |      |      |      |      |

| Intersection Summary              |       |                      |   |  |
|-----------------------------------|-------|----------------------|---|--|
| Average Delay                     | 1.9   |                      |   |  |
| Intersection Capacity Utilization | 59.4% | ICU Level of Service | B |  |
| Analysis Period (min)             | 15    |                      |   |  |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/4/2011

| Movement               | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
|------------------------|------|------|------|------|------|------|
| Lane Configurations    | ↰    | ↱    | ↰    | ↱    | ↱    | ↰    |
| Volume (veh/h)         | 20   | 109  | 120  | 1513 | 1582 | 105  |
| Sign Control           | Stop |      |      | Free | Free |      |
| Grade                  | 0%   |      |      | 0%   | 0%   |      |
| Peak Hour Factor       | 0.79 | 0.79 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 25   | 138  | 138  | 1739 | 1818 | 121  |
| Pedestrians            |      |      |      |      |      |      |
| Lane Width (ft)        |      |      |      |      |      |      |
| Walking Speed (ft/s)   |      |      |      |      |      |      |
| Percent Blockage       |      |      |      |      |      |      |
| Right turn flare (veh) |      |      |      |      |      |      |
| Median type            |      |      | TWLT | TWLT |      |      |
| Median storage (veh)   |      |      | 2    | 2    |      |      |
| Upstream signal (ft)   |      |      |      |      |      |      |
| pX, platoon unblocked  |      |      |      |      |      |      |
| vC, conflicting volume | 2964 | 909  | 1818 |      |      |      |
| vC1, stage 1 conf vol  | 1818 |      |      |      |      |      |
| vC2, stage 2 conf vol  | 1145 |      |      |      |      |      |
| vCu, unblocked vol     | 2964 | 909  | 1818 |      |      |      |
| tC, single (s)         | *5.8 | *5.9 | 4.1  |      |      |      |
| tC, 2 stage (s)        | 4.8  |      |      |      |      |      |
| tF (s)                 | *2.5 | *2.3 | 2.2  |      |      |      |
| p0 queue free %        | 85   | 70   | 59   |      |      |      |
| cM capacity (veh/h)    | 163  | 465  | 333  |      |      |      |

| Direction/Lane #       | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|------|------|------|------|------|------|
| Volume Total           | 25   | 138  | 138  | 870  | 870  | 909  | 909  | 121  |
| Volume Left            | 25   | 0    | 138  | 0    | 0    | 0    | 0    | 0    |
| Volume Right           | 0    | 138  | 0    | 0    | 0    | 0    | 0    | 121  |
| cSH                    | 163  | 465  | 333  | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity     | 0.15 | 0.30 | 0.41 | 0.51 | 0.51 | 0.53 | 0.53 | 0.07 |
| Queue Length 95th (ft) | 13   | 31   | 49   | 0    | 0    | 0    | 0    | 0    |
| Control Delay (s)      | 31.0 | 16.0 | 23.2 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS               | D    | C    | C    |      |      |      |      |      |
| Approach Delay (s)     | 18.3 |      | 1.7  |      |      | 0.0  |      |      |
| Approach LOS           | C    |      |      |      |      |      |      |      |

| Intersection Summary              |       |                      |   |  |
|-----------------------------------|-------|----------------------|---|--|
| Average Delay                     | 1.6   |                      |   |  |
| Intersection Capacity Utilization | 61.2% | ICU Level of Service | B |  |
| Analysis Period (min)             | 15    |                      |   |  |

\* User Entered Value



# HCM Signalized Intersection Capacity Analysis

5: Kulanihakai & Piilani

5/4/2011

| Movement               | EBL  | EBT  | EBR  | WBL   | WBT  | WBR  | NBL   | NTB   | NBR   | SBL  | SBT  | SEB  |
|------------------------|------|------|------|-------|------|------|-------|-------|-------|------|------|------|
| Lane Configurations    | 4    | 4    | 4    | 4     | 4    | 4    | 4     | 4     | 4     | 4    | 4    | 4    |
| Volume (vph)           | 42   | 35   | 135  | 75    | 6    | 27   | 49    | 1226  | 137   | 56   | 1613 | 41   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 2000  | 2000  | 2000  | 2000 | 2000 | 2000 |
| Total Lost time (s)    | 5.0  | 5.0  |      | 5.0   | 5.0  | 5.0  | 5.0   | 4.0   | 5.0   | 5.0  | 4.0  |      |
| Lane Util. Factor      | 1.00 | 1.00 |      | 1.00  | 1.00 | 1.00 | 0.95  | 1.00  | 1.00  | 0.95 | 1.00 |      |
| Flt                    | 1.00 | 0.85 |      | 1.00  | 0.85 | 1.00 | 1.00  | 0.85  | 1.00  | 1.00 | 0.85 |      |
| Flt Protected          | 0.97 | 1.00 |      | 0.96  | 1.00 | 0.95 | 1.00  | 1.00  | 0.95  | 1.00 | 1.00 |      |
| Satd. Flow (prot)      | 1813 | 1583 |      | 1781  | 1583 | 1863 | 3725  | 1667  | 1863  | 3725 | 1667 |      |
| Flt Permitted          | 0.78 | 1.00 |      | 0.68  | 1.00 | 0.95 | 1.00  | 1.00  | 0.95  | 1.00 | 1.00 |      |
| Satd. Flow (perm)      | 1457 | 1583 |      | 1264  | 1583 | 1863 | 3725  | 1667  | 1863  | 3725 | 1667 |      |
| Peak-hour factor, PHF  | 0.85 | 0.85 | 0.85 | 0.92  | 0.92 | 0.92 | 0.94  | 0.94  | 0.94  | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph)        | 49   | 41   | 159  | 82    | 7    | 29   | 52    | 1304  | 146   | 60   | 1734 | 44   |
| RTOR Reduction (vph)   | 0    | 0    | 119  | 0     | 0    | 25   | 0     | 0     | 0     | 0    | 0    | 0    |
| Lane Group Flow (vph)  | 0    | 90   | 40   | 0     | 89   | 4    | 52    | 1304  | 146   | 60   | 1734 | 44   |
| Turn Type              | Perm | Perm | Perm | Perm  | Prot | Free | Prot  | Free  | Prot  | Free | Prot | Free |
| Protected Phases       | 4    | 4    | 8    | 8     | 5    | 2    | Free  | 1     | 6     | Free | 1    | 6    |
| Permitted Phases       | 4    | 4    | 8    | 8     | 5    | 2    | Free  | 1     | 6     | Free | 1    | 6    |
| Actuated Green, G (s)  | 13.9 | 13.9 | 13.9 | 13.9  | 6.6  | 62.1 | 98.2  | 7.2   | 62.7  | 98.2 | 7.2  | 62.7 |
| Effective Green, g (s) | 13.9 | 13.9 | 13.9 | 13.9  | 6.6  | 62.1 | 98.2  | 7.2   | 62.7  | 98.2 | 7.2  | 62.7 |
| Actuated g/C Ratio     | 0.14 | 0.14 | 0.14 | 0.14  | 0.07 | 0.63 | 1.00  | 0.07  | 0.64  | 1.00 | 0.07 | 0.64 |
| Clearance Time (s)     | 5.0  | 5.0  | 5.0  | 5.0   | 5.0  | 5.0  | 5.0   | 5.0   | 5.0   | 5.0  | 5.0  | 5.0  |
| Vehicle Extension (s)  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0  | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 206  | 224  | 179  | 224   | 125  | 2356 | 1667  | 137   | 2378  | 1667 | 137  | 2378 |
| v/s Ratio Prot         |      |      |      |       | 0.03 | 0.35 |       | c0.03 | c0.47 |      |      |      |
| v/s Ratio Perm         | 0.06 | 0.03 |      | c0.07 | 0.00 |      | c0.09 |       |       | 0.03 |      |      |
| v/c Ratio              | 0.44 | 0.18 |      | 0.50  | 0.02 | 0.42 | 0.55  | 0.09  | 0.44  | 0.73 | 0.03 |      |
| Uniform Delay, d1      | 38.6 | 37.1 |      | 38.9  | 36.3 | 44.0 | 10.2  | 0.0   | 43.6  | 12.0 | 0.0  |      |
| Progression Factor     | 1.00 | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 |      |
| Incremental Delay, d2  | 1.5  | 0.4  |      | 2.2   | 0.0  | 2.2  | 0.3   | 0.1   | 2.2   | 1.1  | 0.0  |      |
| Delay (s)              | 40.1 | 37.5 |      | 41.1  | 36.3 | 46.2 | 10.5  | 0.1   | 45.8  | 13.2 | 0.0  |      |
| Level of Service       | D    | D    |      | D     | D    | D    | B     | A     | D     | B    | A    |      |
| Approach Delay (s)     | 38.4 |      |      | 39.9  |      |      | 10.7  |       |       | 13.9 |      |      |
| Approach LOS           | D    |      |      | D     |      |      | B     |       |       | B    |      |      |

