VOLUME 4

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

PI'ILANI PROMENADE

APPENDICES M - N

Appendix M	Traffic Impact Analysis Report dated June 6, 2014
Appendix M-1	SSFM Traffic Impact Analysis Report Update dated December 20, 2016
Appendix N	Conditions of Motion to Amend with Proposed Changes

June 2017

~~August 2014~~

CHRIS HART & PARTNERS, INC.

APPENDIX M

Traffic Impact Analysis Report dated June 6, 2014

TRAFFIC IMPACT ANALYSIS REPORT FOR

PIILANI PROMENADE

IN KIHEI, MAUI, HAWAII

Prepared For

SAROFIM REALTY ADVISORS
8115 Preston Road, Suite 400
Dallas, Texas 75225

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street
Kaneohe, Hawai'I 96744
Tel: 808-239-8206 Fax: 808-239-4175
Email: prowell@hawaii.rr.com

June 6, 2014

TABLE OF CONTENTS

1. INTRODUCTION . . . . . Page 1
   - Project Location and Description . . . . . Page 1
   - Study Methodology . . . . . Page 2
   - Study Area . . . . . Page 3
   - Order of Presentation . . . . . Page 4

2. ANALYSIS OF EXISTING CONDITIONS . . . . . Page 5
   - Existing Streets and Intersection Controls . . . . . Page 5
   - Existing Peak Hour Traffic Volumes . . . . . Page 8
   - Level-of-Service Concept . . . . . Page 9
   - Methodology for Level-of-Service Analysis . . . . . Page 10
   - 2013 Levels-of-Service Analysis . . . . . Page 10
   - Existing Deficiencies . . . . . Page 13

3. PROJECTED BACKGROUND TRAFFIC CONDITIONS . . . . . Page 14
   - Design Year for Traffic Forecasts . . . . . Page 14
   - Background Traffic Growth . . . . . Page 15
   - Related Projects . . . . . Page 15
   - 2018 Background Traffic Projections . . . . . Page 17
   - 2018 Background Levels-of-Service . . . . . Page 17
   - Mitigation Required for 2018 Background Conditions . . . . . Page 20

4. PROJECT-RELATED TRAFFIC CONDITIONS . . . . . Page 23
   - Methodology . . . . . Page 23
   - Trip Generation of Proposed Development . . . . . Page 23
   - Trip Distribution and Assignments . . . . . Page 26
   - 2018 Background Plus Project Projections . . . . . Page 27
   - Honua'ula Affordable Housing Project Traffic . . . . . Page 27

5. TRAFFIC IMPACT ANALYSIS . . . . . Page 29
   - Changes in Total Intersection Volumes . . . . . Page 29
   - 2018 Background Plus Project Level-of-Service Analysis . . . . . Page 31
   - Project Driveways . . . . . Page 34
   - Mitigation Measures . . . . . Page 34
   - Roundabout Analysis . . . . . Page 37
   - Impacts of Pedestrians . . . . . Page 37

6. TRAFFIC IMPACTS OF HONUA'ULA DEVELOPMENT . . . . . Page 38
   - 2018 Background Plus Project Plus Honua'ula Level-of-Service Analysis . . . . . Page 38
   - Project Driveways Along Kaonoulu Street With Honua'ula . . . . . Page 42
   - Mitigation Measures . . . . . Page 42

7. LONG-RANGE FORECASTS . . . . . Page 43
   - Methodology . . . . . Page 43

8. INTERSECTION DESIGN REQUIREMENTS . . . . . Page 48
   - Left Turn Storage Lane Requirements Without Upcountry Highway . . . . . Page 49
   - Left Turn Storage Lane Requirements With Upcountry Highway . . . . . Page 50

9. TRANSPORTATION MANAGEMENT PLAN . . . . . Page 51
   - Purpose and Approach of the Transportation Management Plan . . . . . Page 51
   - Transportation Management Plan Strategies . . . . . Page 51

FIGURES

LIST OF FIGURES

Figure 1	Project Location in Kihei
Figure 2	Site Plan
Figure 3	Schematic Drawing Indicating Approximate Locations of Project Driveways
Figure 4	Existing Lane Configurations and Right-of-Way Controls
Figure 5	Existing (2013) AM Peak Hour Traffic Volumes
Figure 6	Existing (2013) PM Peak Hour Traffic Volumes
Figure 7	Existing (2013) Saturday Peak Hour Traffic Volumes
Figure 8	Locations of Related Projects
Figure 9	2018 Background AM Peak Hour Traffic Projections
Figure 10	2018 Background PM Peak Hour Traffic Projections
Figure 11	2018 Background Saturday Peak Hour Traffic Projections
Figure 12	2018 Background Lane Configurations and Right-of-Way Controls
Figure 13	2018 Background Lane Configurations and Right-of-Way Controls With Mitigation
Figure 14	2018 Lane Configurations and Right-of-Way Controls With Project
Figure 15	AM Peak Hour Project Trip Assignments
Figure 16	PM Peak Hour Project Trip Assignments
Figure 17	Saturday Peak Hour Project Trip Assignments
Figure 18	Background (2018) Plus Project AM Peak Hour Traffic Projections
Figure 19	Background (2018) Plus Project PM Peak Hour Traffic Projections
Figure 20	Background (2018) Plus Project Saturday Peak Hour Traffic Projections
Figure 21	Background (2018) Plus Project Peak Hour Traffic Projections Along Kaonoulu Street
Figure 22	AM Peak Hour Honua'ula Trip Assignments
Figure 23	PM Peak Hour Honua'ula Trip Assignments
Figure 24	Saturday Peak Hour Honua'ula Trip Assignments
Figure 25	Honua'ula Trip Assignments Along Kaonoulu Street
Figure 26	Piilani Promenade Plus Honua'ula AM Peak Hour Traffic Projections
Figure 27	Piilani Promenade Plus Honua'ula PM Peak Hour Traffic Projections
Figure 28	Piilani Promenade Plus Honua'ula Saturday Peak Hour Traffic Projections
Figure 29	Piilani Promenade Plus Honua'ula Peak Hour Traffic Projections Along Kaonoulu Street
Figure 30	2025 Background Plus Project AM Peak Hour Traffic Projections
Figure 31	2025 Background Plus Project PM Peak Hour Traffic Projections
Figure 32	2025 Background Plus Project Saturday Peak Hour Traffic Projections
Figure 33	Schematic Drawing of East Kaonoulu Street

LIST OF TABLES

Table 1 Study Intersections . . . . . Page 4
Table 2 Level-of-Service Definitions for Signalized Intersections . . . . . Page 9
Table 3 Level-of-Service Definitions for Unsignalized Intersections . . . . . Page 10
Table 4 2013 Levels-of-Service of Signalized Intersections . . . . . Page 11
Table 5 2013 Levels-of-Service of Unsignalized Intersections . . . . . Page 12
Table 6 Trip Generation Summary of Related Projects . . . . . Page 17
Table 7 2018 Background Levels-of-Service of Signalized Intersections . . . . . Page 19
Table 8 2018 Background Levels-of-Service of Unsignalized Intersections . . . . . Page 20
Table 9 Mitigation Analysis - Background Conditions . . . . . Page 22
Table 10 Trip Generation Formulas for Retail Uses . . . . . Page 24
Table 11 Formulas For Pass By Trips . . . . . Page 24
Table 12 Trip Generation Rates for Outdoor Garden Uses . . . . . Page 24
Table 13 Trip Generation Formulas for Light Industrial Uses . . . . . Page 25
Table 14 Trip Generation Formulas for Apartments . . . . . Page 25
Table 15 Summary of Trip Generation Analysis . . . . . Page 25
Table 16 Trip Generation Analysis for Honua'ula . . . . . Page 28
Table 17 Analysis of Project's Share of Total Intersection Approach Volumes . . . . . Page 30
Table 18 2018 Background Plus Project Levels-of-Service - Signalized Intersections . . . . . Page 32
Table 19 2018 Background Plus Project Levels-of-Service - Unsignalized Intersections . . . Page 34
Table 20 2018 Levels-of-Service of Project Driveways . . . . . Page 35
Table 21 Summary of Recommended Mitigation Measures Conditions . . . . . Page 36
Table 22 Roundabout Analysis of Piilani Highway at Kaonoulu Street . . . . . Page 37
Table 23 2018 Background Plus Project Plus Honuaula Levels-of-Service - Signalized Intersections . . . . . Page 39
Table 24 2018 Background Plus Project Plus Honua'ula Levels-of-Service - Unsignalized Intersections . . . . . Page 41
Table 25 2018 Levels-of-Service of Project Driveways . . . . . Page 42
Table 26 2025 Levels-of-Service - Signalized Intersections . . . . . Page 45
Table 27 2025 Levels-of-Service of Unsignalized Intersections . . . . . Page 47
Table 28 Left Turn Storage Lane Requirements Without Upcountry Highway . . . . . Page 49
Table 29 Left Turn Storage Lane Requirements With Upcountry Highway . . . . . Page 50
Table 30 Comparison of Left Turn Storage Lane Requirements Without versus With Upcountry Highway . . . . . Page 50

1. INTRODUCTION

Phillip Rowell and Associates has been retained to update the Traffic Impact Analysis Report for the proposed Piilani Promenade project in Kihei, Maui, Hawaii. This introductory chapter discusses the location of the project, the proposed development, and the study methodology.

Project Location and Description

The following is a summary of the project:

1. The project is located along the mauka (east) side of Piilani Highway opposite Kaonoulu Street in the Kihei area of Maui. Figure 1 indicates the approximate location in the Kihei area.

2. A preliminary site plan indicating the approximate locations of buildings and driveways is provided as Figure 2.

3. Primary access to and egress from the project will be provided by extension of Kaonoulu Street mauka of Piilani Highway. This extension is referred to as East Kaonoulu Street. Initially, this extension will be through the project only. In the future, this road will be extended to Haleakala Highway at Haliiemaile Road, providing a connection between Kihei and Upcountry (Upcountry Highway).

4. There will be four (4) driveways along East Kaonoulu Street to serve the project. Refer to Figure 3.

    a. Drive A is the major access and egress driveway. This driveway is located

approximately 600 feet east of Piilani Highway. This will be a full access, signalized intersection.

b. Drive B is located approximately midway between Piilani Highway and Drive A. Drive B provides for right turns only into and out of the north parcel and the south parcel. This intersection is unsignalized.

c. Drive C is located approximately 500 feet east of Drive A. This driveway provides service to the south parcel and future affordable housing units (Honua'ula Off-site Affordable Housing) to be located along the north side of East Kaonoulu Street and east of the North Parcel. All movements will be allowed and the intersection will be unsignalized.

d. Drive D is located approximately 300 feet east of Drive C near the eastern property line of the project. This driveway is behind the last building and will most likely be used be service and employee vehicles. Anticipated use of this driveway is minimal.

4. The extension of Kaonoulu Street will divide the project into two parcels. The north parcel will consist of approximately 100,000 square feet of business commercial, approximately 226 rental apartment units and approximately 5 acres of light industrial uses. The south parcel will consist of approximately 430,000 square feet of business commercial.

5. It is understood that the objective of this project is to provide services for the tourist and residents of the Kihei area and that marketing efforts will be directed toward the South Maui area.

6. The intersection of Piilani Highway at Kaonoulu Street will be signalized and improved to accommodate additional left turn lanes, acceleration lanes and deceleration lanes. This study will determine the final lane configuration.

7.

8. Estimated completion date for the project is 2018. The year 2018 is used as the design year to be consistent with other projects in the area and Institute of Transportation Engineers guidelines.

Study Methodology

The following is a summary list of the tasks performed:

1. State of Hawaii Department of Transportation officials were contacted to confirm the study area and the scope of work.

2. A field reconnaissance was performed to identify existing roadway cross-sections, intersection lane configurations, traffic control devices, and surrounding land uses.

3. Existing weekday and Saturday peak hour traffic volumes were obtained for the study intersections. Existing levels-of-service of the study intersections were determined using the methodology described in the *2000 Highway Capacity Manual*.

4. Existing traffic operating deficiencies were identified. Improvements to mitigate these deficiencies were identified and assessed.

5. A list of related development projects within and adjacent to the study area that will impact traffic conditions at the study intersections was compiled. This list included both development projects and anticipated highway improvement projects.

6. Future background traffic volumes at the study intersections without traffic generated by the study project were estimated. Intersections that are not expected to operate at acceptable levels-of-service were identified. Mitigation measures were identified and assessed.

7. Peak hour traffic that the proposed project will generate was estimated using trip generation analysis procedures recommended by the Institute of Transportation Engineers. Project generated traffic was distributed and assigned to the adjacent roadway network.

8. A level-of-service analysis for future traffic conditions with traffic generated by the study project was performed.

9. The impacts of traffic generated by the proposed project at the study intersections was quantified and summarized. Locations that project generated traffic significantly impacts traffic operating conditions were identified.

10. Improvements or modifications necessary to mitigate the traffic impacts of the project and to provide adequate access to and egress from the site were identified and analyzed.

11. Based on discussions with State of Hawaii Department of Transportation, it was concluded that construction of the Upcountry Highway is not likely until after 2018, the design year for this project. To insure that the intersection of Piilani Highway at Kaonoulu Street is designed to accommodate additional traffic associated with the extension of East Kaonoulu Street, a separate analysis of this intersection was performed to determine the ultimate intersection configuration.

12. A report documenting the conclusions of the analyses performed and recommendations was prepared.

Study Area

The study area for this study is consistent with the study area used in the preparation of traffic studies for other projects in the area. The study intersections are listed in Table 1.

Table 1 Study Intersections

Number	Intersection	Jurisdiction	Existing Right-of-Way Control
1	Piilani Highway at Ohukai Road	State	Signals
2	Piilani Highway at Kaiwahine Street & Uwapo Road	State	Signals
3	Piilani Highway at Mokulele Highway & North Kihei Road	State	Signals
4	North Kihei Road at South Kihei Road	State	Signals
5	Piilani Highway at Piikea Avenue	State	Signals
6	Piilani Highway at Kaonoulu Street	State	Stop Sign
7	Kaonoulu Street at South Kihei Road	County	Stop Sign
8	Piilani Highway at Kulanihakoi Street	State	Stop Sign
9	Kaonoulu Street at Kenolio Road	County	Stop Sign
10	Kaonoulu Street at Alulike Street	County	Stop Sign

Order of Presentation

Chapter 2 describes existing traffic conditions, the Level-of-Service (LOS) concept and the results of the Level-of-Service analysis of existing conditions.

Chapter 3 describes the process used to estimate 2018 background traffic volumes and the resulting background traffic projections. Background conditions are defined as future background traffic conditions without traffic generation by the study project.

Chapter 4 describes the methodology used to estimate the traffic characteristics of the proposed project, including 2018 background plus project traffic projections.

Chapter 5 describes the traffic impacts of the proposed project, conclusions of the impact analysis and recommended mitigation measures.

Chapter 6 describes the impacts of the Honua'ula Off-Site Affordable Housing project at the study intersections.

Chapter 7 describes the long range traffic projections along Piilani Highway.

Chapter 8 describes the design requirements of the intersection of Piilani Highway at Kaonoulu Street and Kaonoulu Street between Piilani Highway and the east end of the project.

Chapter 9 summarizes the recommended traffic management strategies for the proposed project.

2. ANALYSIS OF EXISTING CONDITIONS

This chapter presents the existing traffic conditions on the roadways adjacent to the proposed project. The level-of-service (LOS) concept and the results of the LOS analysis for existing conditions are also presented. The purpose of this analysis is to identify existing deficiencies and to establish the base conditions for the determination of the impacts of the project which are described in a subsequent chapter.

Existing Streets and Intersection Controls

The primary streets and roadways serving the project are Piilani Highway, South Kihei Road and Kaonoulu Street. These streets and the lane configurations of the study intersections are shown as Figure 4. Also shown are the methods of right-of-way control at the study intersections.

Piilani Highway is a four-lane, undivided highway with a north-south orientation connecting Mokulele Highway to the north with the Wailea Resort to the south. The posted speed limit is 40 miles per hour south of Ohukai Road and 45 miles per hour north of Ohukai Road.

Ohukai Road is a basically a two-lane, two-way street, but widens to provide two approach lanes as it approaches Piilani Highway. The posted speed limit is 20 miles per hour. Both the eastbound and westbound approaches provide a through and left turn lane and a separate right turn lane. The eastbound and westbound approaches move concurrently, which means that left turns are permitted rather than protected.

Kaonoulu Street currently connects Piilani Highway with South Kihei Road. Currently, it is a two-lane, two-way street with separate left turn lanes at intersections. The posted speed limit is 20 miles per hour. The intersection with Piilani Highway is currently an unsignalized, T-intersection.

Kaiwahine Street is a two-lane, two-way residential collector street connecting the project with Piilani Highway. The posted speed limit is 20 miles per hour. Residential parking is allowed along both sides of the street.

Uwapo Road is an extension of Kaiwahine Street west of Piilani Highway to South Kihei Road. Uwapo Road is a two-lane, two-way roadway. There is no development along the north side and there are multi-family residential unit along the south side. No parking is allowed along either side. The assumed speed limit is 20 miles per hour.

Study Intersections

The study intersections were selected in consultation with State of Hawaii Department of Transportation. Generally, there are no signalized intersections north of North Kihei Road or west of South Kihei Road for several miles. The intersection of Piilani Highway at Piikea Avenue is the southernmost intersection and is approximately 1.25 miles from the project. Most of the project generated traffic has dissipated before reaching this intersection.

The intersection of Piilani Highway at Ohukai Road is located approximately 2,950 feet north of Kaonoulu Street. The intersection is a four-legged signalized intersection. The northbound and southbound approaches are Piilani Highway and the eastbound and westbound approaches are Ohukai Road. There are separate left turn lanes and separate right turn lanes along the northbound and southbound approaches of Piilani Highway. Left turns are protected. The eastbound and westbound approaches each have an optional left turn or through lane and a separate right turn lane. The eastbound and westbound approaches are split.

The intersection of Piilani Highway at Kaiwahine Street and Uwapo Road is located approximately 1,290 feet north of Ohukai Road along Piilani Highway. The intersection is a four-legged signalized intersection. The northbound and southbound approaches are Piilani Highway, the eastbound approach is Uwapo Road and the westbound approach is Kaiwahine Street. There are separate left turn lanes and separate right turn lanes along the northbound and southbound approaches of Piilani Highway. Left turns are protected. The eastbound and westbound approaches each have an optional left turn or through lane and a separate right turn lane. The eastbound and westbound left turns are permitted.

The intersection of Piilani Highway at North Kihei Road is located approximately 2,175 feet north

of Uwapo Road along Piilani Highway. The intersection is a four-legged signalized intersection. The northbound approach is Piilani Highway, the southbound approach is Mokulele Highway and the eastbound and westbound approaches are North Kihei Road. The northbound approach has two left turn lanes, one through lane and an optional through or right turn lane. The southbound approach has one left turn lane, two through lanes and one right turn lane. The northbound and southbound left turns are protected. The eastbound approach has one left turn lane, an optional left turn or through lane and two right turn lanes. Right turns are allowed on right turn green arrows only. The westbound approach is one lane only.

The intersection of North Kihei Road at South Kihei Road is located approximately 1,500 feet west of Piilani Highway along North Kihei Road. The intersection is a three-legged signalized intersection. The northbound approach is South Kihei Road. The eastbound and westbound approaches are North Kihei Road. The northbound approach has two left turn lanes and one right turn lane. The eastbound approach has one through lane and one right turn lane. The westbound approach has one left turn lane and two through lanes. The westbound left turns are protected.

The intersection of Piilani Highway at Kaonoulu Street is a three-legged unsignalized intersection. The northbound and southbound approaches are Piilani Highway and the eastbound approach is Kaonoulu Street. The northbound approach has one left turn lane and two through lanes. The eastbound approach is the STOP signed controlled approach and has one left turn lane and one right lane. The right turn is channelized.

The intersection of Piilani Highway at Kulanihakoi Road is located approximately 2,100 feet south of Kaonoulu Street along Piilani Highway. The intersection is a three-legged unsignalized intersection. The northbound and southbound approaches are Piilani Highway. The northbound approach has one left turn lane and two through lanes. The southbound approach has two through lanes and one right turn lane. The eastbound approach is Kulanihakoi Road and is the STOP sign controlled approach. The Kulanihakoi Road approach has one left turn lane and one right turn lane. The eastbound to southbound right turns are channelized.

The intersection of Piilani Highway at Piikea Avenue is located approximately 3,850 feet south of Kulanihakoi Road. The intersection is a three legged signalized intersection. The northbound and southbound approaches are Piilani Highway and the eastbound approach is Piikea Avenue. The northbound approach as one left turn lane and two through lanes. The northbound left turns are protected. The southbound approach has two through lanes and one right turn lane. The eastbound approach has one left turn lane and one right turn lane.

The intersection of South Kihei Road at Kaonoulu Street is located approximately 3,230 along Kaonoulu Street west of Piilani Highway. The intersection is a three legged, STOP sign controlled intersection. The northbound and southbound approaches are South Kihei Road. The northbound approach has one optional through or right turn lane. The southbound approach has one optional left turn or through lane. The westbound approach is Kaonoulu Street and is the controlled approach. The westbound approach has one left turn lane and one right turn lane.

The intersection of Kaonoulu Street at Kenolio Road is located approximately 500 feet along Kaonoulu Street west of Piilani Highway. The intersection is a four legged STOP sign controlled intersection. The eastbound and westbound approaches are Kaonoulu Street and the northbound and southbound approaches are Kenolio Road. The northbound and southbound approaches are the controlled approaches. Each approach has a left turn lane and an optional through or right turn

lane.

The intersection of Kaonoulu Street at Alulike Street is located approximately 830 feet west of Kenolio Street. The intersection is a four legged STOP sign controlled intersection. The eastbound and westbound approaches each have one left turn lane and an optional through or right turn lane. The northbound and southbound approaches are the controlled approaches and has one left turn, through or right turn lane.

Existing Peak Hour Traffic Volumes

The existing peak hour traffic volumes are shown in Figures 5, 6 and 7.

1. The traffic counts were performed during May 2013. The intersection of Piilani Highway at Piikea Avenue was added to the study area in response to comments from State of Hawaii Department of Transportation. These counts were performed in October 2013.

2. The traffic counts include buses, trucks, motorcycles, mopeds and other large vehicles. Bicycles and pedestrians were not counted.

3. The weekday traffic counts were performed between 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM on either a Tuesday or Thursday. Several of the intersections were recounted and the recounts were performed on other days because of scheduling or unusual traffic conditions in or adjacent to the intersection. Counts that were performed on days other than Tuesday or Thursday were compared to counts of adjacent intersections to confirm consistency. If the counts were inconsistent, the intersection was recounted again.

4. Saturday traffic counts were performed from 10:00 AM to 2:00 PM with the exceptions of the intersections of North Kihei Road at South Kihei Road, Kaonoulu Street at Kenolio Road and Kaonoulu Street at Alulike Street. The intersections were counted for a shorter time period as determined from counts of adjacent intersections.

5. The traffic volumes shown are the peak hourly volume of the total intersection. The traffic volumes of adjacent intersections may not match the volumes shown for an adjacent intersection because the peak hours of the adjacent intersections may not coincide and there are driveways between the intersections.

6. Pedestrian activity was negligible at the study intersections during the traffic counts.

The traffic count summary worksheets are provided as Appendix A.

Level-of-Service Concept

Signalized Intersections

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 2. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.[1]

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 2 Level-of-Service Definitions for Signalized Intersections(1)

Level of Service	Interpretation	Volume-to-Capacity Ratio(2)	Stopped Delay (Seconds)
A	Uncongested operations; all vehicles clear in a single cycle.	0.000 - 0.700	< 10.0
B			10.1 - 20.0
C	Light congestion; occasional backups on critical approaches	0.701 - 0.800	20.1 - 35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801 - 0.900	35.1 - 55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901 - 1.000	55.1 - 80.0
F	Total breakdown with stop-and-go operation	> 1.001	> 80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

[1] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development*, Washington, D.C., 2006, page 56 - 60

Unsignalized Intersections

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 3 summarizes the definitions for level-of-service and the corresponding delay.

Table 3 Level-of-Service Definitions for Unsignalized Intersections(1)

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

Methodology for Level-of-Service Analysis

1. Synchro 6 was used to analyze the study intersections, which is based on the *Highway Capacity Manual*.

2. The *Highway Capacity Manual* methodology does not report a volume-to-capacity ratio for unsignalized intersections or results for the overall unsignalized intersection. Synchro 6 reports an overall delay for unsignalized intersections. This overall intersection delay and the corresponding level-of-service from the table above is shown in the following tables for unsignalized intersections.

3. As the *Highway Capacity Manual* defines level-of-service by delay, we have used the same definitions.

2013 Levels-of-Service Analysis

The existing levels-of-service of the signalized study intersections are summarized in Table 4. The results shown in the table are the volume-to-capacity ratios, delays and levels-of-service of the overall intersections as reported by the *Highway Capacity Software*.

Table 4 2013 Levels-of-Service of Signalized Intersections

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
Intersection and Lane Group	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Highway at Ohukai Road	***0.95***	***46.7***	***D***	***0.87***	***50.3***	***D***	***0.88***	***29.7***	***C***
Eastbound Left & Thru	0.88	80.6	F	0.97	122.0	F	0.85	50.1	D
astbound Right	0.08	46.8	D	0.06	60.4	E	0.11	26.6	C
Westbound Left & Thru	**1.05**	**116.6**	**F**	**0.91**	**84.4**	**F**	**0.71**	**37.9**	**D**
Westbound Right	0.13	44.4	D	0.12	49.4	D	0.03	26.7	C
Northbound Left	0.36	61.1	E	0.70	67.9	E	0.60	40.8	D
Northbound Thru	0.86	31.7	C	0.87	47.5	D	0.92	32.5	C
Northbound Right	0.04	13.0	B	0.08	30.4	C	0.10	15.2	B
Southbound Left	0.91	100.0	F	0.71	90.1	F	0.68	40.9	D
Southbound Thru	0.97	37.3	D	0.85	33.6	C	0.82	23.4	C
Southbound Right	0.06	2.6	A	0.08	7.4	A	0.05	12.9	B
Piilani Highway at Kaiwahine Street	***0.69***	***32.0***	***C***	***0.64***	***33.3***	***C***	***0.55***	***10.4***	***B***
Eastbound Left & Thru	0.87	77.6	E	0.82	93.9	F	0.55	30.0	C
Eastbound Right	0.11	41.4	D	0.06	58.0	E	0.05	24.2	C
Westbound Left & Thru	0.61	52.2	D	0.51	63.5	E	0.43	27.4	C
Westbound Right	0.06	40.9	D	0.04	57.8	E	0.03	24.1	C
Northbound Left	0.28	31.8	C	0.50	57.2	E	0.49	30.5	C
Northbound Thru	0.64	30.3	C	0.61	32.6	C	0.51	7.5	A
Northbound Right	0.04	42.6	D	0.07	36.3	D	0.03	5.1	A
Southbound Left	0.38	45.1	D	0.60	51.4	D	0.55	30.9	C
Southbound Thru	0.57	23.1	C	0.54	22.2	C	0.59	7.7	A
Southbound Right	0.02	12.9	B	0.05	26.9	C	0.05	4.7	A
Piilani Highway at North Kihei Road	***0.66***	***30.5***	***C***	***0.86***	***48.0***	***D***	***0.58***	***16.6***	***B***
Eastbound Left	0.70	70.8	E	0.82	65.4	E	0.55	31.2	C
Eastbound Left & Thru	0.72	72.0	E	0.86	71.2	E	0.55	31.0	C
Eastbound Right	0.22	26.7	C	0.09	134.3	F	0.15	15.2	B
Westbound Left, Thru & Right	0.31	60.0	E	0.84	83.6	F	0.06	32.4	C
Northbound Left	0.71	41.2	D	0.89	77.4	E	0.55	27.0	C
Northbound Thru & Right	0.54	19.2	B	0.61	15.3	B	0.45	8.3	A
Southbound Left	0.73	172.3	F	0.57	86.1	F	0.60	62.4	E
Southbound Thru	0.66	27.0	C	0.82	41.6	D	0.70	17.9	B
Southbound Right	0.08	18.1	B	0.18	25.7	C	0.11	12.0	B
North Kihei Road at South Kihei Road	***0.39***	***19.5***	***B***	***0.53***	***22.4***	***C***	***0.51***	***10.4***	***B***
Eastbound Thru	0.27	9.7	A	0.54	29.3	C	0.39	9.9	A
Eastbound Right	0.14	8.6	A	0.30	24.5	C	0.20	8.7	A
Westbound Left	0.59	57.3	E	0.58	25.4	C	0.70	26.6	C
Westbound Thru	0.17	1.3	A	0.16	3.7	A	0.13	3.3	A
Northbound Left	0.75	54.2	D	0.32	44.2	D	0.47	16.7	B
Northbound Right	0.13	0.0	A	0.12	0.0	A	0.11	0.0	A
Piilani Highway at Piikea Avenue	***0.71***	***19.2***	***B***	***0.98***	***19.8***	***B***	***0.73***	***16.3***	***B***
Eastbound Left	0.87	71.2	E	0.99	113.8	F	0.76	29.4	C
Eastbound Right	0.51	47.4	D	0.66	71.8	E	0.17	18.5	B
Northbound left	0.67	27.9	C	0.96	57.8	E	0.74	32.7	C
Northbound Thru	0.41	6.0	A	0.54	6.7	A	0.45	6.4	A
Southbound Thru	0.60	12.0	B	0.46	1.7	A	0.71	18.7	B
Southbound Right	0.25	31.3	C	0.25	0.8	A	0.24	13.4	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix B for Level-of-Service Analysis Worksheets.

The results of the Level-of-Service analysis of the unsignalized study intersections are summarized

in Table 5. The methodology for unsignalized intersections does not calculate the volume-to-capacity ratio of the controlled movements or the overall intersection. Shown in the table are the average vehicle delays and levels-of-service of the controlled movements and the weighted delay and corresponding level-of-service of the overall intersection. The weighted delays consider traffic using the uncontrolled lane groups, which has no delay because these movements do not stop or yield, and therefore indicate a lower delay than the controlled movements, even though the controlled movement may have a delay implying Level-of-Service E to F.

Table 5 2013 Levels-of-Service of Unsignalized Intersections

	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
Intersection and Lane Group	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS
Piilani Highway at Kaonoulu Street	***11.5***	***B***	***1.8***	***A***	***1.7***	***A***
Eastbound Left	72.3	F	36.0	E	24.0	C
Eastbound Right	122.6	F	24.2	C	15.6	C
Northbound Left	20.7	C	16.9	C	12.4	B
South Kihei Road at Kaonoulu Street	***2.7***	***A***	***2.9***	***A***	***3.2***	***A***
Westbound Left	29.6	D	42.7	E	32.7	D
Westbound Right	13.5	B	12.8	B	12.5	B
Southbound Left	0.6	A	1.9	A	0.6	A
Piilani Highway at Kulanihakoi Street	***5.0***	***A***	***2.0***	***A***	***1.4***	***A***
Eastbound Left	159.2	0	62.5	F	23.7	C
Eastbound Right	44.2	E	24.0	C	15.0	C
Northbound Left	24.4	C	19.3	C	11.8	B
Kaonoulu Street at Kenolio Road	***7.5***	***A***	***5.4***	***A***	***5.7***	***A***
Eastbound Left	7.5	A	7.6	A	7.5	A
Westbound Left	7.4	A	7.5	A	7.4	A
Northbound Left	0.0	A	0.0	A	0.0	A
Northbound Thru & Right	9.1	A	10.0	B	9.6	A
Southbound Left	14.5	B	14.4	B	12.2	B
Southbound Thru & Right	9.1	A	10.2	B	9.1	A
Kaonoulu Street at Alulike Street	***3.8***	***A***	***3.4***	***A***	***5.0***	***A***
Eastbound Left	7.4	A	7.5	A	7.5	A
Westbound Left	7.4	A	7.5	A	7.5	A
Northbound Left, Thru & Right	10.2	B	11.3	A	10.9	B
Southbound Left, Thru & Right	9.0	A	9.5	A	10.2	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix B for Level-of-Service Analysis Worksheets.

Existing Deficiencies

For signalized intersections, Level-of-Service D is the minimum acceptable Level-of-Service[2] and that this standard is applicable to the overall intersection and major through movements. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better. All volume-to-capacity ratios must be 1.00 or less[3].

A standard has not been established for unsignalized intersections that has been agreed to by State of Hawaii Department of Transportation. Therefore, we have used a standard that Level-of-Service D is an acceptable level-of-service for major controlled lane groups, such as left turns from a major street to a minor street. Side street approaches may operate at Level-of-Service E or F for short periods of time. This is determined from the delays of the individual lane groups. If the delay of any of the side street approaches appears to be so long that it will affect the overall level-of-service of the intersection, then mitigation measures should be accessed.

Using this standard, the following deficiencies were identified:

At the intersection of Piilani Highway at Ohukai Road, the westbound left and through lane group operates at Level-of-Service F during the morning peak hour. The volume-to-capacity ratio is 1.05 and the average vehicle delay is 116.6. This lane group operates at Level-of-Service F during the afternoon peak hour and Level-of-Service D during the Saturday peak hour, but the volume-to-capacity ratio is less than 1.00.

[2] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60.

[3] Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2000, p. 16-35.

3. PROJECTED BACKGROUND TRAFFIC CONDITIONS

The purpose of this chapter is to discuss anticipated 2018 background conditions without project generated traffic. Background traffic conditions are defined as future traffic projections without traffic generated by the proposed project, Piilani Promenade.

Future traffic projections without project generated traffic are first estimated. Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. This growth also considers traffic associated with minor, or small, projects for which no traffic data, or traffic study, are available. The second component is estimated traffic that will be generated by other major development projects in the vicinity of the proposed project. Included in the assessment of future background conditions are roadway improvements that are part of the related projects.

A level-of-service of future (2018) background traffic conditions is then performed and any deficiencies identified.

Design Year for Traffic Forecasts

The design, or horizon, year of a project is the future year for which background traffic conditions are estimated. The design year is typically several years after completion of the study project or the anticipated year of100% occupancy. The year 2018 is used in this study to be compatible with the traffic studies for other major projects within and adjacent to the study area. It is also anticipated that the project will be 100%, or near, occupancy by 2018.

Background Traffic Growth

The *Maui Long Range Transportation Plan*[4] concluded that traffic in Maui would increase an average of 1.6% per year from 1990 to 2020. This growth rate was used to estimate the background growth between 2013 and 2018, which is the design year for this project. The growth factor was calculated using the following formula:

$$F = (1 + i)^n$$

where F = Growth Factor
i = Average annual growth rate, or 0.016
n = Growth period, or 5 years

It should be noted that some traffic studies for projects in Kihei have used a growth factor of 2.0% rather that 1.6% used in the study. We have checked with the other consultants and verified that this is the result of rounding.

This growth factor was applied to the northbound and southbound through traffic movements at the study intersections along Piilani Highway and South Kihei Road. All increases of turning movement traffic volumes and side street approach volumes will be the result of traffic generated by related projects, not the result of regional traffic growth.

Related Projects

The second component in estimating background traffic volumes is traffic resulting from other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction and would significantly impact traffic in the study area. Related projects may be development projects or roadway improvements. The following related projects were identified.

A. Kaiwahine Village

The proposed Kaiwahine Subdivision is located at the east end of Kaiwahine Drive and will consist of 120 multi-family units. This project received an approval for affordable housing but no permits have been filed with the County of Maui for development of this parcel. Timing of this project is uncertain.

The traffic assignments for the subdivision were obtained from the traffic study for the project[5].

B. Maui Lu Resort

Maui Lu Resort is located in the northeast quadrant of the intersection of South Kihei Road at Kaonoulu Street. The existing resort will be demolished and a 400 unit timeshare will be constructed. Each timeshare unit will have one lock off unit which may be used as a separate hotel room. As part of the Maui Lu project, the intersection of South Kihei Road at Kaonoulu Street will

[4] Kaku Associates, *Maui Long Range Land Transportation Plan*, October 1996

[5] Phillip Rowell and Associates, *TIAR for Kaiwahine Village*, July 15, 2010

be signalized. A separate southbound to eastbound left turn lane will also be constructed. The intersection of Kaonoulu Street at Alulike Street will be converted to a roundabout.

Groundbreaking is scheduled for late 2014 or early 2015. The project may not be completed by 2018, the horizon year for this TIAR, but the project will be generating a majority of its estimated traffic. Therefore, the project is included as a related project.

The traffic assignments for the project were obtained from the traffic study for the project[6].

C. Kihei High School

The proposed Kihei High School will be located along the east side of Piilani Highway across from the Piilani Subdivision. According to the Environmental Impact Statement, the school will have a capacity of approximately 1600 students for grades 9 through 12. The development of the school will be in two phases with 800 students in each phase. Phase 1 will be completed in 2015 and Phase 2 in 2025.

Work on Phase 1 has not been initiated as of the date of this report nor is it expected to be completed by 2015. Traffic generation from this project is not expected to occur until at least 2017.

Access and egress will be via the intersection of Piilani Highway at Kulanihakoi Road, which will be modified with an extension of Kulanihakoi Road across Piilani Highway. The intersection of Piilani Highway at Kulanihakoi Street will be signalized.

The number of trips that the high school will generate during weekday peak hours was obtained from the TIAR[7] for the project. Based on trip generation data provided in *Trip Generation*, the number of trips generated on a Saturday will be negligible.

D. Kenolio 6 Affordable Housing Project

The Kenolio 6 Affordable Housing Project is located between Piilani Highway and Kenolio Road in the southwest quadrant of the intersection of Kaonoulu Street at Piilani Highway. The project is a 124 unit multi-family affordable housing development. It is anticipated that the project will be completed in 2017.

Access to and egress from will be via two driveways along the east side of Kenolio Road. The first driveway, referred to as Drive A, is south of the intersection of Kenolio Road at Hoopili Akau Street. Drive B is south of Drive A along Kenolio Road.

The traffic assignments for the project were obtained from the traffic study for the project [8].

The projects that were identified as related projects and the estimated number of peak hour trips generated by each are summarized in Table 6. The approximate locations of these projects are shown in Figure 8.

---

[6] Phillip Rowell and Associates, *TIAR for Maui Lu Resort*, March 7, 2007

[7] Wilson Okamoto Corporation, *Traffic Impact Report Kihei High School*, September 2011

[8] Phillip Rowell and Associates, *TIAR for Kenolio 6 Affordable Housing Project*, May 27, 2010

Table 6 Trip Generation Summary of Related Projects

	Related Project	Description	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
A	Kaiwahine Village	120 Multi-Family	19	47	66	49	31	80	26	26	52
B	Maui Lu Resort	400 Timeshares + 400 Lock Off Units (Maximum)	245	140	385	205	230	435	350	275	625
C	Kihei High School (Phase 1)	800 Students Grades 9 thru 12	228	108	336	104	55	159	0	0	0
D	Kenolio 6 Affordable Housing Project	124 Multi-Family	20	48	68	51	32	83	32	32	64
TOTALS FOR 2018			512	343	855	409	348	757	408	333	741

The Honua'ula Affordable Housing project was not included as a background project because it cannot be constructed until after East Kaonoulu Road is completed, which will be done as part of the Piilani Promenade project. Until this roadway is completed, there is no roadway to assign Honua'ula trips. However, since Honua'ula traffic must be considered in the projections to confirm that they can be accommodated by East Kaonoulu Road, the results of the trip generation analysis of Honua'ula and the results of the trip distribution and assignment process are presented in Chapter 4.

2018 Background Traffic Projections

2018 background traffic projections were calculated by expanding existing traffic volumes by the appropriate growth rates and then superimposing traffic generated by related projects. The resulting 2018 background peak hour traffic projections are shown in Figures 9, 10 and 11.

2018 Background Levels-of-Service

Figure 12 illustrates the intersection configurations and right-of-way controls used for the level-of-service analysis of 2018 background conditions without project generated traffic. The roadway improvements that are proposed as part of the related projects are assumed to be in place for the level-of-service analysis since the project's traffic is included in the projections. These improvements include:

1. The intersection of South Kihei Road at Kaonoulu Street has been signalized and the southbound approach has been modified to provide a separate left turn lane. *These improvements are recommended as part of the Maui Lu Resort Redevelopment project.*

2. The intersection of Piilani Highway at Kaonoulu Street has been signalized. This is recommended as part of the Piilani Promenade project. *This improvement is included because Maui Lu Resort is to participate in this improvement.*

3. The intersection of Kaonoulu Street at Alulike Street has been converted from a STOP sign controlled intersection to a roundabout.

4. The intersection of Piilani Highway at Kulanihakoi Road has been signalized, the northbound approach has been modified to provide a right turn only lane, the southbound approach has been modified to provide a left turn lane and the eastbound and westbound approached have been modified to provide an optional left turn or through lane and a right turn only lane. *These improvements are those recommended in the TIAR for the proposed Kihei High School to be located at this location.*

Table 7 summarizes the results of the level-of-service analysis of the signalized intersections for 2018 background without project generated traffic. Shown in the table are the volume-to-capacity ratios, average vehicle delays and levels-of-service of the overall intersection and all controlled lane groups. Even though the level-of-service is defined by delay, the volume-to-capacity ratios are shown as it is a factor used to determine whether the delay of a particular traffic movement, or lane group, is the result of the traffic signal timing or the result of a capacity deficiency. The level-of-service analysis also used the existing traffic signal cycle lengths.

Table 8 summarizes the results of the level-of-service analysis of the unsignalized intersections along Kaonoulu Street (Kaonoulu Street at Kenolio Road and Kaonoulu Street at Alulike Street)for 2018 background without project traffic conditions. Shown in the table are the average vehicle delays and levels-of-service of the controlled movements. Delays and levels-of-service are not calculated for uncontrolled movements.