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| Intersection Summary              |       |                      |      |
| HCM Average Control Delay         | 15.1  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.63  |                      |      |
| Actuated Cycle Length (s)         | 98.2  | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 67.7% | ICU Level of Service | C    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

# HCM Signalized Intersection Capacity Analysis

5: Kulanihakai & Piilani

5/4/2011

| Movement               | EBL  | EBT  | EBR  | WBL   | WBT   | WBR   | NBL   | NTB  | NBR   | SBL   | SBT  | SEB  |
|------------------------|------|------|------|-------|-------|-------|-------|------|-------|-------|------|------|
| Lane Configurations    | 4    | 4    | 4    | 4     | 4     | 4     | 4     | 4    | 4     | 4     | 4    | 4    |
| Volume (vph)           | 22   | 7    | 93   | 39    | 3     | 13    | 68    | 1598 | 30    | 12    | 1577 | 102  |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900  | 1900  | 1900  | 2000  | 2000 | 2000  | 2000  | 2000 | 2000 |
| Total Lost time (s)    | 5.0  | 5.0  |      | 5.0   | 5.0   | 5.0   | 5.0   | 4.0  | 5.0   | 5.0   | 4.0  |      |
| Lane Util. Factor      | 1.00 | 1.00 |      | 1.00  | 1.00  | 1.00  | 0.95  | 1.00 | 1.00  | 0.95  | 1.00 |      |
| Flt                    | 1.00 | 0.85 |      | 1.00  | 0.85  | 1.00  | 1.00  | 0.85 | 1.00  | 1.00  | 0.85 |      |
| Flt Protected          | 0.96 | 1.00 |      | 0.96  | 1.00  | 0.95  | 1.00  | 1.00 | 0.95  | 1.00  | 1.00 |      |
| Satd. Flow (prot)      | 1794 | 1583 |      | 1780  | 1583  | 1863  | 3725  | 1667 | 1863  | 3725  | 1667 |      |
| Flt Permitted          | 0.75 | 1.00 |      | 0.71  | 1.00  | 0.95  | 1.00  | 1.00 | 0.95  | 1.00  | 1.00 |      |
| Satd. Flow (perm)      | 1392 | 1583 |      | 1327  | 1583  | 1863  | 3725  | 1667 | 1863  | 3725  | 1667 |      |
| Peak-hour factor, PHF  | 0.76 | 0.76 | 0.76 | 0.92  | 0.92  | 0.92  | 0.92  | 0.92 | 0.92  | 0.88  | 0.88 | 0.88 |
| Adj. Flow (vph)        | 29   | 9    | 122  | 42    | 3     | 14    | 74    | 1737 | 33    | 14    | 1792 | 116  |
| RTOR Reduction (vph)   | 0    | 0    | 106  | 0     | 0     | 13    | 0     | 0    | 0     | 0     | 0    | 0    |
| Lane Group Flow (vph)  | 0    | 38   | 16   | 0     | 45    | 1     | 74    | 1737 | 33    | 14    | 1792 | 116  |
| Turn Type              | Perm | Perm | Perm | Perm  | Prot  | Free  | Prot  | Free | Prot  | Free  | Prot | Free |
| Protected Phases       | 4    | 4    | 8    | 8     | 5     | 2     | Free  | 1    | 6     | Free  | 1    | 6    |
| Permitted Phases       | 4    | 4    | 8    | 8     | 5     | 2     | Free  | 1    | 6     | Free  | 1    | 6    |
| Actuated Green, G (s)  | 9.3  | 9.3  | 9.3  | 9.3   | 8.0   | 74.7  | 101.3 | 2.3  | 69.0  | 101.3 | 2.3  | 69.0 |
| Effective Green, g (s) | 9.3  | 9.3  | 9.3  | 9.3   | 8.0   | 74.7  | 101.3 | 2.3  | 69.0  | 101.3 | 2.3  | 69.0 |
| Actuated g/C Ratio     | 0.09 | 0.09 | 0.09 | 0.09  | 0.08  | 0.74  | 1.00  | 0.02 | 0.68  | 1.00  | 0.02 | 0.68 |
| Clearance Time (s)     | 5.0  | 5.0  | 5.0  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0  | 5.0   | 5.0   | 5.0  | 5.0  |
| Vehicle Extension (s)  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0  | 3.0   | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 128  | 145  | 122  | 145   | 147   | 2747  | 1667  | 42   | 2537  | 1667  | 42   | 2537 |
| v/s Ratio Prot         |      |      |      |       | c0.04 | c0.47 |       | 0.01 | c0.48 |       |      |      |
| v/s Ratio Perm         | 0.03 | 0.01 |      | c0.03 | 0.00  |       | 0.02  |      |       | 0.07  |      |      |
| v/c Ratio              | 0.30 | 0.11 |      | 0.37  | 0.01  | 0.50  | 0.63  | 0.02 | 0.33  | 0.71  | 0.02 |      |
| Uniform Delay, d1      | 42.9 | 42.2 |      | 43.2  | 41.8  | 44.7  | 6.5   | 0.0  | 48.7  | 9.9   | 0.0  |      |
| Progression Factor     | 1.00 | 1.00 |      | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 |      |
| Incremental Delay, d2  | 1.3  | 0.3  |      | 1.9   | 0.0   | 2.7   | 0.5   | 0.0  | 4.6   | 0.9   | 0.1  |      |
| Delay (s)              | 44.2 | 42.5 |      | 45.1  | 41.8  | 47.4  | 7.0   | 0.0  | 53.4  | 10.8  | 0.1  |      |
| Level of Service       | D    | D    |      | D     | D     | D     | A     | A    | D     | B     | A    |      |
| Approach Delay (s)     | 42.9 |      |      | 44.3  |       |       | 8.5   |      |       | 10.5  |      |      |
| Approach LOS           | D    |      |      | D     |       |       | A     |      |       | B     |      |      |

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| Intersection Summary              |       |                      |      |
| HCM Average Control Delay         | 11.4  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.70  |                      |      |
| Actuated Cycle Length (s)         | 101.3 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 66.8% | ICU Level of Service | C    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |



# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL  | EBR  | NBL   | NBT  | SBT  | SEB  |
|-----------------------------------|------|------|-------|------|------|------|
| Lane Configurations               |      | ↑    |       | ↑↑   | ↑↑   | ↑    |
| Volume (veh/h)                    | 0    | 23   | 0     | 1412 | 1740 | 82   |
| Sign Control                      | Stop |      |       | Free | Free |      |
| Grade                             | 0%   |      |       | 0%   | 0%   |      |
| Peak Hour Factor                  | 0.58 | 0.58 | 0.88  | 0.88 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 0    | 40   | 0     | 1605 | 1912 | 90   |
| Pedestrians                       |      |      |       |      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |      |
| Percent Blockage                  |      |      |       |      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |      |
| Median type                       |      |      |       | None | None |      |
| Median storage (veh)              |      |      |       |      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |      |
| pX, platoon unblocked             |      |      |       |      |      |      |
| vC, conflicting volume            | 2714 | 956  | 1912  |      |      |      |
| vC1, stage 1 conf vol             |      |      |       |      |      |      |
| vC2, stage 2 conf vol             |      |      |       |      |      |      |
| vCu, unblocked vol                | 2714 | 956  | 1912  |      |      |      |
| tC, single (s)                    | 6.8  | *5.9 | 4.1   |      |      |      |
| tC, 2 stage (s)                   |      |      |       |      |      |      |
| tF (s)                            | 3.5  | *2.3 | 2.2   |      |      |      |
| p0 queue free %                   | 100  | 91   | 100   |      |      |      |
| cM capacity (veh/h)               | 17   | 437  | 306   |      |      |      |
| Direction Lane #                  | EBL  | EBR  | NBL   | NBT  | SBT  | SEB  |
| Volume Total                      | 40   | 802  | 802   | 956  | 956  | 90   |
| Volume Left                       | 0    | 0    | 0     | 0    | 0    | 0    |
| Volume Right                      | 40   | 0    | 0     | 0    | 0    | 90   |
| cSH                               | 437  | 1700 | 1700  | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.09 | 0.47 | 0.47  | 0.56 | 0.56 | 0.05 |
| Queue Length 95th (ft)            | 7    | 0    | 0     | 0    | 0    | 0    |
| Control Delay (s)                 | 14.1 | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | B    |      |       |      |      |      |
| Approach Delay (s)                | 14.1 | 0.0  |       | 0.0  |      |      |
| Approach LOS                      | B    |      |       |      |      |      |
| Intersection Summary              |      |      |       |      |      |      |
| Average Delay                     |      |      | 0.2   |      |      |      |
| Intersection Capacity Utilization |      |      | 55.7% |      |      |      |
| Analysis Period (min)             |      |      | 15    |      |      |      |
| ICU Level of Service              |      |      |       |      | B    |      |