Table 7 2018 Background Levels-of-Service of Signalized Intersections

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
Intersection and Lane Group	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Highway at Ohukai Road	***0.86***	***34.4***	***C***	***0.92***	***49.6***	***D***	***0.77***	***23.8***	***C***
Eastbound Left & Thru	0.78	65.6	E	0.91	100.5	F	0.79	40.6	D
Eastbound Right	0.05	46.7	D	0.06	57.7	E	0.09	24.5	C
Westbound Left & Thru	0.92	82.3	F	0.93	93.8	F	0.96	93.2	F
Westbound Right	0.12	44.5	D	0.12	52.2	D	0.03	29.6	C
Northbound Left	0.27	75.5	E	0.70	92.0	F	0.42	32.9	C
Northbound Thru	0.77	21.4	C	0.92	30.9	C	0.74	19.6	B
Northbound Right	0.03	3.1	A	0.05	6.2	A	0.07	12.3	B
Southbound Left	0.82	83.7	F	0.91	92.3	F	0.57	32.2	C
Southbound Thru	0.90	26.6	C	0.85	47.4	D	0.72	17.0	B
Southbound Right	0.07	2.8	A	0.08	50.4	D	0.07	10.4	B
Piilani Highway at Kaiwahine Street	***0.64***	***29.1***	***C***	***0.68***	***22.8***	***C***	***0.59***	***10.2***	***B***
Eastbound Left & Thru	0.81	69.9	E	0.78	88.3	F	0.55	22.0	C
Eastbound Right	0.07	42.2	D	0.05	58.8	E	0.04	19.8	B
Westbound Left & Thru	0.60	53.0	D	0.52	65.0	E	0.54	23.9	C
Westbound Right	0.07	42.2	D	0.05	58.8	E	0.03	20.1	C
Northbound Left	0.25	35.2	D	0.47	85.7	F	0.33	26.9	C
Northbound Thru	0.62	26.5	C	0.67	15.8	B	0.53	11.9	B
Northbound Right	0.04	35.7	D	0.08	7.3	A	0.04	6.7	A
Southbound Left	0.37	44.0	D	0.63	77.8	E	0.67	28.3	C
Southbound Thru	0.60	22.5	C	0.62	16.1	B	0.62	9.4	A
Southbound Right	0.01	15.6	B	0.05	7.4	A	0.03	4.6	A
Piilani Highway at North Kihei Road	***0.61***	***29.6***	***C***	***0.78***	***36.5***	***D***	***0.61***	***17.1***	***B***
Eastbound Left	0.57	59.7	E	0.75	56.8	E	0.46	29.8	C
Eastbound Left & Thru	0.59	60.9	E	0.78	59.6	E	0.46	29.8	C
Eastbound Right	0.22	59.9	E	0.13	58.2	E	0.14	15.6	B
Westbound Left, Thru & Right	0.20	58.3	E	0.58	73.5	E	0.02	32.5	C
Northbound Left	0.71	42.1	D	0.84	72.9	E	0.54	27.4	C
Northbound Thru & Right	0.54	19.0	B	0.56	16.9	B	0.50	8.7	A
Southbound Left	0.19	63.6	E	0.46	78.4	E	0.35	38.3	D
Southbound Thru	0.66	23.0	C	0.76	32.5	C	0.80	20.6	C
Southbound Right	0.08	14.7	B	0.16	20.0	B	0.11	11.8	B
North Kihei Road at South Kihei Road	***0.40***	***20.5***	***C***	***0.58***	***24.5***	***C***	***0.59***	***10.1***	***B***
Eastbound Thru	0.27	9.9	A	0.42	19.8	C	0.39	10.1	B
Eastbound Right	0.18	9.2	A	0.36	18.8	C	0.27	9.3	A
Westbound Left	0.59	68.9	E	0.71	98.7	F	0.57	21.2	C
Westbound Thru	0.17	1.1	A	0.15	2.1	A	0.14	3.3	A
Northbound Left	0.77	54.8	D	0.37	49.7	D	0.52	17.9	B
Northbound Right	0.13	0.0	A	0.12	0.0	A	0.10	0.0	A
Piilani Highway at Kaonoulu Street	***0.79***	***16.1***	***B***	***0.74***	***13.0***	***B***	***0.61***	***6.1***	***A***
Eastbound Left	0.36	55.5	E	0.45	70.2	E	0.27	21.0	C
Eastbound Right	0.42	56.3	E	0.13	66.6	E	0.46	22.4	C
Northbound Left	0.62	43.2	D	0.72	71.9	E	0.59	8.6	A
Northbound Thru	0.39	7.9	A	0.56	4.1	A	0.46	4.1	A
Southbound Thru	0.68	12.7	B	0.63	9.0	A	0.52	4.4	A
Southbound Right	0.05	13.4	B	0.07	7.6	A	0.08	2.9	A

Table 7 2018 Background Levels-of-Service of Signalized Intersections (Continued)

South Kihei Road at Kaonoulu Street	***0.45***	***6.2***	***A***	***0.50***	***8.4***	***A***	***0.44***	***5.4***	***A***
Westbound Left	0.42	23.8	C	0.46	28.4	C	0.48	23.6	C
Westbound Right	0.03	21.5	C	0.03	25.4	C	0.02	20.8	C
Northbound Thru	0.45	3.5	A	0.49	6.1	A	0.44	3.6	A
Northbound Right	0.06	2.3	A	0.11	4.3	A	0.09	2.5	A
Southbound Left	0.06	2.3	A	0.70	48.5	D	0.10	2.5	A
Southbound Thru	0.30	2.9	A	0.40	2.6	A	0.37	3.3	A
Piilani Highway at Kulanihakoi Road	***0.76***	***15.5***	***B***	***0.66***	***10.8***	***B***	***0.53***	***6.4***	***A***
Eastbound Left & Thru	0.37	54.2	D	0.51	72.0	E	0.29	28.2	C
Eastbound Right	0.27	53.1	D	0.06	65.8	E	0.06	26.6	C
Westbound Left & Thru	0.61	62.3	E	0.47	71.3	E	0.00	0.0	A
Westbound Right	0.02	50.8	D	0.01	65.4	E	0.00	0.0	A
Northbound Left	0.51	74.1	E	0.60	67.0	E	0.73	73.4	E
Northbound Thru	0.54	9.7	A	0.68	4.6	A	0.48	3.1	A
Northbound Right	0.08	4.3	A	0.02	2.1	A	0.00	0.0	A
Southbound Left	0.51	63.0	E	0.32	57.3	E	0.00	0.0	A
Southbound Thru	0.76	12.4	B	0.64	8.4	A	0.53	5.7	A
Southbound Right	0.02	5.5	A	0.06	7.8	A	0.05	3.7	A
Piilani Highway at Piikea Avenue	***0.80***	***19.7***	***B***	***0.78***	***30.8***	***C***	***0.79***	***17.4***	***B***
Eastbound Left	0.86	67.2	E	0.86	77.1	E	0.79	30.8	C
Eastbound Right	0.16	42.1	D	0.17	50.8	D	0.17	18.2	B
Northbound left	0.67	65.1	E	0.85	79.9	E	0.77	35.5	D
Northbound Thru	0.46	7.0	A	0.61	9.5	A	0.51	7.0	A
Southbound Thru	0.80	17.2	B	0.72	32.3	C	0.80	21.4	C
Southbound Right	0.28	10.5	B	0.34	31.6	C	0.26	13.5	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix C for Level-of-Service Analysis Worksheets.

Table 8 2018 Background Levels-of-Service of Unsignalized Intersections

	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
Intersection and Lane Group	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS
Kaonoulu Street at Kenolio Road	***6.7***	***A***	***5.1***	***A***	***6.4***	***A***
Eastbound Left	7.6	A	7.7	A	8.1	A
Westbound Left	7.5	A	7.6	A	7.7	A
Northbound Left	11.2	B	12.8	B	17.9	C
Northbound Thru & Right	9.4	A	10.2	B	11.5	B
Southbound Left	16.0	C	16.2	C	27.7	D
Southbound Thru & Right	9.5	A	11.0	B	12.0	B
Kaonoulu Street at Alulike Street	V/C	LOS	V/C	LOS	V/C	LOS
	0.14	***A***	***0.22***	***A***	***0.20***	***A***
Eastbound Left	0.14	A	0.22	A	0.20	A
Westbound Left	0.09	A	0.12	A	0.14	A
Northbound Left, Thru & Right	0.01	A	0.01	A	0.02	A
Southbound Left, Thru & Right	0.06	A	0.05	A	0.09	A

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix C for Level-of-Service Analysis Worksheets.

Mitigation Required for 2018 Background Conditions

The conclusion of the level-of-service of 2018 baseline conditions is that roadway improvements are required at the intersection of Piilani Highway at Ohukai Road and the intersection of Piilani Highway at Kaiwahine Street and Uwapo Road to accommodate traffic associated with background growth and the related projects.

1. At the intersection of Piilani Highway at Ohukai Road, the eastbound and westbound approaches should be modified to provide one left turn lane, one optional left turn or thru lane and one right turn lane and the southbound approach should be modified to provide an additional left turn only lane. The second left turn lane will require the widening of eastbound Ohukai to accommodate traffic from the second lane at least to the driveway into the service station.

2. At the intersection of Piilani Highway at Kaiwahine Street and Uwapo Road, the eastbound and westbound approaches should be modified to provide separate left turn, through and right turn lanes.

These improvements are shown on Figure 13.

These improvements are required to mitigate the impacts of background growth and traffic generated by the related projects. The level-of-service resulting from the improvements are summarized in Table 9.

Table 9 Mitigation Analysis - Background Conditions

Intersection and Lane Group	AM Peak Hour						PM Peak Hour						Saturday Peak Hour					
	Without Mitigation			With Mitigation			Without Mitigation			With Mitigation			Without Mitigation			With Mitigation		
	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Highway at Ohukai Road	***0.86***	***34.4***	***C***	***0.77***	***25.8***	***C***	***0.92***	***49.6***	***D***	***0.77***	***34.3***	***C***	***0.77***	***29.2***	***C***	***0.62***	***18.8***	***B***
	Cycle Length = 125 Seconds						***Cycle Length = 150 Seconds***						***Cycle Length = 70 Seconds***					
Eastbound Left				0.46	51.7	D				0.62	72.7	E				0.57	37.7	D
Eastbound Left & Thru	0.78	65.6	E	0.41	51.1	D	0.91	100.5	F	0.63	73.1	E	0.79	40.6	D	0.59	38.4	D
Eastbound Right	0.05	46.7	D	0.05	47.6	D	0.06	57.7	E	0.06	61.7	E	0.09	24.5	C	0.09	32.2	C
Westbound Left				0.60	55.9	E				0.69	72.8	E				0.63	48.2	D
Westbound Left & Thru	0.92	82.3	F	0.63	56.9	E	0.93	93.8	F	0.72	74.2	E	0.96	93.2	F	0.55	42.4	D
Westbound Right	0.12	44.5	D	0.12	48.3	D	0.12	52.2	D	0.24	60.1	E	0.03	29.6	C	0.03	35.8	C
Northbound Left	0.27	75.5	E	0.27	74.8	E	0.70	92.0	F	0.69	85.4	F	0.42	32.9	C	0.43	38.8	D
Northbound Thru	0.77	21.4	C	0.69	14.1	B	0.92	30.9	C	0.76	13.9	B	0.74	19.6	B	0.60	14.9	B
Northbound Right	0.03	3.1	A	0.03	2.2	A	0.05	6.2	A	0.05	2.3	A	0.07	12.3	B	0.07	10.2	B
Southbound Left	0.82	83.7	F	0.46	65.2	E	0.91	92.3	F	0.62	63.4	D	0.57	32.2	C	0.30	34.4	C
Southbound Thru	0.90	26.6	D	0.83	19.1	B	0.85	47.4	D	0.74	33.8	C	0.72	17.0	B	0.60	12.7	B
Southbound Right	0.07	2.8	A	0.07	2.4	A	0.08	50.4	D	0.07	35.6	D	0.07	10.4	B	0.07	8.3	A
Piilani Highway at Kaiwahine Street	***0.64***	***29.1***	***C***	***0.60***	***24.5***	***C***	***0.68***	***22.8***	***C***	***0.65***	***22.1***	***C***	***0.59***	***10.2***	***B***	***0.58***	***10.0***	***B***
	Cycle Length = 125 Seconds						***Cycle Length = 150 Seconds***						***Cycle Length = 60 Seconds***					
Eastbound Left	0.81	69.9	E	0.66	56.8	E	0.78	88.3	F	0.65	75.9	E	0.55	22.0	C	0.44	33.0	C
Eastbound Thru				0.06	44.1	D				0.12	62.2	E				0.07	29.1	C
Eastbound Right	0.07	42.2	D	0.07	44.3	D	0.05	58.8	E	0.05	61.7	E	0.04	19.8	B	0.04	28.9	C
Westbound Left & Thru	0.60	53.0	D	0.33	47.3	D	0.52	65.0	E	0.27	63.9	E	0.54	23.9	C	0.30	31.2	C
Westbound Thru				0.10	44.5	D				0.26	63.5	E				0.21	30.0	C
Westbound Right	0.07	42.2	D	0.07	44.3	D	0.05	58.8	E	0.05	61.6	E	0.03	20.1	C	0.03	28.9	C
Northbound Left	0.25	35.2	D	0.25	38.0	D	0.47	85.7	F	0.47	79.2	E	0.33	26.9	C	0.33	34.3	C
Northbound Thru	0.62	26.5	C	0.60	19.7	B	0.67	15.8	B	0.65	18.2	B	0.53	11.9	B	0.53	6.7	A
Northbound Right	0.04	35.7	D	0.04	26.7	C	0.08	7.3	A	0.08	10.2	B	0.04	6.7	A	0.04	4.3	A
Southbound Left	0.37	44.0	D	0.37	44.4	D	0.63	77.8	E	0.63	83.5	F	0.67	28.3	C	0.67	45.2	D
Southbound Thru	0.60	22.5	C	0.56	20.3	C	0.62	16.1	B	0.60	12.3	B	0.62	9.4	A	0.62	7.2	A
Southbound Right	0.01	15.6	B	0.01	13.3	B	0.05	7.4	A	0.05	5.0	A	0.03	4.6	A	0.03	3.8	A

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

4. PROJECT-RELATED TRAFFIC CONDITIONS

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. This chapter presents the trip generation, distribution and assignment of project generated traffic and the background plus project traffic projections. The results of the level-of-service analysis of background plus project conditions is presented in the following chapter.

Methodology

Future traffic volumes generated by the project were estimated using the procedures described in the *Trip Generation Handbook*[9] and data provided in *Trip Generation*[10]. This method used trip generation rates or equations to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street.

Trip Generation of Proposed Development

The assumptions used for the trip generation analysis are:

1. Trip generation equations for shopping centers were used to estimate the number of peak hour trips generated by the retail areas of the project. These rates are based on the leasable floor area. The trip generation equations for shopping centers are summarized in Table 10.

[9] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

[10] Institute of Transportation Engineers, *Trip Generation*, Washington, D.C., 2003

Table 10 Trip Generation Formulas for Retail Uses

	Weekday AM Peak Hour	Weekday PM Peal Hour	Saturday Peak Hour
Total	Ln (T) = 0.59Ln(A)+2.32	Ln (T) = 0.67Ln(A)+3.37	Ln (T) = 0.65Ln(A)+3.76
Inbound	61%	49%	52%
Outbound	39%	51%	48%

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation, 8th Edition*
(2) T = Trips, A = 1,000 gross leasable square feet
(3) Formulas shown are for the peak hour of the adjacent street.

2. The percentage of pass by trips generated by the retail uses was estimated using the data provided in the *Trip Generation Handbook*.[11] The equations for estimating the number of pass by trips are summarized in Table 11. The equations are also based on the gross leasable floor area.

Table 11 Formulas For Pass By Trips

	Weekday AM Peak Hour	Weekday PM Peal Hour	Saturday Peak Hour
Total	No Formula Provided	Ln (T) = - 0.29 Ln(A)+5.00	T = -0.02 + 38.59
Inbound		50%	50%
Outbound		50%	50%

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., June 2004, p 47 and 50
(2) T = Percent Pass By Trips, A = 1,000 gross leasable square feet
(3) Formulas shown are for the peak hour of the adjacent street.

3. Trip generation rates for outdoor nurseries were used to estimate the number of peak hour trips generated by the outdoor garden area. These rates are based on the gross square feet of floor area. The trip generation equations for outdoor garden uses are summarized in Table 12. *Trip Generation* did not provide directional distribution data (% inbound and % outbound). Therefore, it was assumed that the directional distribution would be 50% inbound and 50% outbound.

Table 12 Trip Generation Rates for Outdoor Garden Uses

	Weekday AM Peak Hour	Weekday PM Peal Hour	Saturday Peak Hour
Total	1.31	3.80	11.00
Inbound	50%	50%	50%
Outbound	50%	50%	50%

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation, 8th Edition*
(2) T = Trips, A = 1,000 gross square feet
(3) Formulas shown are for the peak hour of the adjacent street.

4. Trip generation rates for general light industrial uses were used to estimate the number of peak hour trips generated by the light industrial portion of the project. These equations are based on the number of acres developed. The trip generation equations for general light industrial uses are summarized in Table 13.

[11] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., June 2004

Table 13 Trip Generation Formulas for Light Industrial Uses

	Weekday AM Peak Hour	Weekday PM Peal Hour	Saturday Peak Hour
Total	T=7.51(A)	T=3.68(A)+116.82	T=0.96(A)
Inbound	83%	22%	47%
Outbound	17%	78%	53%

Notes: (1) Source: Institute of Transportation Engineers, *Trip Generation, 8th Edition*
(2) T = Trips, A = Number of acres
(3) Formulas shown are for the peak hour of the adjacent street.

5. Trip generation rates for apartments are based on the number of dwelling units. The trip generation equations for apartments are summarized in Table 14.

Table 14 Trip Generation Formulas for Apartments

	Weekday AM Peak Hour	Weekday PM Peal Hour	Saturday Peak Hour
Total	T=0.49(X)+3.73	T=0.55(X)+17.65	T=0.41(X)+19.23
Inbound	20%	65%	50%
Outbound	80%	35%	50%

Notes: (1) Source: Institute of Transportation Engineers, *Trip Generation, 8th Edition*
(2) T = Trips, X = 1,000 number of dwelling units
(3) Formulas shown are for the peak hour of the adjacent street.

The results of the trip generation calculations are summarized in Table 15. The trips shown are the peak hourly trips generated by the project during the peak hours of the adjacent street. As shown, the project will generate 613 new trips during the morning peak hour, 1,830 new trips during the afternoon peak hour and 2,278 new trips during the Saturday peak hour.

Table 15 Summary of Trip Generation Analysis

		North Parcel					South Parcel				Total Project		
		Retail (100,000 SF)			Light Industrial (5 Acres)	Apartment (226 Units)	Retail (358,091 SF)			Outdoor Garden Total Trips (28,000 SF)			
Time Period	Direction	Total Trips	Pass By Trips	Net New Trips			Total Trips	Pass By Trips	Net New Trips		Total Trips	Pass By Trips	Net New Trips
AM Peak Hour	Total	145	15	130	38	114	327	33	294	37	661	48	613
	In	88	8	80	32	23	199	17	182	19	361	25	336
	Out	57	7	50	6	91	128	16	112	18	300	23	277
PM Peak Hour	Total	593	238	355	135	142	1496	404	1092	106	2472	642	1830
	In	291	119	172	30	92	733	202	531	53	1199	321	878
	Out	302	119	183	105	50	763	202	561	53	1273	321	952
Saturday Peak Hour	Total	800	294	506	5	112	1964	617	1347	308	3189	911	2278
	In	416	147	269	2	56	1021	309	712	154	1649	456	1193
	Out	384	147	237	3	56	943	308	635	154	1540	455	1085

Trip Distribution and Assignments

The project-related trips were distributed along the anticipated approach routes to the project site based on following assumptions:

1. The purpose of the project is to provide services for the residents and tourists of South Maui. Thus marketing and advertising will be directed toward this area. Accordingly, it was assumed that 75% of the traffic to and from the project will be generated by Kihei and South Maui.

2. 25% of the project generated traffic will approach and depart via Mokulele Highway (10%) and North Kihei Road (15%). Of the 15% from North Kihei Road, 10% will use North Kihei Road to Piilani Highway at then Piilani Highway to the project. The remaining 5% will use South Kihei Road and Kaonoulu Street.

3. The traffic generated from within Kihei (75%) was distributed based on the distribution of residential units and hotel rooms (including timeshares and vacation rentals) using the data presented in the *Maui Long-Range Land Transportation Plan* with adjustments to reflect Maui Lu Resort Redevelopment, the Kihei Residential Development, Honuaula, Makena Resort and additional Wailea Resort units. Using this distribution, 20% of the trips would be generated by the area north of Kaonoulu Street and 80% would be generated by the area south of Kaonoulu Street.

Trips were assigned based on the following assumptions:

1. Kaonoulu Street is extended mauka of Piilani Highway to provide access to the project and the intersection of Piilani Highway at Kaonoulu Street is signalized.

2. There will be four (4) driveways along East Kaonoulu Street to serve the project. Drive A is the major access and egress driveway. This driveway is located approximately 600 feet east of Piilani Highway. This will be a full access, signalized intersection.

3. Drive B is located approximately midway between Piilani Highway and Drive A. Drive B provides for right turns only into and out of the north parcel and the south parcel. This intersection is unsignalized.

4. Drive C is located approximately 500 feet east of Drive A. This driveway provides service to the south parcel and future affordable housing units (Honua'ula Off-site Affordable Housing) to be located along the north side of East Kaonoulu Street and east of the North Parcel. All movements will be allowed and the intersection will be unsignalized.

5. Drive D is located approximately 300 feet east of Drive C near the eastern property line of the project. This driveway is behind the last building and will most likely be used be service and employee vehicles. Anticipated use of this driveway is minimal.

The lane configurations and right-of-way controls of the study intersections used for the 2018 traffic assignments are shown on Figure 14. The project morning peak hour, afternoon peak hour and Saturday peak hour trip assignments are shown in Figures 15, 16 and 17, respectively.

2018 Background Plus Project Projections

Background plus project traffic conditions are defined as 2018 background traffic conditions plus project related traffic. The incremental difference between background and background plus project is the traffic impact of the project under study.

2018 background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the 2018 background peak hour traffic volumes presented in Chapter 3. The 2018 background plus project traffic projections at the study intersections are shown on Figures 18, 19 and 20. The 2018 background plus project traffic projections along East Kaonoulu Street and at the project driveways are shown on Figure 21.

Honua'ula Affordable Housing Project Traffic

The Honua'ula Affordable Housing Project will consist of 125 owner occupied residential condominiums and 125 residential apartments along the north side of East Kaonoulu Street east of the project. Access to and egress from the project will be via Drive C.

Trip Generation provides rates and equations to estimate the number of peak hour trips during the peak hours of the adjacent street and the peak hours of the generator, which may or may not coincide. The AM peak hour of the adjacent street is typically between 7:00 AM and 9:00 AM and PM peak hour is between 4:00 PM and 6:00 PM, typical commute hours. *Trip Generation* does not note the peak hours of the generators. The trip generation rates and equations are based on the number of dwelling units proposed. For this project, the trip generation equations for the generator have been used as the results are slightly higher than the results using the equations for the peak hours of the adjacent street

The trip generation equations used for the trip generation analysis and the results are summarized in Table 16. The trip generation analysis estimated that the project will generate a total of 131 trips during the morning peak hour, 168 trips during the afternoon peak hour and 149 trip during the Saturday peak hour.

Table 16 Trip Generation Analysis for Honua'ula

Period & Direction		Condominiums (Land Use Code 230)			Apartments (Land Use Code 220)			Total
		Trips per Unit or Percent[(1),(2)]	Units	Trips	Trips per Unit or Percent	Units	Trips	
AM Peak Hour of Adjacent Street	Total	Ln(T) = 0.80 Ln(X) + 0.26	125	62	T = 0.49 (X) + 3.73	125	65	127
	Inbound	17%		11	20%		13	24
	Outbound	83%		51	80%		52	103
PM Peak Hour of Adjacent Street	Total	Ln(T) = 0.82 Ln(X) + 0.32		72	T = 0.55 (X) + 17.65		86	158
	Inbound	67%		48	65%		56	104
	Outbound	33%		24	35%		30	54
AM Peak Hour of Generator	Total	Ln(T) = 0.82 Ln(X) + 0.15		61	T = 0.54 (X) + 2.45		70	131
	Inbound	19%		12	29%		20	32
	Outbound	81%		49	71%		50	99
PM Peak Hour of Generator	Total	T = 0.34 (X) + 35.87		78	T = 0.60 (X) + 14.91		90	168
	Inbound	64%		50	61%		55	105
	Outbound	36%		28	39%		35	63
Saturday Peak Hour	Total	T = 0.29 (X) + 42.63		79	T = 0.41(X) + 19.23		70	149
	Inbound	54%		43	50% [(3)]		35	78
	Outbound	46%		36	50%		35	71

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation 8th Edition*, 2008, pages 389 and 390.
(2) T=trips, X=number of dwelling units
(3) Trip Generation did not provide directional split data. A directional split of 50/50 was assumed.

Honua'ula trips were distributed and assigned based on existing traffic patterns as estimated from the traffic counts. The traffic assignments are shown as Figures 22,23, 24 and 25. These trips are included in the analysis as background traffic to confirm that the improvements along East kaonoulu Street will accommodate both Piilani Promenade traffic and Honua'ula traffic.

Honua'ula trip assignments were added to the background traffic projections for Piilani Promenade to estimate total traffic of the two projects along East Kaonoulu Street. These projections include both Piilani Promenade and Honua'ula Traffic and are shown as Figures 26, 27, 28 and 29.

5. TRAFFIC IMPACT ANALYSIS

The traffic impacts of the project was assessed by analyzing the changes in traffic volumes and levels-of-service at the study intersections. These impacts are discussed in this chapter. Intersections with overall levels-of-service or traffic movements that do not meet the standard for acceptable levels-of-service are identified and improvements that will provide acceptable levels-of-service are identified and assessed. This chapter also describes anticipated traffic operating conditions at the project's driveways along East Kaonoulu Street.

Changes in Total Intersection Volumes

An analysis of the project's share of 2018 background plus project intersection approach volumes at the study intersections is summarized in Table 17. The table summarizes the project's share of total 2018 peak hour approach volumes at each intersection. Also shown are the percentage of 2018 background plus project traffic that is the result of background growth and traffic generated by related projects.

The project's traffic impacts are concentrated at the intersection of Piilani Highway at Kaonoulu Street where project generated traffic represents almost a third of the afternoon peak hour traffic and almost half of the Saturday peak hour traffic. Also, it should be noted that project generated traffic represents a larger percentage of Saturday peak hour traffic than weekday peak hour traffic because the project generates more traffic during the Saturday peak hour and background traffic is less during the Saturday peak hour than weekday peak hours.

Table 17 Analysis of Project's Share of Total Intersection Approach Volumes (1)

Intersection	Period	Existing	2018 Background	2018 Background Plus Project	Background Growth		Project Traffic	
					Trips	Percent of Total Traffic (2)	Trips	Percent of Total Traffic (3)
Piilani Hwy at Ohukai Road	AM	3321	3601	3830	280	7.3%	229	6.0%
	PM	3688	3976	4630	288	6.2%	654	14.1%
	SAT	2622	2961	3778	339	9.0%	817	21.6%
Piilani Hwy at Uwapo Rd & Kaiwahine St	AM	2939	3249	3421	310	9.1%	172	5.0%
	PM	3337	3669	4160	332	8.0%	491	11.8%
	SAT	2619	2981	3594	362	10.1%	613	17.1%
Piilani Hwy at N. Kihei Rd & Mokulele Hwy	AM	3081	3381	3495	300	8.6%	114	3.3%
	PM	3402	3711	4039	309	7.7%	328	8.1%
	SAT	2738	3077	3487	339	9.7%	410	11.8%
S. Kihei Rd at N. Kihei Rd	AM	1498	1677	1763	179	10.2%	86	4.9%
	PM	1730	1879	2125	149	7.0%	246	11.6%
	SAT	1329	1538	1845	209	11.3%	307	16.6%
Piilani Hwy at Kaonoulu St	AM	2941	3117	3711	176	4.7%	594	16.0%
	PM	3288	3581	5537	293	5.3%	1956	35.3%
	SAT	2296	2680	5181	384	7.4%	2501	48.3%
S. Kihei Rd at Kaonoulu St	AM	1017	1183	1285	166	12.9%	102	7.9%
	PM	1242	1407	1701	165	9.7%	294	17.3%
	SAT	1122	1306	1676	184	11.0%	370	22.1%
Piilani Hwy at Kulanihakoi St	AM	3363	3698	3921	335	8.5%	223	5.7%
	PM	3488	3772	4409	284	6.4%	637	14.4%
	SAT	2323	2597	3395	274	8.1%	798	23.5%
Kaonoulu Street at Kenolio Drive	AM	366	556	677	190	28.1%	121	17.9%
	PM	364	583	926	219	23.7%	343	37.0%
	SAT	273	532	961	259	27.0%	429	44.6%
Kaonoulu Street at Alulike Drive	AM	200	347	450	147	32.7%	103	22.9%
	PM	272	486	780	214	27.4%	294	37.7%
	SAT	246	537	905	291	32.2%	368	40.7%
Piilani Highway at Piikea Avenue	AM	3385	3641	3841	256	6.7%	200	5.2%
	PM	3679	3938	4511	259	5.7%	573	12.7%
	SAT	2930	3203	3920	273	7.0%	717	18.3%

Notes:
(1) Volumes shown are total intersection approach volumes or projections.
(2) Percentage of total 2018 background plus project traffic.

2018 Background Plus Project Level-of-Service Analysis

The level-of-service analysis was performed for background and background plus project conditions. The incremental difference between the two conditions quantifies the impact of the project. The assumptions used for the level-of-service analysis are:

1. The intersection of South Kihei Road at Kaonoulu Street is signalized.

2. The intersection of Piilani Highway at Kaonoulu Street is improved as follows as part of the proposed project:

    a. The intersection is signalized. Northbound and southbound left turns are protected.

    b. Two southbound to eastbound left turn lanes are added.

    c. Two northbound to eastbound right turn and deceleration lanes are added.

    d. Two eastbound through lanes are added.

    e. A westbound approach with two left turn lanes, one through lane and two right turn lanes is added.

3. The traffic signal cycle lengths of the traffic signals along Piilani Highway are150 seconds for the afternoon peak hour. The morning peak hour traffic signal cycle lengths are 125 seconds. These are the existing signal cycle lengths.

4. The mitigation measures to accommodate 2018 background traffic as described in the previous chapter are implemented. The eastbound approach has been modified to provide one separate left turn lane, one through lane and one right turn lane. The westbound approach has been modified to provide one left turn lane, one thru or left turn lane and one right turn lane.

The results of the Level-of-Service analysis of the signalized intersections are summarized in Table 18 and the results of the Level-of-Service analysis of the unsignalized intersections are summarized in Table 19.

Table 18 2018 Background Plus Project Levels-of-Service - Signalized Intersections

	AM Peak Hour						PM Peak Hour						Saturday Peak Hour					
	Without Promenade Without Honuaula			With Promenade With Honuaula			Without Promenade Without Honuaula			With Promenade With Honuaula			Without Promenade Without Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Hwy at Ohukai Rd	***0.77***	***25.8***	***C***	***0.82***	***29.9***	***C***	***0.77***	***34.3***	***C***	***0.90***	***44.2***	***D***	***.62***	***18.8***	***B***	***0.80***	***24.3***	***C***
Eastbound Left	0.46	51.7	D	0.46	51.7	D	0.62	72.7	E	0.72	84.2	F	0.57	37.7	D	0.54	38.2	D
Eastbound Left & Thru	0.41	51.1	D	0.41	51.1	D	0.63	73.1	E	0.72	83.4	F	0.59	38.4	D	0.56	38.8	D
Eastbound Right	0.05	47.6	D	0.06	47.7	D	0.06	61.7	E	0.08	63.7	E	0.09	32.2	C	0.39	36.1	D
Westbound Left	0.60	55.9	E	0.63	56.6	E	0.69	72.8	E	0.78	80.7	F	0.63	48.2	D	0.80	68.6	E
Westbound Left & Thru	0.63	56.9	E	0.65	58.0	E	0.72	74.2	E	0.80	83.1	F	0.55	42.4	D	0.81	70.1	E
Westbound Right	0.12	48.3	D	0.12	47.9	D	0.24	60.1	E	0.43	62.2	E	0.03	35.8	C	0.03	37.4	D
Northbound Left	0.27	74.8	E	0.32	58.9	E	0.69	85.4	F	0.82	86.6	F	0.43	38.8	D	0.83	77.0	E
Northbound Thru	0.69	14.1	B	0.76	18.6	B	0.76	13.9	B	0.87	28.1	C	0.60	14.9	B	0.75	18.2	B
Northbound Right	0.03	2.2	A	0.04	17.1	B	0.05	2.3	A	0.08	11.3	B	0.07	10.2	B	0.10	10.1	B
Southbound Left	0.46	65.2	E	0.46	66.4	E	0.62	63.4	D	0.73	65.2	E	0.30	34.4	C	0.37	38.1	D
Southbound Thru	0.83	19.1	B	0.92	25.8	C	0.74	33.8	C	0.90	43.7	D	0.60	12.7	B	0.81	18.6	B
Southbound Right	0.07	2.4	A	0.07	4.1	A	0.07	35.6	D	0.07	33.0	C	0.07	8.3	A	0.07	9.2	A
Piilani Hwy at Kaiwahine St	***0.60***	***24.5***	***C***	***0.63***	***26.6***	***C***	***0.65***	***22.1***	***C***	***0.74***	***26.9***	***C***	***0.58***	***10.0***	***B***	***0.71***	***15.1***	***B***
Eastbound Left	0.66	56.8	E	0.66	56.8	E	0.65	75.9	E	0.63	73.7	E	0.44	33.0	C	0.35	37.2	D
Eastbound Thru	0.06	44.1	D	0.06	44.1	D	0.12	62.2	E	0.11	61.7	E	0.07	29.1	C	0.06	34.3	C
Eastbound Right	0.07	44.3	D	0.08	44.4	D	0.05	61.7	E	0.08	61.5	E	0.04	28.9	C	0.08	34.5	C
Westbound Left	0.33	47.3	D	0.41	48.3	D	0.27	63.9	E	0.56	69.5	E	0.30	31.2	C	0.55	40.9	D
Westbound Thru	0.10	44.5	D	0.10	44.5	D	0.26	63.5	E	0.25	63.0	E	0.21	30.0	C	**0.17**	**35.1**	**D**
Westbound Right	0.07	44.3	D	0.07	44.3	D	0.05	61.6	E	0.05	61.2	E	0.03	28.9	C	0.03	34.2	C
Northbound Left	0.25	38.0	D	0.33	32.5	C	0.47	79.2	E	0.62	76.5	E	0.33	34.3	C	0.56	43.4	D
Northbound Thru	0.60	19.7	B	0.64	22.5	C	0.65	18.2	B	0.74	23.5	C	0.53	6.7	A	0.64	10.2	B
Northbound Right	0.04	26.7	C	0.05	26.3	C	0.08	10.2	B	0.11	13.2	B	0.04	4.3	A	0.07	5.8	A
Southbound Left	0.37	44.4	D	0.37	45.5	D	0.63	83.5	F	0.63	82.9	F	0.67	45.2	D	0.53	41.8	D
Southbound Thru	0.56	20.3	C	0.63	22.6	C	0.60	12.3	B	0.71	17.2	B	0.62	7.2	A	0.77	12.8	B
Southbound Right	0.01	13.3	B	0.01	16.9	B	0.05	5.0	A	0.05	6.7	A	0.03	3.8	A	0.03	5.6	A
Piilani Hwy at N. Kihei Rd	***0.61***	***29.6***	***C***	***0.64***	***29.6***	***C***	***0.78***	***36.5***	***D***	***0.85***	***39.9***	***D***	***0.61***	***17.1***	***B***	***0.69***	***19.0***	***B***
Eastbound Left	0.57	59.7	E	0.58	58.9	E	0.75	56.8	E	0.74	55.6	E	0.46	29.8	C	0.54	37.8	D
Eastbound Left & Thru	0.59	60.9	E	0.60	59.8	E	0.78	59.6	E	0.77	58.1	E	0.46	29.8	C	0.54	37.8	D
Eastbound Right	0.22	59.9	E	0.28	54.4	D	0.13	58.2	E	0.23	39.5	D	0.14	15.6	B	0.33	20.4	C
Westbound Left, Thru & Rt	0.20	58.3	E	0.22	59.0	E	0.58	73.5	E	0.58	73.5	E	0.02	32.5	C	0.02	38.5	D
Northbound Left	0.71	42.1	D	0.74	44.5	D	0.84	72.9	E	0.94	85.0	F	0.54	27.4	C	0.69	34.3	C
Northbound Thru & Right	0.54	19.0	B	0.56	18.7	B	0.56	16.9	B	0.61	18.7	B	0.50	8.7	A	0.51	7.9	A
Southbound Left	0.19	63.6	E	0.21	64.4	E	0.46	78.4	E	0.46	78.4	E	0.35	38.3	D	0.41	46.3	D
Southbound Thru	0.66	23.0	C	0.68	23.8	C	0.76	32.5	C	0.86	39.0	D	0.80	20.6	C	**0.81**	**21.4**	**C**
Southbound Right	0.08	14.7	B	0.08	14.8	B	0.16	20.0	C	0.17	21.4	C	0.11	11.8	B	0.11	11.7	B
N. KIhei Rd at S. Kihei Rd	***0.40***	***20.5***	***C***	***0.42***	***20.2***	***C***	***0.58***	***24.5***	***C***	***0.64***	***28.6***	***C***	***0.59***	***10.1***	***B***	***0.61***	***12.5***	***B***
Eastbound Thru	0.27	9.9	A	0.30	10.5	B	0.42	19.8	B	0.51	21.8	C	0.39	10.1	B	0.54	14.0	B
Eastbound Right	0.18	9.2	A	0.19	9.5	A	0.36	18.8	B	**0.42**	**20.1**	**C**	0.27	9.3	A	0.30	11.7	B
Westbound Left	0.59	68.9	E	0.59	70.5	E	0.71	98.7	F	0.71	99.7	F	0.57	21.2	C	0.51	24.5	C
Westbound Thru	0.17	1.1	A	0.19	1.1	A	0.15	2.1	A	0.19	1.8	A	0.14	3.3	A	0.18	4.2	A
Northbound Left	0.77	54.8	D	0.77	54.5	D	0.37	49.7	D	0.43	50.7	D	0.52	17.9	B	0.52	21.8	C
Northbound Right	0.13	0.0	A	0.13	0.0	A	0.12	0.0	A	0.12	46.1	D	0.10	0.0	A	0.10	0.0	A

Table 18 2018 Background Plus Projects Levels-of-Service - Signalized Intersections (Continued)

	AM Peak Hour						PM Peak Hour						Saturday Peak Hour					
	Without Promenade Without Honuaula			With Promenade With Honuaula			Without Promenade Without Honuaula			With Promenade With Honuaula			Without Promenade Without Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Hwy at Kaonoulu St	***0.79***	***16.1***	***B***	***0.78***	***32.9***	***C***	***0.74***	***13.0***	***B***	***0.88***	***50.5***	***D***	***0.61***	***6.1***	***A***	***0.87***	***37.2***	***D***
Eastbound Left	0.36	55.5	E	0.48	59.8	E	0.45	70.2	E	0.57	91.8	F	0.27	21.0	C	0.51	41.9	D
Eastbound Thru				0.26	53.7	D				0.66	85.0	F				0.64	41.4	D
Eastbound Right	0.42	56.3	E	0.64	48.4	D	0.13	66.6	E	0.62	75.1	E	0.46	22.4	C	0.39	30.5	C
Westbound Left				0.74	70.0	E				0.90	78.7	E				0.97	62.3	E
Westbound Thru				0.50	56.6	E				0.52	66.4	E				0.54	31.4	C
Westbound Right				0.05	42.4	D				0.40	44.8	D				0.36	15.5	B
Northbound Left	0.62	43.2	D	0.55	38.6	D	0.72	71.9	E	0.57	84.0	F	0.59	8.6	A	0.74	54.0	D
Northbound Thru	0.39	7.9	A	0.52	26.8	C	0.56	4.1	A	0.90	51.0	D	0.46	4.1	A	0.94	49.4	D
Northbound Right				0.05	36.4	D				0.28	13.6	B				0.48	16.5	B
Southbound Left				0.53	41.3	D				0.89	86.8	F				0.96	56.5	E
Southbound Thru	0.68	12.7	B	0.80	26.1	C	0.63	9.0	A	0.70	28.7	C	0.52	4.4	A	0.73	25.4	C
Southbound Right	0.05	13.4	B	0.05	26.2	C	0.07	7.6	A	0.08	16.8	B	0.08	2.9	A	0.08	17.4	B
S. Kihei Rd at Kaonoulu St.	***0.45***	***6.2***	***A***	***0.47***	***6.6***	***A***	***0.50***	***8.4***	***A***	***0.66***	***15.9***	***B***	***0.44***	***6.4***	***A***	***0.55***	***7.2***	***A***
Westbound Left	0.42	23.8	C	0.42	20.8	C	0.46	28.4	C	0.57	22.6	C	0.48	23.6	C	0.55	15.4	B
Westbound Right	0.03	21.5	C	0.05	18.6	B	0.03	25.4	C	**0.08**	**18.6**	**B**	0.02	20.8	C	0.08	12.5	B
Northbound Thru	0.45	3.5	A	0.49	4.7	A	0.49	6.1	A	0.63	10.9	B	0.44	3.6	A	0.55	6.0	A
Northbound Thru	0.06	2.3	A	0.08	3.2	A	0.11	4.3	A	0.16	7.3	A	0.09	2.5	A	0.16	4.2	A
Southbound Left	0.06	2.3	A	0.14	3.5	A	0.70	48.5	D	**0.95**	**79.1**	**E**	0.10	2.5	A	0.43	5.8	A
Southbound Thru	0.30	2.9	A	0.33	4.0	A	0.40	2.6	A	0.45	4.3	A	0.37	3.3	A	0.46	5.4	A
Piilani Hwy at Kulanihakoi St	***0.76***	***15.5***	***B***	***0.81***	***16.7***	***B***	***0.66***	***10.8***	***B***	***0.79***	***15.1***	***B***	***0.53***	***6.4***	***A***	***0.67***	***8.1***	***A***
Eastbound Left & Thru	0.37	54.2	D	0.52	57.0	E	0.51	72.0	E	0.64	75.2	E	0.29	28.2	C	0.57	41.3	D
Eastbound Right	0.27	53.1	D	0.37	54.1	D	0.06	65.8	E	0.06	62.1	E	0.06	26.6	C	0.06	34.5	C
Westbound Left & Thru	0.61	62.3	E	0.66	67.4	E	0.47	71.3	E	0.39	66.2	E	0.00	0.0	A	0.00	0.0	A
Westbound Right	0.02	50.8	D	0.02	50.8	D	0.01	65.4	E	0.01	61.6	E	0.00	0.0	A	0.00	0.0	A
Northbound Left	0.51	74.1	E	0.60	85.6	F	0.60	67.0	E	0.60	64.7	E	0.73	73.4	E	0.44	44.0	D
Northbound Thru	0.54	9.7	A	**0.58**	**10.0**	**B**	0.68	4.6	A	0.80	8.5	A	0.48	3.1	A	0.63	4.2	A
Northbound Right	0.08	4.3	A	0.08	3.1	A	0.02	2.1	A	0.02	3.9	A	0.00	0.0	A	0.00	0.0	A
Southbound Left	0.51	63.0	E	0.55	56.9	E	0.32	57.3	E	0.32	77.5	E	0.00	0.0	A	0.00	0.0	A
Southbound Thru	0.76	12.4	B	0.80	14.5	B	0.64	8.4	A	0.80	14.8	B	0.53	5.7	A	0.68	8.4	A
Southbound Right	0.02	5.5	A	0.03	7.7	A	0.06	7.8	A	0.09	5.4	A	0.05	3.7	A	0.07	4.3	A
Piilani Hwy at Piikea Ave	***0.80***	***19.7***	***B***	***0.84***	***21.6***	***C***	***0.78***	***30.8***	***C***	***0.92***	***32.3***	***C***	***0.79***	***17.4***	***B***	***0.91***	***28.4***	***C***
Eastbound Left	0.86	67.2	E	0.89	70.4	E	0.86	77.1	E	0.97	93.6	F	0.79	30.8	C	**0.92**	**55.5**	**E**
Eastbound Right	0.16	42.1	D	0.24	41.3	D	0.17	50.8	D	0.25	47.3	D	0.17	18.2	B	0.18	24.8	C
Northbound Left	0.67	65.1	E	0.76	77.3	E	0.85	79.9	E	0.85	79.9	E	0.77	35.5	D	0.91	75.1	E
Northbound Thru	0.46	7.0	A	0.51	8.3	A	0.61	9.5	A	0.73	14.8	B	0.51	7.0	A	0.65	12.3	B
Southbound Thru	0.80	17.2	B	0.84	19.3	B	0.72	32.3	C	0.91	31.5	C	0.80	21.4	C	0.90	32.7	C
Southbound Right	0.28	10.5	B	0.32	11.6	B	0.34	31.6	C	0.47	17.7	B	0.26	13.5	B	0.33	18.2	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix D for Level-of-Service Analysis Worksheets without Promenade without Honuaula conditions
(4) See Appendix F for Level-of-Service Analysis Worksheets with Promenade with Honuaula conditions.

Table 19 2018 Background Plus Project Levels-of-Service - Unsignalized Intersections

	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
	Without Promenade Without Honuaula		With Promenade With Honuaula		Without Promenade Without Honuaula		With Promenade With Honuaula		With Promenade With Honuaula		With Promenade With Honuaula	
Intersection and Movement	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Kaonoulu St at Kenolio Rd	***6.9***	***A***	***6.9***	***A***	***5.1***	***A***	***6.8***	***A***	***6.4***	***A***	***6.2***	***A***
Eastbound Left	7.6	A	7.8	A	7.7	A	8.3	A	8.1	A	8.4	A
Westbound Left	7.5	A	7.6	A	7.6	A	8.0	A	7.7	A	8.1	A
Northbound Left	11.2	B	12.5	B	12.8	B	19.1	C	17.9	C	19.6	C
Northbound Thru & Right	9.4	A	9.9	A	10.2	B	12.3	B	11.5	B	13.1	B
Southbound Left	16.0	C	20.4	C	16.2	C	39.0	E	27.7	D	39.5	E
Southbound Thru & Right	9.5	A	10.0	B	11.0	B	14.2	B	12.0	B	12.6	B
Kaonoulu St at Alulike St	***2.8***	***A***	***2.4***	***A***	***2.7***	***A***	***1.9***	***A***	***3.4***	***A***	***2.4***	***A***
Eastbound Left	7.5	A	7.6	A	7.7	A	8.1	A	7.7	A	8.2	A
Westbound Left	7.5	A	7.6	A	7.7	A	8.0	A	7.6	A	8.1	A
Northbound Left, Thru & Right	11.7	B	12.8	B	11.9	B	15.5	C	12.6	B	18.5	C
Southbound Left, Thru & Right	9.2	A	9.6	A	9.7	A	11.2	B	10.3	B	12.8	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix D for Level-of-Service Analysis Worksheets for Without Project conditions.
(4) See Appendix F for Level-of-Service Analysis Worksheets for With Project conditions.

Project Driveways

The results of the Level-of-Service analysis of the project driveways are summarized in Table 20. Drive A, which is the only signalized driveway, will operate at Level-of-Service A during the morning peak hour, Level-of-Service D during the afternoon peak hour and Level-of-Service C during the Saturday. Drives B, C and D will operate at Level-of-Service A during all peak hours.

Mitigation Measures

Table 21 summarizes the recommended mitigation.

Table 20 2018 Levels-of-Service of Project Driveways

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	With Promenade With Honuaula			With Promenade With Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C(1)	Delay (2)	LOS (3)	V/C	Delay	LOS	V/C	Delay	LOS
E. Kaonoulu Street at Drive A	***0.13***	***7.7***	***A***	***0.61***	***33.9***	***C***	***0.72***	***32.2***	***C***
Eastbound Left	0.15	8.0	A	0.62	40.9	D	0.76	40.8	D
Eastbound Thru	0.05	7.3	A	0.17	20.5	C	0.20	15.9	B
Eastbound Right	0.06	7.6	A	0.20	24.3	D	0.30	16.9	B
Westbound Left	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A
Westbound Thru & Right	0.13	7.4	A	0.75	39.3	D	0.84	42.4	D
Northbound Left	0.07	7.5	A	0.62	34.5	C	0.79	39.3	D
Northbound Thru & Right	0.02	0.0	A	0.04	12.2	A	0.07	12.8	B
Southbound Left & Thru	0.01	0.0	A	0.14	27.4	C	0.14	28.6	C
Southbound Right	0.04	7.5	A	0.12	27.1	C	0.12	28.4	C
E. Kaonoulu St at Drive B South	***nc***	***0.0***	***A***	***nc***	***0.0***	***A***	***nc***	***0.0***	***A***
Northbound Right	nc	0.0	A	nc	0.0	A	nc	0.0	A
E. Kaonoulu St at Drive B North	***nc***	***1.3***	***A***	***nc***	***1.7***	***A***	***nc***	***1.6***	***A***
Southbound Right	nc	9.7	A	nc	16.0	C	nc	19.7	C
E. Kaonoulu Street at Drive C	***nc***	***7.7***	***A***	***nc***	***16.4***	***B***	***nc***	***8.9***	***A***
Eastbound Left	nc	7.3	A	nc	7.5	A	nc	7.5	A
Westbound Left	nc	0.0	A	nc	0.0	A	nc	0.0	A
Northbound Left	nc	10.9	B	nc	28.5	D	nc	47.0	E
Northbound Thru & Right	nc	0.0	A	nc	0.0	A	nc	0.0	A
Southbound Left & Thru	nc	0.0	A	nc	0.0	A	nc	0.0	A
Southbound Right	nc	8.8	A	nc	8.7	A	nc	8.8	A
E. Kaonoulu Street at Drive D	***nc***	***4.3***	***A***	***nc***	***5.8***	***A***	***nc***	***5.8***	***A***
Northbound Left & Right	nc	8.5	A	nc	8.7	A	nc	8.8	A

NOTES:
(1) Denotes volume-to-capacity ratio. Volume-to-capacity ratios are not calculated for the unsignalized intersections.
(2) Delay is in seconds per vehicle.
(3) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(4) See Appendix F for Level-of-Service Analysis Worksheets.
(5) nc = not calculated.

Table 21 Summary of Recommended Mitigation Measures Conditions

Location	Mitigation Required to Mitigate 2018 Background Conditions (These improvements are to be implemented by others)	Improvements Recommended As Part of Piilani Promenade Project	Additional Mitigation Required to Mitigate 2018 Background Plus Project
Overall			1. Provide set backs along East Kaonoulu Street at all project driveways for future right turn decelerations lanes . (Required by SDOT)
Piilani Highway at Ohukai Street	1. Modify the westbound approach to provide a one left turn lane, one optional left or thru lane and one right turn lane. 2. Modify the eastbound approach to provide one left turn lane, one thru lane and one right turn lane. 3. Modify the southbound approach to provide an additional left turn lane.		No additional mitigation required
Piilani Highway at Kaiwahine St and Uwapo Road	1. Modify the eastbound approach to provide separate left, through and right turn lanes 2. Modify the westbound approach to provide two left turn lanes, one through lane and one right turn lane. 3. Modify the southbound approach to provide a second left turn lane.		No additional mitigation required
Piilani Highway at Kaonoulu Street	1. Install traffic signals	1. Modify eastbound approach to provide one left turn lane, one through lane and one right turn lane 2. Provide two southbound to eastbound left turn lanes 3. Provide two left turn lanes, one through lane and one right turn lanes along the westbound approach	No additional mitigation required
South Kihei Road at Kaonoulu Street	1. Install traffic signals 2. Provide southbound to eastbound left turn lane and northbound to eastbound right turn lane.		No additional mitigation required
Piilani Highway at Kulanihakoi Road			No additional mitigation required

Roundabout Analysis

The viability of providing a roundabout at the intersection of Piilani Highway at Kaonoulu Street was assessed and the results are summarized in Table 22. Shown are the high and low volume-to-capacity ratios. High and low volume-to-capacity ratios are reported since there is a learning process as drivers learn to drive a roundabout. The high volume-to-capacity ratio would be the condition expected after the roundabout has been in use sufficiently long for drivers to learn to drive the roundabout.

The roundabout analysis was performed to different scenarios of configuration. The number of lanes was varied from one to three lanes and the inside radius was varied from 25 to 80 feet. The data reported was the same for all scenarios.

Table 22 Roundabout Analysis of Piilani Highway at Kaonoulu Street

	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
Approach	High V/C	Low V/C	High V/C	Low V/C	High V/C	Low V/C
Eastbound	1.49	2.12	2.61	3.92	2.97	4.44
Westbound	0.87	1.16	3.75	5.17	2.84	3.69
Northbound	1.32	1.60	2.95	3.73	3.06	3.99
Southbound	1.87	2.29	3.03	3.87	3.26	4.23

Impacts of Pedestrians

An assessment of the potential impacts of pedestrians on traffic conditions at the intersection of Piilani Highway at Kaonoulu Street was performed. It is anticipated that there will be pedestrian traffic across Piilani Highway at this intersection. However, there are no pedestrian trip generation data to develop reliable estimates. In order to assess the impacts of pedestrian traffic across Piilani Highway, the level-of-service was rerun assuming that 100 pedestrians per hour would use the crosswalks across Piilani Highway. The addition of 100 pedestrians per hour increased the intersection volume-to-capacity ratios and increased the overall intersection delays slightly but not enough to change the intersection level-of-service.

It has been recommended that traffic conditions at this intersection be assessed at 65% occupancy.

Impacts on Emergency Services

There is no indication within the TIAR that operation of emergency vehicles on the Piilani Highway or the future improved section of the Kihei Upcountry Highway within the proposed Piilani Promenade project will be impaired in any way. All the final levels-of-service are within accepted standards. To the contrary, the traffic signal systems planned for the project will be designed to automatically prioritize emergency vehicle operations, subject to State of Hawaii Department of Transportation's approval of the plans. The roadways and intersections included in the TIAR will operate within acceptable ranges of operation and there is no indication that development of the proposed project or roadway improvements will create a system that impairs the operation of emergency vehicles.

6. TRAFFIC IMPACTS OF HONUA'ULA DEVELOPMENT

The following chapter discusses the impacts of the Honua'ula Affordable Housing Project. The Honua'ula Affordable Housing Project is not part of the Piilani Promenade Project, nor is it considered a related background project, for the reasons discussed previously (page 17). However, if completed, Honua'ula Affordable Housing Project traffic would impact traffic along East Kaonoulu Road and is discussed in this chapter in response to public comments.

2018 Background Plus Project Plus Honua'ula Level-of-Service Analysis

The level-of-service analysis was performed using traffic conditions for background plus project plus mitigation roadway conditions and the traffic projections presented at the end of Chapter 4. The results of the Level-of-Service analysis of the signalized intersections are summarized in Table 23 and the results of the Level-of-Service analysis of the unsignalized intersections are summarized in Table 24.

Table 23 2018 Background Plus Project Plus Honuaula Levels-of-Service - Signalized Intersections

	AM Peak Hour						PM Peak Hour						Saturday Peak Hour					
	With Promenade Without Honuaula			With Promenade With Honuaula			With Promenade Without Honuaula			With Promenade With Honuaula			With Promenade Without Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Hwy at Ohukai Rd	***0.82***	***29.4***	***C***	***0.82***	***29.9***	***C***	***0.86***	***43.4***	***D***	***0.90***	***44.2***	***D***	***0.79***	***24.1***	***C***	***0.80***	***24.3***	***C***
Eastbound Left	0.46	51.7	D	0.46	51.7	D	0.72	84.2	F	0.72	84.2	F	0.53	37.5	D	0.54	38.2	D
Eastbound Left & Thru	0.41	51.1	D	0.41	51.1	D	0.72	83.4	F	0.72	83.4	F	0.55	38.0	D	0.56	38.8	D
Eastbound Right	0.06	47.7	D	0.06	47.7	D	0.08	63.7	E	0.08	63.7	E	0.38	35.5	D	0.39	36.1	D
Westbound Left	0.63	56.6	E	0.63	56.6	E	0.78	80.7	F	0.78	80.7	F	0.80	69.8	E	0.80	68.6	E
Westbound Left & Thru	0.65	58.0	E	0.65	58.0	E	0.80	83.1	F	0.80	83.1	F	0.82	71.4	E	0.81	70.1	E
Westbound Right	0.12	47.9	D	0.12	47.9	D	0.42	62.1	E	0.43	62.2	E	0.03	37.2	D	0.03	37.4	D
Northbound Left	0.32	58.7	E	0.32	58.9	E	0.82	86.6	F	0.82	86.6	F	0.82	74.6	E	0.83	77.0	E
Northbound Thru	0.74	17.9	B	0.76	18.6	B	0.86	27.2	C	0.87	28.1	C	0.75	18.0	B	0.75	18.2	B
Northbound Right	0.04	17.6	B	0.04	17.1	B	0.08	11.3	B	0.08	11.3	B	0.10	10.2	B	0.10	10.1	B
Southbound Left	0.46	66.5	E	0.46	66.4	E	0.73	65.1	E	0.73	65.2	E	0.37	37.7	D	0.37	38.1	D
Southbound Thru	0.91	24.6	C	0.92	25.8	C	0.87	41.9	D	0.90	43.7	D	0.79	18.3	B	0.81	18.6	B
Southbound Right	0.07	3.7	A	0.07	4.1	A	0.07	34.0	C	0.07	33.0	C	0.07	9.3	A	0.07	9.2	A
Piilani Hwy at Kaiwahine St	***0.62***	***26.5***	***C***	***0.63***	***26.6***	***C***	***0.73***	***26.5***	***C***	***0.74***	***26.9***	***C***	***0.70***	***14.9***	***B***	***0.71***	***15.1***	***B***
Eastbound Left	0.66	56.8	E	0.66	56.8	E	0.63	73.7	E	0.63	73.7	E	0.35	36.8	D	0.35	37.2	D
Eastbound Thru	0.06	44.1	D	0.06	44.1	D	0.11	61.7	E	0.11	61.7	E	0.06	34.0	C	0.06	34.3	C
Eastbound Right	0.08	44.4	D	0.08	44.4	D	0.08	61.5	E	0.08	61.5	E	0.08	34.1	C	0.08	34.5	C
Westbound Left	0.41	48.3	D	0.41	48.3	D	0.56	69.5	E	0.56	69.5	E	0.55	40.3	D	0.55	40.9	D
Westbound Thru	0.10	44.5	D	0.10	44.5	D	0.25	63.0	E	0.25	63.0	E	**0.17**	**34.8**	**C**	**0.17**	**35.1**	**D**
Westbound Right	0.07	44.3	D	0.07	44.3	D	0.05	61.2	E	0.05	61.2	E	0.03	33.8	C	0.03	34.2	C
Northbound Left	0.33	32.8	C	0.33	32.5	C	0.62	76.7	E	0.62	76.5	E	0.56	42.9	D	0.56	43.4	D
Northbound Thru	0.62	21.9	C	0.64	22.5	C	0.73	22.9	C	0.74	23.5	C	0.63	10.0	B	0.64	10.2	B
Northbound Right	0.05	27.1	C	0.05	26.3	C	0.11	13.5	B	0.11	13.2	B	0.07	5.8	A	0.07	5.8	A
Southbound Left	0.37	44.9	D	0.37	45.5	D	0.63	83.3	F	0.63	82.9	F	0.53	41.9	D	0.53	41.8	D
Southbound Thru	0.62	22.6	C	0.63	22.6	C	0.69	16.6	B	0.71	17.2	B	0.75	12.5	B	0.77	12.8	B
Southbound Right	0.01	16.4	B	0.01	16.9	B	0.05	6.9	A	0.05	6.7	A	0.03	5.7	A	0.03	5.6	A
Piilani Hwy at N. Kihei Rd	***0.63***	***29.5***	***C***	***0.64***	***29.6***	***C***	***0.84***	***39.4***	***D***	***0.85***	***39.9***	***D***	***0.65***	***16.4***	***B***	***0.69***	***19.0***	***B***
Eastbound Left	0.58	59.4	E	0.58	58.9	E	0.75	56.6	E	0.74	55.6	E	0.53	35.9	D	0.54	37.8	D
Eastbound Left & Thru	0.61	60.5	E	0.60	59.8	E	0.78	59.2	E	0.77	58.1	E	0.53	35.9	D	0.54	37.8	D
Eastbound Right	0.28	54.8	D	0.28	54.4	D	0.22	40.9	D	0.23	39.5	D	0.35	22.0	C	0.33	20.4	C
Westbound Left, Thru & Rt	0.22	59.0	E	0.22	59.0	E	0.58	73.5	E	0.58	73.5	E	0.02	37.3	D	0.02	38.5	D
Northbound Left	0.73	44.7	D	0.74	44.5	D	0.93	84.9	F	0.94	85.0	F	0.42	31.8	C	0.69	34.3	C
Northbound Thru & Right	0.54	18.3	B	0.56	18.7	B	0.60	18.2	B	0.61	18.7	B	0.51	8.0	A	0.51	7.9	A
Southbound Left	0.21	64.4	E	0.21	64.4	E	0.46	78.4	E	0.46	78.4	E	0.39	44.3	D	0.41	46.3	D
Southbound Thru	0.67	23.4	C	0.68	23.8	C	0.83	37.3	D	0.86	39.0	D	**0.75**	**17.2**	**B**	**0.81**	**21.4**	**C**
Southbound Right	0.08	14.7	B	0.08	14.8	B	0.17	21.2	C	0.17	21.4	C	0.11	10.0	B	0.11	11.7	B
N. Kihei Rd at S. Kihei Rd	***0.42***	***20.3***	***C***	***0.42***	***20.2***	***C***	***0.64***	***28.5***	***C***	***0.64***	***28.6***	***C***	***0.61***	***12.5***	***B***	***0.61***	***12.5***	***B***
Eastbound Thru	0.30	10.5	B	0.30	10.5	B	0.50	21.7	C	0.51	21.8	C	0.53	13.9	B	0.54	14.0	B
Eastbound Right	0.19	9.5	A	0.19	9.5	A	**0.41**	**20.0**	**B**	**0.42**	**20.1**	**C**	0.30	11.8	B	0.30	11.7	B
Westbound Left	0.59	70.2	E	0.59	70.5	E	0.70	98.4	F	0.71	99.7	F	0.51	24.5	C	0.51	24.5	C
Westbound Thru	0.18	1.1	A	0.19	1.1	A	0.19	1.8	A	0.19	1.8	A	0.18	4.2	A	0.18	4.2	A
Northbound Left	0.77	54.5	D	0.77	54.5	D	0.43	50.7	D	0.43	50.7	D	0.52	21.6	C	0.52	21.8	C
Northbound Right	0.13	0.0	A	0.13	0.0	A	0.12	46.1	D	0.12	46.1	D	0.10	0.0	A	0.10	0.0	A

Table 23 2018 Background Plus Project Plus Honuaula Levels-of-Service - Signalized Intersections (Continued)

	AM Peak Hour						PM Peak Hour						Saturday Peak Hour					
	With Promenade Without Honuaula			With Promenade With Honuaula			With Promenade Without Honuaula			With Promenade With Honuaula			With Promenade Without Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Piilani Hwy at Kaonoulu St	***0.78***	***33.0***	***C***	***0.78***	***32.9***	***C***	***0.86***	***48.4***	***D***	***0.88***	***50.5***	***D***	***0.84***	***35.1***	***D***	***0.87***	***37.2***	***D***
Eastbound Left	0.48	59.8	E	0.48	59.8	E	0.57	91.8	F	0.57	91.8	F	0.51	41.9	D	0.51	41.9	D
Eastbound Thru	0.26	53.7	D	0.26	53.7	D	0.61	83.6	F	0.66	85.0	F	0.60	40.3	D	0.64	41.4	D
Eastbound Right	0.64	48.4	D	0.64	48.4	D	0.63	76.2	E	0.62	75.1	E	0.39	30.5	C	0.39	30.5	C
Westbound Left	0.74	70.0	E	0.74	70.0	E	0.89	77.1	E	0.90	78.7	E	0.93	53.9	D	0.97	62.3	E
Westbound Thru	0.50	56.6	E	0.50	56.6	E	0.51	66.4	E	0.52	66.4	E	0.50	30.7	C	0.54	31.4	C
Westbound Right	0.05	42.4	D	0.05	42.4	D	0.39	45.4	D	0.40	44.8	D	0.34	15.3	B	0.36	15.5	B
Northbound Left	0.55	38.7	D	0.55	38.6	D	0.57	84.0	F	0.57	84.0	F	0.74	54.0	D	0.74	54.0	D
Northbound Thru	0.52	26.9	C	0.52	26.8	C	0.88	48.1	D	0.90	51.0	D	0.94	49.4	D	0.94	49.4	D
Northbound Right	0.05	36.6	D	0.05	36.4	D	0.25	12.8	B	0.28	13.6	B	0.48	16.2	B	0.48	16.5	B
Southbound Left	0.53	41.5	D	0.53	41.3	D	0.82	80.3	F	0.89	86.8	F	0.92	49.2	D	0.96	56.5	E
Southbound Thru	0.80	26.1	C	0.80	26.1	C	0.69	27.5	C	0.70	28.7	C	0.73	25.4	C	0.73	25.4	C
Southbound Right	0.05	25.2	C	0.05	26.2	C	0.08	16.1	B	0.08	16.8	B	0.08	17.4	B	0.08	17.4	B
S. Kihei Rd at Kaonoulu St.	***0.46***	***6.3***	***A***	***0.47***	***6.6***	***A***	***0.62***	***15.8***	***B***	***0.66***	***15.9***	***B***	***0.54***	***7.1***	***A***	***0.55***	***7.2***	***A***
Westbound Left	0.41	21.3	C	0.42	20.8	C	0.55	25.0	C	0.57	22.6	C	0.53	15.5	B	0.55	15.4	B
Westbound Right	0.04	19.1	B	0.05	18.6	B	**0.08**	**21.2**	**C**	**0.08**	**18.6**	**B**	0.08	12.7	B	0.08	12.5	B
Northbound Thru	0.48	4.5	A	0.49	4.7	A	0.59	10.5	B	0.63	10.9	B	0.54	6.0	A	0.55	6.0	A
Northbound Thru	0.08	3.1	A	0.08	3.2	A	0.18	7.2	A	0.16	7.3	A	0.15	4.2	A	0.16	4.2	A
Southbound Left	0.13	3.3	A	0.14	3.5	A	**0.94**	**80.2**	**F**	**0.95**	**79.1**	**E**	0.40	5.6	A	0.43	5.8	A
Southbound Thru	0.32	3.8	A	0.33	4.0	A	0.44	4.4	A	0.45	4.3	A	0.46	5.4	A	0.46	5.4	A
Piilani Hwy at Kulanihakoi St	***0.79***	***16.5***	***B***	***0.81***	***16.7***	***B***	***0.77***	***14.9***	***B***	***0.79***	***15.1***	***B***	***0.66***	***8.0***	***A***	***0.67***	***8.1***	***A***
Eastbound Left & Thru	0.52	57.0	E	0.52	57.0	E	0.64	76.2	E	0.64	75.2	E	0.57	40.7	D	0.57	41.3	D
Eastbound Right	0.35	53.9	D	0.37	54.1	D	0.06	62.1	E	0.06	62.1	E	0.06	34.2	C	0.06	34.5	C
Westbound Left & Thru	0.66	67.4	E	0.66	67.4	E	0.39	66.2	E	0.39	66.2	E	0.00	0.0	A	0.00	0.0	A
Westbound Right	0.02	50.8	D	0.02	50.8	D	0.01	61.6	E	0.01	61.6	E	0.00	0.0	A	0.00	0.0	A
Northbound Left	0.60	85.9	F	0.60	85.6	F	0.60	64.8	E	0.60	64.7	E	0.44	43.7	D	0.44	44.0	D
Northbound Thru	**0.58**	**9.9**	**A**	**0.58**	**10.0**	**B**	0.78	8.2	A	0.80	8.5	A	0.62	4.2	A	0.63	4.2	A
Northbound Right	0.08	3.1	A	0.08	3.1	A	0.02	3.9	A	0.02	3.9	A	0.00	0.0	A	0.00	0.0	A
Southbound Left	0.55	56.6	E	0.55	56.9	E	0.32	77.5	E	0.32	77.5	E	0.00	0.0	A	0.00	0.0	A
Southbound Thru	0.79	14.0	B	0.80	14.5	B	0.79	14.4	B	0.80	14.8	B	0.67	8.2	A	0.68	8.4	A
Southbound Right	0.03	7.8	A	0.03	7.7	A	0.09	5.4	A	0.09	5.4	A	0.07	4.3	A	0.07	4.3	A
Piilani Hwy at Piikea Ave	***0.84***	***21.4***	***C***	***0.84***	***21.6***	***C***	***0.90***	***30.6***	***C***	***0.92***	***32.3***	***C***	***0.89***	***27.5***	***C***	***0.91***	***28.4***	***C***
Eastbound Left	0.88	68.8	E	0.89	70.4	E	0.95	88.7	F	0.97	93.6	F	**0.89**	**50.7**	**D**	**0.92**	**55.5**	**E**
Eastbound Right	0.24	41.5	D	0.24	41.3	D	0.22	47.7	D	0.25	47.3	D	0.18	24.8	C	0.18	24.8	C
Northbound Left	0.76	77.3	E	0.76	77.3	E	0.85	79.9	E	0.85	79.9	E	0.91	75.1	E	0.91	75.1	E
Northbound Thru	0.51	8.2	A	0.51	8.3	A	0.72	13.9	B	0.73	14.8	B	0.64	12.2	B	0.65	12.3	B
Southbound Thru	0.83	19.2	B	0.84	19.3	B	0.89	29.3	C	0.91	31.5	C	0.89	31.8	C	0.90	32.7	C
Southbound Right	0.30	11.8	B	0.32	11.6	B	0.45	17.0	B	0.47	17.7	B	0.32	18.1	B	0.33	18.2	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix D for Level-of-Service Analysis Worksheets for With Promenade Without Honuaula Conditions.
(4) See Appendix F for Level-of-Service Analysis Worksheets With Promenade With Honuaula Conditions.

Table 24 2018 Background Plus Project Plus Honua'ula Levels-of-Service - Unsignalized Intersections

Intersection & Movement	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
	With Promenade Without Honuaula		With Promenade With Honuaula		With Promenade Without Honuaula		With Promenade With Honuaula		With Promenade Without Honuaula		With Promenade With Honuaula	
Kaonoulu Street at Kenolio Road	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
	6.9	***A***	***7.0***	***A***	***6.8***	***A***	***7.4***	***A***	***6.3***	***A***	***6.7***	***A***
Eastbound Left	7.8	A	7.8	A	8.3	A	8.4	A	8.4	A	8.4	A
Westbound Left	7.6	A	7.6	A	8.0	A	8.1	A	8.1	A	8.1	A
Northbound Left	12.5	B	12.9	B	19.1	C	20.2	C	19.7	C	20.6	C
Northbound Thru & Right	9.9	A	10.0	A	12.3	B	12.7	B	13.1	B	13.5	B
Southbound Left	20.4	C	21.9	E	39.0	E	44.8	E	39.7	E	44.8	E
Southbound Thru & Right	10.0	B	10.2	B	14.2	B	14.7	B	12.7	B	13.0	B
Kaonoulu Street at Alulike Street	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
	0.21	***A***	***0.21***	***A***	***0.39***	***A***	***0.41***	***A***	***0.42***	***A***	***0.44***	***A***
Eastbound Approach	0.21	A	0.21	A	0.39	A	0.41	A	0.42	A	0.44	A
Westbound Approach	0.15	A	0.17	A	0.30	A	0.31	A	0.35	A	0.36	A
Northbound Approach	0.01	A	0.01	A	0.01	A	0.01	A	0.02	A	0.02	A
Southbound Approach	0.07	A	0.08	A	0.08	A	0.08	A	0.13	A	0.13	A

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix E for Level-of-Service Analysis Worksheets for With Promenade Without Honuaula conditions.
(4) See Appendix F for Level-of-Service Analysis Worksheets for With Promenade With Honuaula conditions.

Project Driveways Along Kaonoulu Street With Honua'ula

The results of the Level-of-Service analysis of the project driveways are summarized in Table 25.

Table 25 2018 Levels-of-Service of Project Driveways

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	With Promenade With Honuaula			With Promenade With Honuaula			With Promenade With Honuaula		
Intersection and Movement	V/C(1)	Delay (2)	LOS (3)	V/C	Delay	LOS	V/C	Delay	LOS
E. Kaonoulu Street at Drive A	***0.13***	***7.7***	***A***	***0.61***	***33.9***	***C***	***0.72***	***32.2***	***C***
Eastbound Left	0.15	8.0	A	0.62	40.9	D	0.76	40.8	D
Eastbound Thru	0.05	7.3	A	0.17	20.5	C	0.20	15.9	B
Eastbound Right	0.06	7.6	A	0.20	24.3	D	0.30	16.9	B
Westbound Left	0.00	0.0	A	0.00	0.0	A	0.00	0.0	A
Westbound Thru & Right	0.13	7.4	A	0.75	39.3	D	0.84	42.4	D
Northbound Left	0.07	7.5	A	0.62	34.5	C	0.79	39.3	D
Northbound Thru & Right	0.02	0.0	A	0.04	12.2	A	0.07	12.8	B
Southbound Left & Thru	0.01	0.0	A	0.14	27.4	C	0.14	28.6	C
Southbound Right	0.04	7.5	A	0.12	27.1	C	0.12	28.4	C
E. Kaonoulu St at Drive B South	***nc***	***0.0***	***A***	***nc***	***0.0***	***A***	***nc***	***0.0***	***A***
Northbound Right	nc	0.0	A	nc	0.0	A	nc	0.0	A
E. Kaonoulu St at Drive B North	***nc***	***1.3***	***A***	***nc***	***1.7***	***A***	***nc***	***1.6***	***A***
Southbound Right	nc	9.7	A	nc	16.0	C	nc	19.7	C
E. Kaonoulu Street at Drive C	***nc***	***7.7***	***A***	***nc***	***16.4***	***B***	***nc***	***8.9***	***A***
Eastbound Left	nc	7.3	A	nc	7.5	A	nc	7.5	A
Westbound Left	nc	0.0	A	nc	0.0	A	nc	0.0	A
Northbound Left	nc	10.9	B	nc	28.5	D	nc	47.0	E
Northbound Thru & Right	nc	0.0	A	nc	0.0	A	nc	0.0	A
Southbound Left & Thru	nc	0.0	A	nc	0.0	A	nc	0.0	A
Southbound Right	nc	8.8	A	nc	8.7	A	nc	8.8	A
E. Kaonoulu Street at Drive D	***nc***	***4.3***	***A***	***nc***	***5.8***	***A***	***nc***	***5.8***	***A***
Northbound Left & Right	nc	8.5	A	nc	8.7	A	nc	8.8	A

NOTES:
(1) Denotes volume-to-capacity ratio. Volume-to-capacity ratios are not calculated for the unsignalized intersections.
(2) Delay is in seconds per vehicle.
(3) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(4) See Appendix F for Level-of-Service Analysis Worksheets.
(5) nc = not calculated.

Mitigation Measures

No additional mitigation is required to accommodate traffic generated by the Honua'ula Affordable Housing project.

7. LONG-RANGE FORECASTS

State of Hawaii Department of Transportation requested long-range forecasts of the intersections along Piilani Highway that included traffic generated by the south Maui projects (Honua'ula, Wailea Resort and Makena Resort).

Methodology

The *Kihei Master Traffic Plan Study*[12] contained morning and afternoon traffic forecasts for the intersections along Piilani Highway that included traffic associated the Upcountry Highway. The report also implies that the forecast include traffic associated with major South Maui projects known at the time, primarily Wailea, Makena and Honua'ula.

The traffic forecasts in the *Kihei Master Traffic Plan Study* were also adjusted to include traffic from the following projects

(1) Kaiwahine Village
(2) Maui Lu Resort
(3) Kenolio 6 Residential
(4) Kihei Residential
(5) Kihei High School Phases 1 and 2
(6) Honua'ula Off-site Affordable Housing
(7) Maui Research and Technology park

[12] Parsons Brinckerhoff Quade & Douglas, *Kihei Master Traffic Plan Study*, Honolulu, HI, September 2003

The resulting morning and afternoon 2025 traffic projections are shown on Figures 29 and 30, respectively. The resulting peak hour projections along East Kaonoulu Street are shown on Figure 31. A level-of-service analysis was performed to confirm that the study intersections would operate at acceptable levels-of-service. The level-of-service analysis confirmed that the following improvements should be implemented:

(1) The North-South Collector Road should be completed between Kaonoulu Street and Waipuilani Road.

(2) The mauka roadway should be completed between Ohukai Street and Lipoa Street. It should be noted that the connection between Lipoa Street and the proposed Kihei High School was recommended in the TIAR for the Maui Research and Technology Park and the connection between Ohukai Road and East Kaonoulu Street is recommended in this report.

(3) The intersection of East Kaonoulu Street at Drive C should be signalized. This intersection provides access and egress to the proposed Honua'ula Affordable Housing project.

The final levels-of-service are summarized in Tables 26 and 27.

Table 26 2025 Levels-of-Service - Signalized Intersections

	AM Peak Hour			PM Peak Hour		
Intersection and Movement	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS
Piilani Hwy at Ohukai Rd	***0.78***	***27.5***	***C***	***0.98***	***37.6***	***D***
Eastbound Left	0.52	54.8	D	0.47	83.5	F
Eastbound Thru	0.31	51.9	D	0.43	82.7	F
Eastbound Right	0.06	49.7	D	0.06	78.2	E
Westbound Left	0.77	66.2	E	0.66	88.6	F
Westbound Left & Thru	0.25	49.2	D	0.67	89.5	F
Westbound Right	0.09	47.7	D	0.08	75.0	E
Northbound Left	0.38	51.3	D	0.63	79.0	E
Northbound Thru	0.83	26.1	C	1.00	29.7	C
Northbound Right	0.11	22.8	C	0.13	8.1	A
Southbound Left	0.55	64.1	E	0.85	83.8	F
Southbound Thru	0.84	16.5	B	0.83	32.8	C
Southbound Right	0.03	4.8	A	0.09	19.7	B
Piilani Hwy at Kaiwahine St	***0.78***	***31.8***	***C***	***0.87***	***44.7***	***D***
Eastbound Left	0.09	41.6	D	0.19	71.4	E
Eastbound Thru	0.14	42.0	D	0.44	74.5	E
Eastbound Right	0.04	41.1	D	0.08	70.1	E
Westbound Left	0.72	52.6	D	0.82	97.0	F
Westbound Thru	0.25	43.2	D	0.31	72.7	E
Westbound Right	0.64	51.1	D	0.07	69.9	E
Northbound Left	0.41	32.5	C	0.65	77.8	E
Northbound Thru	0.75	26.6	C	0.89	39.3	D
Northbound Right	0.05	32.0	C	0.14	19.3	B
Southbound Left	0.39	46.3	D	0.73	76.0	E
Southbound Thru	0.63	25.3	C	0.82	37.4	D
Southbound Right	0.01	11.7	B	0.03	14.2	B
Piilani Hwy at N. Kihei Rd	***0.63***	***29.0***	***C***	***0.97***	***58.5***	***E***
Eastbound Left	0.57	59.3	E	0.82	76.9	E
Eastbound Left & Thru	0.59	60.1	E	0.85	81.9	F
Eastbound Right	0.29	34.4	C	0.42	46.6	D
Westbound Left, Thru & Right	0.22	59.0	E	0.92	143.1	F
Northbound Left	0.68	39.5	D	1.14	141.9	F
Northbound Thru & Right	0.61	17.1	B	0.67	20.2	C
Southbound Left	0.27	66.6	E	0.55	105.8	F
Southbound Thru	0.70	30.7	C	0.94	53.3	D
Southbound Right	0.09	20.4	C	0.18	25.0	C
N. KIhei Rd at S. Kihei Rd	***0.49***	***19.7***	***B***	***0.64***	***31.1***	***c***
Eastbound Thru	0.38	13.2	B	0.53	25.4	C
Eastbound Right	0.18	11.0	B	0.46	23.8	C
Westbound Left	0.59	68.1	E	0.66	90.4	F
Westbound Thru	0.29	2.0	A	0.23	1.4	A
Northbound Left	0.79	52.2	D	0.48	62.3	E
Northbound Right	0.13	0.0	A	0.12	56.0	E

Table 26 2025 Levels-of-Service - Signalized Intersections (Continued)

	AM Peak Hour			PM Peak Hour		
Intersection and Movement	V/C	Delay [1]	LOS [2]	V/C	Delay	LOS
Piilani Hwy at Kaonoulu St	***0.82***	***57.6***	***E***	***0.98***	***62.3***	***E***
Eastbound Left	0.87	74.4	E	0.98	141.2	F
Eastbound Thru	0.18	45.9	D	0.76	92.8	F
Eastbound Right	0.31	35.6	D	0.43	55.6	E
Westbound Left	0.64	73.3	E	0.99	104.9	F
Westbound Thru	0.69	84.4	F	0.98	126.7	F
Westbound Right	0.10	212.8	F	0.56	49.3	D
Northbound Left	0.78	50.1	D	0.83	89.0	F
Northbound Thru	0.59	38.7	D	0.98	66.5	E
Northbound Right	0.11	92.9	F	0.27	14.1	B
Southbound Left	0.72	47.7	D	0.98	114.7	C
Southbound Thru	0.84	33.9	C	0.71	20.5	C
Southbound Right	0.10	39.9	D	0.22	5.5	A
S. Kihei Rd at Kaonoulu St.	***0.64***	***7.6***	***A***	***0.67***	***14.9***	***B***
Westbound Left	0.54	23.5	C	0.75	31.3	C
Westbound Right	0.04	19.9	B	0.08	19.4	B
Northbound Thru	0.67	6.6	A	0.68	12.6	B
Northbound Thru	0.11	3.1	A	0.18	7.7	A
Southbound Left	0.24	3.8	A	0.84	54.9	D
Southbound Thru	0.32	3.8	A	0.64	6.5	A
Piilani Hwy at Kulanihakoi St	***0.73***	***24.5***	***C***	***0.84***	***16.7***	***B***
Eastbound Left & Thru	0.30	44.7	D	0.43	79.2	E
Eastbound Right	0.02	41.9	D	0.02	73.6	E
Westbound Left & Thru	0.85	74.5	E	0.75	101.4	F
Westbound Right	0.04	42.0	D	0.02	73.5	E
Northbound Left	0.52	75.2	E	0.64	78.6	E
Northbound Thru	0.68	15.9	B	0.85	11.4	B
Northbound Right	0.21	6.1	A	0.05	4.7	A
Southbound Left	0.68	51.5	D	0.51	80.4	F
Southbound Thru	0.72	25.0	C	0.71	12.8	B
Southbound Right	0.01	13.1	B	0.05	6.5	A
Piilani Hwy at Piikea Ave	***0.89***	***26.6***	***C***	***0.89***	***34.9***	***C***
Eastbound Left	0.92	69.3	E	0.93	90.3	F
Eastbound Right	0.14	36.1	D	0.34	53.9	D
Northbound Left	0.80	72.9	E	0.84	94.4	F
Northbound Thru	0.57	11.5	B	0.80	22.2	C
Southbound Thru	0.89	25.7	C	0.88	29.7	C
Southbound Right	0.20	6.3	A	0.41	10.9	B
Kaonoulu St at Kenolio Rd	***0.69***	***20.1***	***C***	***1.00***	***35.3***	***D***
Eastbound Left	0.20	17.7	B	0.48	19.1	B
Eastbound Thru & Right	0.45	18.8	B	0.43	14.5	B
Westbound Left	0.09	21.5	C	0.11	8.0	A
Westbound Thru & Right	0.76	46.7	D	0.93	44.8	D
Northbound Left	0.03	5.5	A	0.04	16.2	B
Northbound Thru & Right	0.26	7.0	A	0.59	24.1	C
Southbound Left	0.60	12.7	B	1.00	85.6	F
Southbound Thru & Right	0.30	7.2	A	0.48	21.7	C

Table 26 2025 Levels-of-Service - Signalized Intersections (Continued)

Intersection and Movement	AM Peak Hour V/C	AM Peak Hour Delay [1]	AM Peak Hour LOS [2]	PM Peak Hour V/C	PM Peak Hour Delay	PM Peak Hour LOS
Kaonoulu St at Drive A	***0.28***	***34.0***	***C***	***0.55***	***45.3***	***D***
Eastbound Left	0.17	43.2	D	0.68	45.8	D
Eastbound Thru	0.30	35.6	D	0.31	29.2	C
Eastbound Right	0.04	84.6	F	0.16	139.2	F
Westbound Left	0.06	35.8	D	0.42	31.5	C
Westbound Thru & Right	0.43	24.9	C	0.70	37.9	D
Northbound Left	0.09	32.7	C	0.58	38.6	D
Northbound Thru & Right	0.01	31.8	C	0.12	12.1	B
Southbound Left & Thru	0.06	32.5	C	0.14	22.2	C
Southbound Right	0.04	32.2	C	0.12	21.7	C
Kaonoulu Street at Drive C	***0.36***	***17.5***	***B***	***0.60***	***25.8***	***C***
Eastbound Left	0.33	44.0	D	0.58	53.6	D
Eastbound Thru	0.57	21.3	C	0.69	28.5	C
Eastbound Right	0.00	5.6	A	0.02	9.8	A
Westbound Left	0.33	34.8	C	0.41	44.3	D
Westbound Thru & Right	0.32	13.2	B	0.13	23.4	C
Northbound Left	0.13	13.9	B	0.52	19.2	B
Northbound Thru & Right	0.01	12.8	B	0.03	12.5	B
Southbound Left & Thru	0.03	13.0	B	0.02	12.4	B
Southbound Right	0.06	13.2	B	0.04	12.6	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix D for Level-of-Service Analysis Worksheets without Project.
(4) See Appendix E for Level-of-Service Analysis Worksheets with Project.