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL  | EBR  | NBL   | NBT  | SBT  | SEB  |
|-----------------------------------|------|------|-------|------|------|------|
| Lane Configurations               |      | ↑    |       | ↑↑   | ↑↑   | ↑    |
| Volume (veh/h)                    | 0    | 32   | 0     | 1696 | 1608 | 101  |
| Sign Control                      | Stop |      |       | Free | Free |      |
| Grade                             | 0%   |      |       | 0%   | 0%   |      |
| Peak Hour Factor                  | 0.57 | 0.57 | 0.95  | 0.95 | 0.96 | 0.96 |
| Hourly flow rate (vph)            | 0    | 56   | 0     | 1785 | 1675 | 105  |
| Pedestrians                       |      |      |       |      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |      |
| Percent Blockage                  |      |      |       |      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |      |
| Median type                       |      |      |       | None | None |      |
| Median storage (veh)              |      |      |       |      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |      |
| pX, platoon unblocked             |      |      |       |      |      |      |
| vC, conflicting volume            | 2568 | 838  | 1675  |      |      |      |
| vC1, stage 1 conf vol             |      |      |       |      |      |      |
| vC2, stage 2 conf vol             |      |      |       |      |      |      |
| vCu, unblocked vol                | 2568 | 838  | 1675  |      |      |      |
| tC, single (s)                    | 6.8  | *5.9 | 4.1   |      |      |      |
| tC, 2 stage (s)                   |      |      |       |      |      |      |
| tF (s)                            | 3.5  | *2.3 | 2.2   |      |      |      |
| p0 queue free %                   | 100  | 89   | 100   |      |      |      |
| cM capacity (veh/h)               | 21   | 512  | 379   |      |      |      |
| Direction Lane #                  | EBL  | EBR  | NBL   | NBT  | SBT  | SEB  |
| Volume Total                      | 56   | 893  | 893   | 838  | 838  | 105  |
| Volume Left                       | 0    | 0    | 0     | 0    | 0    | 0    |
| Volume Right                      | 56   | 0    | 0     | 0    | 0    | 105  |
| cSH                               | 512  | 1700 | 1700  | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.11 | 0.53 | 0.53  | 0.49 | 0.49 | 0.06 |
| Queue Length 95th (ft)            | 9    | 0    | 0     | 0    | 0    | 0    |
| Control Delay (s)                 | 12.9 | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | B    |      |       |      |      |      |
| Approach Delay (s)                | 12.9 | 0.0  |       | 0.0  |      |      |
| Approach LOS                      | B    |      |       |      |      |      |
| Intersection Summary              |      |      |       |      |      |      |
| Average Delay                     |      |      | 0.2   |      |      |      |
| Intersection Capacity Utilization |      |      | 52.2% |      |      |      |
| Analysis Period (min)             |      |      | 15    |      |      |      |
| ICU Level of Service              |      |      |       |      | A    |      |

\* User Entered Value



# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

| Movement                          | EBL   | EBH   | NBL   | NBT                  | SBT   | SBH   |
|-----------------------------------|-------|-------|-------|----------------------|-------|-------|
| Lane Configurations               | ↖     | ↗     | ↖     | ↗                    | ↗     | ↗     |
| Volume (vph)                      | 294   | 133   | 123   | 1118                 | 1442  | 321   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95                 | 0.95  | 1.00  |
| Flt                               | 1.00  | 0.85  | 1.00  | 1.00                 | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Flt Permitted                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.90  | 0.90  | 0.88  | 0.88                 | 0.91  | 0.91  |
| Adj. Flow (vph)                   | 327   | 148   | 140   | 1270                 | 1585  | 353   |
| RTOR Reduction (vph)              | 0     | 113   | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 327   | 35    | 140   | 1270                 | 1585  | 353   |
| Turn Type                         | Perm  |       | Prot  | Free                 |       | Free  |
| Protected Phases                  | 4     |       | 5     | 2                    |       | 6     |
| Permitted Phases                  | 4     |       | Free  |                      | Free  |       |
| Actuated Green, G (s)             | 28.6  | 28.6  | 15.2  | 83.0                 | 62.8  | 121.6 |
| Effective Green, g (s)            | 28.6  | 28.6  | 15.2  | 83.0                 | 62.8  | 121.6 |
| Actuated g/C Ratio                | 0.24  | 0.24  | 0.12  | 0.68                 | 0.52  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 416   | 372   | 233   | 2543                 | 1924  | 1667  |
| v/s Ratio Prot                    | c0.18 |       | c0.08 | 0.34                 | c0.43 |       |
| v/s Ratio Perm                    |       | 0.02  |       |                      |       | 0.21  |
| v/c Ratio                         | 0.79  | 0.09  | 0.60  | 0.50                 | 0.82  | 0.21  |
| Uniform Delay, d1                 | 43.6  | 36.4  | 50.3  | 9.3                  | 24.7  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 9.4   | 0.1   | 4.3   | 0.2                  | 3.0   | 0.3   |
| Delay (s)                         | 53.1  | 36.5  | 54.6  | 9.5                  | 27.7  | 0.3   |
| Level of Service                  | D     | D     | D     | A                    | C     | A     |
| Approach Delay (s)                | 47.9  |       |       | 13.9                 | 22.7  |       |
| Approach LOS                      | D     |       |       | B                    | C     |       |
| <b>Intersection Summary</b>       |       |       |       |                      |       |       |
| HCM Average Control Delay         |       | 22.6  |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      |       | 0.78  |       |                      |       |       |
| Actuated Cycle Length (s)         |       | 121.6 |       | Sum of lost time (s) |       | 15.0  |
| Intersection Capacity Utilization |       | 73.1% |       | ICU Level of Service |       | D     |
| Analysis Period (min)             |       | 15    |       |                      |       |       |
| c Critical Lane Group             |       |       |       |                      |       |       |

# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

| Movement                          | EBL   | EBH   | NBL   | NBT                  | SBT   | SBH   |
|-----------------------------------|-------|-------|-------|----------------------|-------|-------|
| Lane Configurations               | ↖     | ↗     | ↖     | ↗                    | ↗     | ↗     |
| Volume (vph)                      | 270   | 277   | 233   | 1426                 | 1268  | 374   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95                 | 0.95  | 1.00  |
| Flt                               | 1.00  | 0.85  | 1.00  | 1.00                 | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Flt Permitted                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.89  | 0.89  | 0.95  | 0.95                 | 0.96  | 0.96  |
| Adj. Flow (vph)                   | 303   | 311   | 245   | 1501                 | 1319  | 390   |
| RTOR Reduction (vph)              | 0     | 240   | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 303   | 71    | 245   | 1501                 | 1319  | 390   |
| Turn Type                         | Perm  |       | Prot  | Free                 |       | Free  |
| Protected Phases                  | 4     |       | 5     | 2                    |       | 6     |
| Permitted Phases                  | 4     |       | Free  |                      | Free  |       |
| Actuated Green, G (s)             | 26.3  | 26.3  | 21.4  | 78.7                 | 52.3  | 115.0 |
| Effective Green, g (s)            | 26.3  | 26.3  | 21.4  | 78.7                 | 52.3  | 115.0 |
| Actuated g/C Ratio                | 0.23  | 0.23  | 0.19  | 0.68                 | 0.45  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 405   | 362   | 347   | 2549                 | 1694  | 1667  |
| v/s Ratio Prot                    | c0.17 |       | c0.13 | 0.40                 | c0.35 |       |
| v/s Ratio Perm                    |       | 0.04  |       |                      |       | 0.23  |
| v/c Ratio                         | 0.75  | 0.20  | 0.71  | 0.59                 | 0.78  | 0.23  |
| Uniform Delay, d1                 | 41.3  | 35.8  | 43.9  | 9.6                  | 26.5  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 7.4   | 0.3   | 6.4   | 0.4                  | 2.3   | 0.3   |
| Delay (s)                         | 48.7  | 36.1  | 50.3  | 9.9                  | 28.8  | 0.3   |
| Level of Service                  | D     | D     | D     | A                    | C     | A     |
| Approach Delay (s)                | 42.3  |       |       | 15.6                 | 22.3  |       |
| Approach LOS                      | D     |       |       | B                    | C     |       |
| <b>Intersection Summary</b>       |       |       |       |                      |       |       |
| HCM Average Control Delay         |       | 22.4  |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      |       | 0.76  |       |                      |       |       |
| Actuated Cycle Length (s)         |       | 115.0 |       | Sum of lost time (s) |       | 15.0  |
| Intersection Capacity Utilization |       | 73.0% |       | ICU Level of Service |       | C     |
| Analysis Period (min)             |       | 15    |       |                      |       |       |
| c Critical Lane Group             |       |       |       |                      |       |       |