Table 27 2025 Levels-of-Service of Unsignalized Intersections

Intersection and Movement	AM Peak Hour Delay [1]	AM Peak Hour LOS [2]	PM Peak Hour Delay	PM Peak Hour LOS
Kaonoulu Street at Alulike Street	***1.9***	***A***	***1.7***	***A***
Eastbound Left	7.9	A	8.3	A
Westbound Left	7.8	A	8.2	A
Northbound Left, Thru & Right	15.8	B	17.7	B
Southbound Left, Thru & Right	10.6	B	11.9	B
Kaonoulu Street At Drive B South	***0.0***	***A***	***0.0***	***A***
Northbound Right	0.0	A	0.0	A
Kaonoulu Street at Drive B North	***0.6***	***A***	***1.9***	***A***
Southbound Right	11.6	B	16.4	C
Kaonoulu Street at Drive D	***0.1***	***A***	***0.9***	***A***
Northbound Left & Right	16.8	C	13.5	B

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(3) See Appendix C for Level-of-Service Analysis Worksheets.

8. INTERSECTION DESIGN REQUIREMENTS

Based on discussions with State of Hawaii Department of Transportation, it is understood that the Upcountry Highway will not be constructed until several years after Piilani Promenade has been completed. However, East Kaonoulu east of Piilani Highway should be constructed with capacity to accommodate Upcountry Highway traffic. The intersections along East Kaonoulu Street, including the intersection of Piilani Highway at East Kaonoulu Street, are to be constructed with capacity to accommodate traffic associated with the Upcountry Highway as well as traffic generated by the Piilani Promenade project.

This chapter describes the methodology used to estimate future design volumes of the intersections of Piilani Highway at East Kaonoulu Street and East Kaonoulu Street at Drive A to determine the design requirements of the intersections without and with the Upcountry Highway.

Required Left Turn Storage Lane Lengths

The left turn storage lengths required to accommodate estimated traffic volumes were calculated using guidelines in *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials. There are separate policies for signalized and unsignalized intersections. Based on this policy, the assumptions used to determine the required lengths of the left turn storage lanes are:

1. For signalized intersections, the length of the left turn storage lane should be "1.5 to 2.0 times the average number of vehicles that would store per cycle, which is predicted on the design volume."

2. For unsignalized intersections, the length of the left turn storage lane is "based on the number of vehicles likely to arrive in an average 2-minute period within the peak hour. As a minimum requirement, space for at least two passenger cars should be provided; with over 10 percent truck traffic, provisions should be made for at least one car and one truck."

3. The average length required per vehicle is 25 feet.

Left Turn Storage Lane Requirements Without Upcountry Highway

Using the above criteria, the turn storage lane requirements were calculated and the results are summarized in Table 28. Also shown are the storage lane length recommended. Figure 32 is a schematic drawing of the proposed lane configurations along East Kaonoulu Street between Piilani Highway and Drive D.

Table 28 Left Turn Storage Lane Requirements Without Upcountry Highway

Intersection	Approach & Time Period		Design Volume	Cycle Length (Seconds)	Cycles per Hour	Average Vehicles per Cycle	Recommended Length [1]				Recommendation
							Minimum		Desirable		
							Veh	Ft	Veh	Ft	
Piilani Hwy at Kaonoulu Street	EB	AM	50	125	29	2	3	75	4	100	1 Lane at 100 ft
		PM	49	180	20	2	3	75	4	100	
		Sat	74	45	80	1	2	50	2	50	
	WB	AM	152	125	29	5	8	200	10	250	2 Lanes with 1300 ft Total
		PM	515	180	20	26	39	975	52	1300	
		Sat	647	45	80	8	12	300	16	400	
	NB	AM	111	125	29	4	6	150	8	200	1 Lane at 350 ft
		PM	135	180	20	7	11	275	14	350	
		Sat	129	45	80	2	3	75	4	100	
	SB	AM	154	125	29	5	8	200	10	250	2 Lanes with 1350 ft Total
		PM	512	180	20	26	39	975	52	1300	
		Sat	704	45	80	9	14	350	18	450	
East Kaonoulu Street at Drive A	EB	AM	131	60	60	2	3	75	4	100	2 Lanes with 500 ft Total
		PM	376	90	40	9	14	350	18	450	
		Sat	414	90	40	10	15	375	20	500	
	WB	AM	0	60	60	0	0	0	0	0	1 lane at 60 ft.
		PM	0	90	40	0	0	0	0	0	
		Sat	0	90	40	0	0	0	0	0	

NOTE:
(1) Minimum queue length is 1.5 time average number of vehicles. Desirable queue length is 2.0 time average number of vehicles.

Left Turn Storage Lane Requirements With Upcountry Highway

Using the AASHTO standards described in the previous section, the left turn storage lengths required to accommodate Upcountry Highway traffic plus Piilani Promenade traffic was estimated. The results are presented in Table 29. A comparison of the required lengths without versus with the Upcountry Highway as calculated using the AASHTO standards is presented in Table 30.

Table 29 Left Turn Storage Lane Requirements With Upcountry Highway

Intersection	Approach & Time Period		Design Volume	Cycle Length (Seconds)	AASHTO Method						Provided (3)
					Cycles per Hour	Average Vehicles per Cycle	Recommended Length (1)				
							Minimum		Desirable		
							Veh	Ft	Veh	Ft	
Piilani Hwy at Kaonoulu Street	EB	AM	201	125	29	7	11	275	14	350	1 Lane at 400 ft
		PM	156	180	20	8	12	300	16	400	
	WB	AM	183	125	29	6	9	225	12	300	2 Lanes with 1400 ft Total
		PM	556	180	20	28	42	1050	56	1400	
	NB	AM	149	125	29	5	8	200	10	250	1 Lane at 400 ft
		PM	166	180	20	8	12	300	16	400	
	SB	AM	290	125	29	10	15	375	20	500	2 Lanes with 1250 ft Total
		PM	495	180	20	25	38	950	50	1250	
East Kaonoulu Street at Drive A	EB	AM	123	60	60	2	3	75	4	100	2 Lanes with 450 ft Total
		PM	369	90	40	9	14	350	18	450	
	WB	AM	18	60	60	0	0	0	0	0	1 lane at 60 ft.
		PM	53	90	40	1	2	50	2	50	

NOTE:
(1) Minimum queue length is 1.5 time average number of vehicles. Desirable queue length is 2.0 time average number of vehicles.
(2) See Appendix I.

Table 30 Comparison of Left Turn Storage Lane Requirements Without versus With Upcountry Highway

Intersection	Approach	Recommended Left Turn Storage Lengths	
		Without Upcountry Highway	With Upcountry Highway
Piilani Hwy at Kaonoulu Street	EB	1 lane at 100 ft	1 lane at 400 ft
	WB	2 lanes with 1300 ft Total	2 lanes with 1400 ft Total
	NB	1 lane at 350 ft	1 lane at 400 ft
	SB	2 lanes with 1350 ft Total	2 lanes with 1250 ft Total
East Kaonoulu Street at Drive A	EB	2 lanes with 500 ft Total	2 lanes with 450 ft Total
	WB	1 lane at 60 ft.	1 lane at 60 ft.

9. TRANSPORTATION MANAGEMENT PLAN

Purpose and Approach of the Transportation Management Plan

The purpose of the Transportation Management Plan (TMP) is typically to identify and describe transportation management strategies to reduce travel demand, primarily "single-occupancy private vehicles", or to redistribute demand in time. These strategies should accomplish the following:

1. Reduce the need for employees and customers of Piilani Promenade to use "single-occupancy private vehicles" by encouraging the use of alternative modes of transportation, such as walking, biking, and public transportation and ride sharing.

2. Provide alternative modes and facilities for these alternative modes.

3. Coordinate the establishment of programs, such as carpools and other ride sharing programs, that reduce the amount of traffic generated by the project.

Transportation Management Plan Strategies

1. A Transportation Coordinator should be designated by the developer or property manager. The Transportation Coordinator will be responsible for establishing, coordinating and managing the TMP strategies identified in the plan. The Transportation Coordinator should also document any traffic related complaints received from the surrounding community.

2. Employers should allow flexible work hours. Examples of flexible work hour are:

   A. Start the work day such that employees get to work before or after the weekday commute peak hours.

   B. Some employees have scheduled four 10-hour work days per week, with alternating Monday through Thursday and Tuesday through Friday work weeks. Every other week end is a four day weekend. Employees are divided into two groups so that offices are always covered with half the staff on the alternating Monday and Fridays.

3. The Transportation Coordinator should establish and coordinate a ride sharing program for employees. Since the Transportation Coordinator is employed by the developer or property manager, employees of various employers of Piilani Promenade can be brought into the program, not those from just a single major employer.

4. The Transportation Coordinator should coordinate with the Maui Department of Transportation to establish bus routes to provide service between the project, hotels and Kihei.

5. Bus passes should be provided to employees free or at a subsidized price.

6. Bus stops should be provided within the project that will minimize walking distances to the various businesses in the project.

7. The Transportation Coordinator should coordinate with the hotels, especially those in Kihei and adjacent area, to provide shuttle bus service between the hotels and Piilani Promenade.

8. A voucher program should be established for employees that participate in one of the ride sharing programs or bus pass programs and have to leave work for family emergencies.

9. Preferential parking spaces should be provided for employees participating it in ride sharing programs.

10. Secure bicycle storage facilities should be provided at several locations within the project. Showers for employees should also be considered.

11. Pedestrian walkways should be designated within the parking lot area to encourage pedestrian circulation and enhance safety of pedestrians between the roadways and buildings.

FIGURES

LIST OF FIGURES

Figure 1	Project Location in Kihei
Figure 2	Site Plan
Figure 3	Schematic Drawing Indicating Approximate Locations of Project Driveways
Figure 4	Existing Lane Configurations and Right-of-Way Controls
Figure 5	Existing (2013) AM Peak Hour Traffic Volumes
Figure 6	Existing (2013) PM Peak Hour Traffic Volumes
Figure 7	Existing (2013) Saturday Peak Hour Traffic Volumes
Figure 8	Locations of Related Projects
Figure 9	2018 Background AM Peak Hour Traffic Projections
Figure 10	2018 Background PM Peak Hour Traffic Projections
Figure 11	2018 Background Saturday Peak Hour Traffic Projections
Figure 12	2018 Background Lane Configurations and Right-of-Way Controls
Figure 13	2018 Background Lane Configurations and Right-of-Way Controls With Mitigation
Figure 14	2018 Lane Configurations and Right-of-Way Controls With Project
Figure 15	AM Peak Hour Project Trip Assignments
Figure 16	PM Peak Hour Project Trip Assignments
Figure 17	Saturday Peak Hour Project Trip Assignments
Figure 18	Background (2018) Plus Project AM Peak Hour Traffic Projections
Figure 19	Background (2018) Plus Project PM Peak Hour Traffic Projections
Figure 20	Background (2018) Plus Project Saturday Peak Hour Traffic Projections
Figure 21	Background (2018) Plus Project Peak Hour Traffic Projections Along Kaonoulu Street
Figure 22	AM Peak Hour Honua'ula Trip Assignments
Figure 23	PM Peak Hour Honua'ula Trip Assignments
Figure 24	Saturday Peak Hour Honua'ula Trip Assignments
Figure 25	Honua'ula Trip Assignments Along Kaonoulu Street
Figure 26	Piilani Promenade Plus Honua'ula AM Peak Hour Traffic Projections
Figure 27	Piilani Promenade Plus Honua'ula PM Peak Hour Traffic Projections
Figure 28	Piilani Promenade Plus Honua'ula Saturday Peak Hour Traffic Projections
Figure 29	Piilani Promenade Plus Honua'ula Peak Hour Traffic Projections Along Kaonoulu Street
Figure 30	2025 Background Plus Project AM Peak Hour Traffic Projections
Figure 31	2025 Background Plus Project PM Peak Hour Traffic Projections
Figure 32	2025 Background Plus Project Saturday Peak Hour Traffic Projections
Figure 33	Schematic Drawing of East Kaonoulu Street

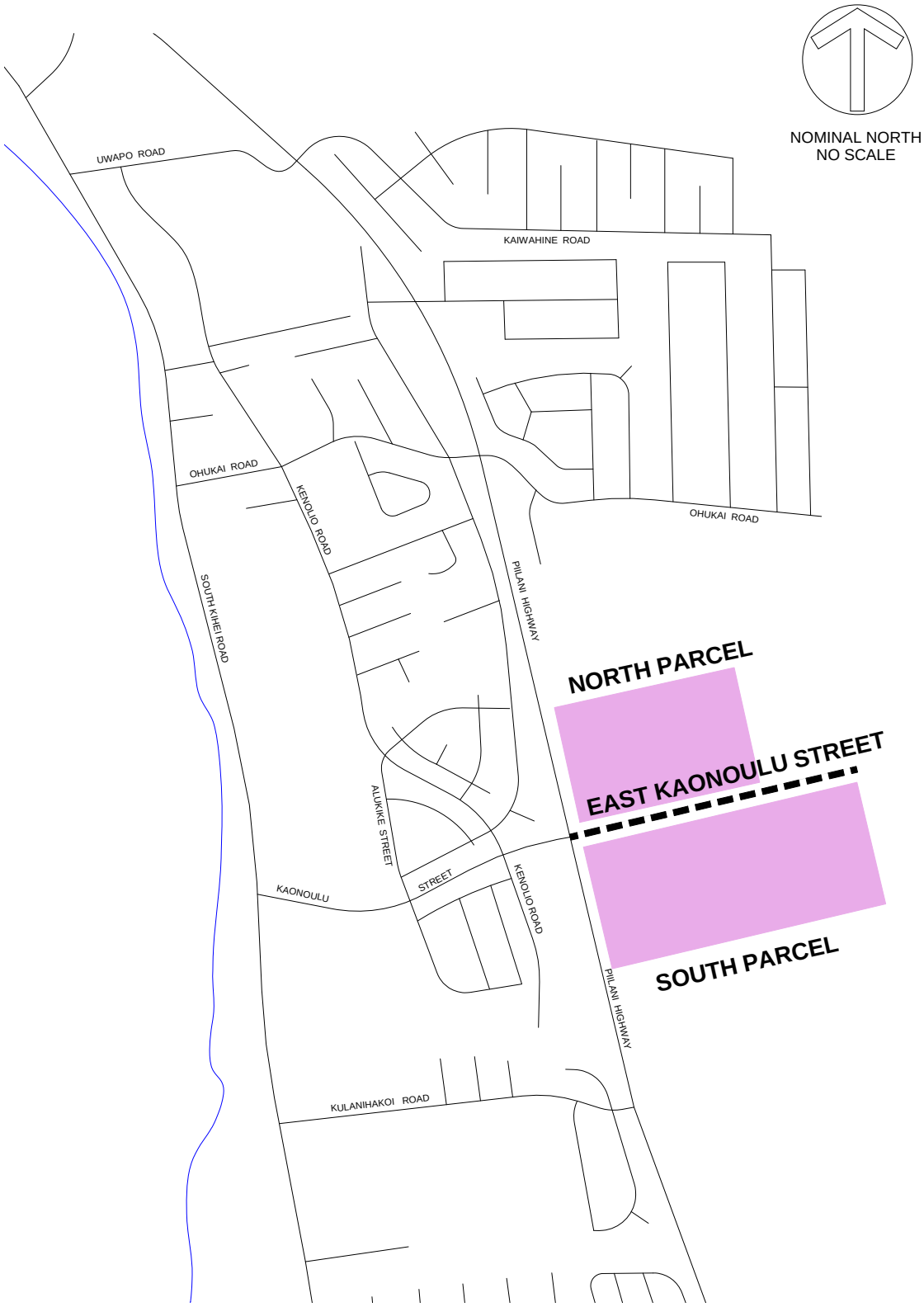


Figure 1
PROJECT LOCATION IN KIHEI

Phillip Rowell and Associates

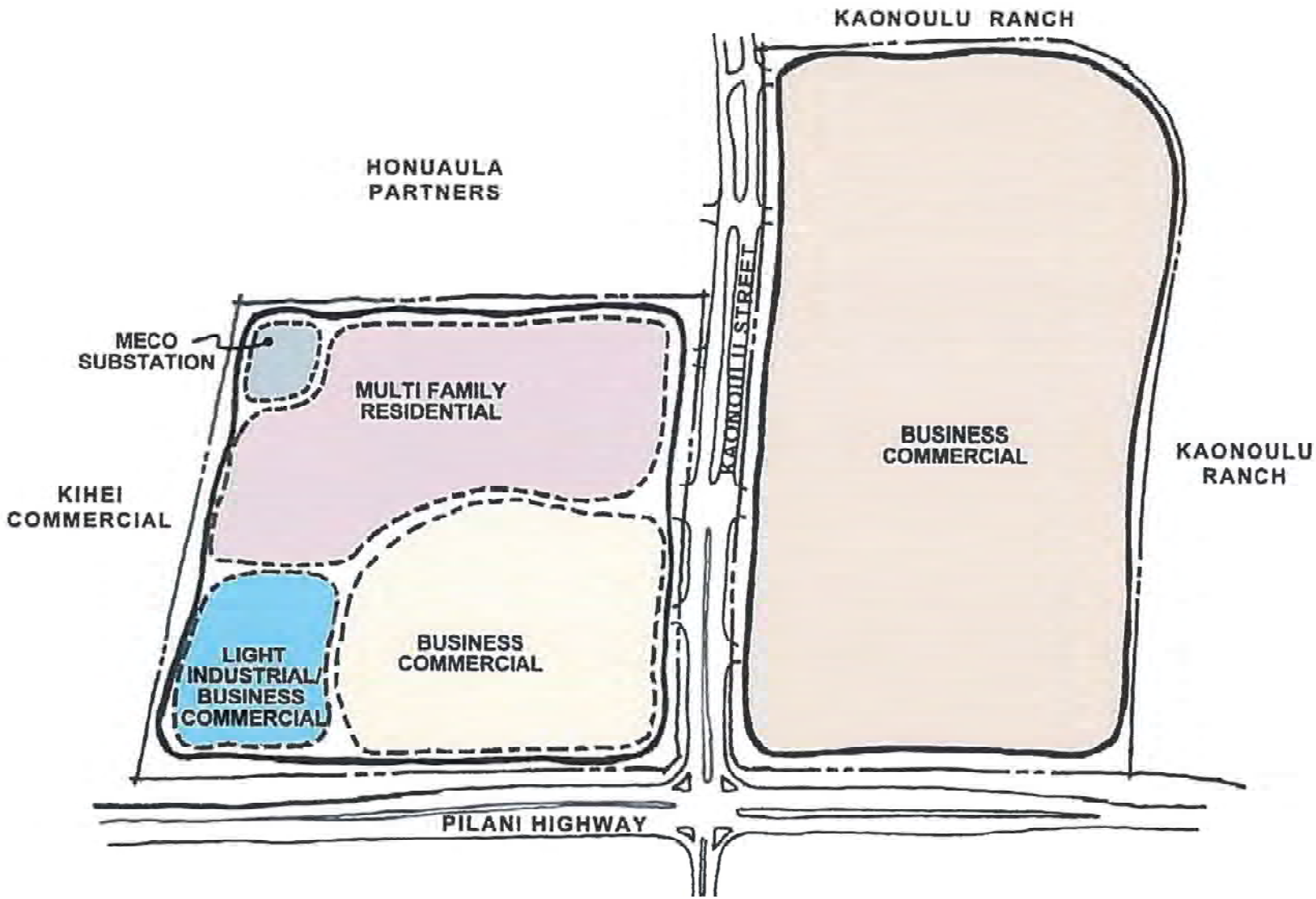


Figure 2
SITE PLAN

Phillip Rowell and Associates

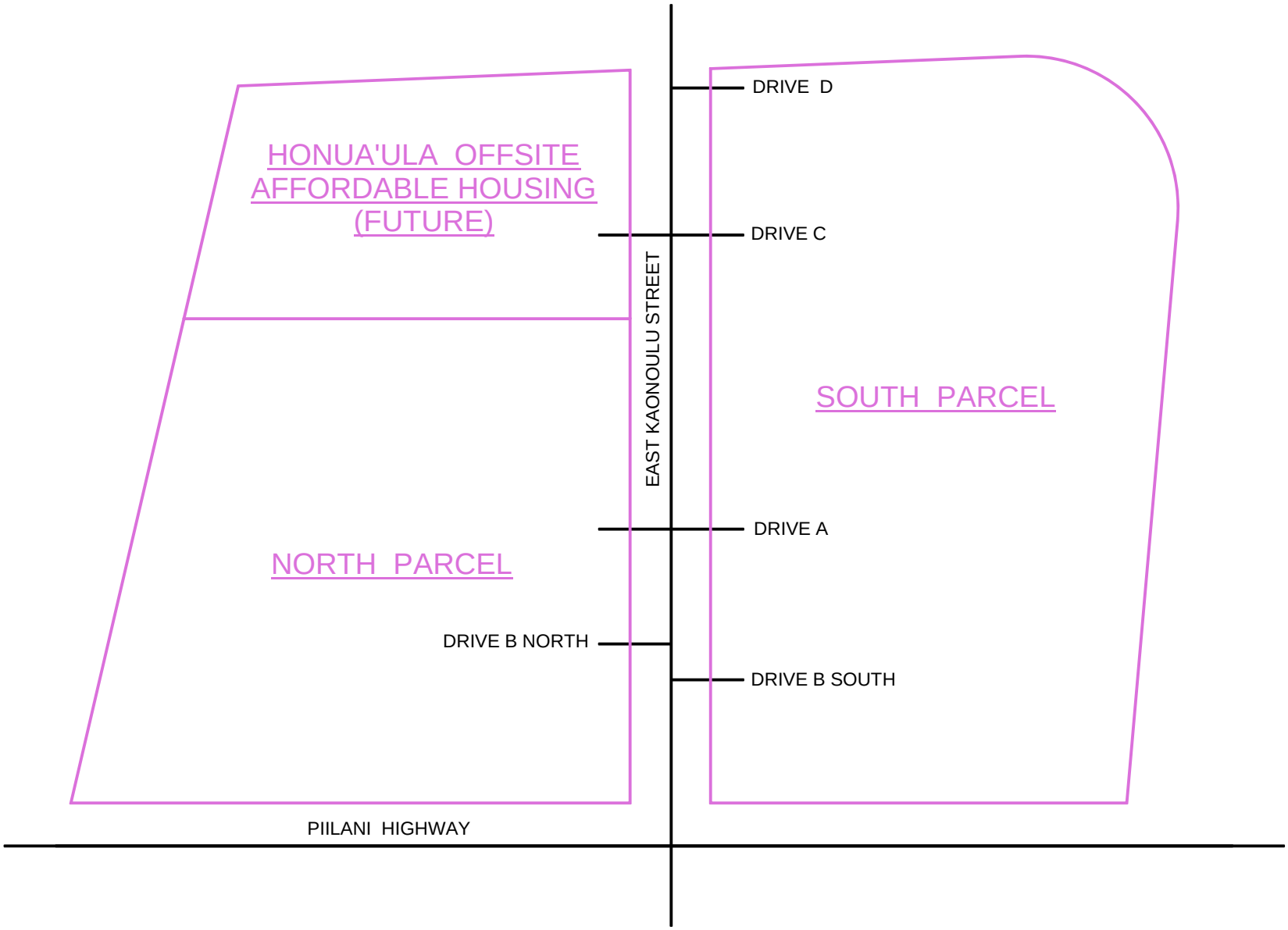


Figure 3
SCHEMATIC DRAWING INDICATING APPROXIMATE LOCATIONS OF PROJECT DRIVEWAYS

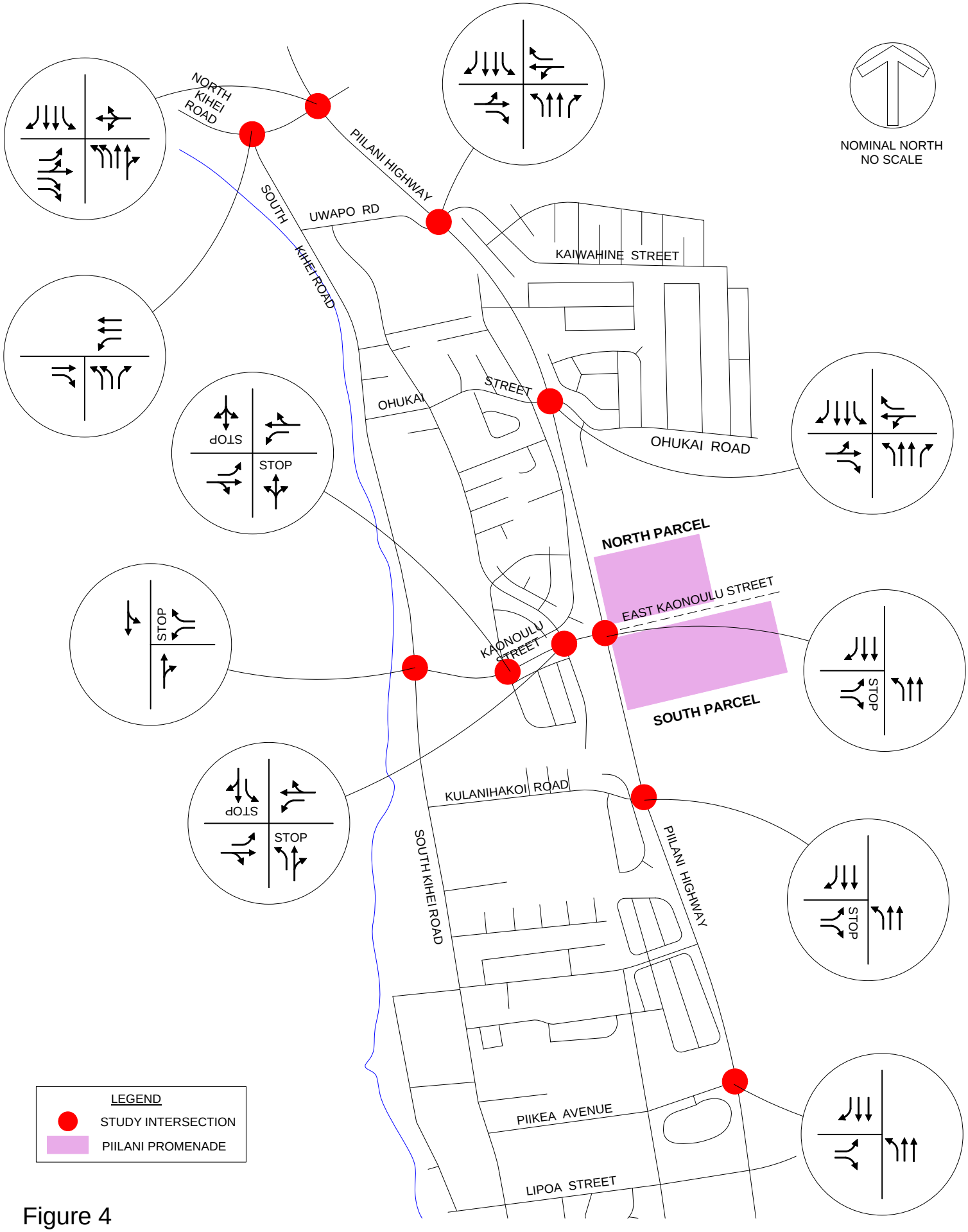


Figure 4
EXISTING LANE CONFIGURATIONS AND RIGHT-OF-WAY CONTROLS

Phillip Rowell and Associates

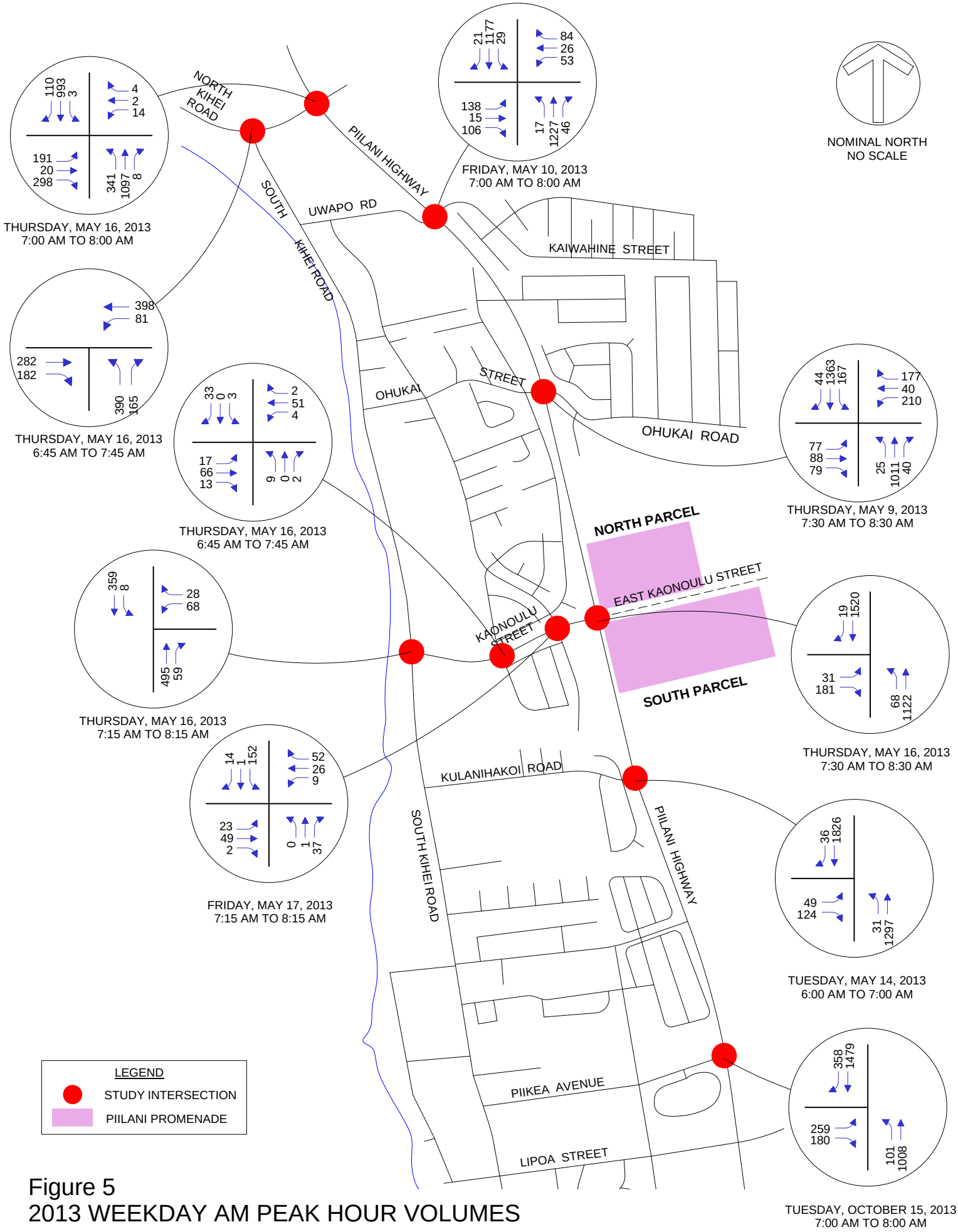


Figure 5
2013 WEEKDAY AM PEAK HOUR VOLUMES

Phillip Rowell and Associates

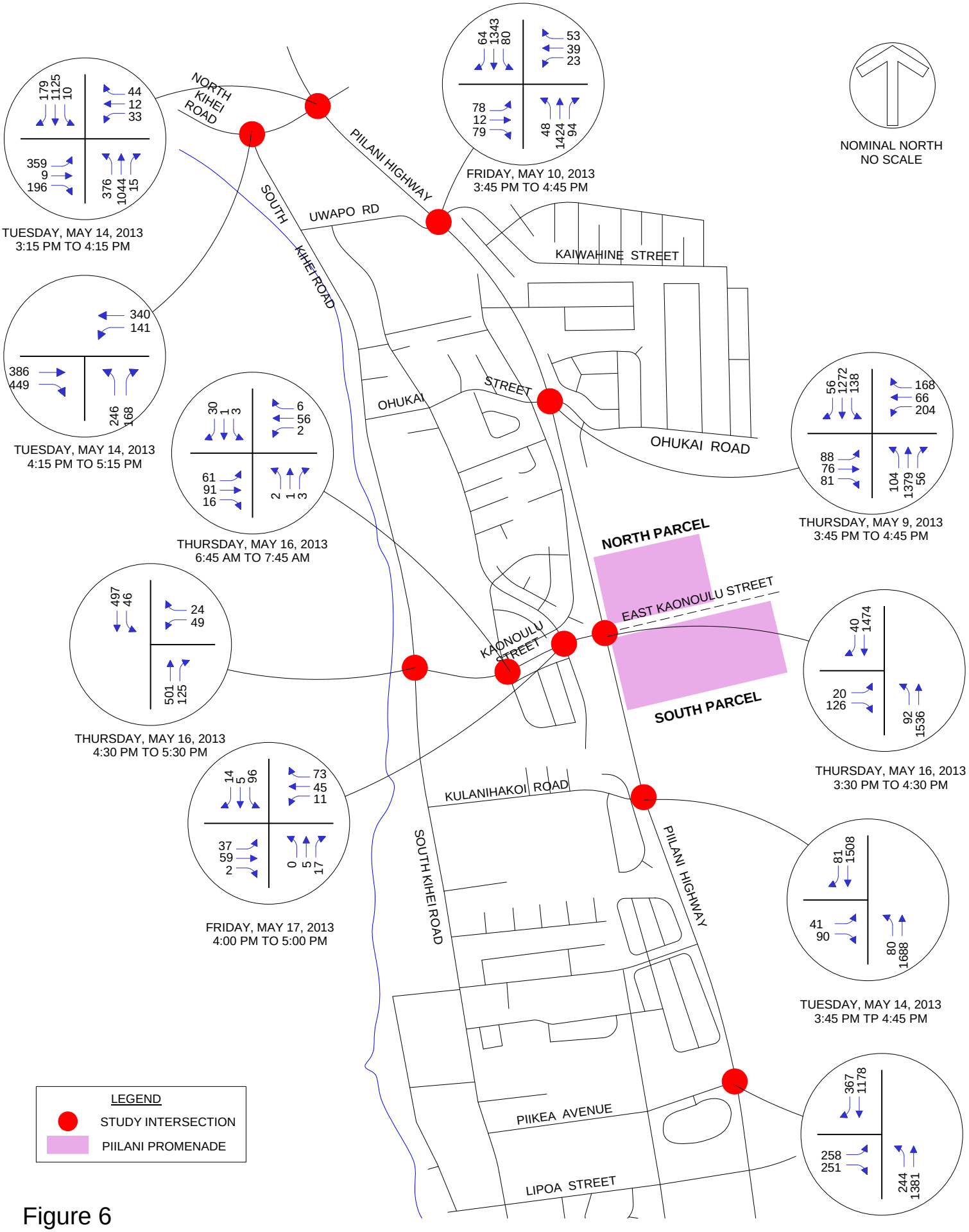


Figure 6
2013 WEEKDAY PM PEAK HOUR VOLUMES

Phillip Rowell and Associates

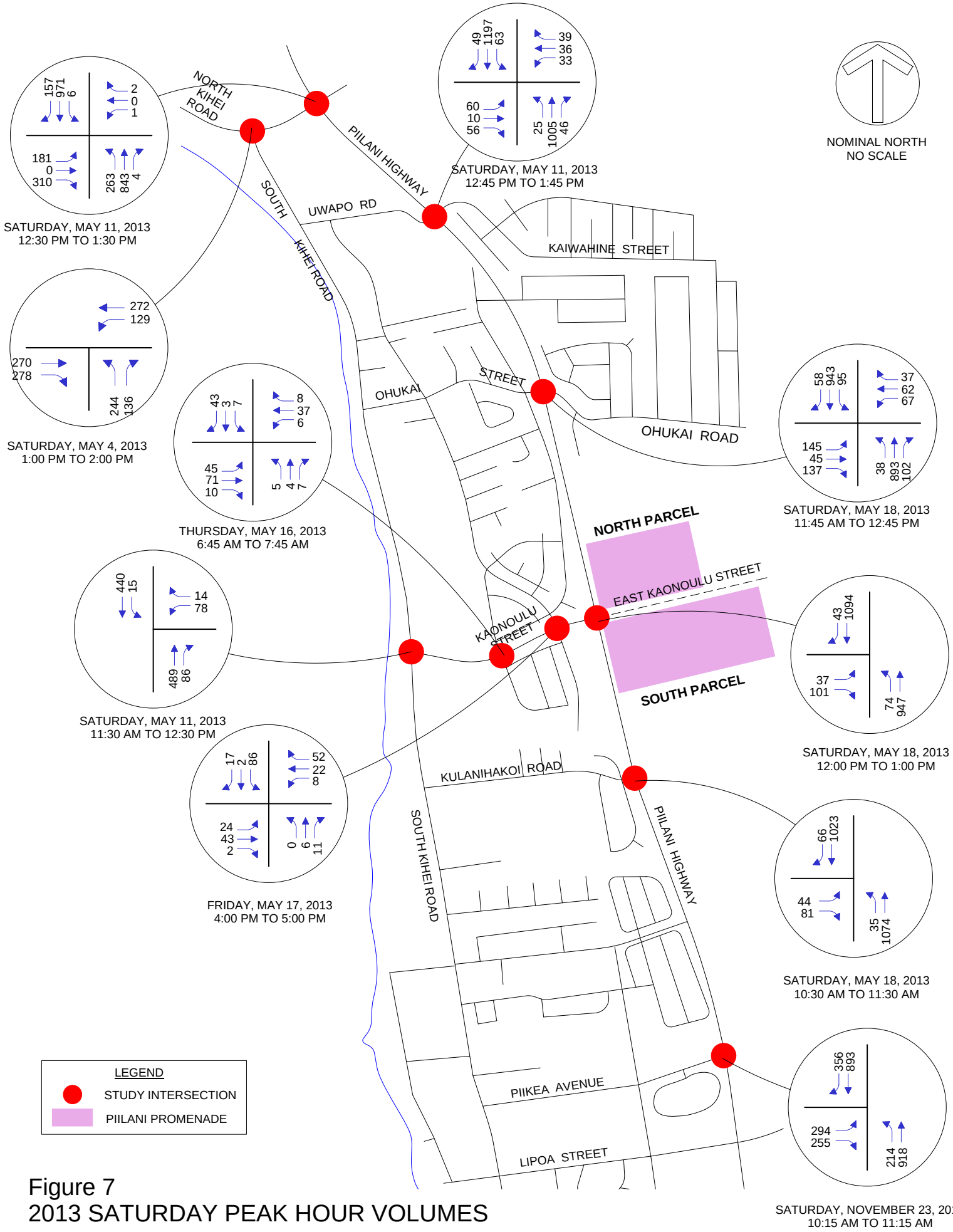


Figure 7
2013 SATURDAY PEAK HOUR VOLUMES

Phillip Rowell and Associates

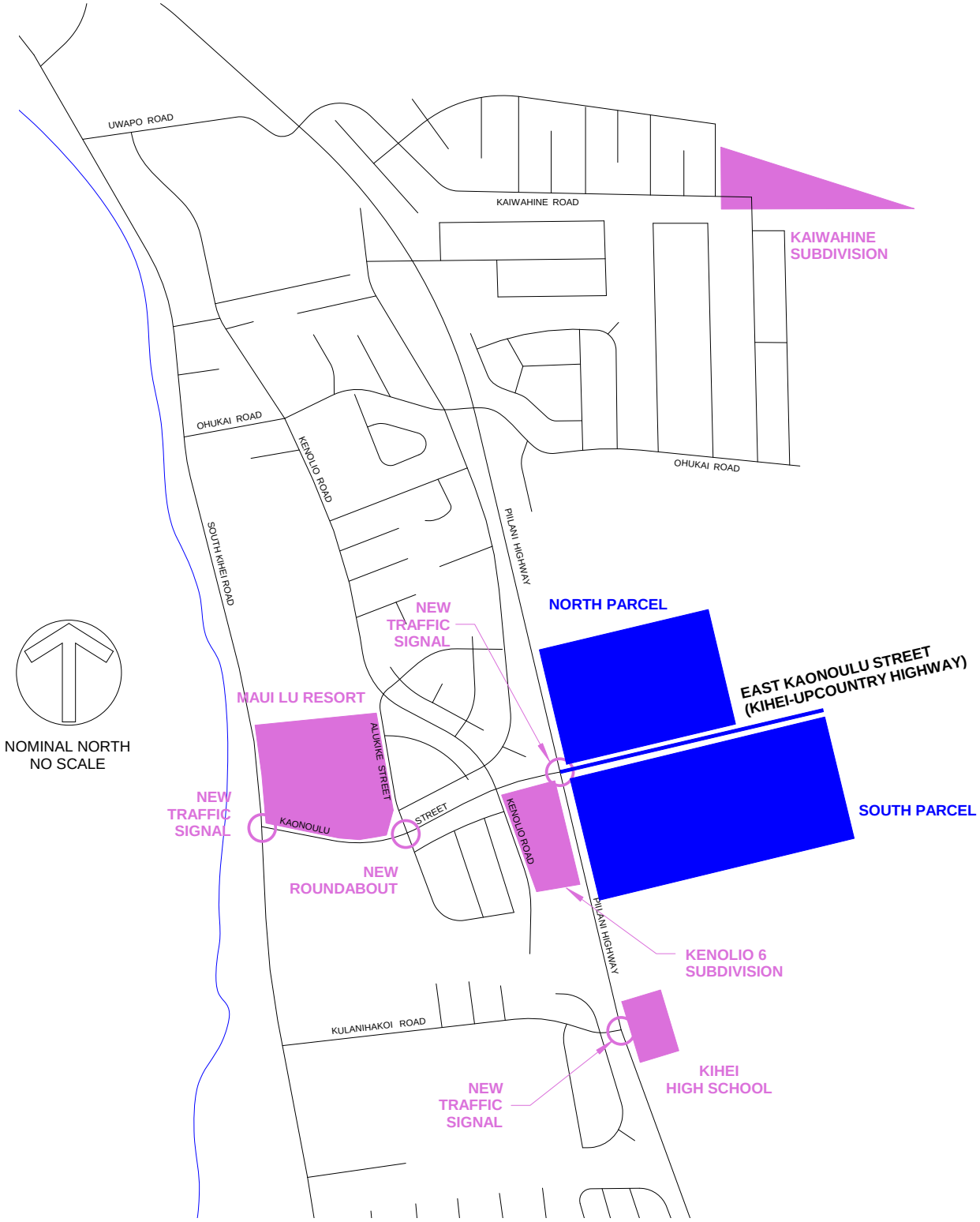


Figure 8
LOCATIONS OF RELATED PROJECTS

Phillip Rowell and Associates

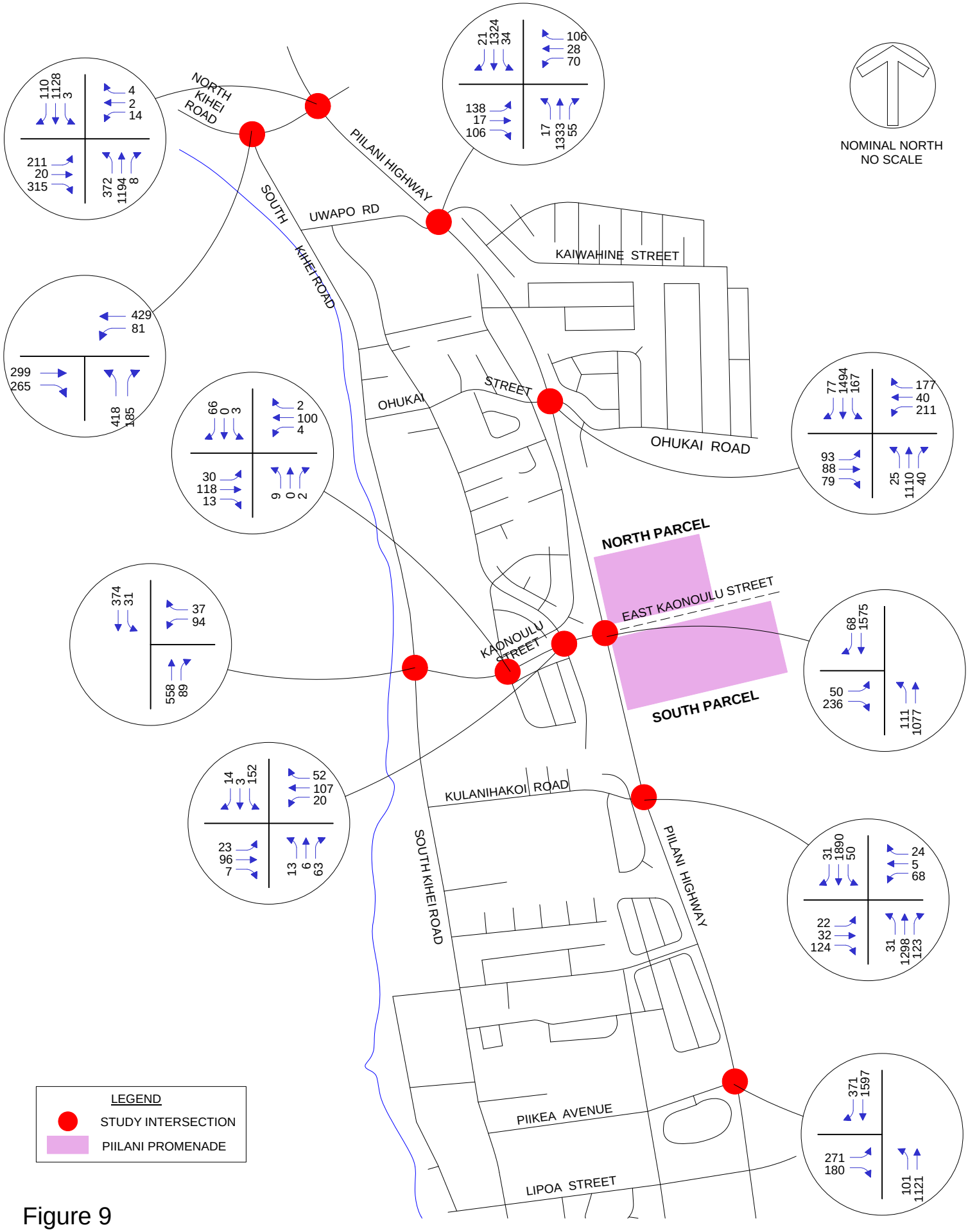


Figure 9
2018 BACKGROUND WEEKDAY AM PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