# HCM Unsignalized Intersection Capacity Analysis 13: Kulanihakai &

5/4/2011

| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↰    | ↱     | ↰    | ↱                    | ↰    | ↱    |
| Volume (veh/h)                    | 43   | 60    | 437  | 50                   | 21   | 337  |
| Sign Control                      | Stop |       | Free |                      |      | Free |
| Grade                             | 0%   |       | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.83 | 0.83  | 0.93 | 0.93                 | 0.98 | 0.98 |
| Hourly flow rate (vph)            | 52   | 72    | 470  | 54                   | 21   | 344  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      |       | None |                      | None |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 884  | 497   |      |                      | 524  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 884  | 497   |      |                      | 524  |      |
| tC, single (s)                    | 6.4  | 6.2   |      |                      | 4.1  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | 3.5  | 3.3   |      |                      | 2.2  |      |
| p0 queue free %                   | 83   | 87    |      |                      | 98   |      |
| cM capacity (veh/h)               | 310  | 573   |      |                      | 1043 |      |
| Direction Lane #                  | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Volume Total                      | 52   | 72    | 524  | 21                   | 344  |      |
| Volume Left                       | 52   | 0     | 0    | 21                   | 0    |      |
| Volume Right                      | 0    | 72    | 54   | 0                    | 0    |      |
| cSH                               | 310  | 573   | 1700 | 1043                 | 1700 |      |
| Volume to Capacity                | 0.17 | 0.13  | 0.31 | 0.02                 | 0.20 |      |
| Queue Length 95th (ft)            | 15   | 11    | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 19.0 | 12.2  | 0.0  | 8.5                  | 0.0  |      |
| Lane LOS                          | C    | B     |      | A                    |      |      |
| Approach Delay (s)                | 15.0 |       | 0.0  | 0.5                  |      |      |
| Approach LOS                      | C    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 2.0   |      |                      |      |      |
| Intersection Capacity Utilization |      | 36.4% |      | ICU Level of Service | A    |      |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 13: Kulanihakai &

5/4/2011

| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↰    | ↱     | ↰    | ↱                    | ↰    | ↱    |
| Volume (veh/h)                    | 56   | 27    | 603  | 54                   | 23   | 483  |
| Sign Control                      | Stop |       | Free |                      |      | Free |
| Grade                             | 0%   |       | 0%   |                      |      | 0%   |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.96 | 0.96                 | 0.84 | 0.84 |
| Hourly flow rate (vph)            | 72   | 35    | 628  | 56                   | 27   | 575  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      |       | None |                      | None |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 1286 | 656   |      |                      | 684  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 1286 | 656   |      |                      | 684  |      |
| tC, single (s)                    | *5.4 | *5.2  |      |                      | 4.1  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | *2.5 | *2.3  |      |                      | 2.2  |      |
| p0 queue free %                   | 77   | 95    |      |                      | 97   |      |
| cM capacity (veh/h)               | 307  | 743   |      |                      | 909  |      |
| Direction Lane #                  | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Volume Total                      | 72   | 35    | 684  | 27                   | 575  |      |
| Volume Left                       | 72   | 0     | 0    | 27                   | 0    |      |
| Volume Right                      | 0    | 35    | 56   | 0                    | 0    |      |
| cSH                               | 307  | 743   | 1700 | 909                  | 1700 |      |
| Volume to Capacity                | 0.23 | 0.05  | 0.40 | 0.03                 | 0.34 |      |
| Queue Length 95th (ft)            | 22   | 4     | 0    | 2                    | 0    |      |
| Control Delay (s)                 | 20.3 | 10.1  | 0.0  | 9.1                  | 0.0  |      |
| Lane LOS                          | C    | B     |      | A                    |      |      |
| Approach Delay (s)                | 17.0 |       | 0.0  | 0.4                  |      |      |
| Approach LOS                      | C    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.5   |      |                      |      |      |
| Intersection Capacity Utilization |      | 45.0% |      | ICU Level of Service | A    |      |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

\* User Entered Value

**APPENDIX G**  
**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2025 PEAK HOUR TRAFFIC**  
**ANALYSIS WITH PROJECT**

**HCM Unsignalized Intersection Capacity Analysis**  
**3: Kaonoulu & Piilani**

5/4/2011

| Movement                          | EBL   | EBR  | NBL  | NBT                  | SBT  | SBR  |      |      |
|-----------------------------------|-------|------|------|----------------------|------|------|------|------|
| Lane Configurations               | ↰     | ↱    | ↰    | ↱↱                   | ↱↱   | ↱    |      |      |
| Volume (veh/h)                    | 18    | 232  | 72   | 1383                 | 1685 | 11   |      |      |
| Sign Control                      | Stop  |      |      | Free                 | Free |      |      |      |
| Grade                             | 0%    |      |      | 0%                   | 0%   |      |      |      |
| Peak Hour Factor                  | 0.84  | 0.84 | 0.95 | 0.95                 | 0.91 | 0.91 |      |      |
| Hourly flow rate (vph)            | 21    | 276  | 76   | 1456                 | 1852 | 12   |      |      |
| Pedestrians                       |       |      |      |                      |      |      |      |      |
| Lane Width (ft)                   |       |      |      |                      |      |      |      |      |
| Walking Speed (ft/s)              |       |      |      |                      |      |      |      |      |
| Percent Blockage                  |       |      |      |                      |      |      |      |      |
| Right turn flare (veh)            |       |      |      |                      |      |      |      |      |
| Median type                       |       |      |      | TWLT                 | TWLT |      |      |      |
| Median storage (veh)              |       |      |      | 2                    | 2    |      |      |      |
| Upstream signal (ft)              |       |      |      |                      |      |      |      |      |
| pX, platoon unblocked             |       |      |      |                      |      |      |      |      |
| vC, conflicting volume            | 2731  | 926  | 1852 |                      |      |      |      |      |
| vC1, stage 1 conf vol             | 1852  |      |      |                      |      |      |      |      |
| vC2, stage 2 conf vol             | 879   |      |      |                      |      |      |      |      |
| vCu, unblocked vol                | 2731  | 926  | 1852 |                      |      |      |      |      |
| tC, single (s)                    | *5.8  | *5.9 | 4.1  |                      |      |      |      |      |
| tC, 2 stage (s)                   | 4.8   |      |      |                      |      |      |      |      |
| tF (s)                            | *2.5  | *2.3 | 2.2  |                      |      |      |      |      |
| p0 queue free %                   | 89    | 39   | 77   |                      |      |      |      |      |
| cM capacity (veh/h)               | 190   | 455  | 323  |                      |      |      |      |      |
| Direction Lane #                  | EB 1  | EB 2 | NB 1 | NB 2                 | NB 3 | SB 1 | SB 2 | SB 3 |
| Volume Total                      | 21    | 276  | 76   | 728                  | 728  | 926  | 926  | 12   |
| Volume Left                       | 21    | 0    | 76   | 0                    | 0    | 0    | 0    | 0    |
| Volume Right                      | 0     | 276  | 0    | 0                    | 0    | 0    | 0    | 12   |
| cSH                               | 190   | 455  | 323  | 1700                 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity                | 0.11  | 0.61 | 0.23 | 0.43                 | 0.43 | 0.54 | 0.54 | 0.01 |
| Queue Length 95th (ft)            | 9     | 99   | 22   | 0                    | 0    | 0    | 0    | 0    |
| Control Delay (s)                 | 26.3  | 24.4 | 19.5 | 0.0                  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane LOS                          | D     | C    | C    |                      |      |      |      |      |
| Approach Delay (s)                | 24.6  |      | 1.0  |                      |      | 0.0  |      |      |
| Approach LOS                      | C     |      |      |                      |      |      |      |      |
| Intersection Summary              |       |      |      |                      |      |      |      |      |
| Average Delay                     | 2.4   |      |      |                      |      |      |      |      |
| Intersection Capacity Utilization | 65.3% |      |      | ICU Level of Service |      |      | C    |      |
| Analysis Period (min)             | 15    |      |      |                      |      |      |      |      |
| * User Entered Value              |       |      |      |                      |      |      |      |      |












\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

3: Kaonoulu & Piilani

5/4/2011

|                                   |   |   |   |   |   |   |      |
|-----------------------------------|---|---|---|---|---|---|------|
|                                   |  |  |  |  |  |   |      |
| Movement                          | EBL   | EBR   | NBL   | NBT   | SBT   | SBH   |      |
| Lane Configurations               |  |  |  |  |  |  |      |
| Volume (veh/h)                    | 20  | 112   | 123   | 1673  | 1747  | 105   |      |
| Sign Control                      | Stop  |   |   | Free  | Free  |   |      |
| Grade                             | 0%  |   |   | 0%  | 0%  |   |      |
| Peak Hour Factor                  | 0.79  | 0.79  | 0.87  | 0.87  | 0.87  | 0.87  |      |
| Hourly flow rate (vph)            | 25  | 142   | 141   | 1923  | 2008  | 121   |      |
| Pedestrians                       |   |   |   |   |   |   |      |
| Lane Width (ft)                   |   |   |   |   |   |   |      |
| Walking Speed (ft/s)              |   |   |   |   |   |   |      |
| Percent Blockage                  |   |   |   |   |   |   |      |
| Right turn flare (veh)            |   |   |   |   |   |   |      |
| Median type                       |   |   |   | TWLT  | TWLT  |   |      |
| Median storage (veh)              |   |   |   | 2   | 2   |   |      |
| Upstream signal (ft)              |   |   |   |   |   |   |      |
| pX, platoon unblocked             |   |   |   |   |   |   |      |
| vC, conflicting volume            | 3252  | 1004  | 2008  |   |   |   |      |
| vC1, stage 1 conf vol             | 2008  |   |   |   |   |   |      |
| vC2, stage 2 conf vol             | 1244  |   |   |   |   |   |      |
| vCu, unblocked vol                | 3252  | 1004  | 2008  |   |   |   |      |
| tC, single (s)                    | 5.8   | 5.9   | 4.1   |   |   |   |      |
| tC, 2 stage (s)                   | 4.8   |   |   |   |   |   |      |
| tF (s)                            | 2.5   | 2.3   | 2.2   |   |   |   |      |
| p0 queue free %                   | 80  | 65  | 50  |   |   |   |      |
| cM capacity (veh/h)               | 129   | 409   | 281   |   |   |   |      |
| Direction/Lane #                  | EB1   | EB2   | NB1   | NB2   | SB1   | SB2   | SB3  |
| Volume Total                      | 25  | 142   | 141   | 961   | 961   | 1004  | 121  |
| Volume Left                       | 25  | 0   | 141   | 0   | 0   | 0   | 0    |
| Volume Right                      | 0   | 142   | 0   | 0   | 0   | 0   | 121  |
| cSH                               | 129   | 409   | 281   | 1700  | 1700  | 1700  | 1700 |
| Volume to Capacity                | 0.20  | 0.35  | 0.50  | 0.57  | 0.57  | 0.59  | 0.07 |
| Queue Length 95th (ft)            | 17  | 38  | 66  | 0   | 0   | 0   | 0    |
| Control Delay (s)                 | 39.8  | 18.4  | 30.1  | 0.0   | 0.0   | 0.0   | 0.0  |
| Lane LOS                          | E   | C   | D   |   |   |   |      |
| Approach Delay (s)                | 21.6  |   | 2.1   |   |   | 0.0   |      |
| Approach LOS                      | C   |   |   |   |   |   |      |
| Intersection Summary              |   |   |   |   |   |   |      |
| Average Delay                     |   |   | 1.8   |   |   |   |      |
| Intersection Capacity Utilization |   |   | 65.7%   |   | ICU Level of Service  |   | C    |
| Analysis Period (min)             |   |   | 15  |   |   |   |      |

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

5: Kulanihakai & Piilani

5/4/2011

| Movement                          | EBL  | EBR   | EBB  | WBL  | WBT   | WBH  | NBL  | NBT  | NBR   | SBL   | SBT   | SBR   |
|-----------------------------------|------|-------|------|------|-------|------|------|------|-------|-------|-------|-------|
| Lane Configurations               | ↰    | ↱     | ↱    | ↰    | ↱     | ↱    | ↰    | ↱    | ↱     | ↰     | ↱     | ↱     |
| Volume (vph)                      | 42   | 71    | 135  | 154  | 12    | 56   | 49   | 1357 | 283   | 117   | 1759  | 41    |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 2000 | 2000 | 2000  | 2000  | 2000  | 2000  |
| Total Lost time (s)               | 5.0  | 5.0   |      | 5.0  | 5.0   | 5.0  | 5.0  | 5.0  | 4.0   | 5.0   | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00 | 1.00  |      | 1.00 | 1.00  | 1.00 | 0.95 | 1.00 | 1.00  | 0.95  | 1.00  | 1.00  |
| Flt                               | 1.00 | 0.85  |      | 1.00 | 0.85  | 1.00 | 1.00 | 0.85 | 1.00  | 1.00  | 0.85  | 1.00  |
| Flt Protected                     | 0.98 | 1.00  |      | 0.96 | 1.00  | 0.95 | 1.00 | 1.00 | 0.95  | 1.00  | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1829 | 1583  |      | 1780 | 1583  | 1863 | 3725 | 1667 | 1863  | 3725  | 1667  | 1667  |
| Flt Permitted                     | 0.74 | 1.00  |      | 0.58 | 1.00  | 0.95 | 1.00 | 1.00 | 0.95  | 1.00  | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1386 | 1583  |      | 1084 | 1583  | 1863 | 3725 | 1667 | 1863  | 3725  | 1667  | 1667  |
| Peak-hour factor, PHF             | 0.85 | 0.85  | 0.85 | 0.92 | 0.92  | 0.92 | 0.94 | 0.94 | 0.94  | 0.93  | 0.93  | 0.93  |
| Adj. Flow (vph)                   | 49   | 84    | 159  | 167  | 13    | 61   | 52   | 1444 | 301   | 126   | 1891  | 44    |
| RTOR Reduction (vph)              | 0    | 0     | 75   | 0    | 0     | 48   | 0    | 0    | 0     | 0     | 0     | 0     |
| Lane Group Flow (vph)             | 0    | 133   | 84   | 0    | 180   | 13   | 52   | 1444 | 301   | 126   | 1891  | 44    |
| Turn Type                         | Perm | Perm  | Perm | Perm | Prot  | Prot | Free | Prot | Free  | Prot  | Free  | Free  |
| Protected Phases                  |      | 4     |      |      | 8     |      | 5    | 2    |       | 1     | 6     |       |
| Permitted Phases                  | 4    |       | 4    | 8    |       |      |      |      | Free  |       |       | Free  |
| Actuated Green, G (s)             |      | 26.4  | 26.4 |      | 26.4  | 26.4 | 5.1  | 67.6 | 123.0 | 14.0  | 76.5  | 123.0 |
| Effective Green, g (s)            |      | 26.4  | 26.4 |      | 26.4  | 26.4 | 5.1  | 67.6 | 123.0 | 14.0  | 76.5  | 123.0 |
| Actuated g/C Ratio                |      | 0.21  | 0.21 |      | 0.21  | 0.21 | 0.04 | 0.55 | 1.00  | 0.11  | 0.62  | 1.00  |
| Clearance Time (s)                |      | 5.0   | 5.0  |      | 5.0   | 5.0  | 5.0  | 5.0  |       | 5.0   | 5.0   |       |
| Vehicle Extension (s)             |      | 3.0   | 3.0  |      | 3.0   | 3.0  | 3.0  | 3.0  |       | 3.0   | 3.0   |       |
| Lane Grp Cap (vph)                |      | 297   | 340  |      | 233   | 340  | 77   | 2047 | 1667  | 212   | 2317  | 1667  |
| v/s Ratio Prot                    |      |       |      |      |       |      | 0.03 | 0.39 |       | c0.07 | c0.51 |       |
| v/s Ratio Perm                    |      | 0.10  | 0.05 |      | c0.17 | 0.01 |      |      | 0.18  |       |       | 0.03  |
| v/c Ratio                         |      | 0.45  | 0.25 |      | 0.77  | 0.04 | 0.68 | 0.71 | 0.18  | 0.59  | 0.82  | 0.03  |
| Uniform Delay, d1                 |      | 42.0  | 40.0 |      | 45.5  | 38.2 | 58.1 | 20.4 | 0.0   | 51.8  | 17.9  | 0.0   |
| Progression Factor                |      | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |
| Incremental Delay, d2             |      | 1.1   | 0.4  |      | 14.6  | 0.0  | 20.9 | 1.1  | 0.2   | 4.4   | 2.3   | 0.0   |
| Delay (s)                         |      | 43.0  | 40.4 |      | 60.1  | 38.3 | 79.1 | 21.5 | 0.2   | 56.2  | 20.2  | 0.0   |
| Level of Service                  |      | D     | D    |      | E     | D    | E    | C    | A     | E     | C     | A     |
| Approach Delay (s)                |      | 41.6  |      |      | 54.6  |      |      | 19.6 |       |       | 22.0  |       |
| Approach LOS                      |      | D     |      |      | D     |      |      | B    |       |       | C     |       |
| Intersection Summary              |      |       |      |      |       |      |      |      |       |       |       |       |
| HCM Average Control Delay         |      | 24.1  |      |      |       |      |      |      |       |       |       |       |
| HCM Volume to Capacity ratio      |      | 0.81  |      |      |       |      |      |      |       |       |       |       |
| Actuated Cycle Length (s)         |      | 123.0 |      |      |       |      |      |      |       | 15.0  |       |       |
| Intersection Capacity Utilization |      | 77.9% |      |      |       |      |      |      |       | D     |       |       |
| Analysis Period (min)             |      | 15    |      |      |       |      |      |      |       |       |       |       |
| c Critical Lane Group             |      |       |      |      |       |      |      |      |       |       |       |       |