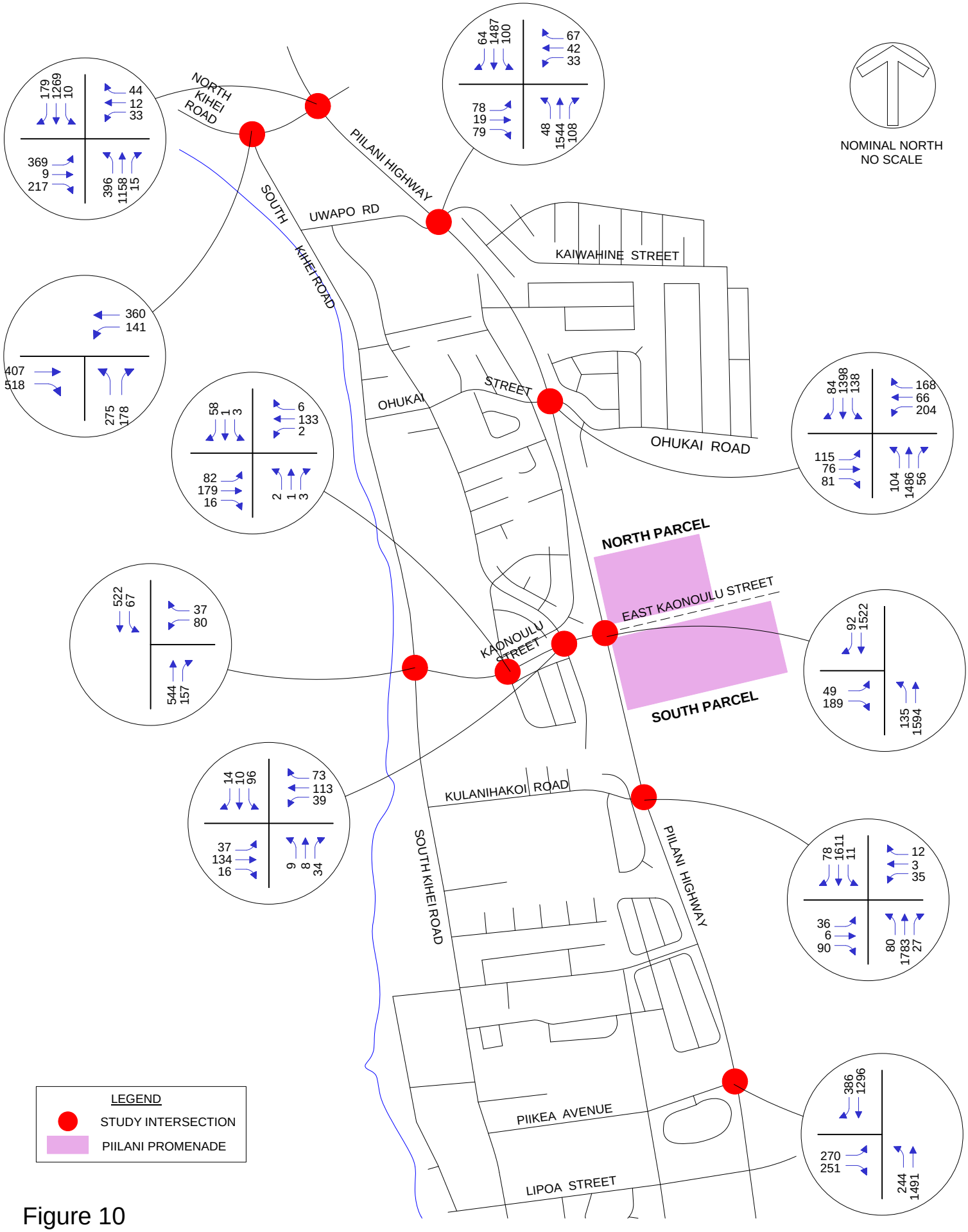


Figure 10
2018 BACKGROUND WEEKDAY PM PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

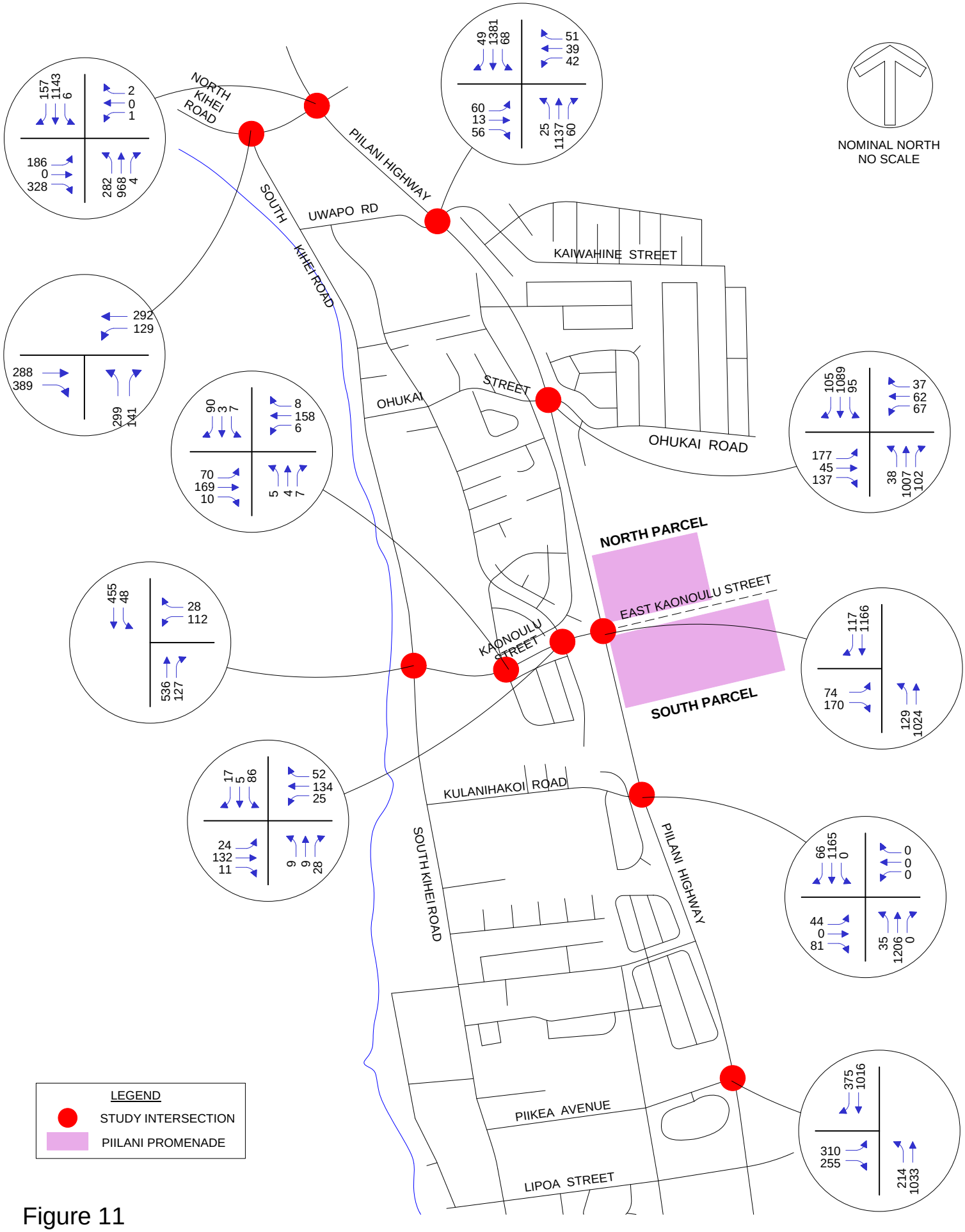


Figure 11
2018 BACKGROUND SATURDAY PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

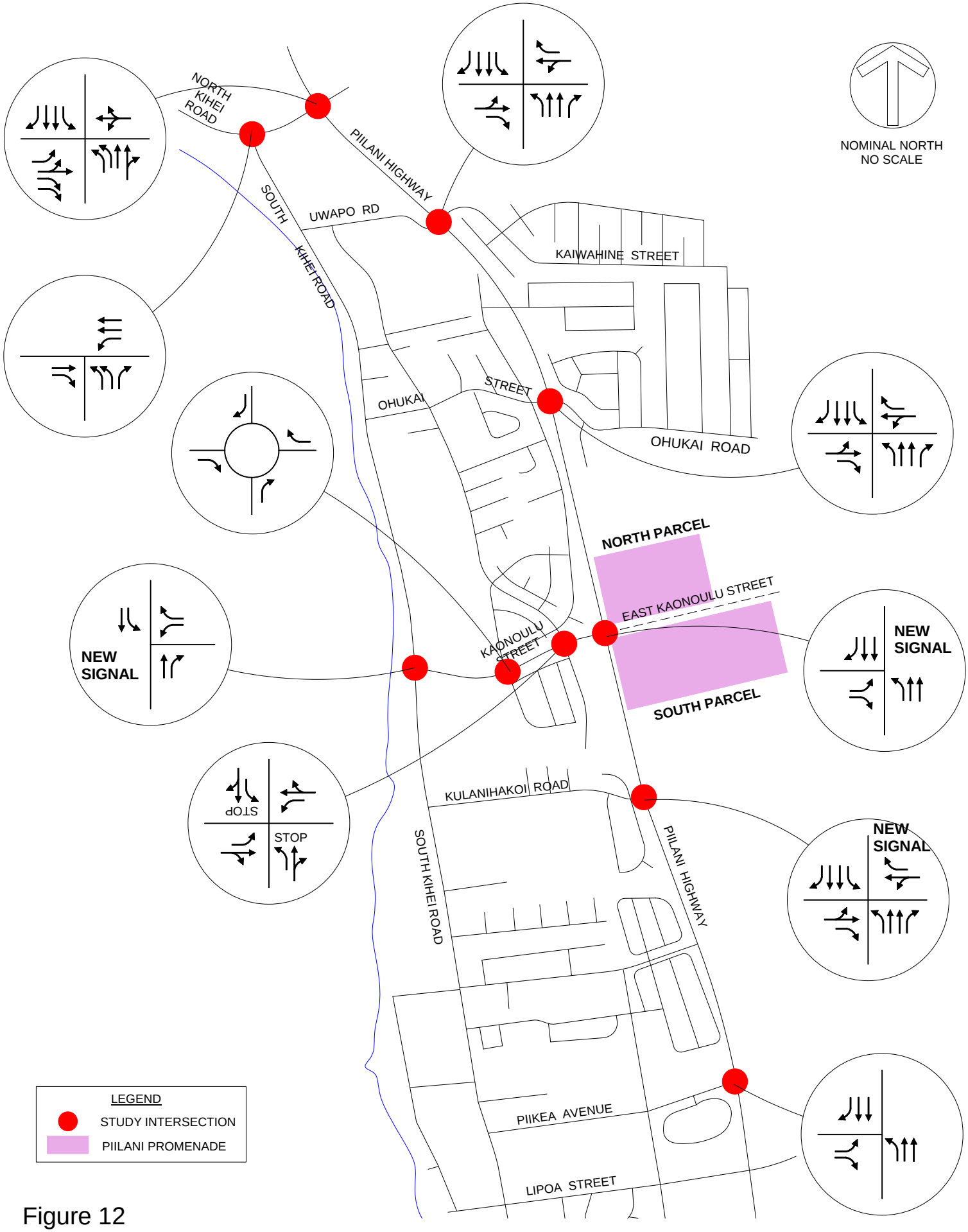


Figure 12
2018 BASELINE LANE CONFIGURATIONS AND RIGHT-OF-WAY CONTROLS

Phillip Rowell and Associates

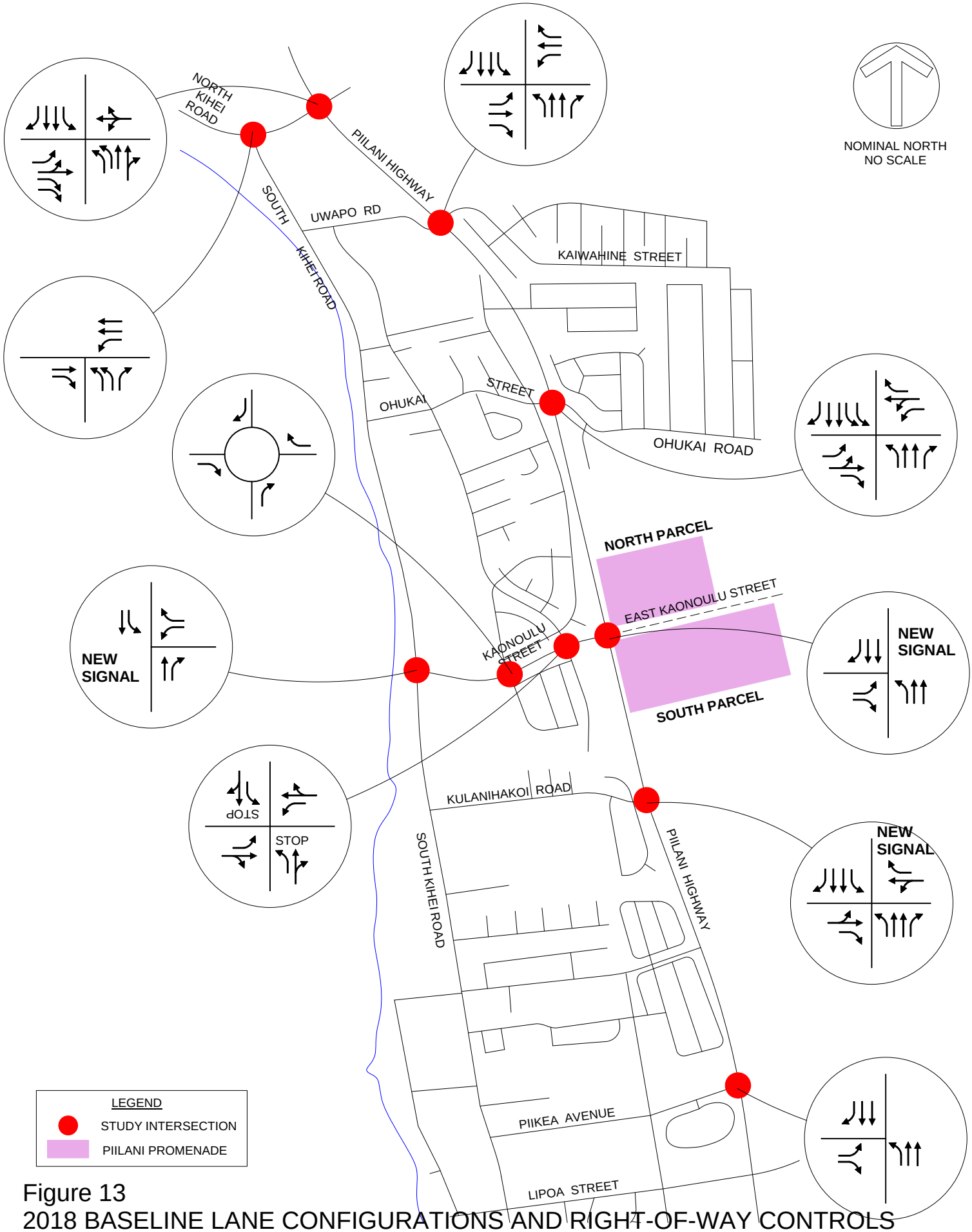


Figure 13
2018 BASELINE LANE CONFIGURATIONS AND RIGHT-OF-WAY CONTROLS WITH MITIGATION

Phillip Rowell and Associates

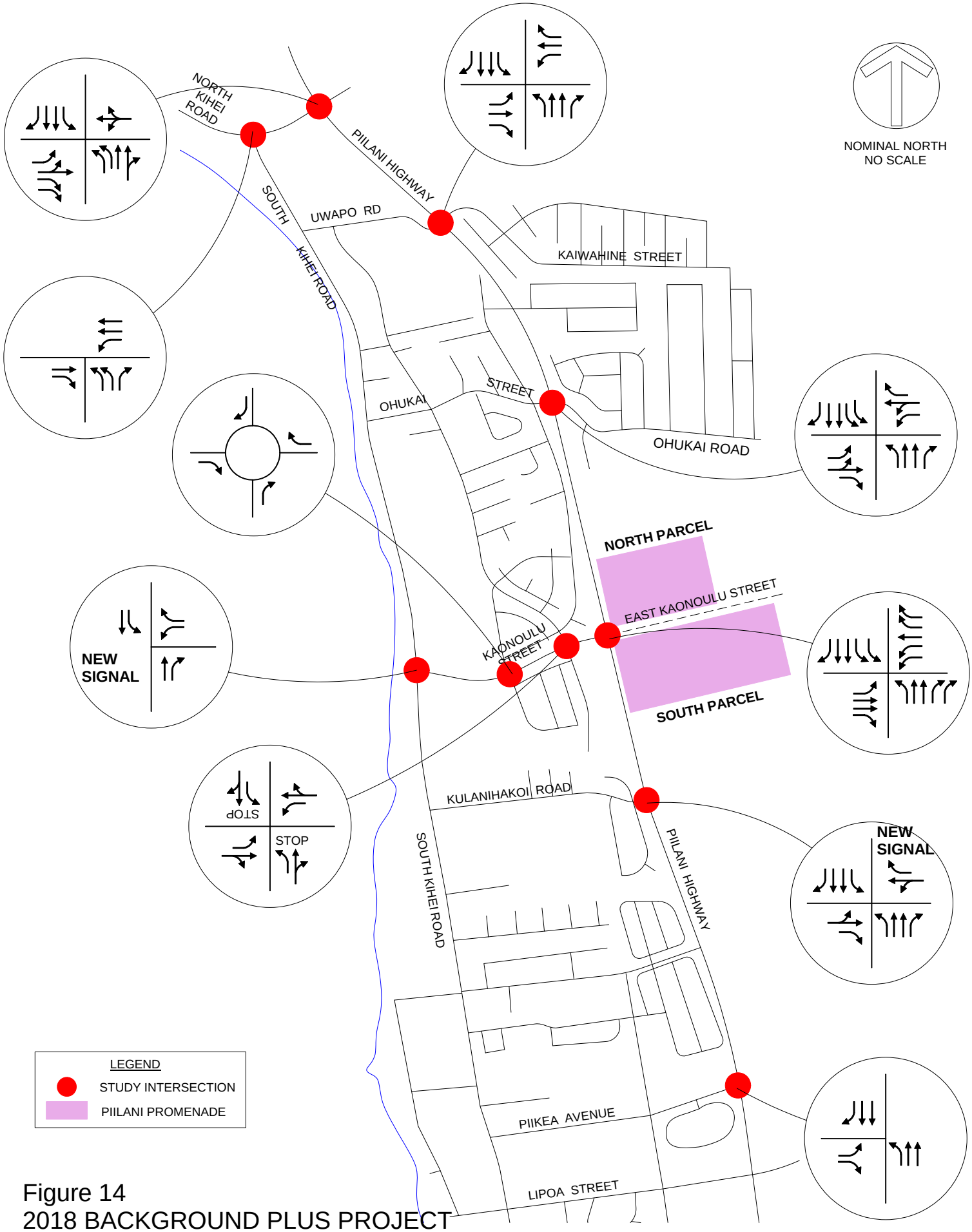


Figure 14
2018 BACKGROUND PLUS PROJECT
LANE CONFIGURATIONS AND RIGHT-OF-WAY CONTROLS

Phillip Rowell and Associates

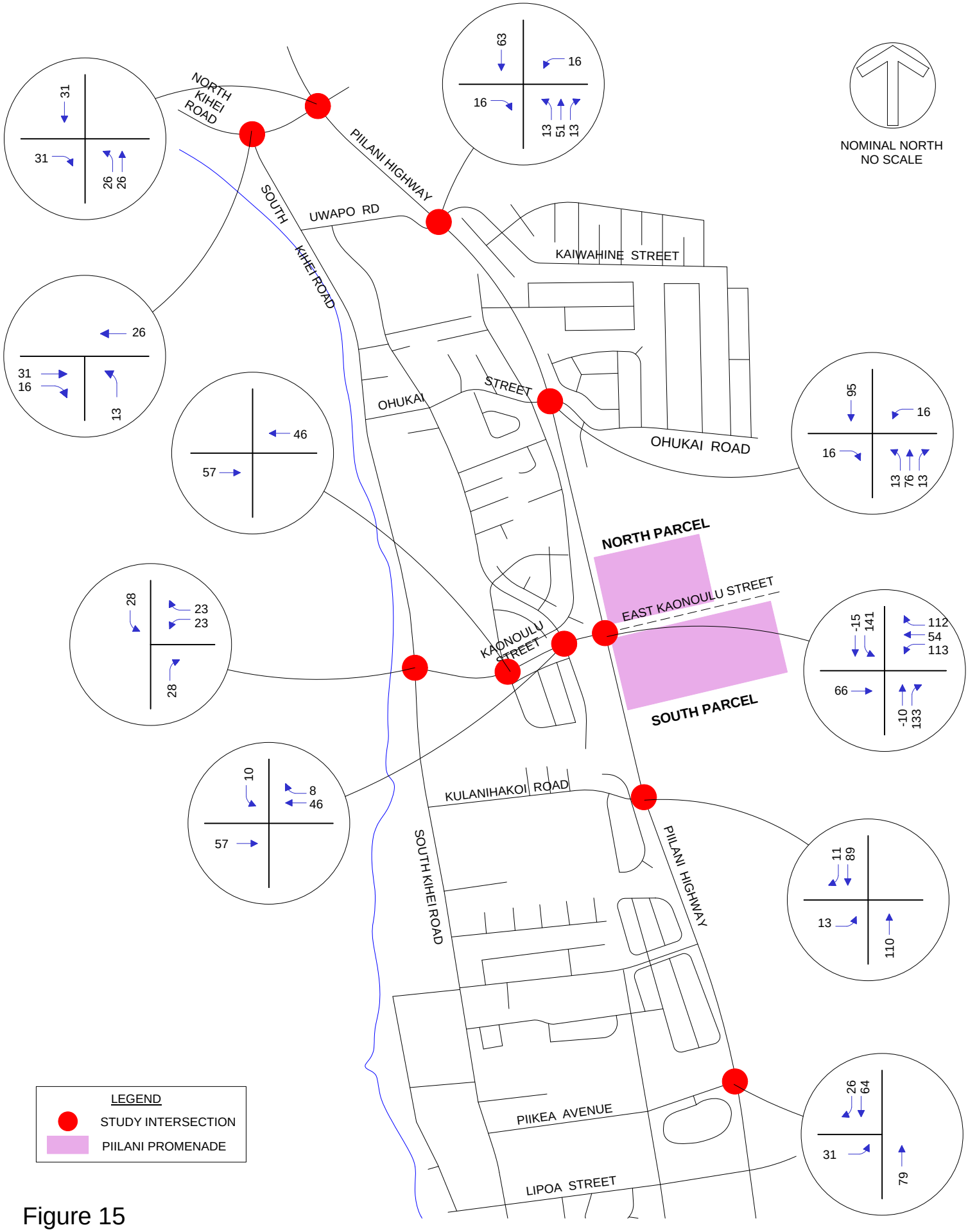


Figure 15
AM PEAK HOUR TRIP ASSIGNMENTS

Phillip Rowell and Associates

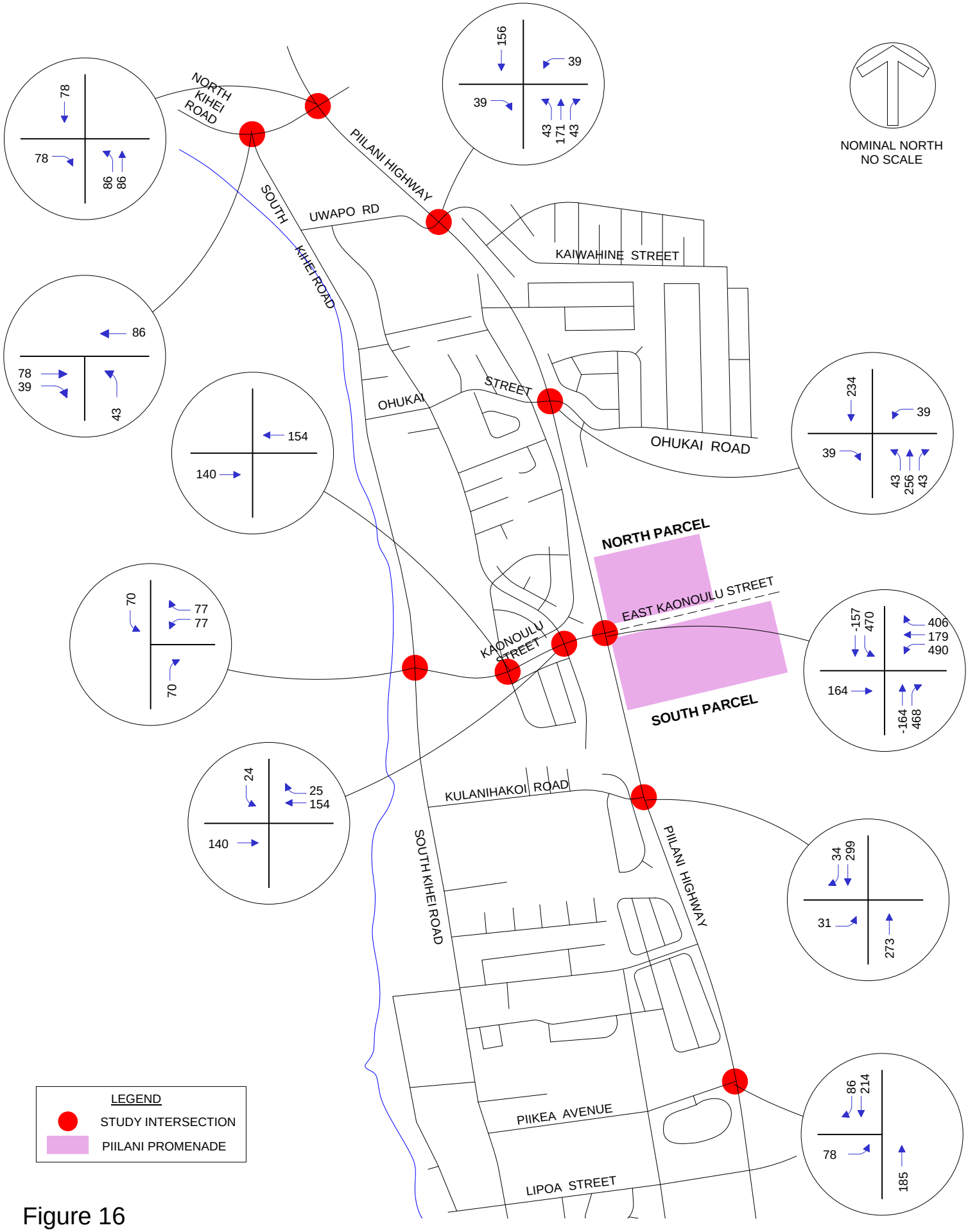


Figure 16
PM PEAK HOUR TRIP ASSIGNMENTS

Phillip Rowell and Associates

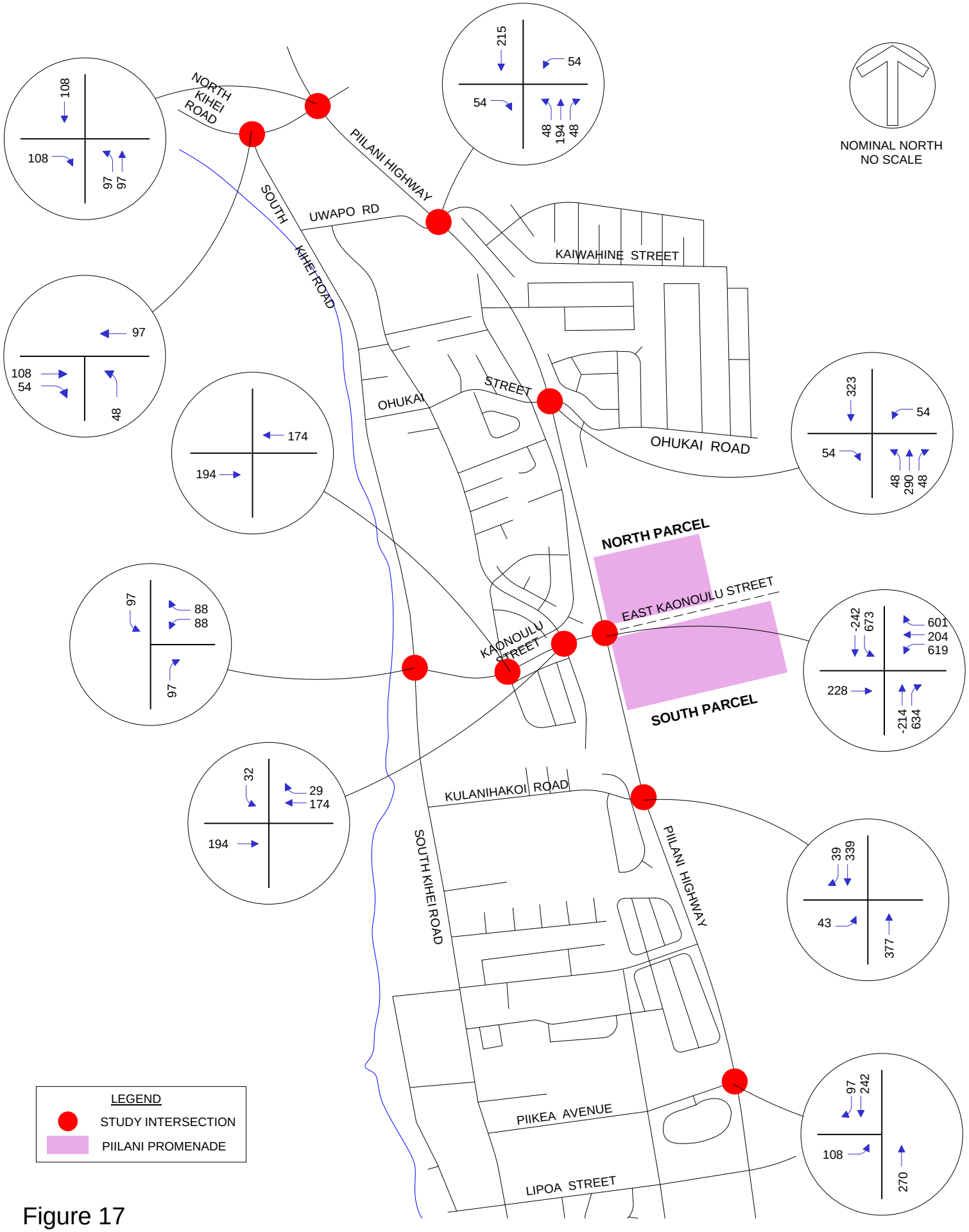


Figure 17
SATURDAY PEAK HOUR TRIP ASSIGNMENTS

Phillip Rowell and Associates

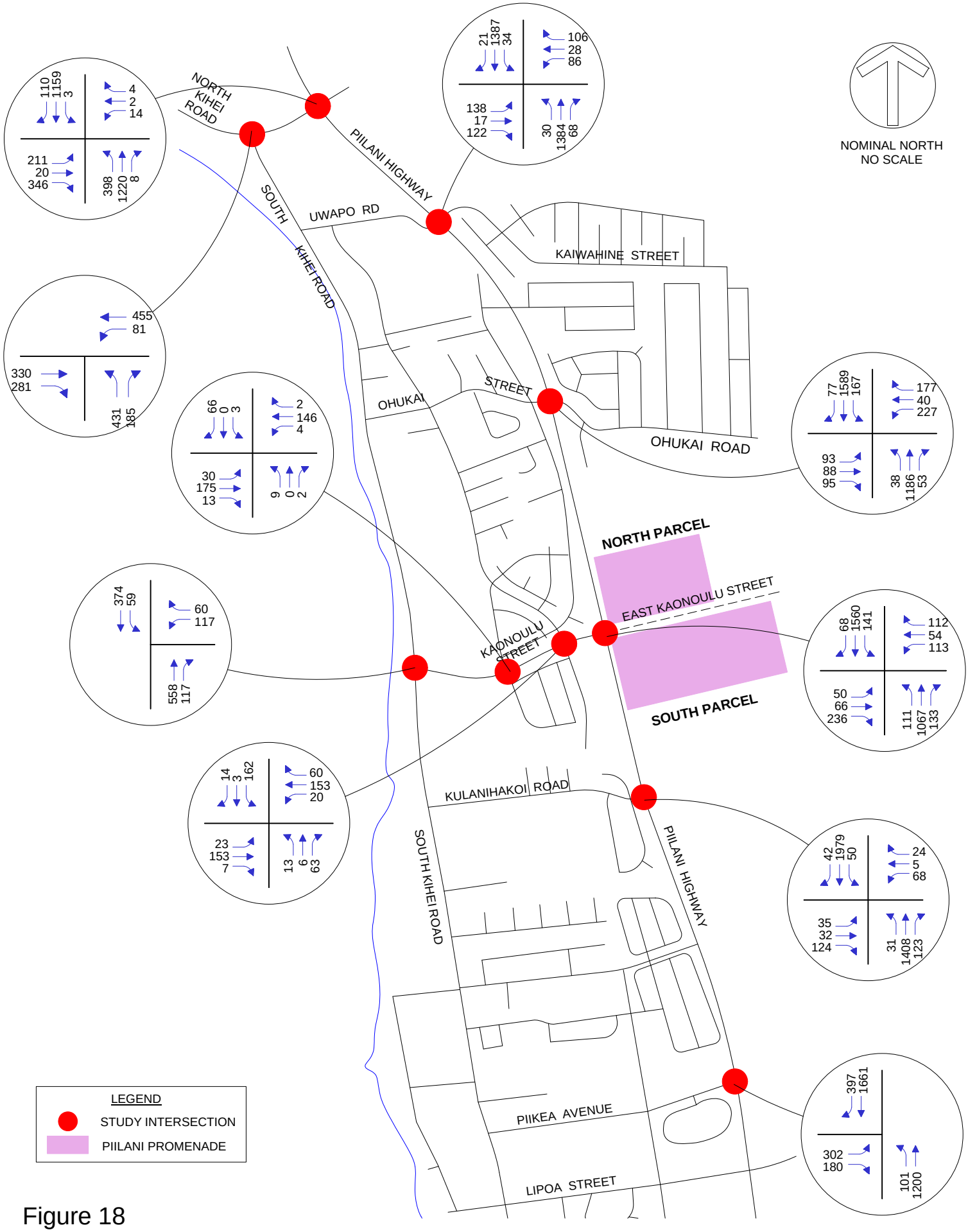


Figure 18
2018 BACKGROUND PLUS PROJECT WEEKDAY AM PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

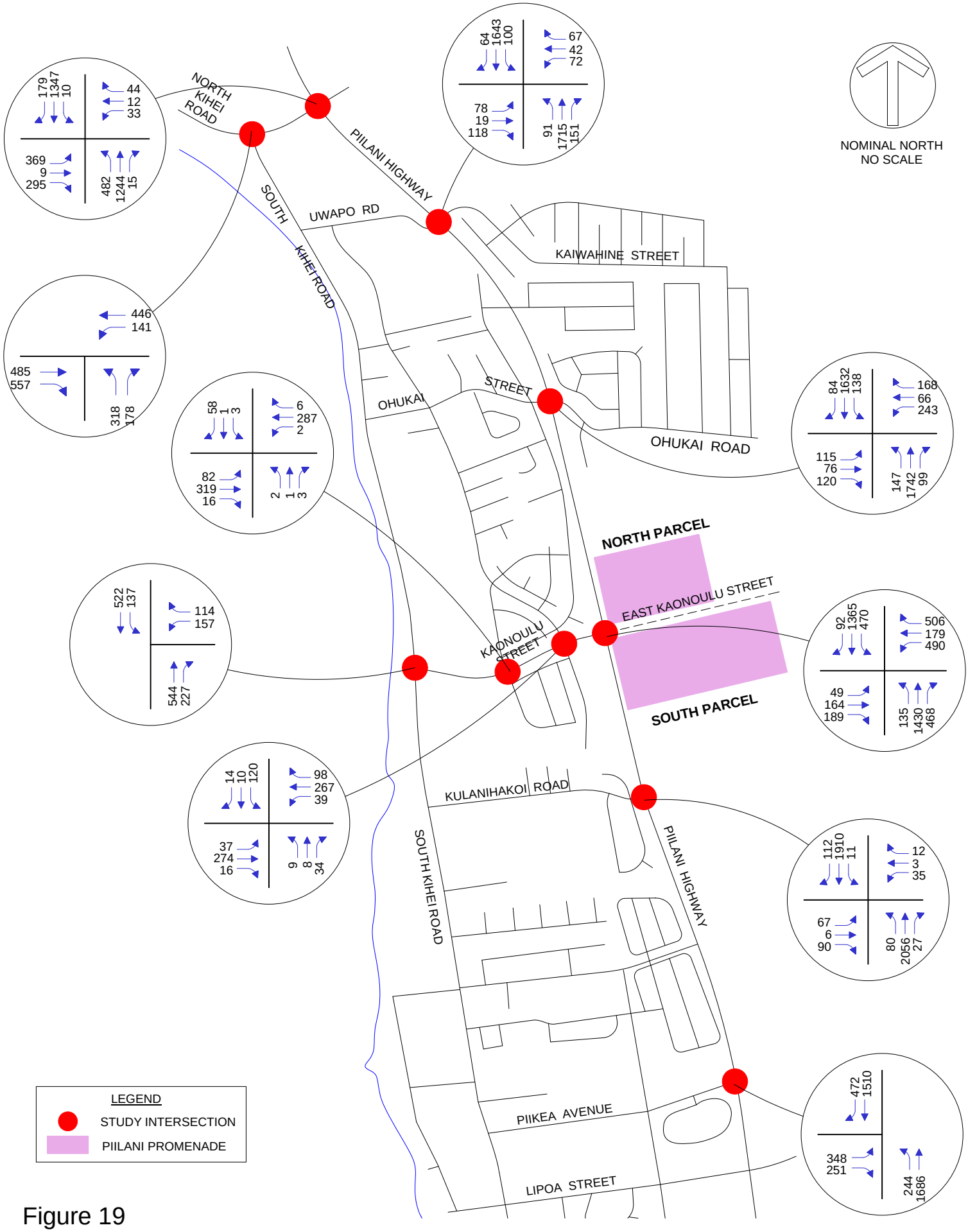


Figure 19
2018 BACKGROUND PLUS PROJECT WEEKDAY PM PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

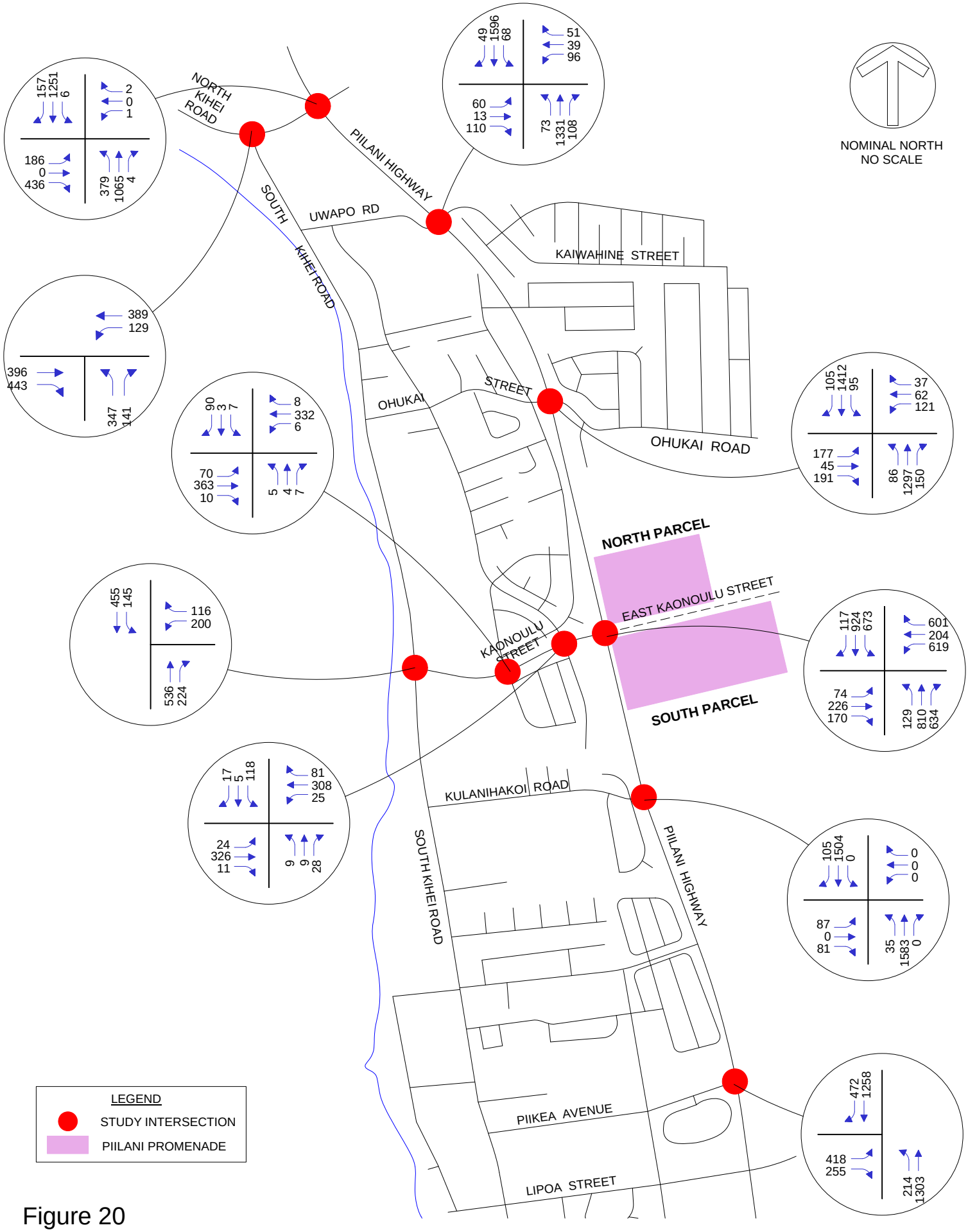


Figure 20
2018 BACKGROUND PLUS PROJECT SATURDAY PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

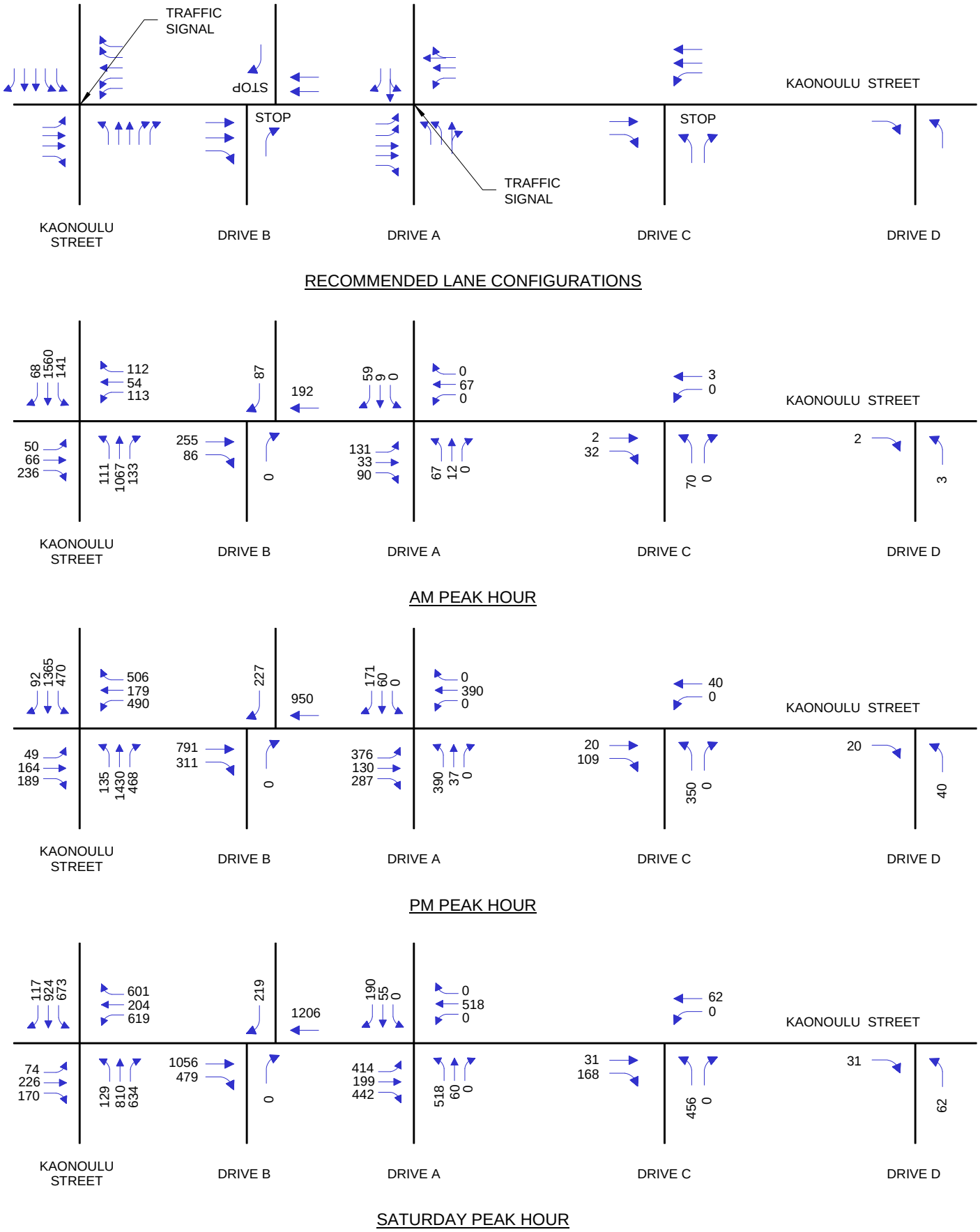


Figure 21
2018 TRAFFIC PROJECTIONS AT PROJECT DRIVEWAYS

Phillip Rowell and Associates

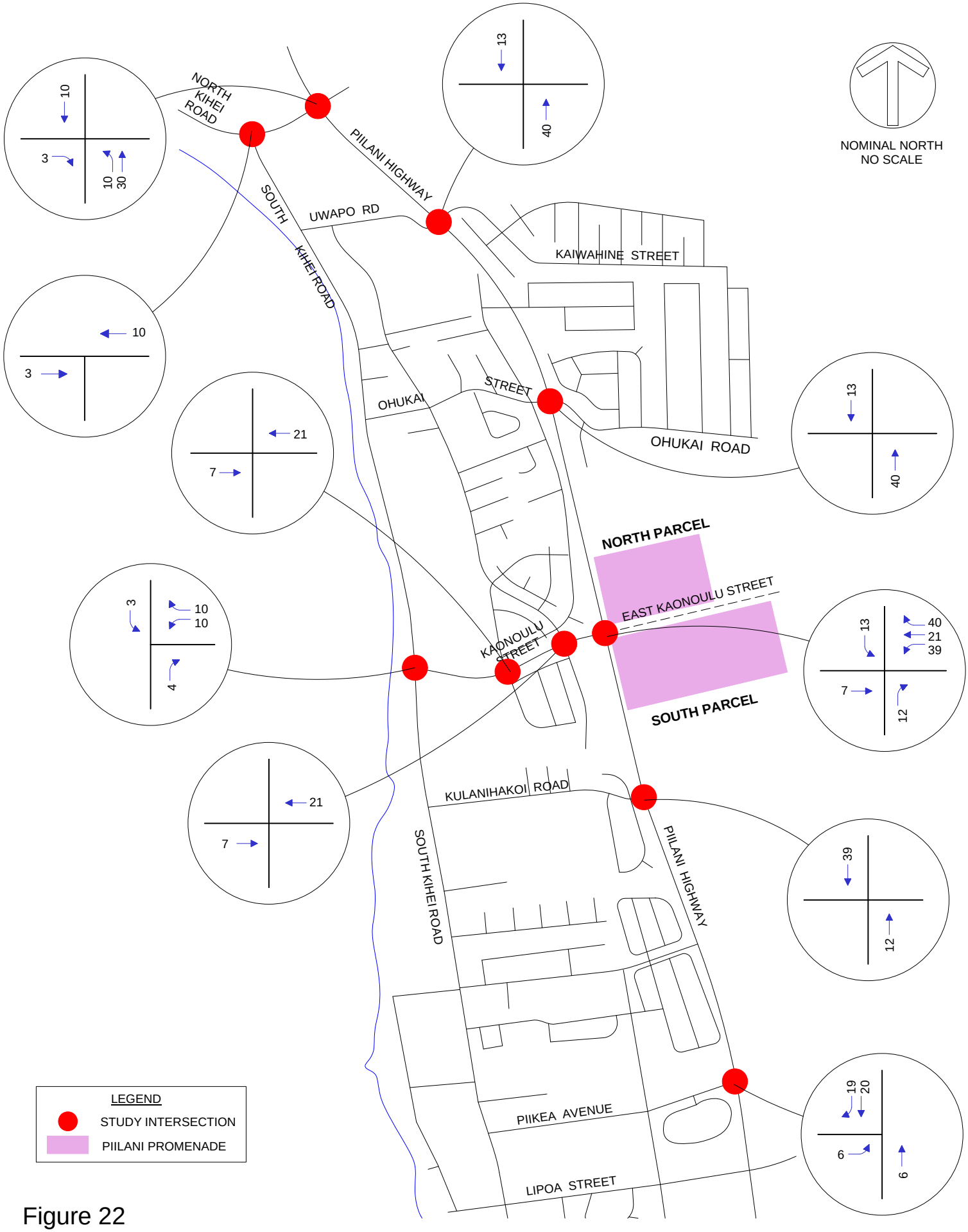


Figure 22
AM PROJECT TRIP ASSIGNMENTS FOR HONUA'ULA

Phillip Rowell and Associates

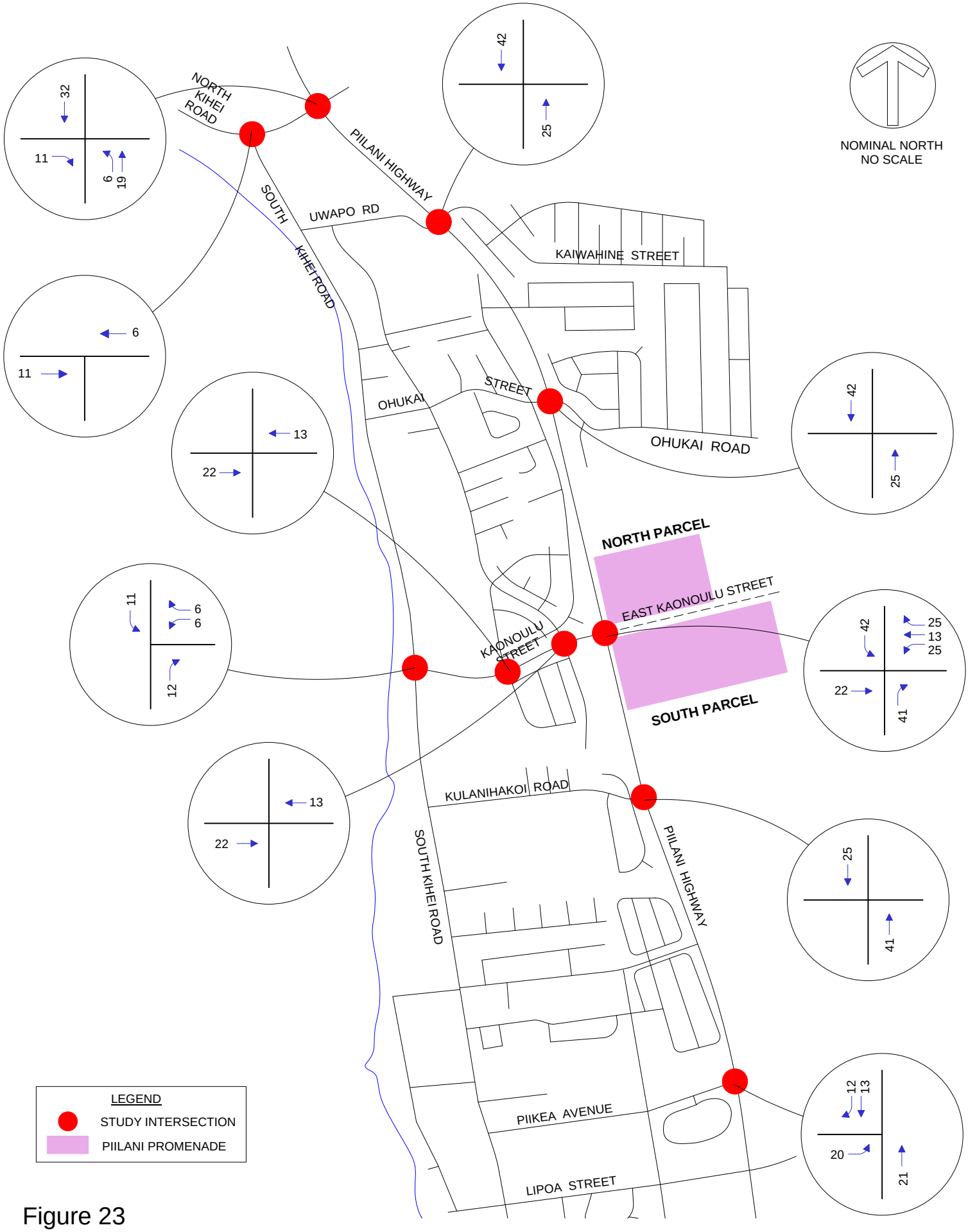


Figure 23
PM PROJECT TRIP ASSIGNMENTS FOR HONUA'ULA

Phillip Rowell and Associates

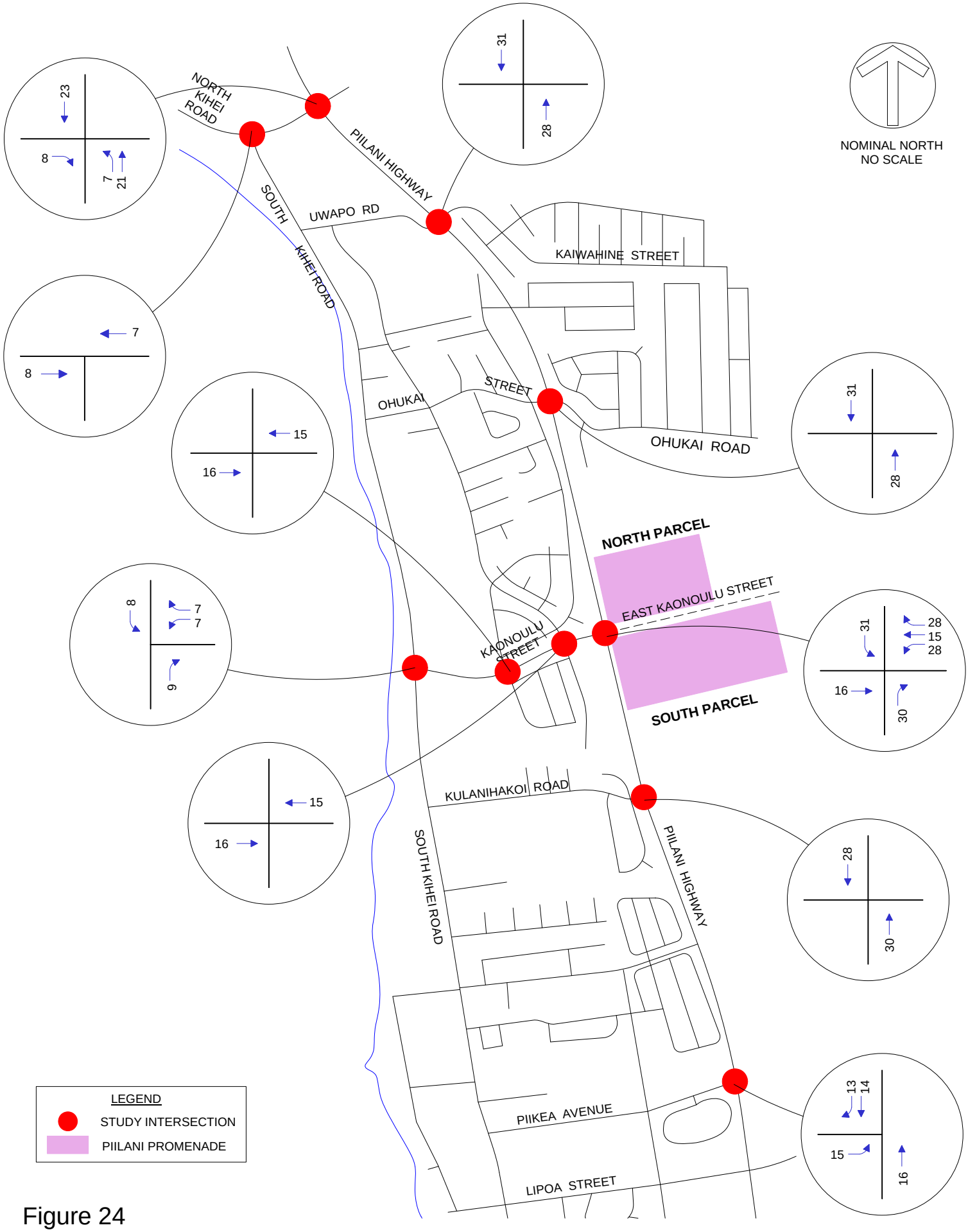
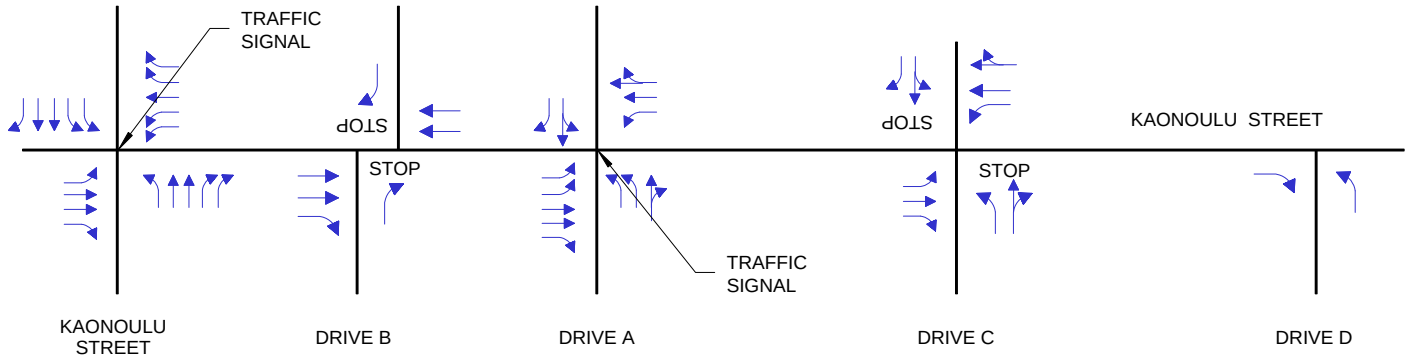
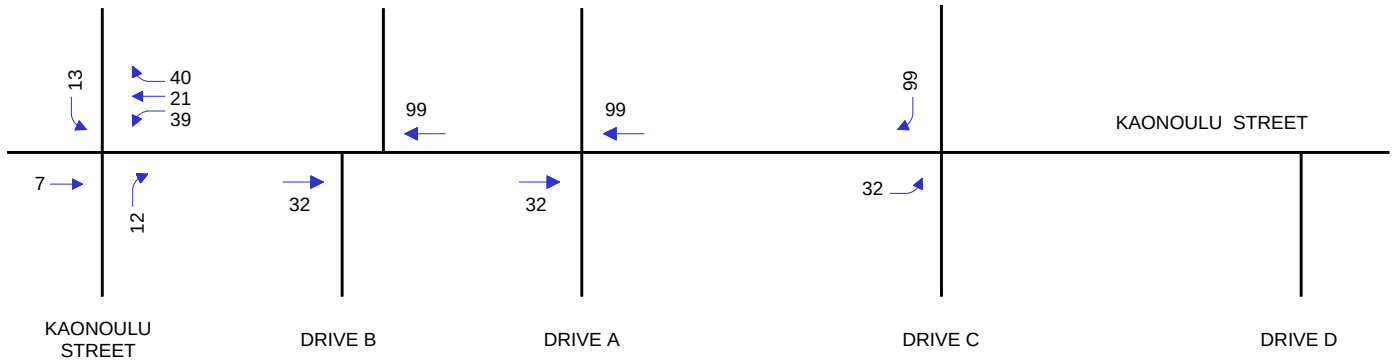