Year 2025 AM Peak With Project 4/20/2011 Baseline

Synchro 7 - Report

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Year 2025 PM Peak With Project 4/20/2011 Baseline

Synchro 7 - Report























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# HCM Signalized Intersection Capacity Analysis

5: Kulanihakoi & Piilani

5/4/2011

|                                   |  |  |  |  |  |  |  |  |  |  |  |   |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|--|
| Movement                          | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SEB   | SEB   | SEB  |
| Lane Configurations               |   |  |  |   |  |  |  |  |  |  |  |  |
| Volume (vph)                      | 22  | 15  | 93  | 80  | 6   | 28  | 68  | 1746  | 61  | 25  | 1732  | 102  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  | 2000  | 2000  | 2000  | 2000  | 2000  | 2000   |
| Total Lost time (s)               | 5.0   | 5.0   |   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 4.0   | 5.0   | 5.0   | 4.0  |
| Lane Util. Factor                 |   | 1.00  | 1.00  |   | 1.00  | 1.00  | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  | 1.00   |
| Frt                               |   | 1.00  | 0.85  |   | 1.00  | 0.85  | 1.00  | 1.00  | 0.85  | 1.00  | 1.00  | 0.85   |
| Flt Protected                     |   | 0.97  | 1.00  |   | 0.96  | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  | 1.00   |
| Satd. Flow (prot)                 |   | 1809  | 1583  |   | 1780  | 1583  | 1863  | 3725  | 1667  | 1863  | 3725  | 1667   |
| Flt Permitted                     |   | 0.78  | 1.00  |   | 0.71  | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  | 1.00   |
| Satd. Flow (perm)                 |   | 1453  | 1583  |   | 1316  | 1583  | 1863  | 3725  | 1667  | 1863  | 3725  | 1667   |
| Peak-hour factor, PHF             | 0.76  | 0.76  | 0.76  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.88  | 0.88  | 0.88   |
| Adj. Flow (vph)                   | 29  | 20  | 122   | 87  | 7   | 30  | 74  | 1898  | 66  | 28  | 1968  | 116  |
| RTOR Reduction (vph)              | 0   | 0   | 80  | 0   | 0   | 27  | 0   | 0   | 0   | 0   | 0   | 0  |
| Lane Group Flow (vph)             | 0   | 49  | 42  | 0   | 94  | 3   | 74  | 1898  | 66  | 28  | 1968  | 116  |
| Turn Type                         | Perm  |   | Perm  | Perm  |   | Perm  | Prot  |   | Free  | Prot  |   | Free   |
| Protected Phases                  |   | 4   |   |   | 8   |   | 5   | 2   |   | 1   | 6   |  |
| Permitted Phases                  | 4   |   | 4   | 8   |   | 8   |   |   | Free  |   |   | Free   |
| Actuated Green, G (s)             |   | 13.8  | 13.8  |   | 13.8  | 13.8  | 8.0   | 89.2  | 121.1   | 3.1   | 84.3  | 121.1  |
| Effective Green, g (s)            |   | 13.8  | 13.8  |   | 13.8  | 13.8  | 8.0   | 89.2  | 121.1   | 3.1   | 84.3  | 121.1  |
| Actuated g/C Ratio                |   | 0.11  | 0.11  |   | 0.11  | 0.11  | 0.07  | 0.74  | 1.00  | 0.03  | 0.70  | 1.00   |
| Clearance Time (s)                |   | 5.0   | 5.0   |   | 5.0   | 5.0   | 5.0   | 5.0   |   | 5.0   | 5.0   |  |
| Vehicle Extension (s)             |   | 3.0   | 3.0   |   | 3.0   | 3.0   | 3.0   | 3.0   |   | 3.0   | 3.0   |  |
| Lane Grp Cap (vph)                |   | 166   | 180   |   | 150   | 180   | 123   | 2744  | 1667  | 48  | 2593  | 1667   |
| v/s Ratio Prot                    |   |   |   |   |   |   | c0.04   | c0.51   |   | 0.02  | c0.53   |  |
| v/s Ratio Perm                    |   | 0.03  | 0.03  |   | c0.07   | 0.00  |   |   | 0.04  |   |   | 0.07   |
| v/c Ratio                         |   | 0.30  | 0.23  |   | 0.63  | 0.02  | 0.60  | 0.69  | 0.04  | 0.58  | 0.76  | 0.07   |
| Uniform Delay, d1                 |   | 49.2  | 48.8  |   | 51.2  | 47.6  | 55.0  | 8.6   | 0.0   | 58.4  | 11.9  | 0.0  |
| Progression Factor                |   | 1.00  | 1.00  |   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   |
| Incremental Delay, d2             |   | 1.0   | 0.7   |   | 7.9   | 0.0   | 8.0   | 0.8   | 0.0   | 16.8  | 1.3   | 0.1  |
| Delay (s)                         |   | 50.2  | 49.5  |   | 59.1  | 47.7  | 63.0  | 9.3   | 0.0   | 75.1  | 13.2  | 0.1  |
| Level of Service                  |   | D   | D   |   | E   | D   | E   | A   | A   | E   | B   | A  |
| Approach Delay (s)                |   | 49.7  |   |   | 56.4  |   |   | 11.0  |   |   | 13.3  |  |
| Approach LOS                      |   | D   |   |   | E   |   |   | B   |   |   | B   |  |
| Intersection Summary              |   |   |   |   |   |   |   |   |   |   |   |  |
| HCM Average Control Delay         | 14.8  |   |   | HCM Level of Service  |   |   |   |   |   | B   |   |  |
| HCM Volume to Capacity ratio      | 0.77  |   |   |   |   |   |   |   |   |   |   |  |
| Actuated Cycle Length (s)         | 121.1   |   |   | Sum of lost time (s)  |   |   |   |   |   | 20.0  |   |  |
| Intersection Capacity Utilization | 73.1%   |   |   | ICU Level of Service  |   |   |   |   |   | D   |   |  |
| Analysis Period (min)             | 15  |   |   |   |   |   |   |   |   |   |   |  |
| c Critical Lane Group             |   |   |   |   |   |   |   |   |   |   |   |  |

# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL   | EBR  | NBL  | NBT                  | SBT  | SEB  |
|-----------------------------------|-------|------|------|----------------------|------|------|
| Lane Configurations               |       |      |      |                      |      |      |
| Volume (veh/h)                    | 0     | 23   | 0    | 1689                 | 1954 | 93   |
| Sign Control                      | Stop  |      |      | Free                 | Free |      |
| Grade                             | 0%    |      |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.58  | 0.58 | 0.88 | 0.88                 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 0     | 40   | 0    | 1919                 | 2147 | 102  |
| Pedestrians                       |       |      |      |                      |      |      |
| Lane Width (ft)                   |       |      |      |                      |      |      |
| Walking Speed (ft/s)              |       |      |      |                      |      |      |
| Percent Blockage                  |       |      |      |                      |      |      |
| Right turn flare (veh)            |       |      |      |                      |      |      |
| Median type                       |       |      |      | None                 | None |      |
| Median storage veh                |       |      |      |                      |      |      |
| Upstream signal (ft)              |       |      |      |                      |      |      |
| pX, platoon unblocked             |       |      |      |                      |      |      |
| vC, conflicting volume            | 3107  | 1074 | 2147 |                      |      |      |
| vC1, stage 1 conf vol             |       |      |      |                      |      |      |
| vC2, stage 2 conf vol             |       |      |      |                      |      |      |
| vCu, unblocked vol                | 3107  | 1074 | 2147 |                      |      |      |
| tC, single (s)                    | 6.8   | 5.9  | 4.1  |                      |      |      |
| tC, 2 stage (s)                   |       |      |      |                      |      |      |
| tF (s)                            | 3.5   | 2.3  | 2.2  |                      |      |      |
| p0 queue free %                   | 100   | 89   | 100  |                      |      |      |
| cM capacity (veh/h)               | 9     | 372  | 248  |                      |      |      |
| Direction Lane #                  | EBL   | NBL  | NBR  | SBT                  | SEB  | SEB  |
| Volume Total                      | 40    | 960  | 960  | 1074                 | 1074 | 102  |
| Volume Left                       | 0     | 0    | 0    | 0                    | 0    | 0    |
| Volume Right                      | 40    | 0    | 0    | 0                    | 0    | 102  |
| cSH                               | 372   | 1700 | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.11  | 0.56 | 0.56 | 0.63                 | 0.63 | 0.06 |
| Queue Length 95th (ft)            | 9     | 0    | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 15.8  | 0.0  | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | C     |      |      |                      |      |      |
| Approach Delay (s)                | 15.8  | 0.0  | 0.0  |                      |      |      |
| Approach LOS                      | C     |      |      |                      |      |      |
| Intersection Summary              |       |      |      |                      |      |      |
| Average Delay                     | 0.1   |      |      |                      |      |      |
| Intersection Capacity Utilization | 61.3% |      |      | ICU Level of Service |      | B    |
| Analysis Period (min)             | 15    |      |      |                      |      |      |
| * User Entered Value              |       |      |      |                      |      |      |