Figure 24
SATURDAY PROJECT TRIP ASSIGNMENTS FOR HONUA'ULA

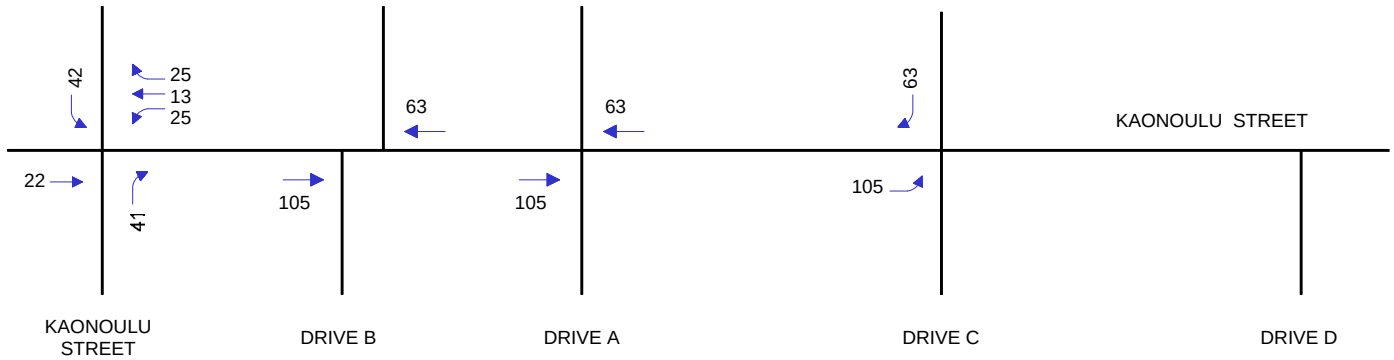
Phillip Rowell and Associates



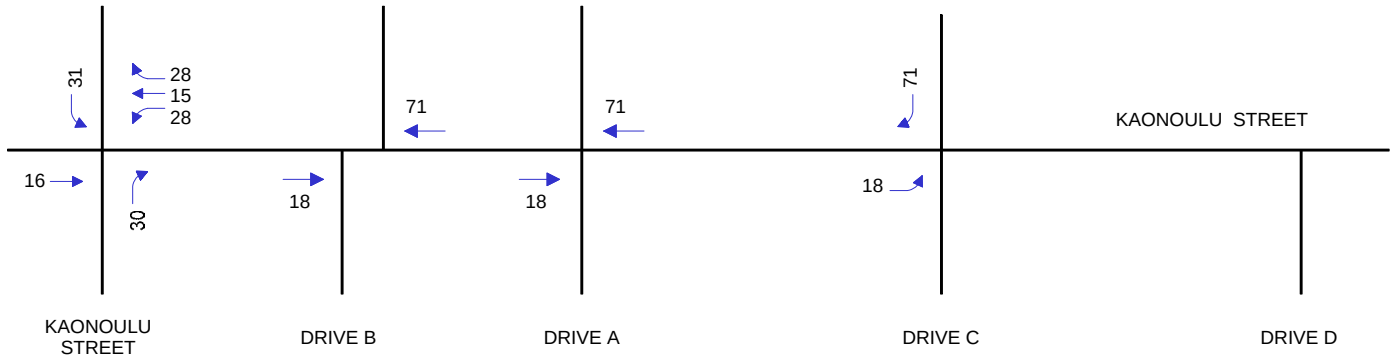
RECOMMENDED LANE CONFIGURATIONS



AM PEAK HOUR



PM PEAK HOUR



SATURDAY PEAK HOUR

Figure 25
PROJECT TRIP ASSIGNMENTS FOR HONUA'ULA
ALONG EAST KAONOULU STREET

Phillip Rowell and Associates

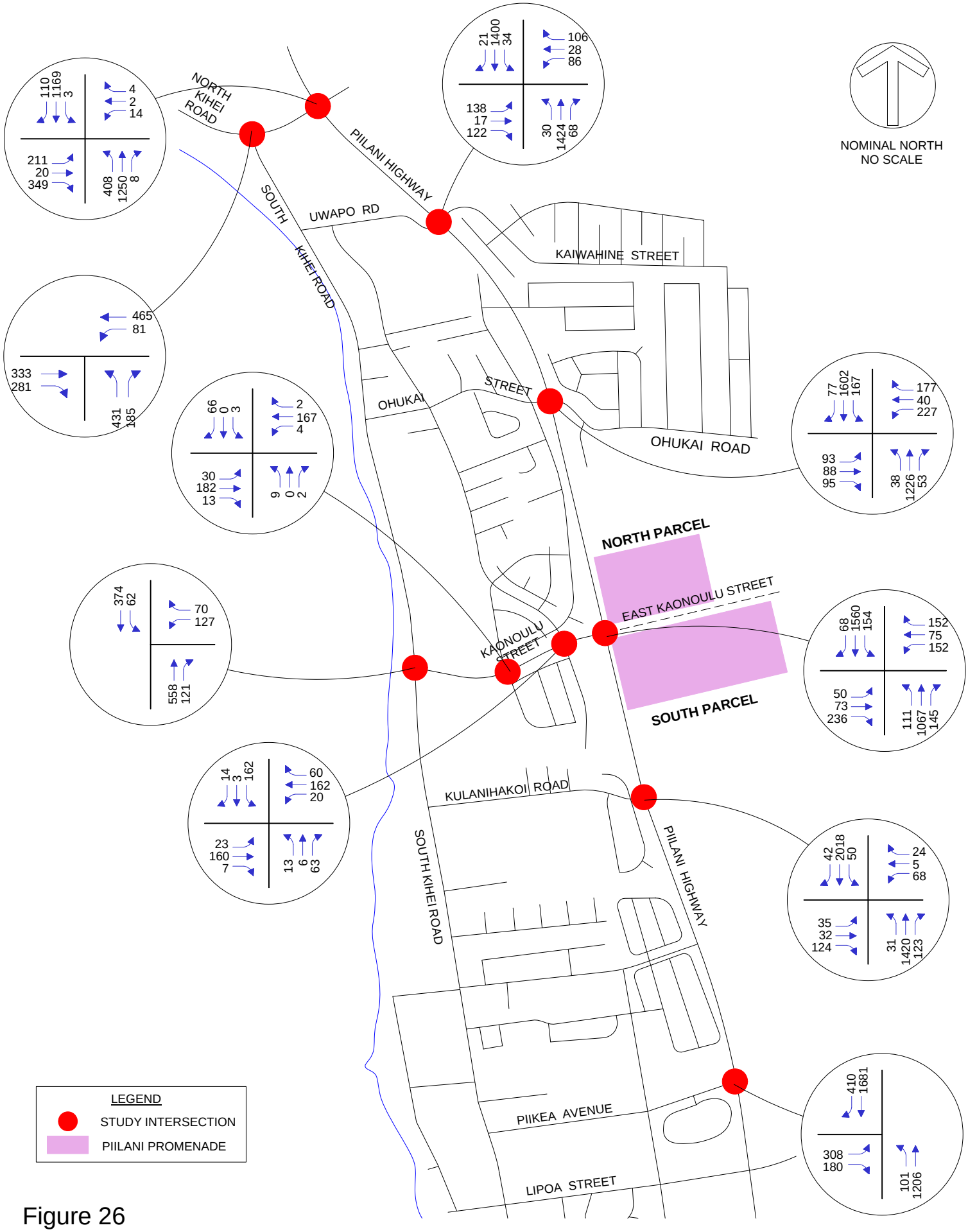


Figure 26
PIILANI PROMNADE PLUS HONUA'ULA AM PEAK HOUR TRAFFIC PROJECTIONS

Phillip Rowell and Associates

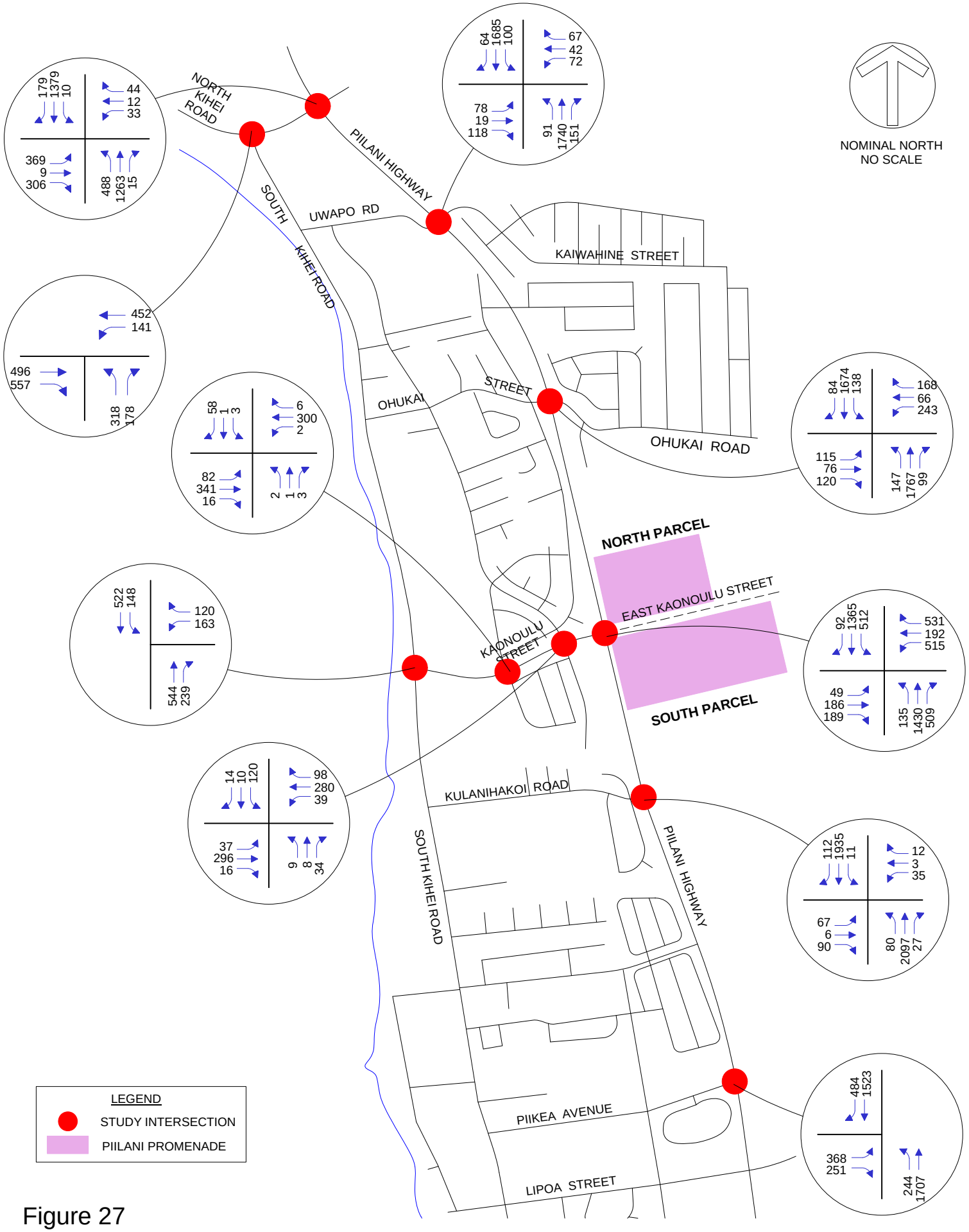


Figure 27
PIILANI PROMENADE PLUS HONUA'ULA PM PEAK HOUR TRAFFIC PROJECTIONS

Phillip Rowell and Associates

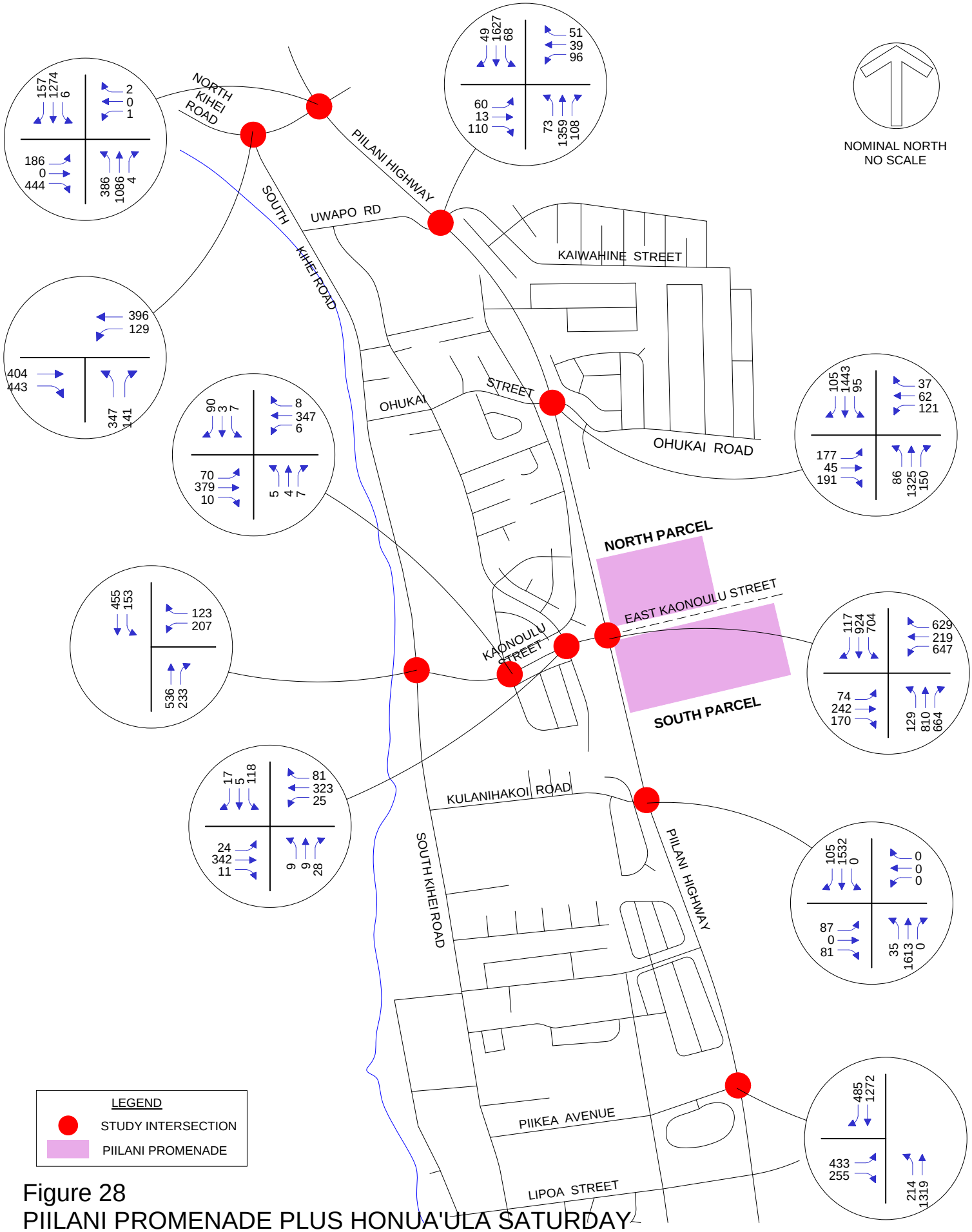


Figure 28
PIILANI PROMENADE PLUS HONUA'ULA SATURDAY
PEAK HOUR TRAFFIC PROJECTIONS

Phillip Rowell and Associates

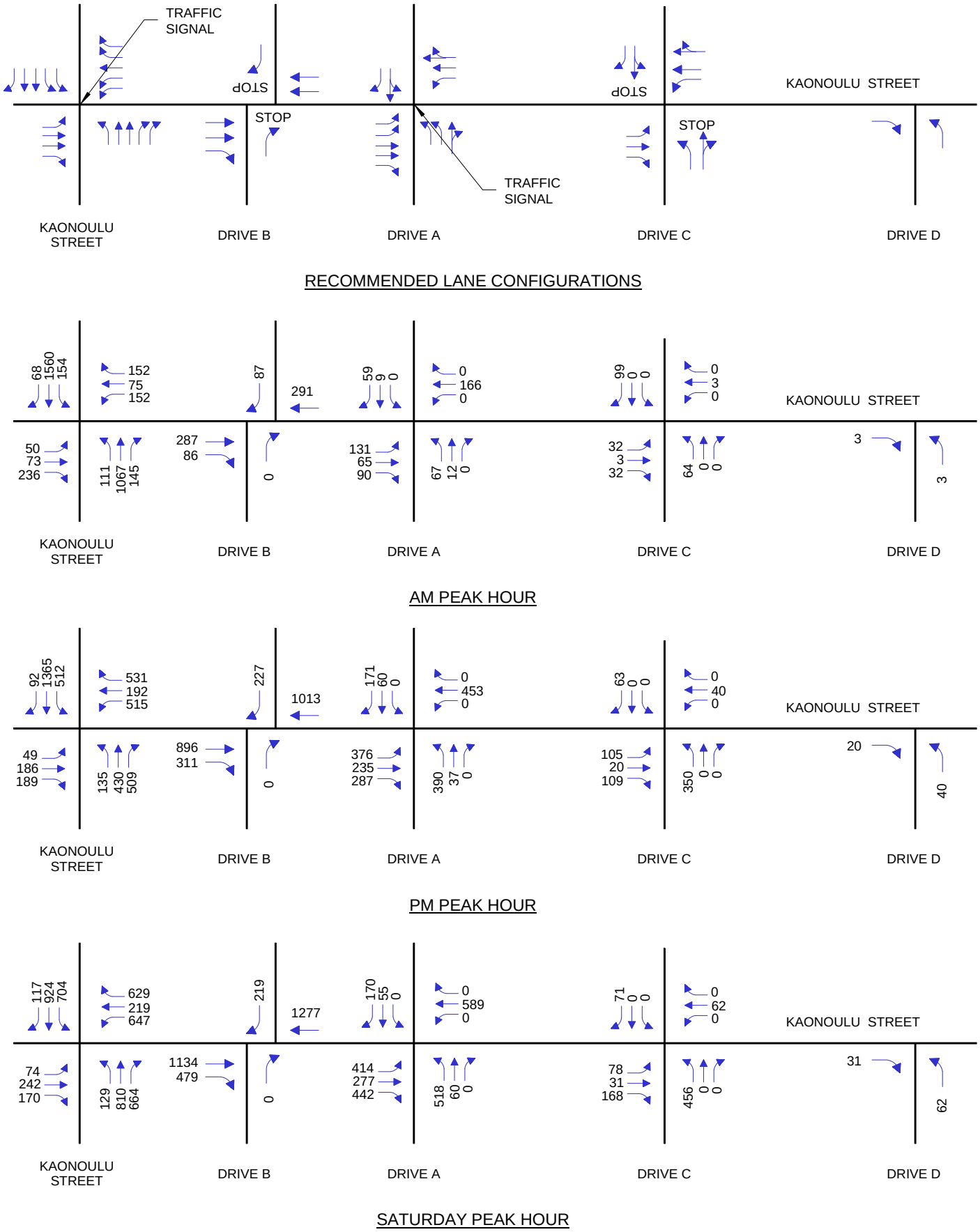


Figure 29
PIILANI PROMENADE PLUS HONUA'ULA PEAK HOUR TRAFFIC PROJECTIONS ALONG EAST KAONOULU STREET

Phillip Rowell and Associates

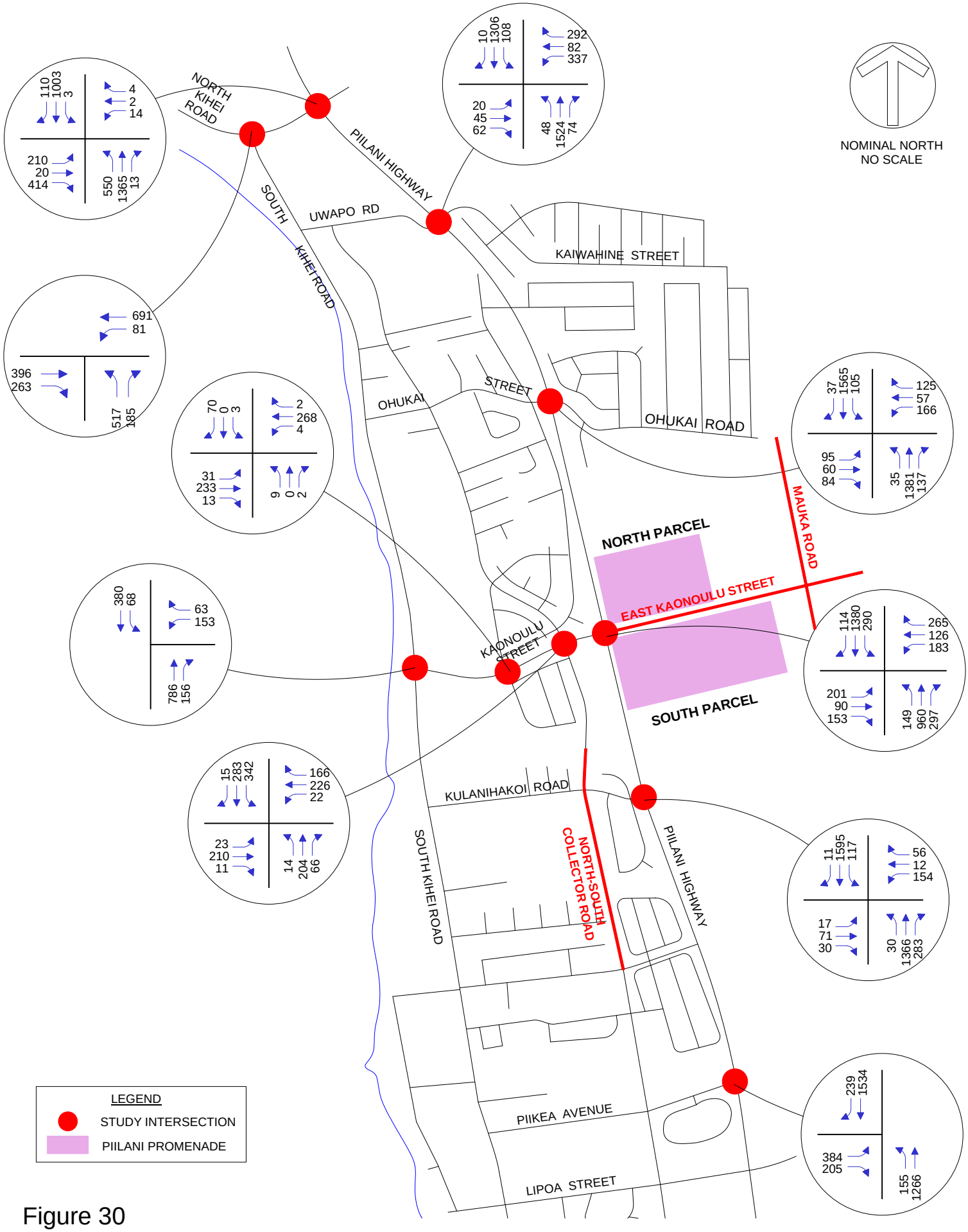


Figure 30
2025 BACKGROUND PLUS PROJECT WEEKDAY AM PEAK HOUR PROJECTIONS

Phillip Rowell and Associates

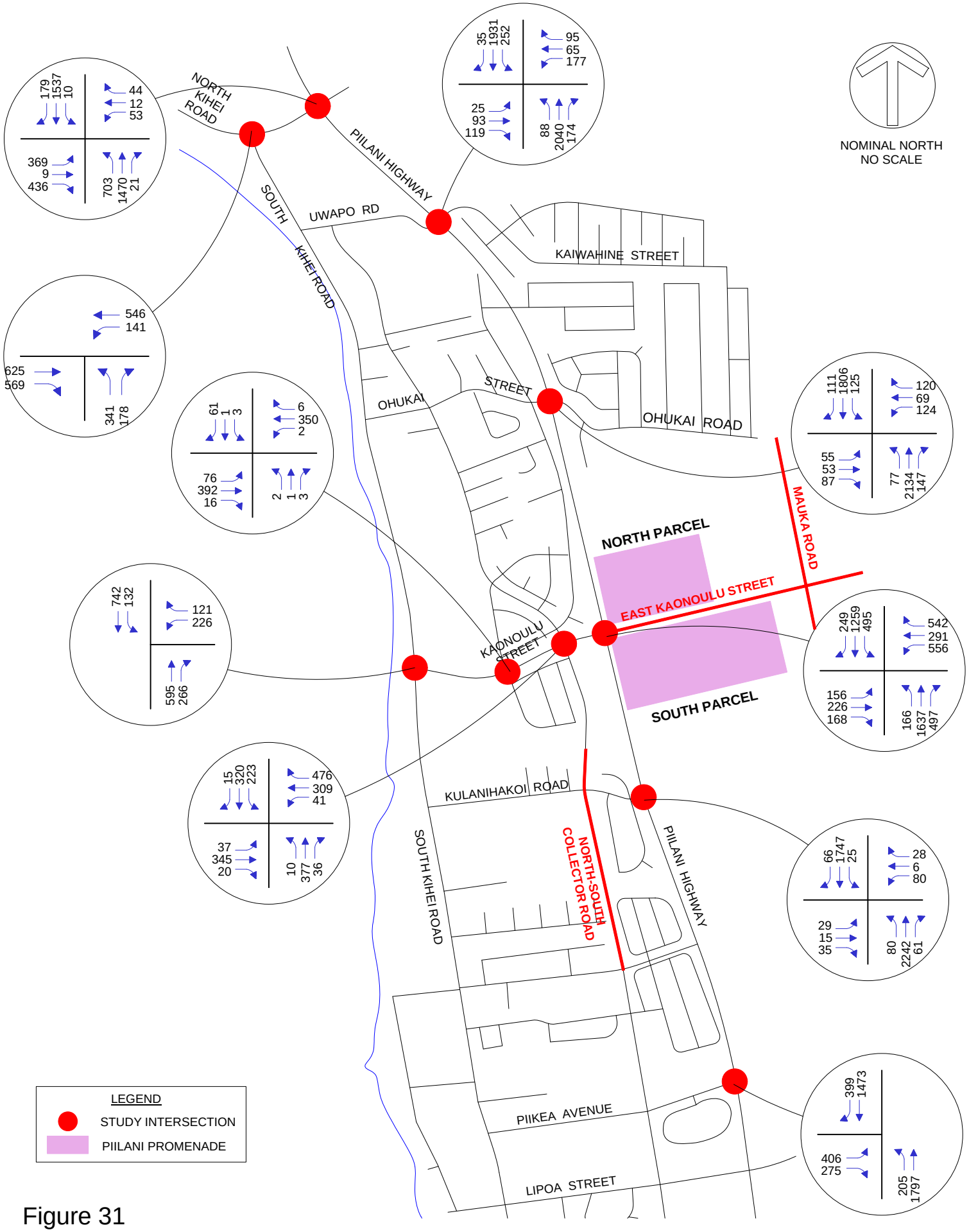
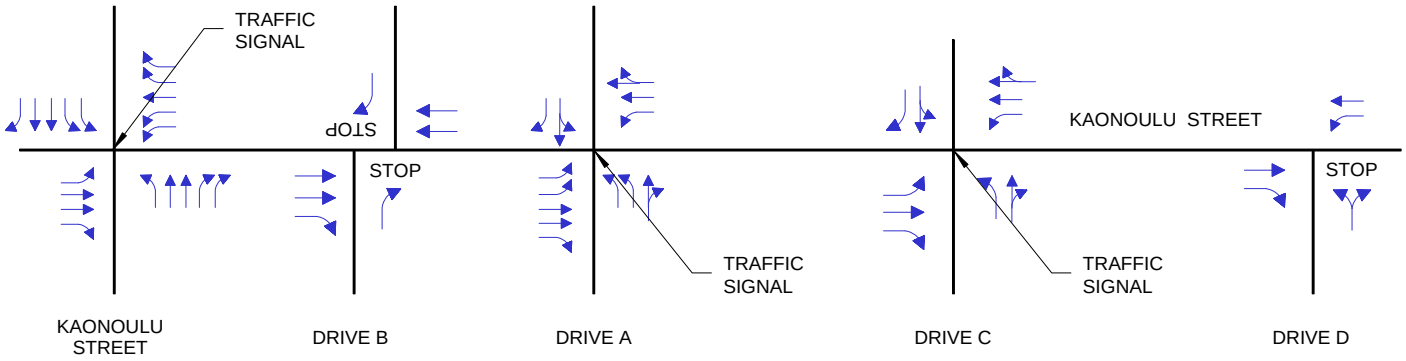
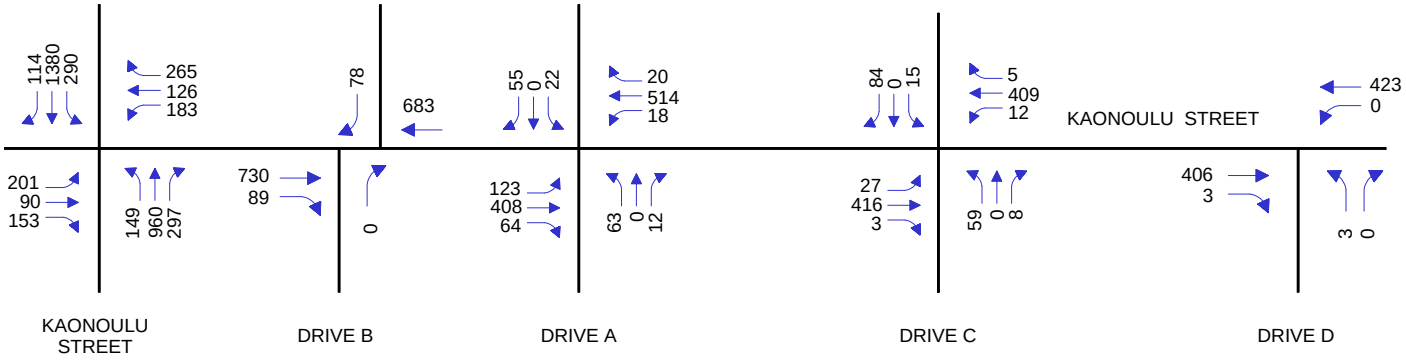


Figure 31
2025 BACKGROUND WEEKDAY PM PEAK HOUR PROJECTIONS

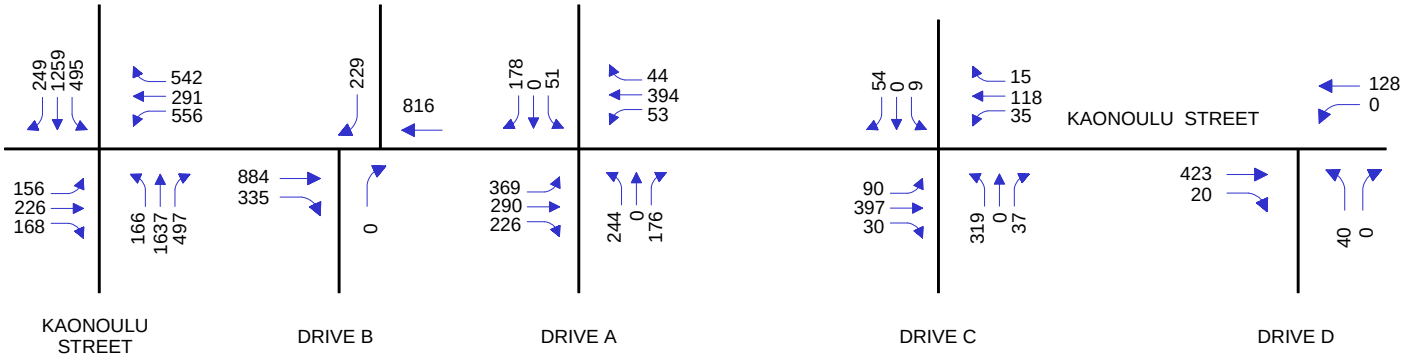
Phillip Rowell and Associates



RECOMMENDED LANE CONFIGURATIONS



AM PEAK HOUR



PM PEAK HOUR

NOTES
1. PROJECTIONS OF ADJACENT INTERSECTIONS MAY NOT MATCH BECAUSE OF ROUNDING.

Figure 32
2025 TRAFFIC PROJECTIONS AT PROJECT DRIVEWAYS

Phillip Rowell and Associates

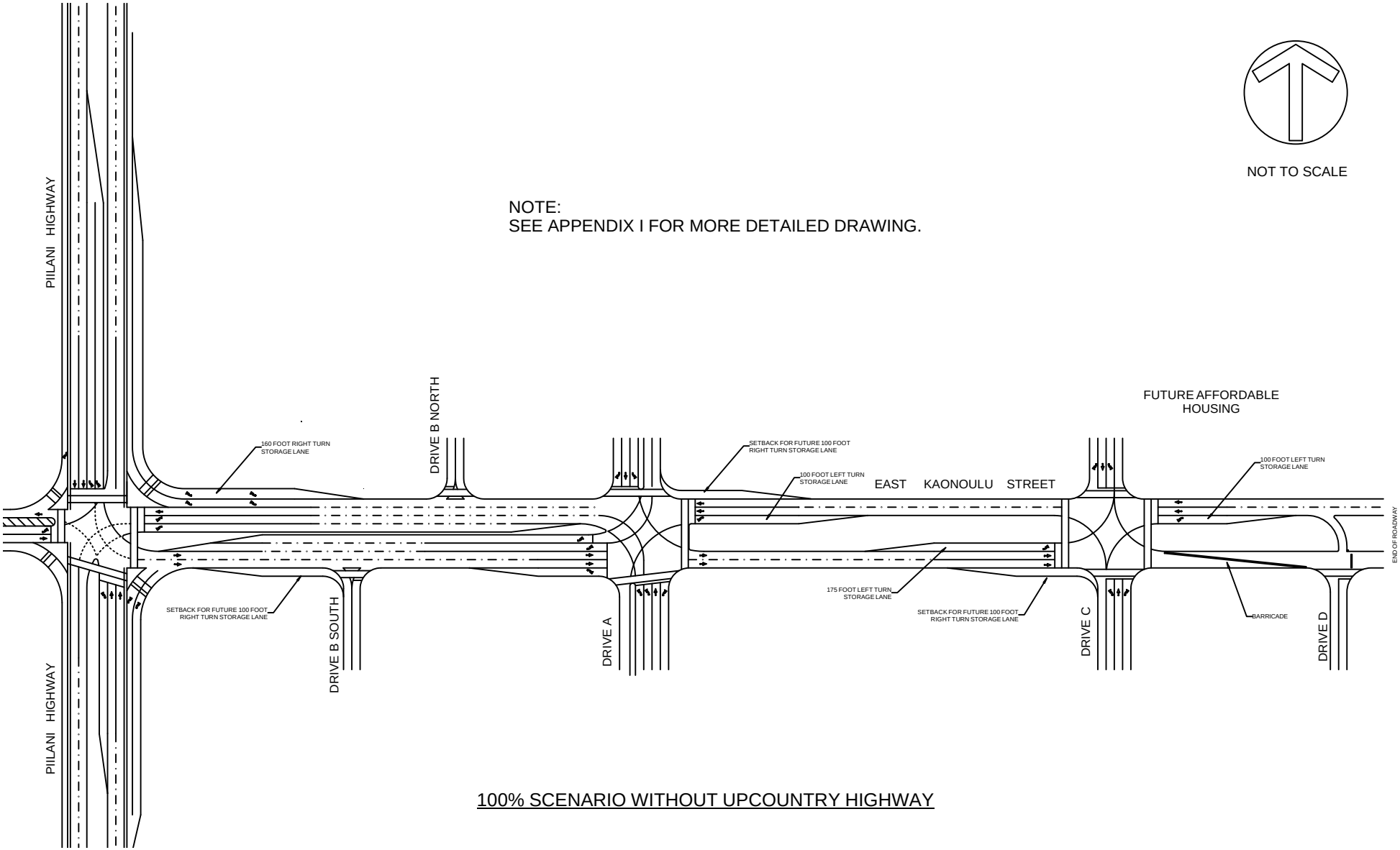


Figure 33
SCHEMATIC DRAWING OF EAST KAONOULU STREET

Appendix A
Traffic County Summary Worksheets

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Ohukai Street
DAY & DATE: Thursday, May 9, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am	3	149	20	20	5	23	3	121	0	3	8	12	367
2	6:15 am	7	202	15	26	6	30	1	136	6	6	10	12	457
3	6:30 am	8	254	19	35	5	35	2	183	4	12	13	30	600
4	6:45 am	10	282	32	38	2	26	12	218	3	23	17	29	692
5	7:00 am	8	230	25	54	8	40	5	257	11	19	16	26	699
6	7:15 am	5	228	30	49	11	50	6	201	7	27	20	16	650
7	7:30 am	8	438	45	42	14	57	12	332	6	32	34	21	1041
8	7:45 am	16	363	51	51	11	65	11	227	4	15	23	15	852
9	8:00 am	7	282	31	45	7	51	5	199	6	21	8	23	685
10	8:15 am	13	280	40	39	8	37	12	253	9	11	23	18	743
11	8:30 am	12	280	28	35	10	34	13	250	10	13	12	16	713
12	8:45 am	11	224	38	24	14	37	7	185	4	19	15	14	592
13	9:00 am													0
14	9:15 am													0
	Maximum:	16	438	51	51	14	65	12	332	9	32	34	23	1041

Hourly Volume of Each Movement

6:00 am	7:00 am	28	887	86	119	18	114	18	658	13	44	48	83	2116
6:15 am	7:15 am	33	968	91	153	21	131	20	794	24	60	56	97	2448
6:30 am	7:30 am	31	994	106	176	26	151	25	859	25	81	66	101	2641
6:45 am	7:45 am	31	1178	132	183	35	173	35	1008	27	101	87	92	3082
7:00 am	8:00 am	37	1259	151	196	44	212	34	1017	28	93	93	78	3242
7:15 am	8:15 am	36	1311	157	187	43	223	34	959	23	95	85	75	3228
7:30 am	8:30 am	44	1363	167	177	40	210	40	1011	25	79	88	77	3321
7:45 am	8:45 am	48	1205	150	170	36	187	41	929	29	60	66	72	2993
8:00 am	9:00 am	43	1066	137	143	39	159	37	887	29	64	58	71	2733
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		44	1363	167	177	40	210	40	1011	25	79	88	77	3321
Per Cent of Approach		3%	87%	11%	41%	9%	49%	4%	94%	2%	32%	36%	32%	
Peak Hour Factor:		0.69	0.78	0.82	0.87	0.71	0.81	0.83	0.76	0.69	0.62	0.65	0.84	0.8
Total Arrivals			1574			427			1076			244		
Total Departures			1265			295			1652			109		
Total			2839			722			2728			353		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Ohukai Street
DAY & DATE: Thursday, May 9, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	10	325	21	41	14	62	10	268	21	11	14	15	812
2	3:15 pm	12	269	32	35	13	43	12	234	21	11	14	17	713
3	3:30 pm	11	301	39	42	11	49	11	321	20	10	9	17	841
4	3:45 pm	11	297	37	40	22	59	11	313	30	19	14	24	877
5	4:00 pm	14	361	27	37	13	45	14	356	23	21	16	17	944
6	4:15 pm	22	324	37	44	15	46	22	346	18	19	23	23	939
7	4:30 pm	9	290	37	47	16	54	9	364	33	22	23	24	928
8	4:45 pm	11	263	25	47	14	55	11	264	26	17	25	20	778
9	5:00 pm	17	308	35	53	16	70	17	295	22	25	24	17	899
10	5:15 pm	14	340	29	33	15	48	14	322	26	17	18	10	886
11	5:30 pm	12	245	32	27	11	33	12	175	15	9	11	18	600
12	5:45 pm	13	286	30	29	13	38	13	250	22	9	16	20	739
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	22	361	37	47	22	59	22	364	33	22	23	24	944

Hourly Volume of Each Movement

3:00 pm	4:00 pm	44	1192	129	158	60	213	44	1136	92	51	51	73	3243
3:15 pm	4:15 pm	48	1228	135	154	59	196	48	1224	94	61	53	75	3375
3:30 pm	4:30 pm	58	1283	140	163	61	199	58	1336	91	69	62	81	3601
3:45 pm	4:45 pm	56	1272	138	168	66	204	56	1379	104	81	76	88	3688
4:00 pm	5:00 pm	56	1238	126	175	58	200	56	1330	100	79	87	84	3589
4:15 pm	5:15 pm	59	1185	134	191	61	225	59	1269	99	83	95	84	3544
4:30 pm	5:30 pm	51	1201	126	180	61	227	51	1245	107	81	90	71	3491
4:45 pm	5:45 pm	54	1156	121	160	56	206	54	1056	89	68	78	65	3163
5:00 pm	6:00 pm	56	1179	126	142	55	189	56	1042	85	60	69	65	3124
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		56	1272	138	168	66	204	56	1379	104	81	76	88	3688
Per Cent of Approach		4%	87%	9%	38%	15%	47%	4%	90%	7%	33%	31%	36%	
Peak Hour Factor:		0.64	0.88	0.93	0.89	0.75	0.86	0.64	0.95	0.79	0.92	0.83	0.92	0.98
Total Arrivals			1466			438			1539			245		
Total Departures			1635			270			1557			226		
Total			3101			708			3096			471		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Ohukai Street
DAY & DATE: Saturday, May 18, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	5	184	25	13	16	20	11	226	8	40	12	35	595
2	10:15 am	14	206	31	16	19	21	24	246	5	25	14	34	655
3	10:30 am	7	207	23	14	11	20	25	233	10	29	11	39	629
4	10:45 am	11	242	36	13	18	17	28	275	10	39	8	41	738
5	11:00 am	17	160	18	14	11	16	18	130	8	28	14	37	471
6	11:15 am	8	173	26	11	21	19	27	221	6	24	12	22	570
7	11:30 am	16	231	38	12	14	15	15	234	13	22	18	42	670
8	11:45 am	15	303	29	12	20	29	38	300	14	44	18	42	864
9	12:00 pm	8	146	15	6	10	8	12	127	9	22	9	18	390
10	12:15 pm	14	232	25	13	16	15	23	218	11	32	9	44	652
11	12:30 pm	21	262	26	6	16	15	29	248	4	39	9	41	716
12	12:45 pm	18	312	38	13	18	15	16	242	13	33	11	48	777
13	1:00 pm													0
14	1:15 pm													0
15	1:30 pm													0
16	1:45 pm													0
		21	303	29	13	20	29	38	300	14	44	18	44	864

Hourly Volume of Each Movement

10:00 am	11:00 am	37	839	115	56	64	78	88	980	33	133	45	149	2617
10:15 am	11:15 am	49	815	108	57	59	74	95	884	33	121	47	151	2493
10:30 am	11:30 am	43	782	103	52	61	72	98	859	34	120	45	139	2408
10:45 am	11:45 am	52	806	118	50	64	67	88	860	37	113	52	142	2449
11:00 am	12:00 pm	56	867	111	49	66	79	98	885	41	118	62	143	2575
11:15 am	12:15 pm	47	853	108	41	65	71	92	882	42	112	57	124	2494
11:30 am	12:30 pm	53	912	107	43	60	67	88	879	47	120	54	146	2576
11:45 am	12:45 pm	58	943	95	37	62	67	102	893	38	137	45	145	2622
12:00 pm	1:00 pm	61	952	104	38	60	53	80	835	37	126	38	151	2535
12:15 pm	1:15 pm													
12:30 pm	1:30 pm													
12:45 pm	1:45 pm													
1:00 pm	2:00 pm													
Peak Hour Volume		58	943	95	37	62	67	102	893	38	137	45	145	2622
Per Cent of Approach		5%	86%	9%	22%	37%	40%	10%	86%	4%	42%	14%	44%	
Peak Hour Factor:		0.69	0.78	0.82	0.71	0.78	0.58	0.67	0.74	0.68	0.78	0.63	0.82	

Total Arrivals	1096	166	1033	327
Total Departures	1075	242	1147	158
Total	2171	408	2180	485

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaiwahine Street and Uwapo Road
DAY & DATE: Friday, May 10, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am	1	136	5	8	0	7	1	126	1	12	0	7	304
2	6:15 am	4	217	7	6	1	15	8	171	7	21	6	19	482
3	6:30 am	5	221	8	9	4	17	13	245	1	33	3	18	577
4	6:45 am	1	185	7	8	2	16	7	231	1	27	4	20	509
5	7:00 am	5	272	6	23	7	17	10	355	2	44	7	37	785
6	7:15 am	4	274	12	20	5	9	15	310	5	32	3	43	732
7	7:30 am	6	339	5	25	9	19	6	328	5	18	2	29	791
8	7:45 am	6	292	6	16	5	8	15	234	5	12	3	29	631
9	8:00 am	2	380	10	19	5	3	14	254	11	25	5	23	751
10	8:15 am	4	239	10	13	2	16	9	243	1	12	0	22	571
11	8:30 am	2	223	8	8	6	13	9	260	6	23	2	16	576
12	8:45 am	4	227	12	9	1	10	6	256	9	23	4	16	577
13	9:00 am													0
14	9:15 am													0
	Maximum:	6	339	12	25	9	19	15	355	5	44	7	43	791

Hourly Volume of Each Movement

6:00 am	7:00 am	11	759	27	31	7	55	29	773	10	93	13	64	1872
6:15 am	7:15 am	15	895	28	46	14	65	38	1002	11	125	20	94	2353
6:30 am	7:30 am	15	952	33	60	18	59	45	1141	9	136	17	118	2603
6:45 am	7:45 am	16	1070	30	76	23	61	38	1224	13	121	16	129	2817
7:00 am	8:00 am	21	1177	29	84	26	53	46	1227	17	106	15	138	2939
7:15 am	8:15 am	18	1285	33	80	24	39	50	1126	26	87	13	124	2905
7:30 am	8:30 am	18	1250	31	73	21	46	44	1059	22	67	10	103	2744
7:45 am	8:45 am	14	1134	34	56	18	40	47	991	23	72	10	90	2529
8:00 am	9:00 am	12	1069	40	49	14	42	38	1013	27	83	11	77	2475
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		21	1177	29	84	26	53	46	1227	17	106	15	138	2939
Per Cent of Approach		2%	96%	2%	52%	16%	33%	4%	95%	1%	41%	6%	53%	
Peak Hour Factor:		0.88	0.87	0.6	0.84	0.72	0.7	0.77	0.86	0.85	0.6	0.54	0.8	0.93

Total Arrivals	1227	163	1290	259
Total Departures	1449	90	1336	64
Total	2676	253	2626	323

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaiwahine Street and Uwapo Road
DAY & DATE: Friday, May 10, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	10	297	16	12	3	5	15	266	12	13	3	15	667
2	3:15 pm	15	332	17	10	4	7	13	317	7	19	4	20	765
3	3:30 pm	14	313	21	15	6	6	12	317	13	12	0	15	744
4	3:45 pm	14	327	24	14	8	5	27	326	11	12	1	23	792
5	4:00 pm	13	348	18	16	8	8	27	346	9	25	2	16	836
6	4:15 pm	20	339	23	15	15	7	24	382	14	21	4	21	885
7	4:30 pm	17	329	15	8	8	3	16	370	14	21	5	18	824
8	4:45 pm	19	306	13	13	18	11	18	315	6	18	3	18	758
9	5:00 pm	14	320	20	14	17	10	30	277	8	17	3	19	749
10	5:15 pm	15	331	17	19	16	6	20	307	12	20	3	11	777
11	5:30 pm	14	282	14	15	9	9	11	236	9	20	4	15	638
12	5:45 pm	17	295	22	13	11	7	15	213	5	16	6	15	635
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	20	348	24	16	15	8	27	382	14	25	5	23	885

Hourly Volume of Each Movement

3:00 pm	4:00 pm	53	1269	78	51	21	23	67	1226	43	56	8	73	2968
3:15 pm	4:15 pm	56	1320	80	55	26	26	79	1306	40	68	7	74	3137
3:30 pm	4:30 pm	61	1327	86	60	37	26	90	1371	47	70	7	75	3257
3:45 pm	4:45 pm	64	1343	80	53	39	23	94	1424	48	79	12	78	3337
4:00 pm	5:00 pm	69	1322	69	52	49	29	85	1413	43	85	14	73	3303
4:15 pm	5:15 pm	70	1294	71	50	58	31	88	1344	42	77	15	76	3216
4:30 pm	5:30 pm	65	1286	65	54	59	30	84	1269	40	76	14	66	3108
4:45 pm	5:45 pm	62	1239	64	61	60	36	79	1135	35	75	13	63	2922
5:00 pm	6:00 pm	60	1228	73	61	53	32	76	1033	34	73	16	60	2799
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		64	1343	80	53	39	23	94	1424	48	79	12	78	3337
Per Cent of Approach		4%	90%	5%	46%	34%	20%	6%	91%	3%	47%	7%	46%	
Peak Hour Factor:		0.8	0.96	0.83	0.83	0.65	0.72	0.87	0.93	0.86	0.79	0.6	0.85	0.94
Total Arrivals			1487			115			1566			169		
Total Departures			1555			186			1445			151		
Total			3042			301			3011			320		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaiwahine Street and Uwapo Road
DAY & DATE: Saturday, May 11, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	5	185	7	11	3	12	16	277	5	20	2	17	560
2	10:15 am	9	203	9	14	3	9	10	323	5	15	1	13	614
3	10:30 am	10	168	9	13	1	12	8	280	5	20	5	11	542
4	10:45 am	11	198	9	10	7	9	15	256	5	22	5	6	553
5	11:00 am	12	250	10	8	3	6	9	335	4	15	6	15	673
6	11:15 am	12	225	11	6	5	11	12	276	7	9	1	9	584
7	11:30 am	10	267	15	14	3	10	12	165	8	16	2	15	537
8	11:45 am	6	234	10	9	4	13	12	241	7	12	1	15	564
9	12:00 pm	12	243	13	9	2	10	15	278	12	15	3	12	624
10	12:15 pm	10	221	14	6	9	12	17	266	9	11	2	15	592
11	12:30 pm	11	278	17	11	3	13	11	259	2	10	3	11	629
12	12:45 pm	9	327	13	12	10	10	11	252	5	15	5	18	687
13	1:00 pm	9	292	18	12	11	9	10	255	5	14	1	10	646
14	1:15 pm	21	262	17	6	6	5	13	227	3	9	1	13	583
15	1:30 pm	10	316	15	9	9	9	12	271	12	18	3	19	703
16	1:45 pm	6	244	11	14	5	14	17	204	4	10	8	14	551
	Maximum:	21	327	18	12	11	10	13	271	12	18	5	19	703

Hourly Volume of Each Movement

10:00 am	11:00 am	35	754	34	48	14	42	49	1136	20	77	13	47	2269
10:15 am	11:15 am	42	819	37	45	14	36	42	1194	19	72	17	45	2382
10:30 am	11:30 am	45	841	39	37	16	38	44	1147	21	66	17	41	2352
10:45 am	11:45 am	45	940	45	38	18	36	48	1032	24	62	14	45	2347
11:00 am	12:00 pm	40	976	46	37	15	40	45	1017	26	52	10	54	2358
11:15 am	12:15 pm	40	969	49	38	14	44	51	960	34	52	7	51	2309
11:30 am	12:30 pm	38	965	52	38	18	45	56	950	36	54	8	57	2317
11:45 am	12:45 pm	39	976	54	35	18	48	55	1044	30	48	9	53	2409
12:00 pm	1:00 pm	42	1069	57	38	24	45	54	1055	28	51	13	56	2532
12:15 pm	1:15 pm	39	1118	62	41	33	44	49	1032	21	50	11	54	2554
12:30 pm	1:30 pm	50	1159	65	41	30	37	45	993	15	48	10	52	2545
12:45 pm	1:45 pm	49	1197	63	39	36	33	46	1005	25	56	10	60	2619
1:00 pm	2:00 pm	46	1114	61	41	31	37	52	957	24	51	13	56	2483
Peak Hour Volume		49	1197	63	39	36	33	46	1005	25	56	10	60	2619
Per Cent of Approach		4%	92%	46%	36%	31%	3%	4%	93%	27%	44%	0%	2%	
Peak Hour Factor:		0.58	0.92	0.88	0.81	0.82	0.83	0.88	0.93	0.52	0.78	0.5	0.79	0.93

Total Arrivals	1309	108	1076	126
Total Departures	1104	119	1286	110
Total	2413	227	2362	236

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at North Kihei Road
DAY & DATE: Thursday, May 16, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am	9	137	10	1	2	0	6	110	41	38	1	24	379
2	6:15 am	12	144	9	0	0	2	7	123	80	52	1	16	446
3	6:30 am	24	176	14	2	2	5	9	181	74	52	3	30	572
4	6:45 am	23	161	14	4	1	1	8	202	89	53	5	26	587
5	7:00 am	29	234	2	1	0	5	4	321	92	76	20	65	849
6	7:15 am	29	275	0	1	1	3	1	319	129	68	0	44	870
7	7:30 am	24	228	1	1	1	5	1	208	53	67	0	38	627
8	7:45 am	28	256	0	1	0	1	2	249	67	87	0	44	735
9	8:00 am	32	257	2	1	1	3	6	192	68	73	1	37	673
10	8:15 am	29	186	1	0	0	1	4	164	51	57	0	55	548
11	8:30 am	27	206	2	4	0	1	2	211	60	57	0	49	619
12	8:45 am	23	187	1	5	1	1	0	222	68	57	0	38	603
13	9:00 am													0
14	9:15 am													0
	Maximum:	29	275	2	1	1	5	4	321	129	87	20	65	870

Hourly Volume of Each Movement

6:00 am	7:00 am	68	618	47	7	5	8	30	616	284	195	10	96	1984
6:15 am	7:15 am	88	715	39	7	3	13	28	827	335	233	29	137	2454
6:30 am	7:30 am	105	846	30	8	4	14	22	1023	384	249	28	165	2878
6:45 am	7:45 am	105	898	17	7	3	14	14	1050	363	264	25	173	2933
7:00 am	8:00 am	110	993	3	4	2	14	8	1097	341	298	20	191	3081
7:15 am	8:15 am	113	1016	3	4	3	12	10	968	317	295	1	163	2905
7:30 am	8:30 am	113	927	4	3	2	10	13	813	239	284	1	174	2583
7:45 am	8:45 am	116	905	5	6	1	6	14	816	246	274	1	185	2575
8:00 am	9:00 am	111	836	6	10	2	6	12	789	247	244	1	179	2443
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		110	993	3	4	2	14	8	1097	341	298	20	191	3081
Per Cent of Approach		10%	90%	0%	20%	10%	70%	1%	76%	24%	59%	4%	38%	
Peak Hour Factor:		0.95	0.9	0.38	1	0.5	0.7	0.5	0.85	0.66	0.86	0.25	0.73	0.89

Total Arrivals	1106	20	1446	509
Total Departures	1292	31	1305	453
Total	2398	51	2751	962

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at North Kihei Road
DAY & DATE: Tuesday, May 14, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	39	266	4	1	0	1	3	228	65	34	0	62	703
2	3:15 pm	42	262	5	0	0	1	8	222	84	32	2	91	749
3	3:30 pm	40	280	4	32	3	20	5	285	90	62	3	81	905
4	3:45 pm	49	260	1	8	7	8	2	239	98	43	3	115	833
5	4:00 pm	48	323	0	4	2	4	0	298	104	59	1	72	915
6	4:15 pm	23	175	0	1	0	0	1	177	65	20	1	61	524
7	4:30 pm	47	284	0	1	1	2	2	324	115	48	0	77	901
8	4:45 pm	44	247	1	1	0	4	0	264	120	23	0	85	789
9	5:00 pm	59	244	0	3	0	0	1	247	75	36	3	74	742
10	5:15 pm	45	298	0	1	1	2	5	246	75	53	0	95	821
11	5:30 pm	36	277	0	3	0	2	0	231	77	32	2	92	752
12	5:45 pm	29	240	0	1	0	0	1	214	57	25	0	70	637
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	49	323	5	32	7	20	8	298	104	62	3	115	915

Hourly Volume of Each Movement

3:00 pm	4:00 pm	170	1068	14	41	10	30	18	974	337	171	8	349	3190
3:15 pm	4:15 pm	179	1125	10	44	12	33	15	1044	376	196	9	359	3402
3:30 pm	4:30 pm	160	1038	5	45	12	32	8	999	357	184	8	329	3177
3:45 pm	4:45 pm	167	1042	1	14	10	14	5	1038	382	170	5	325	3173
4:00 pm	5:00 pm	162	1029	1	7	3	10	3	1063	404	150	2	295	3129
4:15 pm	5:15 pm	173	950	1	6	1	6	4	1012	375	127	4	297	2956
4:30 pm	5:30 pm	195	1073	1	6	2	8	8	1081	385	160	3	331	3253
4:45 pm	5:45 pm	184	1066	1	8	1	8	6	988	347	144	5	346	3104
5:00 pm	6:00 pm	169	1059	0	8	1	4	7	938	284	146	5	331	2952
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		179	1125	10	44	12	33	15	1044	376	196	9	359	3402
Per Cent of Approach		14%	86%	1%	49%	13%	37%	1%	73%	26%	35%	2%	64%	
Peak Hour Factor:		0.91	0.87	0.5	0.34	0.43	0.41	0.47	0.88	0.9	0.79	0.75	0.78	0.93

Total Arrivals	1314	89	1435	564
Total Departures	1447	34	1354	567
Total	2761	123	2789	1131

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at North Kihei Road
DAY & DATE: Saturday, May 11, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	25	145	4	1	0		1	156	47	40	1	49	469
2	10:15 am	9	143	1	0	0		0	268	52	30	1	86	590
3	10:30 am	42	143	2	0	2	2	0	245	70	29	0	33	568
4	10:45 am	35	227	0	0		0	0	297	51	50	0	70	730
5	11:00 am	21	190	0	5		0	3	253	57	57	0	42	628
6	11:15 am	40	202	0	1		3	1	258	57	67	2	46	677
7	11:30 am	30	194	2			0	1	201	58	62	1	55	604
8	11:45 am	43	214	2		1	0	0	220	56	64	0	36	636
9	12:00 pm	41	220	0		0	0	0	277	60	55	1	50	704
10	12:15 pm	39	172	0		0	0	0	194	57	44	1	33	540
11	12:30 pm	36	266	1		0	0	1	231	53	82	0	58	728
12	12:45 pm	42	205	3		0	1	0	195	61	91	0	23	621
13	1:00 pm	41	242	2	2	0	0	2	207	79	51	0	40	666
14	1:15 pm	38	258	0		0	0	1	210	70	86	0	60	723
15	1:30 pm	26	175	1		0	0	1	163	30	42	0	39	477
16	1:45 pm	43	214	1		0	0	0	196	61	56	0	43	614
	Maximum:	42	266	3	2	0	1	2	231	79	91	0	60	728

Hourly Volume of Each Movement

10:00 am	11:00 am	111	658	7	1	2	2	1	966	220	149	2	238	2357
10:15 am	11:15 am	107	703	3	5	2	2	3	1063	230	166	1	231	2516
10:30 am	11:30 am	138	762	2	6	2	5	4	1053	235	203	2	191	2603
10:45 am	11:45 am	126	813	2	6	0	3	5	1009	223	236	3	213	2639
11:00 am	12:00 pm	134	800	4	6	1	3	5	932	228	250	3	179	2545
11:15 am	12:15 pm	154	830	4	1	1	3	2	956	231	248	4	187	2621
11:30 am	12:30 pm	153	800	4	0	1	0	1	892	231	225	3	174	2484
11:45 am	12:45 pm	159	872	3	0	1	0	1	922	226	245	2	177	2608
12:00 pm	1:00 pm	158	863	4	0	0	1	1	897	231	272	2	164	2593
12:15 pm	1:15 pm	158	885	6	2	0	1	3	827	250	268	1	154	2555
12:30 pm	1:30 pm	157	971	6	2	0	1	4	843	263	310	0	181	2738
12:45 pm	1:45 pm	147	880	6	2	0	1	4	775	240	270	0	162	2487
1:00 pm	2:00 pm	148	889	4	2	0	0	4	776	240	235	0	182	2480
Peak Hour Volume		157	971	6	2	0	1	4	843	263	310	0	181	2738
Per Cent of Approach		14%	86%	1%	67%	0%	33%	0%	76%	24%	63%	0%	37%	
Peak Hour Factor:		0.93	0.91	0.5	0.25	0	0.25	0.5	0.91	0.83	0.85	0	0.75	0.94

Total Arrivals	1134	3	1110	491
Total Departures	1026	10	1282	420
Total	2160	13	2392	911

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	North Kihei Road at South Kihei Road
DAY & DATE:	Thursday, May 16, 2013
START TIME:	6:30 am
END TIME:	8:30 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:30 am					82	14	30		100	28	52		306
2	6:45 am					94	20	33		94	45	66		352
3	7:00 am					92	18	43		107	35	60		355
4	7:15 am					117	22	37		105	48	73		402
5	7:30 am					95	21	52		84	54	83		389
6	7:45 am					55	21	45		96	51	81		349
7	8:00 am					67	27	38		73	56	70		331
8	8:15 am					70	28	38		76	37	48		297
	Maximum:					117	22	52		107	54	83		402

Hourly Volume of Each Movement

6:30 am	7:30 am	0	0	0	0	385	74	143	0	406	156	251	0	1415
6:45 am	7:45 am	0	0	0	0	398	81	165	0	390	182	282	0	1498
7:00 am	8:00 am	0	0	0	0	359	82	177	0	392	188	297	0	1495
7:15 am	8:15 am	0	0	0	0	334	91	172	0	358	209	307	0	1471
7:30 am	8:30 am	0	0	0	0	287	97	173	0	329	198	282	0	1366
Maximum Volume		0	0	0	0	398	81	165	0	390	182	282	0	1498
Per Cent of Approach		0%	0%	0%	0%	83%	17%	30%	0%	70%	39%	61%	0%	
Peak Hour Factor:		0	0	0	0	0.85	0.92	0.79	0	0.91	0.84	0.85	0	0.93
Total Arrivals			0			479			555			464		
Total Departures			0			447			263			788		
Total			0			926			818			1252		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	North Kihei Road at South Kihei Road
DAY & DATE:	Tuesday, May 14, 2013
START TIME:	3:30 pm
END TIME:	5:30 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:30 pm					67	37	39		61	92	106		402
2	3:45 pm					90	37	39		67	104	92		429
3	4:00 pm					81	28	37		53	94	80		373
4	4:15 pm					83	42	30		54	102	85		396
5	4:30 pm					95	38	47		74	117	93		464
6	4:45 pm					85	36	47		63	119	87		437
7	5:00 pm					77	25	44		55	111	121		433
8	5:15 pm					80	41	23		60	110	78		392
	Maximum:					95	42	47		74	119	121		464