# HCM Unsignalized Intersection Capacity Analysis

7: E. Waipuilani & Piilani

5/4/2011

| Movement                          | EBL  | EBR   | NBL  | NBT                  | SBT  | SBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      | ↑     |      | ↑↑                   | ↑↑   | ↑    |
| Volume (veh/h)                    | 0    | 32    | 0    | 1875                 | 1798 | 107  |
| Sign Control                      | Stop |       |      | Free                 | Free |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.57 | 0.57  | 0.95 | 0.95                 | 0.96 | 0.96 |
| Hourly flow rate (vph)            | 0    | 56    | 0    | 1974                 | 1873 | 111  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       |      |       | None | None                 |      |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            | 2860 | 936   | 1873 |                      |      |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                | 2860 | 936   | 1873 |                      |      |      |
| IC, single (s)                    | 6.8  | 5.9   | 4.1  |                      |      |      |
| IC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            | 3.5  | 2.3   | 2.2  |                      |      |      |
| p0 queue free %                   | 100  | 87    | 100  |                      |      |      |
| cM capacity (veh/h)               | 13   | 448   | 317  |                      |      |      |
| Direction Lane #                  | EBL  | EBR   | NBL  | NBT                  | SBT  | SBR  |
| Volume Total                      | 56   | 987   | 987  | 936                  | 936  | 111  |
| Volume Left                       | 0    | 0     | 0    | 0                    | 0    | 0    |
| Volume Right                      | 56   | 0     | 0    | 0                    | 0    | 111  |
| cSH                               | 448  | 1700  | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.13 | 0.58  | 0.58 | 0.55                 | 0.55 | 0.07 |
| Queue Length 95th (ft)            | 11   | 0     | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 14.2 | 0.0   | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | B    |       |      |                      |      |      |
| Approach Delay (s)                | 14.2 | 0.0   |      | 0.0                  |      |      |
| Approach LOS                      | B    |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 57.2% |      | ICU Level of Service |      | B    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

| Movement                          | EBL   | EBR   | NBL   | NBT                  | SBT   | SBR   |
|-----------------------------------|-------|-------|-------|----------------------|-------|-------|
| Lane Configurations               | ↑     | ↑     | ↑     | ↑↑                   | ↑↑    | ↑     |
| Volume (vph)                      | 294   | 133   | 123   | 1395                 | 1656  | 321   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00  | 0.95                 | 0.95  | 1.00  |
| Frt                               | 1.00  | 0.85  | 1.00  | 1.00                 | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Flt Permitted                     | 0.95  | 1.00  | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583  | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.90  | 0.90  | 0.88  | 0.88                 | 0.91  | 0.91  |
| Adj. Flow (vph)                   | 327   | 148   | 140   | 1585                 | 1820  | 353   |
| RTOR Reduction (vph)              | 0     | 116   | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 327   | 32    | 140   | 1585                 | 1820  | 353   |
| Turn Type                         | Perm  |       | Prot  |                      |       | Free  |
| Protected Phases                  | 4     |       | 5     | 2                    | 6     |       |
| Permitted Phases                  |       | 4     |       |                      |       | Free  |
| Actuated Green, G (s)             | 29.6  | 29.6  | 14.2  | 95.3                 | 76.1  | 134.9 |
| Effective Green, g (s)            | 29.6  | 29.6  | 14.2  | 95.3                 | 76.1  | 134.9 |
| Actuated g/C Ratio                | 0.22  | 0.22  | 0.11  | 0.71                 | 0.56  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0   | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 388   | 347   | 196   | 2632                 | 2101  | 1667  |
| v/s Ratio Prot                    | c0.18 |       | c0.08 | 0.43                 | c0.49 |       |
| v/s Ratio Perm                    |       | 0.02  |       |                      |       | 0.21  |
| v/c Ratio                         | 0.84  | 0.09  | 0.71  | 0.60                 | 0.87  | 0.21  |
| Uniform Delay, d1                 | 50.4  | 42.0  | 58.4  | 10.1                 | 25.1  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 15.2  | 0.1   | 11.7  | 0.4                  | 4.0   | 0.3   |
| Delay (s)                         | 65.6  | 42.1  | 70.0  | 10.5                 | 29.1  | 0.3   |
| Level of Service                  | E     | D     | E     | B                    | C     | A     |
| Approach Delay (s)                | 58.3  |       |       | 15.3                 | 24.4  |       |
| Approach LOS                      | E     |       |       | B                    | C     |       |
| Intersection Summary              |       |       |       |                      |       |       |
| HCM Average Control Delay         |       | 24.5  |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      |       | 0.84  |       |                      |       |       |
| Actuated Cycle Length (s)         |       | 134.9 |       | Sum of lost time (s) |       | 15.0  |
| Intersection Capacity Utilization |       | 78.7% |       | ICU Level of Service |       | D     |
| Analysis Period (min)             |       | 15    |       |                      |       |       |
| c Critical Lane Group             |       |       |       |                      |       |       |



# HCM Signalized Intersection Capacity Analysis

9: Piikea & Piilani

5/4/2011

| Movement                          | EBL   | EBR  | NBL   | NBT                  | SBT   | SBR   |
|-----------------------------------|-------|------|-------|----------------------|-------|-------|
| Lane Configurations               | ↰     | ↱    | ↰     | ↕                    | ↕     | ↱     |
| Volume (vph)                      | 270   | 277  | 233   | 1605                 | 1456  | 374   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 2000  | 2000                 | 2000  | 2000  |
| Total Lost time (s)               | 5.0   | 5.0  | 5.0   | 5.0                  | 5.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 1.00 | 1.00  | 0.95                 | 0.95  | 1.00  |
| Frt                               | 1.00  | 0.85 | 1.00  | 1.00                 | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00 | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1770  | 1583 | 1863  | 3725                 | 3725  | 1667  |
| Flt Permitted                     | 0.95  | 1.00 | 0.95  | 1.00                 | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1770  | 1583 | 1863  | 3725                 | 3725  | 1667  |
| Peak-hour factor, PHF             | 0.89  | 0.89 | 0.95  | 0.95                 | 0.96  | 0.96  |
| Adj. Flow (vph)                   | 303   | 311  | 245   | 1689                 | 1517  | 390   |
| RTOR Reduction (vph)              | 0     | 244  | 0     | 0                    | 0     | 0     |
| Lane Group Flow (vph)             | 303   | 67   | 245   | 1689                 | 1517  | 390   |
| Turn Type                         | Perm  |      | Prot  | Free                 |       |       |
| Protected Phases                  | 4     |      | 5     | 2                    | 6     |       |
| Permitted Phases                  | 4     |      | Free  |                      |       |       |
| Actuated Green, G (s)             | 27.2  | 27.2 | 22.0  | 88.5                 | 61.5  | 125.7 |
| Effective Green, g (s)            | 27.2  | 27.2 | 22.0  | 88.5                 | 61.5  | 125.7 |
| Actuated g/C Ratio                | 0.22  | 0.22 | 0.18  | 0.70                 | 0.49  | 1.00  |
| Clearance Time (s)                | 5.0   | 5.0  | 5.0   | 5.0                  | 5.0   | 5.0   |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0   | 3.0                  | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 383   | 343  | 326   | 2623                 | 1822  | 1667  |
| v/s Ratio Prot                    | c0.17 |      | c0.13 | 0.45                 | c0.41 |       |
| v/s Ratio Perm                    | 0.04  |      | 0.23  |                      |       |       |
| v/c Ratio                         | 0.79  | 0.20 | 0.75  | 0.64                 | 0.83  | 0.23  |
| Uniform Delay, d1                 | 46.6  | 40.3 | 49.3  | 10.1                 | 27.7  | 0.0   |
| Progression Factor                | 1.00  | 1.00 | 1.00  | 1.00                 | 1.00  | 1.00  |
| Incremental Delay, d2             | 10.6  | 0.3  | 9.4   | 0.5                  | 3.4   | 0.3   |
| Delay (s)                         | 57.2  | 40.6 | 58.7  | 10.6                 | 31.1  | 0.3   |
| Level of Service                  | E     |      | E     | B                    | C     | A     |
| Approach Delay (s)                | 48.8  |      | 16.7  |                      | 24.8  |       |
| Approach LOS                      | D     |      | B     |                      | C     |       |
| Intersection Summary              |       |      |       |                      |       |       |
| HCM Average Control Delay         | 24.6  |      |       | HCM Level of Service |       | C     |
| HCM Volume to Capacity ratio      | 0.81  |      |       |                      |       |       |
| Actuated Cycle Length (s)         | 125.7 |      |       | Sum of lost time (s) |       | 15.0  |
| Intersection Capacity Utilization | 78.0% |      |       | ICU Level of Service |       | D     |
| Analysis Period (min)             | 15    |      |       |                      |       |       |
| c Critical Lane Group             |       |      |       |                      |       |       |

# HCM Unsignalized Intersection Capacity Analysis

13: Kulanihakai &

5/4/2011

| Movement                          | WBT  | WBR  | NBT   | NBR                  | SBT  | SBR  |
|-----------------------------------|------|------|-------|----------------------|------|------|
| Lane Configurations               | ↖    | ↗    | ↖     | ↗                    | ↖    | ↗    |
| Volume (veh/h)                    | 43   | 60   | 479   | 74                   | 21   | 369  |
| Sign Control                      | Stop |      | Free  |                      |      | Free |
| Grade                             | 0%   |      | 0%    |                      |      | 0%   |
| Peak Hour Factor                  | 0.83 | 0.83 | 0.93  | 0.93                 | 0.98 | 0.98 |
| Hourly flow rate (vph)            | 52   | 72   | 515   | 80                   | 21   | 377  |
| Pedestrians                       |      |      |       |                      |      |      |
| Lane Width (ft)                   |      |      |       |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |                      |      |      |
| Percent Blockage                  |      |      |       |                      |      |      |
| Right turn flare (veh)            |      |      |       |                      |      |      |
| Median type                       |      |      | None  |                      | None |      |
| Median storage (veh)              |      |      |       |                      |      |      |
| Upstream signal (ft)              |      |      |       |                      |      |      |
| pX, platoon unblocked             |      |      |       |                      |      |      |
| vC, conflicting volume            | 974  | 555  |       |                      | 595  |      |
| vC1, stage 1 conf vol             |      |      |       |                      |      |      |
| vC2, stage 2 conf vol             |      |      |       |                      |      |      |
| vCu, unblocked vol                | 974  | 555  |       |                      | 595  |      |
| tC, single (s)                    | 6.4  | 6.2  |       |                      | 4.1  |      |
| tC, 2 stage (s)                   |      |      |       |                      |      |      |
| tF (s)                            | 3.5  | 3.3  |       |                      | 2.2  |      |
| p0 queue free %                   | 81   | 86   |       |                      | 98   |      |
| cM capacity (veh/h)               | 273  | 531  |       |                      | 982  |      |
| Direction / Lane #                | WB 1 | WB 2 | NB 1  | NB 2                 | SB 1 | SB 2 |
| Volume Total                      | 52   | 72   | 595   | 21                   | 377  |      |
| Volume Left                       | 52   | 0    | 0     | 21                   | 0    |      |
| Volume Right                      | 0    | 72   | 80    | 0                    | 0    |      |
| cSH                               | 273  | 531  | 1700  | 982                  | 1700 |      |
| Volume to Capacity                | 0.19 | 0.14 | 0.35  | 0.02                 | 0.22 |      |
| Queue Length 95th (ft)            | 17   | 12   | 0     | 2                    | 0    |      |
| Control Delay (s)                 | 21.2 | 12.8 | 0.0   | 8.7                  | 0.0  |      |
| Lane LOS                          | C    | B    |       | A                    |      |      |
| Approach Delay (s)                | 16.3 |      | 0.0   | 0.5                  |      |      |
| Approach LOS                      | C    |      |       |                      |      |      |
| Intersection Summary              |      |      |       |                      |      |      |
| Average Delay                     |      |      | 2.0   |                      |      |      |
| Intersection Capacity Utilization |      |      | 40.1% | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |      | 15    |                      |      |      |



# HCM Unsignalized Intersection Capacity Analysis

13: Kulanihakoi &

5/4/2011

| Movement                          | WB1   | WB2  | NBT  | NBT  | SBL  | SBL                    |
|-----------------------------------|-------|------|------|------|------|------------------------|
| Lane Configurations               | ↰     | ↰    | ↰    | ↰    | ↰    | ↰                      |
| Volume (veh/h)                    | 56    | 27   | 636  | 59   | 23   | 510                    |
| Sign Control                      | Stop  |      | Free |      |      | Free                   |
| Grade                             | 0%    |      | 0%   |      |      | 0%                     |
| Peak Hour Factor                  | 0.78  | 0.78 | 0.96 | 0.84 | 0.84 | 0.84                   |
| Hourly flow rate (vph)            | 72    | 35   | 662  | 61   | 27   | 607                    |
| Pedestrians                       |       |      |      |      |      |                        |
| Lane Width (ft)                   |       |      |      |      |      |                        |
| Walking Speed (ft/s)              |       |      |      |      |      |                        |
| Percent Blockage                  |       |      |      |      |      |                        |
| Right turn flare (veh)            |       |      |      |      |      |                        |
| Median type                       |       |      | None |      | None |                        |
| Median storage (veh)              |       |      |      |      |      |                        |
| Upstream signal (ft)              |       |      |      |      |      |                        |
| pX, platoon unblocked             |       |      |      |      |      |                        |
| vC, conflicting volume            | 1355  | 693  |      |      | 724  |                        |
| vC1, stage 1 conf vol             |       |      |      |      |      |                        |
| vC2, stage 2 conf vol             |       |      |      |      |      |                        |
| vCu, unblocked vol                | 1355  | 693  |      |      | 724  |                        |
| tC, single (s)                    | *5.4  | *5.2 |      |      | 4.1  |                        |
| tC, 2 stage (s)                   |       |      |      |      |      |                        |
| tF (s)                            | *2.5  | *2.3 |      |      | 2.2  |                        |
| p0 queue free %                   | 75    | 95   |      |      | 97   |                        |
| cM capacity (veh/h)               | 282   | 712  |      |      | 879  |                        |
| Direction Lane                    | WB1   | WB2  | NBT  | SBL  | SBL  |                        |
| Volume Total                      | 72    | 35   | 724  | 27   | 607  |                        |
| Volume Left                       | 72    | 0    | 0    | 27   | 0    |                        |
| Volume Right                      | 0     | 35   | 61   | 0    | 0    |                        |
| cSH                               | 282   | 712  | 1700 | 879  | 1700 |                        |
| Volume to Capacity                | 0.25  | 0.05 | 0.43 | 0.03 | 0.36 |                        |
| Queue Length 95th (ft)            | 25    | 4    | 0    | 2    | 0    |                        |
| Control Delay (s)                 | 22.1  | 10.3 | 0.0  | 9.2  | 0.0  |                        |
| Lane LOS                          | C     | B    |      | A    |      |                        |
| Approach Delay (s)                | 18.2  |      | 0.0  | 0.4  |      |                        |
| Approach LOS                      | C     |      |      |      |      |                        |
| Intersection Summary              |       |      |      |      |      |                        |
| Average Delay                     | 1.5   |      |      |      |      |                        |
| Intersection Capacity Utilization | 47.1% |      |      |      |      | ICU Level of Service A |
| Analysis Period (min)             | 15    |      |      |      |      |                        |

\* User Entered Value

BEFORE THE LAND USE COMMISSION  
OF THE STATE OF HAWAI'I

In the Matter of the Petition of

DEPARTMENT OF EDUCATION,  
STATE OF HAWAI'I,

To Amend the Agricultural Land Use  
District Boundaries into the Urban Land  
Use District for Approximately 77.2 acres  
of land at Kihei, Maui, Hawai'i, Maui Tax  
Map Key Nos. 2-2-02: 81 and 83.

DOCKET NO. A11-794

CERTIFICATE OF SERVICE

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY THAT a copy of Supplemental Exhibit to Petitioner Department of Education, State of Hawaii's Motion to Amend the Land Use Commission's Findings of Fact, Conclusions of Law and Decision and Order Filed July 29, 2013; Exhibit "38"; was duly served via Electronic Mail upon the following at:

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Attorneys for State Office of Planning and Sustainable Development

DATED: Honolulu, Hawai'i, August 31, 2021.

/s/ Stuart N. Fujioka  
STUART N. FUJIOKA  
RYAN W. ROYLO  
MELISSA J. KOLONIE  
CARTER K. SIU  
Deputy Attorneys General

Attorneys for Petitioner  
DEPARTMENT OF EDUCATION,  
STATE OF HAWAII

Docket No. A11-794; In the Matter of the Petition of Department of Education, State of Hawai'i, before the Land Use Commission of the State of Hawai'i; SUPPLEMENTAL EXHIBIT TO PETITIONER DEPARTMENT OF EDUCATION, STATE OF HAWAII'S MOTION TO AMEND THE LAND USE COMMISSION'S FINDINGS OF FACT, CONCLUSIONS OF LAW AND DECISION AND ORDER FILED JULY 29, 2013; EXHIBIT "38"; CERTIFICATE OF SERVICE