Hourly Volume of Each Movement

3:30 pm	4:30 pm	0	0	0	0	321	144	145	0	235	392	363	0	1600
3:45 pm	4:45 pm	0	0	0	0	349	145	153	0	248	417	350	0	1662
4:00 pm	5:00 pm	0	0	0	0	344	144	161	0	244	432	345	0	1670
4:15 pm	5:15 pm	0	0	0	0	340	141	168	0	246	449	386	0	1730
4:30 pm	5:30 pm	0	0	0	0	337	140	161	0	252	457	379	0	1726
Maximum Volume		0	0	0	0	340	141	168	0	246	449	386	0	1730
Per Cent of Approach		0%	0%	0%	0%	71%	29%	41%	0%	59%	54%	46%	0%	
Peak Hour Factor:		0	0	0	0	0.89	0.84	0.89	0	0.83	0.94	0.8	0	0.93
Total Arrivals			0			481			414			835		
Total Departures			0			554			590			586		
Total			0			1035			1004			1421		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: North Kihei Road at South Kihei Road
DAY & DATE: Saturday, May 4, 2013
START TIME: 12:00 pm
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach				East Approach		South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	12:00 pm					69	27	36		70	59	57		318
2	12:15 pm					65	28	27		49	64	60		293
3	12:30 pm					75	42	35		60	62	71		345
4	12:45 pm					62	37	34		64	70	56		323
5	1:00 pm					61	35	29		53	64	59		301
6	1:15 pm					69	26	31		76	74	68		344
7	1:30 pm					74	41	42		54	62	75		348
8	1:45 pm					68	27	34		61	78	68		336
9	2:00 pm													0
10	2:15 pm													0
11	2:30 pm													0
12	2:45 pm													0
13	3:00 pm													0
14	3:15 pm													0
15	3:30 pm													0
16	3:45 pm													0
	Maximum:					74	41	42		76	78	75		348

Hourly Volume of Each Movement

12:00 pm	1:00 pm	0	0	0	0	271	134	132	0	243	255	244	0	1279
12:15 pm	1:15 pm	0	0	0	0	263	142	125	0	226	260	246	0	1262
12:30 pm	1:30 pm	0	0	0	0	267	140	129	0	253	270	254	0	1313
12:45 pm	1:45 pm	0	0	0	0	266	139	136	0	247	270	258	0	1316
1:00 pm	2:00 pm	0	0	0	0	272	129	136	0	244	278	270	0	1329
1:15 pm	2:15 pm	0	0	0	0	211	94	107	0	191	214	211	0	1028
1:30 pm	2:30 pm	0	0	0	0	142	68	76	0	115	140	143	0	684
1:45 pm	2:45 pm	0	0	0	0	68	27	34	0	61	78	68	0	336
2:00 pm	3:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 pm	3:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 pm	3:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 pm	3:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 pm	4:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Volume		0	0	0	0	272	129	136	0	244	278	270	0	1329
Per Cent of Approach		0%	0%	0%	0%	68%	32%	36%	0%	64%	51%	49%	0%	
Peak Hour Factor:		0	0	0	0	0.92	0.79	0.81	0	0.8	0.89	0.9	0	0.95
Total Arrivals			0			401			380			548		
Total Departures			0			406			407			516		
Total			0			807			787			1064		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaonoulu Street
DAY & DATE: Thursday, May 16, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am	1	129						131	8	14		2	285
2	6:15 am	1	254						138	4	17		3	417
3	6:30 am	1	253						211	5	29		7	506
4	6:45 am	2	285						237	12	30		9	575
5	7:00 am	6	316						344	8	43		10	727
6	7:15 am	3	285						226	8	51		6	579
7	7:30 am	4	455						380	25	77		15	956
8	7:45 am	4	366						232	18	36		7	663
9	8:00 am	7	356						259	16	32		2	672
10	8:15 am	4	343						251	9	36		7	650
11	8:30 am	6	268						227	8	28		5	542
12	8:45 am	5	303						236	9	37		3	593
13	9:00 am													0
14	9:15 am													0
	Maximum:	7	455						380	25	77		15	956

Hourly Volume of Each Movement

6:00 am	7:00 am	5	921	0	0	0	0	0	717	29	90	0	21	1783
6:15 am	7:15 am	10	1108	0	0	0	0	0	930	29	119	0	29	2225
6:30 am	7:30 am	12	1139	0	0	0	0	0	1018	33	153	0	32	2387
6:45 am	7:45 am	15	1341	0	0	0	0	0	1187	53	201	0	40	2837
7:00 am	8:00 am	17	1422	0	0	0	0	0	1182	59	207	0	38	2925
7:15 am	8:15 am	18	1462	0	0	0	0	0	1097	67	196	0	30	2870
7:30 am	8:30 am	19	1520	0	0	0	0	0	1122	68	181	0	31	2941
7:45 am	8:45 am	21	1333	0	0	0	0	0	969	51	132	0	21	2527
8:00 am	9:00 am	22	1270	0	0	0	0	0	973	42	133	0	17	2457
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		19	1520	0	0	0	0	0	1122	68	181	0	31	2941
Per Cent of Approach		1%	99%	0%	0%	0%	0%	0%	94%	6%	85%	0%	15%	
Peak Hour Factor:		0.68	0.84	0	0	0	0	0	0.74	0.68	0.59	0	0.52	0.77

Total Arrivals	1539	0	1190	212
Total Departures	1153	0	1701	87
Total	2692	0	2891	299

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaonoulu Street
DAY & DATE: Thursday, May 16, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	12	320						359	22	29		4	746
2	3:15 pm	13	334						381	23	29		8	788
3	3:30 pm	10	381						401	20	25		5	842
4	3:45 pm	10	375						329	23	33		6	776
5	4:00 pm	7	335						380	22	28		4	776
6	4:15 pm	13	383						426	27	40		5	894
7	4:30 pm	11	334						357	29	22		5	758
8	4:45 pm	12	362						334	23	41		3	775
9	5:00 pm	6	366						414	20	38		9	853
10	5:15 pm	10	257						268	17	21		3	576
11	5:30 pm	9	288						232	22	28		6	585
12	5:45 pm	8	325						258	14	30		2	637
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	13	383						426	27	40		6	894

Hourly Volume of Each Movement

3:00 pm	4:00 pm	45	1410	0	0	0	0	0	1470	88	116	0	23	3152
3:15 pm	4:15 pm	40	1425	0	0	0	0	0	1491	88	115	0	23	3182
3:30 pm	4:30 pm	40	1474	0	0	0	0	0	1536	92	126	0	20	3288
3:45 pm	4:45 pm	41	1427	0	0	0	0	0	1492	101	123	0	20	3204
4:00 pm	5:00 pm	43	1414	0	0	0	0	0	1497	101	131	0	17	3203
4:15 pm	5:15 pm	42	1445	0	0	0	0	0	1531	99	141	0	22	3280
4:30 pm	5:30 pm	39	1319	0	0	0	0	0	1373	89	122	0	20	2962
4:45 pm	5:45 pm	37	1273	0	0	0	0	0	1248	82	128	0	21	2789
5:00 pm	6:00 pm	33	1236	0	0	0	0	0	1172	73	117	0	20	2651
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		40	1474	0	0	0	0	0	1536	92	126	0	20	3288
Per Cent of Approach		3%	97%	0%	0%	0%	0%	0%	94%	6%	86%	0%	14%	
Peak Hour Factor:		0.77	0.96	0	0	0	0	0	0.9	0.85	0.79	0	0.83	0.92
Total Arrivals			1514			0			1628			146		
Total Departures			1556			0			1600			132		
Total			3070			0			3228			278		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kaonoulu Street
DAY & DATE: Saturday, May 18, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	11	231						245	12	33		12	544
2	10:15 am	11	187						212	33	22		24	489
3	10:30 am	10	260						288	12	25		6	601
4	10:45 am	8	250						250	21	22		7	558
5	11:00 am	9	198						233	14	27		3	484
6	11:15 am	5	240						242	11	19		15	532
7	11:30 am	14	271						235	15	34		3	572
8	11:45 am	5	202						255	17	20		4	503
9	12:00 pm	12	269						224	17	18		8	548
10	12:15 pm	13	267						272	18	31		12	613
11	12:30 pm	12	286						230	24	24		8	584
12	12:45 pm	6	272						221	15	28		9	551
13	1:00 pm	8	237						228	19	24		8	524
14	1:15 pm	6	240						268	13	21		11	559
15	1:30 pm	15	283						265	16	29		11	619
16	1:45 pm	12	230						227	9	22		6	506
	Maximum:	13	286						272	24	31		12	613

Hourly Volume of Each Movement

10:00 am	11:00 am	40	928	0	0	0	0	0	995	78	102	0	49	2192
10:15 am	11:15 am	38	895	0	0	0	0	0	983	80	96	0	40	2132
10:30 am	11:30 am	32	948	0	0	0	0	0	1013	58	93	0	31	2175
10:45 am	11:45 am	36	959	0	0	0	0	0	960	61	102	0	28	2146
11:00 am	12:00 pm	33	911	0	0	0	0	0	965	57	100	0	25	2091
11:15 am	12:15 pm	36	982	0	0	0	0	0	956	60	91	0	30	2155
11:30 am	12:30 pm	44	1009	0	0	0	0	0	986	67	103	0	27	2236
11:45 am	12:45 pm	42	1024	0	0	0	0	0	981	76	93	0	32	2248
12:00 pm	1:00 pm	43	1094	0	0	0	0	0	947	74	101	0	37	2296
12:15 pm	1:15 pm	39	1062	0	0	0	0	0	951	76	107	0	37	2272
12:30 pm	1:30 pm	32	1035	0	0	0	0	0	947	71	97	0	36	2218
12:45 pm	1:45 pm	35	1032	0	0	0	0	0	982	63	102	0	39	2253
1:00 pm	2:00 pm	41	990	0	0	0	0	0	988	57	96	0	36	2208
Peak Hour Volume		43	1094	0	0	0	0	0	947	74	101	0	37	2296
Per Cent of Approach		4%	96%	0%	0%	0%	0%	0%	93%	7%	73%	0%	27%	
Peak Hour Factor:		0.83	0.96	0	0	0	0	0	0.87	0.77	0.81	0	0.77	0.94

Total Arrivals	1137	0	1021	138
Total Departures	984	0	1195	117
Total	2121	0	2216	255

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: South Kihei Road at Kaonoulu Street
DAY & DATE: Thursday, May 16, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am		32	0	7		6	4	59					108
2	6:15 am		40	1	8		5	5	74					133
3	6:30 am		77	4	5		9	7	124					226
4	6:45 am		69	5	12		10	6	105					207
5	7:00 am		59	4	8		14	8	108					201
6	7:15 am		93	3	6		22	16	158					298
7	7:30 am		80	1	9		18	14	99					221
8	7:45 am		87	4	4		17	13	142					267
9	8:00 am		99	0	9		11	16	96					231
10	8:15 am		93	5	6		8	19	106					237
11	8:30 am		82	3	4		12	15	116					232
12	8:45 am		66	2	6		11	18	88					191
13	9:00 am													0
14	9:15 am													0
	Maximum:		99	4	9		22	16	158					298

Hourly Volume of Each Movement

6:00 am	7:00 am	0	218	10	32	0	30	22	362	0	0	0	0	674
6:15 am	7:15 am	0	245	14	33	0	38	26	411	0	0	0	0	767
6:30 am	7:30 am	0	298	16	31	0	55	37	495	0	0	0	0	932
6:45 am	7:45 am	0	301	13	35	0	64	44	470	0	0	0	0	927
7:00 am	8:00 am	0	319	12	27	0	71	51	507	0	0	0	0	987
7:15 am	8:15 am	0	359	8	28	0	68	59	495	0	0	0	0	1017
7:30 am	8:30 am	0	359	10	28	0	54	62	443	0	0	0	0	956
7:45 am	8:45 am	0	361	12	23	0	48	63	460	0	0	0	0	967
8:00 am	9:00 am	0	340	10	25	0	42	68	406	0	0	0	0	891
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		0	359	8	28	0	68	59	495	0	0	0	0	1017
Per Cent of Approach		0%	98%	2%	29%	0%	71%	11%	89%	0%	0%	0%	0%	
Peak Hour Factor:		0	0.91	0.5	0.78	0	0.77	0.92	0.78	0	0	0	0	0.85

Total Arrivals	367	96	554	0
Total Departures	523	67	427	0
Total	890	163	981	0

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: South Kihei Road at Kaonoulu Street
DAY & DATE: Thursday, May 16, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm		145	8	10		10	19	133					325
2	3:15 pm		116	3	4		13	23	127					286
3	3:30 pm		109	9	4		14	33	115					284
4	3:45 pm		131	8	8		9	32	140					328
5	4:00 pm		103	4	11		21	24	125					288
6	4:15 pm		135	7	5		21	23	119					310
7	4:30 pm		82	9	7		11	31	138					278
8	4:45 pm		148	10	7		9	31	127					332
9	5:00 pm		118	17	4		15	33	110					297
10	5:15 pm		149	10	6		14	30	126					335
11	5:30 pm		130	5	5		13	21	90					264
12	5:45 pm		98	2	7		11	22	104					244
13	6:00 pm													0
14	6:15 pm													0
	Maximum:		149	17	7		15	33	138					335

Hourly Volume of Each Movement

3:00 pm	4:00 pm	0	501	28	26	0	46	107	515	0	0	0	0	1223
3:15 pm	4:15 pm	0	459	24	27	0	57	112	507	0	0	0	0	1186
3:30 pm	4:30 pm	0	478	28	28	0	65	112	499	0	0	0	0	1210
3:45 pm	4:45 pm	0	451	28	31	0	62	110	522	0	0	0	0	1204
4:00 pm	5:00 pm	0	468	30	30	0	62	109	509	0	0	0	0	1208
4:15 pm	5:15 pm	0	483	43	23	0	56	118	494	0	0	0	0	1217
4:30 pm	5:30 pm	0	497	46	24	0	49	125	501	0	0	0	0	1242
4:45 pm	5:45 pm	0	545	42	22	0	51	115	453	0	0	0	0	1228
5:00 pm	6:00 pm	0	495	34	22	0	53	106	430	0	0	0	0	1140
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		0	497	46	24	0	49	125	501	0	0	0	0	1242
Per Cent of Approach		0%	92%	8%	33%	0%	67%	20%	80%	0%	0%	0%	0%	
Peak Hour Factor:		0	0.83	0.68	0.86	0	0.82	0.95	0.91	0	0	0	0	0.93

Total Arrivals	543	73	626	0
Total Departures	525	171	546	0
Total	1068	244	1172	0

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: South Kihei Road at Kaonoulu Street
DAY & DATE: Saturday, May 11, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am		80	4	3		15	26	141					269
2	10:15 am		71	2	3		15	30	121					242
3	10:30 am		71	0	3		7	22	131					234
4	10:45 am		94	1	9		13	21	111					249
5	11:00 am		91	5	2		18	23	122					261
6	11:15 am		95	4	4		11	25	128					267
7	11:30 am		110	5	5		11	20	114					265
8	11:45 am		115	3	3		25	24	124					294
9	12:00 pm		108	4	5		16	20	114					267
10	12:15 pm		107	3	1		26	22	137					296
11	12:30 pm		115	2	2		10	15	114					258
12	12:45 pm		115	7	10		20	33	96					281
13	1:00 pm		107	6	5		13	31	98					260
14	1:15 pm		102	2	1		17	25	132					279
15	1:30 pm		108	2	3		5	24	114					256
16	1:45 pm		117	6	3		13	15	122					276
	Maximum:		115	5	5		26	24	137					296

Hourly Volume of Each Movement

10:00 am	11:00 am	0	316	7	18	0	50	99	504	0	0	0	0	994
10:15 am	11:15 am	0	327	8	17	0	53	96	485	0	0	0	0	986
10:30 am	11:30 am	0	351	10	18	0	49	91	492	0	0	0	0	1011
10:45 am	11:45 am	0	390	15	20	0	53	89	475	0	0	0	0	1042
11:00 am	12:00 pm	0	411	17	14	0	65	92	488	0	0	0	0	1087
11:15 am	12:15 pm	0	428	16	17	0	63	89	480	0	0	0	0	1093
11:30 am	12:30 pm	0	440	15	14	0	78	86	489	0	0	0	0	1122
11:45 am	12:45 pm	0	445	12	11	0	77	81	489	0	0	0	0	1115
12:00 pm	1:00 pm	0	445	16	18	0	72	90	461	0	0	0	0	1102
12:15 pm	1:15 pm	0	444	18	18	0	69	101	445	0	0	0	0	1095
12:30 pm	1:30 pm	0	439	17	18	0	60	104	440	0	0	0	0	1078
12:45 pm	1:45 pm	0	432	17	19	0	55	113	440	0	0	0	0	1076
1:00 pm	2:00 pm	0	434	16	12	0	48	95	466	0	0	0	0	1071
Peak Hour Volume		0	440	15	14	0	78	86	489	0	0	0	0	1122
Per Cent of Approach		0%	97%	3%	15%	0%	85%	15%	85%	0%	0%	0%	0%	
Peak Hour Factor:		0	0.96	0.75	0.7	0	0.75	0.9	0.89	0	0	0	0	0.95

Total Arrivals	455	92	575	0
Total Departures	503	101	518	0
Total	958	193	1093	0

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kulanihakoi Street
DAY & DATE: Tuesday, May 14, 2013
START TIME: 6:00 am
END TIME: 9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:00 am	1	189						104	0	11		6	311
2	6:15 am	0	251						167	3	13		9	443
3	6:30 am	5	265						184	4	20		19	497
4	6:45 am	10	303						216	2	18		10	559
5	7:00 am	6	420						316	6	28		17	793
6	7:15 am	6	511						366	5	28		11	927
7	7:30 am	10	480						302	2	31		13	838
8	7:45 am	14	415						313	18	37		8	805
9	8:00 am	17	362						235	21	41		11	687
10	8:15 am	15	398						266	7	32		14	732
11	8:30 am	7	282						270	9	25		9	602
12	8:45 am	8	309						250	12	23		9	611
13	9:00 am													0
14	9:15 am													0
	Maximum:	14	511						366	18	37		17	927

Hourly Volume of Each Movement

6:00 am	7:00 am	16	1008	0	0	0	0	0	671	9	62	0	44	1810
6:15 am	7:15 am	21	1239	0	0	0	0	0	883	15	79	0	55	2292
6:30 am	7:30 am	27	1499	0	0	0	0	0	1082	17	94	0	57	2776
6:45 am	7:45 am	32	1714	0	0	0	0	0	1200	15	105	0	51	3117
7:00 am	8:00 am	36	1826	0	0	0	0	0	1297	31	124	0	49	3363
7:15 am	8:15 am	47	1768	0	0	0	0	0	1216	46	137	0	43	3257
7:30 am	8:30 am	56	1655	0	0	0	0	0	1116	48	141	0	46	3062
7:45 am	8:45 am	53	1457	0	0	0	0	0	1084	55	135	0	42	2826
8:00 am	9:00 am	47	1351	0	0	0	0	0	1021	49	121	0	43	2632
8:15 am	9:15 am													
8:30 am	9:30 am													
Peak Hour Volume		36	1826	0	0	0	0	0	1297	31	124	0	49	3363
Per Cent of Approach		2%	98%	0%	0%	0%	0%	0%	98%	2%	72%	0%	28%	
Peak Hour Factor:		0.64	0.89	0	0	0	0	0	0.89	0.43	0.84	0	0.72	0.91
Total Arrivals			1862			0			1328			173		
Total Departures			1346			0			1950			67		
Total			3208			0			3278			240		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kulanihakoi Street
DAY & DATE: Tuesday, May 14, 2013
START TIME: 3:00 pm
END TIME: 6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	17	284						339	20	27		11	698
2	3:15 pm	14	330						346	16	19		10	735
3	3:30 pm	21	366						397	15	25		4	828
4	3:45 pm	17	366						398	19	26		7	833
5	4:00 pm	25	426						413	23	28		14	929
6	4:15 pm	14	352						480	17	10		6	879
7	4:30 pm	25	364						395	21	26		14	845
8	4:45 pm	20	373						368	13	28		7	809
9	5:00 pm	28	420						413	21	31		9	922
10	5:15 pm	18	293						278	14	19		4	626
11	5:30 pm	22	354						322	11	17		7	733
12	5:45 pm	17	300						259	17	17		12	622
13	6:00 pm													0
14	6:15 pm													0
	Maximum:	25	426						480	23	28		14	929

Hourly Volume of Each Movement

3:00 pm	4:00 pm	69	1346	0	0	0	0	0	1480	70	97	0	32	3094
3:15 pm	4:15 pm	77	1488	0	0	0	0	0	1554	73	98	0	35	3325
3:30 pm	4:30 pm	77	1510	0	0	0	0	0	1688	74	89	0	31	3469
3:45 pm	4:45 pm	81	1508	0	0	0	0	0	1686	80	90	0	41	3486
4:00 pm	5:00 pm	84	1515	0	0	0	0	0	1656	74	92	0	41	3462
4:15 pm	5:15 pm	87	1509	0	0	0	0	0	1656	72	95	0	36	3455
4:30 pm	5:30 pm	91	1450	0	0	0	0	0	1454	69	104	0	34	3202
4:45 pm	5:45 pm	88	1440	0	0	0	0	0	1381	59	95	0	27	3090
5:00 pm	6:00 pm	85	1367	0	0	0	0	0	1272	63	84	0	32	2903
5:15 pm	6:15 pm													
5:30 pm	6:30 pm													
Peak Hour Volume		81	1508	0	0	0	0	0	1686	80	90	0	41	3486
Per Cent of Approach		5%	95%	0%	0%	0%	0%	0%	95%	5%	69%	0%	31%	
Peak Hour Factor:		0.81	0.88	0	0	0	0	0	0.88	0.87	0.8	0	0.73	0.94
Total Arrivals			1589			0			1766			131		
Total Departures			1727			0			1598			161		
Total			3316			0			3364			292		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Kulanihakoi Street
DAY & DATE: Saturday, May 18, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	6	263						275	9	15		17	585
2	10:15 am	8	221						220	8	22		12	491
3	10:30 am	22	280						305	10	22		5	644
4	10:45 am	16	240						270	7	19		10	562
5	11:00 am	17	264						244	9	12		14	560
6	11:15 am	11	239						255	9	28		15	557
7	11:30 am	5	310						249	11	16		15	606
8	11:45 am	7	232						224	15	10		9	497
9	12:00 pm	12	210						201	8	6		11	448
10	12:15 pm	15	370						331	18	13		11	758
11	12:30 pm	18	270						212	7	9		12	528
12	12:45 pm	15	210						155	11	12		11	414
13	1:00 pm	17	239						221	13	18		21	529
14	1:15 pm	14	241						230	13	16		9	523
15	1:30 pm	16	275						258	9	16		22	596
16	1:45 pm	12	265						232	14	21		13	557
	Maximum:	22	280						305	10	28			15

Hourly Volume of Each Movement

10:00 am	11:00 am	52	1004	0	0	0	0	0	1070	34	78	0	44	2282
10:15 am	11:15 am	63	1005	0	0	0	0	0	1039	34	75	0	41	2257
10:30 am	11:30 am	66	1023	0	0	0	0	0	1074	35	81	0	44	2323
10:45 am	11:45 am	49	1053	0	0	0	0	0	1018	36	75	0	54	2285
11:00 am	12:00 pm	40	1045	0	0	0	0	0	972	44	66	0	53	2220
11:15 am	12:15 pm	35	991	0	0	0	0	0	929	43	60	0	50	2108
11:30 am	12:30 pm	39	1122	0	0	0	0	0	1005	52	45	0	46	2309
11:45 am	12:45 pm	52	1082	0	0	0	0	0	968	48	38	0	43	2231
12:00 pm	1:00 pm	60	1060	0	0	0	0	0	899	44	40	0	45	2148
12:15 pm	1:15 pm	65	1089	0	0	0	0	0	919	49	52	0	55	2229
12:30 pm	1:30 pm	64	960	0	0	0	0	0	818	44	55	0	53	1994
12:45 pm	1:45 pm	62	965	0	0	0	0	0	864	46	62	0	63	2062
1:00 pm	2:00 pm	59	1020	0	0	0	0	0	941	49	71	0	65	2205
Peak Hour Volume		66	1023	0	0	0	0	0	1074	35	81	0	44	2323
Per Cent of Approach		6%	94%	0%	0%	0%	0%	0%	97%	3%	65%	0%	35%	
Peak Hour Factor:		0.75	0.91	0	0	0	0	0	0.88	0.88	0.72	0	0.73	??
Total Arrivals			1089			0			1109			125		
Total Departures			1118			0			1104			101		
Total			2207			0			2213			226		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Kaonoulu Street at Kenolio Road
DAY & DATE: Friday, May 17, 2013
START TIME: 6:30 am
END TIME: 8:30 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:30 am	4	0	27	6	0	0	2	0	0	1	8	7	55
2	6:45 am	3	0	27	8	1	3	4	1	0	0	10	1	58
3	7:00 am	6	1	27	9	1	3	3	0	1	0	12	3	66
4	7:15 am	2	0	47	7	5	0	16	0	0	2	18	2	99
5	7:30 am	3	0	46	17	8	3	15	1	0	0	10	9	112
6	7:45 am	4	1	30	20	4	5	2	0	0	0	11	6	83
7	8:00 am	5	0	29	8	9	1	4	0	0	0	10	6	72
8	8:15 am	3	0	23	5	2	3	2	1	0	0	11	3	53
9	8:30 am													0
10	8:45 am													0
	Maximum:	5	1	47	20	9	5	16	1	0	2	18	9	112

Hourly Volume of Each Movement

6:30 am	7:30 am	15	1	128	30	7	6	25	1	1	3	48	13	278
6:45 am	7:45 am	14	1	147	41	15	9	38	2	1	2	50	15	335
7:00 am	8:00 am	15	2	150	53	18	11	36	1	1	2	51	20	360
7:15 am	8:15 am	14	1	152	52	26	9	37	1	0	2	49	23	366
7:30 am	8:30 am	15	1	128	50	23	12	23	2	0	0	42	24	320
7:45 am	8:45 am	12	1	82	33	15	9	8	1	0	0	32	15	208
8:00 am	9:00 am	8	0	52	13	11	4	6	1	0	0	21	9	125
Maximum Volume		14	1	152	52	26	9	37	1	0	2	49	23	366
Per Cent of Approach		8%	1%	91%	60%	30%	10%	97%	3%	0%	3%	66%	31%	
Peak Hour Factor:		0.7	0.25	0.81	0.65	0.72	0.45	0.58	0.25	0	0.25	0.68	0.64	0.82
Total Arrivals			167			87			38			74		
Total Departures			76			238			12			40		
Total			243			325			50			114		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	Kaonoulu Street at Kenolio Road
DAY & DATE:	Friday, May 17, 2013
START TIME:	3:30 pm
END TIME:	5:30 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:30 pm	5	2	26	18	8	2	6	0	1	1	13	8	90
2	3:45 pm	3	1	27	19	12	6	7	1			8	5	89
3	4:00 pm	5	0	20	22	14	5	1	0			5	7	79
4	4:15 pm	1	3	31	19	12	3	4	2			10	12	97
5	4:30 pm	5	0	22	13	12	1	6	2		1	8	13	83
6	4:45 pm	3	2	23	19	7	2	6	1		1	36	5	105
7	5:00 pm	1	0	17	17	6	5	3	1		1	11	8	70
8	5:15 pm	4	0	15	9	7	2	0	0	1	0	9	13	60
9	5:30 pm													0
10	5:45 pm													0
11	6:00 pm													0
12	6:15 pm													0
	Maximum:	5	3	31	22	14	5	6	2		1	36	13	105

Hourly Volume of Each Movement

3:30 pm	4:30 pm	14	6	104	78	46	16	18	3	1	1	36	32	355
3:45 pm	4:45 pm	14	4	100	73	50	15	18	5	0	1	31	37	348
4:00 pm	5:00 pm	14	5	96	73	45	11	17	5	0	2	59	37	364
4:15 pm	5:15 pm	10	5	93	68	37	11	19	6	0	3	65	38	355
4:30 pm	5:30 pm	13	2	77	58	32	10	15	4	1	3	64	39	318
4:45 pm	5:45 pm	8	2	55	45	20	9	9	2	1	2	56	26	235
5:00 pm	6:00 pm	5	0	32	26	13	7	3	1	1	1	20	21	130
5:15 pm	6:15 pm	4	0	15	9	7	2	0	0	1	0	9	13	60
5:30 pm	6:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Volume		14	5	96	73	45	11	17	5	0	2	59	37	364
Per Cent of Approach		12%	4%	83%	57%	35%	9%	77%	23%	0%	2%	60%	38%	1
Peak Hour Factor:		0.7	0.42	0.77	0.83	0.8	0.55	0.71	0.63	0	0.5	0.41	0.71	0.87
Total Arrivals			115			129			22			98		
Total Departures			115			172			18			59		
Total			230			301			40			157		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Kaonoulu Street at Kenolio Road
DAY & DATE: Saturday
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	1	0	23	12	5	3	3	2		1	10	3	63
2	10:15 am	6	1	20	11	2	2	4	3		0	11	8	68
3	10:30 am	7	0	26	9	9	3	4	0		0	8	7	73
4	10:45 am	3	1	17	20	6	0	0	1		1	14	6	69
5	11:00 am	3	0	18	7	4	0	3	1		0	13	5	54
6	11:15 am	3	0	17	13	2	1	5	1		0	14	10	66
7	11:30 am	3	0	19	9	5	3	4	2		1	5	7	58
8	11:45 am	3	1	17	9	6	3	4	1		0	11	8	63
9	12:00 pm	6	0	20	15	6	3	1	2		0	5	9	67
10	12:15 pm	4	1	17	7	2	1	1	1		0	7	4	45
11	12:30 pm	4	0	12	9	1	2	7	2	1	0	5	11	54
12	12:45 pm	5	1	12	5	4	5	0	2		1	5	4	44
13	1:00 pm	0	1	16	7	4	3	4	1		0	7	5	48
14	1:15 pm	3	0	9	12	8	3	3	0		0	10	8	56
15	1:30 pm	2	1	15	9	8	1	3	0		1	13	1	54
16	1:45 pm	1	1	12	6	11	2	0	0	1	0	10	7	51
	Maximum:	7	1	26	20	9	3	4	3		1	14	8	73

Hourly Volume of Each Movement

10:00 am	11:00 am	17	2	86	52	22	8	11	6	0	2	43	24	273
10:15 am	11:15 am	19	2	81	47	21	5	11	5	0	1	46	26	264
10:30 am	11:30 am	16	1	78	49	21	4	12	3	0	1	49	28	262
10:45 am	11:45 am	12	1	71	49	17	4	12	5	0	2	46	28	247
11:00 am	12:00 pm	12	1	71	38	17	7	16	5	0	1	43	30	241
11:15 am	12:15 pm	15	1	73	46	19	10	14	6	0	1	35	34	254
11:30 am	12:30 pm	16	2	73	40	19	10	10	6	0	1	28	28	233
11:45 am	12:45 pm	17	2	66	40	15	9	13	6	1	0	28	32	229
12:00 pm	1:00 pm	19	2	61	36	13	11	9	7	1	1	22	28	210
12:15 pm	1:15 pm	13	3	57	28	11	11	12	6	1	1	24	24	191
12:30 pm	1:30 pm	12	2	49	33	17	13	14	5	1	1	27	28	202
12:45 pm	1:45 pm	10	3	52	33	24	12	10	3	0	2	35	18	202
1:00 pm	2:00 pm	6	3	52	34	31	9	10	1	1	1	40	21	209
Peak Hour Volume		17	2	86	52	22	8	11	6	0	2	43	24	273
Per Cent of Approach		16%	2%	82%	63%	27%	10%	65%	35%	0%	3%	62%	35%	
Peak Hour Factor:		0.61	0.5	0.83	0.65	0.61	0.67	0.69	0.5	0	0.5	0.77	0.75	0.93

Total Arrivals	105	82	17	69
Total Departures	82	140	12	39
Total	187	222	29	108

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	Kaonoulu Street at Alulike Street
DAY & DATE:	Thursday, February 25, 2010
START TIME:	6:30 am
END TIME:	9:00 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:30 am	6	0	2	0	9	0	1	0	4	1	13	1	37
2	6:45 am	9	1	0	0	6	0	0	1	2	1	10	5	35
3	7:00 am	7	0	0	1	10	1	2	0	2	1	9	3	36
4	7:15 am	9	0	1	1	11	2	0	0	3	2	13	2	44
5	7:30 am	6	0	1	1	14	0	1	0	2	4	17	1	47
6	7:45 am	9	0	0	0	12	0	0	0	2	4	18	9	54
7	8:00 am	9	0	1	0	14	2	1	0	2	3	18	5	55
8	8:15 am	7	0	0	1	6	0	2	1	4	0	13	6	40
9	8:30 am	8	0	1	0	4	2	1	1	1	5	12	4	39
10	8:45 am	11	0	0	1	12	1	0	1	3	0	18	3	50
	Maximum:	9	0	1	1	14	2	1	0	3	4	18	9	55

Hourly Volume of Each Movement

6:30 am	7:30 am	31	1	3	2	36	3	3	1	11	5	45	11	152
6:45 am	7:45 am	31	1	2	3	41	3	3	1	9	8	49	11	162
7:00 am	8:00 am	31	0	2	3	47	3	3	0	9	11	57	15	181
7:15 am	8:15 am	33	0	3	2	51	4	2	0	9	13	66	17	200
7:30 am	8:30 am	31	0	2	2	46	2	4	1	10	11	66	21	196
7:45 am	8:45 am	33	0	2	1	36	4	4	2	9	12	61	24	188
8:00 am	9:00 am	35	0	2	2	36	5	4	3	10	8	61	18	184
Maximum Volume		33	0	3	2	51	4	2	0	9	13	66	17	200
Per Cent of Approach		92%	0%	8%	4%	89%	7%	18%	0%	82%	14%	69%	18%	
Peak Hour Factor:		0.92	0	0.75	0.5	0.91	0.5	0.5	0	0.75	0.81	0.92	0.47	0.91
Total Arrivals			36			57			11			96		
Total Departures			19			71			17			93		
Total			55			128			28			189		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	Kaonoulu Street at Alulike Street
DAY & DATE:	Thursday, February 25
START TIME:	3:00 pm
END TIME:	6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	9	0	1	0	14	1	0	2	5	1	22	13	68
2	3:15 pm	8	1	0	1	13	1	0	0	4	6	15	7	56
3	3:30 pm	6	0	0	0	11	3	0	0	2	3	14	6	45
4	3:45 pm	11	0	0	1	6	1	2	0	2	2	11	12	48
5	4:00 pm	7	0	0	0	21	1	0	0	0	7	16	14	66
6	4:15 pm	11	0	1	1	15	0	0	1	2	2	24	17	74
7	4:30 pm	5	1	1	4	8	0	0	0	1	5	22	15	62
8	4:45 pm	7	0	1	1	12	1	2	0	0	2	29	15	70
9	5:00 pm	8	1	1	0	13	0	0	0	3	1	16	16	59
10	5:15 pm	7	0	0	0	6	0	0	0	2	7	15	13	50
11	5:30 pm	8	0	0	1	4	0	1	0	1	6	15	11	47
12	5:45 pm	11	0	0	3	13	2	1	0	2	2	19	12	65
	Maximum:	11	1	1	4	21	1	2	1	2	7	29	17	74

Hourly Volume of Each Movement

3:00 pm	4:00 pm	34	1	1	2	44	6	2	2	13	12	62	38	217
3:15 pm	4:15 pm	32	1	0	2	51	6	2	0	8	18	56	39	215
3:30 pm	4:30 pm	35	0	1	2	53	5	2	1	6	14	65	49	233
3:45 pm	4:45 pm	34	1	2	6	50	2	2	1	5	16	73	58	250
4:00 pm	5:00 pm	30	1	3	6	56	2	2	1	3	16	91	61	272
4:15 pm	5:15 pm	31	2	4	6	48	1	2	1	6	10	91	63	265
4:30 pm	5:30 pm	27	2	3	5	39	1	2	0	6	15	82	59	241
4:45 pm	5:45 pm	30	1	2	2	35	1	3	0	6	16	75	55	226
5:00 pm	6:00 pm	34	1	1	4	36	2	2	0	8	16	65	52	221
Maximum Volume		30	1	3	6	56	2	2	1	3	16	91	61	272
Per Cent of Approach		88%	3%	9%	9%	88%	3%	33%	17%	50%	10%	54%	36%	1
Peak Hour Factor:		0.68	0.25	0.75	0.38	0.67	0.5	0.25	0.25	0.38	0.57	0.78	0.9	0.92

Total Arrivals	34	64	6	168
Total Departures	68	96	19	89
Total	102	160	25	257

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Kaonoulu Street at Alulike Street
DAY & DATE: Saturday
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	14	1	0	5	8	0	3	0	2	2	24	9	68
2	10:15 am	17	2	0	4	4	0	2	0	0	2	14	10	55
3	10:30 am	5	0	1	1	12	0	0	0	2	2	8	13	44
4	10:45 am	12	0	0	1	13	0	0	1	0	3	19	12	61
5	11:00 am	7	1	1	2	8	2	2	3	0	4	23	11	64
6	11:15 am	10	0	1	1	10	0	1	1	2	1	23	8	58
7	11:30 am	10	1	3	0	9	0	3	0	1	1	13	14	55
8	11:45 am	16	1	2	5	10	4	1	0	2	4	12	12	69
9	12:00 pm	10	0	1	1	12	0	2	0	1	3	15	11	56
10	12:15 pm	5	0	1	2	12	0	0	0	1	2	22	13	58
11	12:30 pm	6	1	1	1	7	1	1	0	1	0	22	12	53
12	12:45 pm	7	1	3	3	8	0	0	0	2	3	20	7	54
13	1:00 pm	14	0	7	2	11	2	0	0	2	2	22	16	78
14	1:15 pm	12	0	0	1	6	0	0	1	2	3	20	7	52
15	1:30 pm	5	1	3	0	5	1	1	1	1	3	10	11	42
16	1:45 pm	4	0	0	1	12	1	1	0	2	7	18	10	56
	Maximum:	16	1	3	5	10	4	3	3	2	4	23	14	69

Hourly Volume of Each Movement

10:00 am	11:00 am	48	3	1	11	37	0	5	1	4	9	65	44	228
10:15 am	11:15 am	41	3	2	8	37	2	4	4	2	11	64	46	224
10:30 am	11:30 am	34	1	3	5	43	2	3	5	4	10	73	44	227
10:45 am	11:45 am	39	2	5	4	40	2	6	5	3	9	78	45	238
11:00 am	12:00 pm	43	3	7	8	37	6	7	4	5	10	71	45	246
11:15 am	12:15 pm	46	2	7	7	41	4	7	1	6	9	63	45	238
11:30 am	12:30 pm	41	2	7	8	43	4	6	0	5	10	62	50	238
11:45 am	12:45 pm	37	2	5	9	41	5	4	0	5	9	71	48	236
12:00 pm	1:00 pm	28	2	6	7	39	1	3	0	5	8	79	43	221
12:15 pm	1:15 pm	32	2	12	8	38	3	1	0	6	7	86	48	243
12:30 pm	1:30 pm	39	2	11	7	32	3	1	1	7	8	84	42	237
12:45 pm	1:45 pm	38	2	13	6	30	3	1	2	7	11	72	41	226
1:00 pm	2:00 pm	35	1	10	4	34	4	2	2	7	15	70	44	228
Peak Hour Volume		43	3	7	8	37	6	7	4	5	10	71	45	246
Per Cent of Approach		81%	6%	13%	16%	73%	12%	44%	25%	31%	8%	56%	36%	
Peak Hour Factor:		0.67	0.75	0.58	0.4	0.93	0.38	0.58	0.33	0.63	0.63	0.77	0.8	0.89

Total Arrivals	53	51	16	126
Total Departures	57	85	19	85
Total	110	136	35	211

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	Piilani Highway at Piikea Avenue
DAY & DATE:	Tuesday, October 15, 2013
START TIME:	6:30 am
END TIME:	8:30 am

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	6:30 am	55	272						186	10	39		42	604
2	6:45 am	58	211						162	22	33		43	529
3	7:00 am	75	326						273	23	40		58	795
4	7:15 am	94	345						282	25	46		53	845
5	7:30 am	105	487						237	23	41		78	971
6	7:45 am	84	321						216	30	53		71	775
7	8:00 am	81	336						220	38	43		64	782
8	8:15 am	74	322						259	62	58		47	822
9														
10														
	Maximum:	105	487						282	30	53		78	971

Hourly Volume of Each Movement

6:30 am	7:30 am	282	1154	0	0	0	0	0	903	80	158	0	196	2773
6:45 am	7:45 am	332	1369	0	0	0	0	0	954	93	160	0	232	3140
7:00 am	8:00 am	358	1479	0	0	0	0	0	1008	101	180	0	260	3386
7:15 am	8:15 am	364	1489	0	0	0	0	0	955	116	183	0	266	3373
7:30 am	8:30 am	344	1466	0	0	0	0	0	932	153	195	0	260	3350
7:45 am	8:45 am	239	979	0	0	0	0	0	695	130	154	0	182	2379
8:00 am	9:00 am	155	658	0	0	0	0	0	479	100	101	0	111	1604
Maximum Volume		358	1479	0	0	0	0	0	1008	101	180	0	260	3386
Per Cent of Approach		19%	81%	0%	0%	0%	0%	0%	91%	9%	41%	0%	59%	
Peak Hour Factor:		0.85	0.76	0	0	0	0	0	0.89	0.84	0.85	0	0.83	0.87
Total Arrivals			1837			0			1109			440		
Total Departures			1268			0			1659			459		
Total			3105			0			2768			899		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT:	Piilani Promenade 2013
INTERSECTION:	Piilani Highway at Piikea Avenue
DAY & DATE:	Tuesday, October 15, 2013
START TIME:	3:00 pm
END TIME:	6:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
		Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	3:00 pm	102	323						355	60	68		75	983
2	3:15 pm	88	264						305	59	48		56	820
3	3:30 pm	115	356						418	71	89		88	1137
4	3:45 pm	62	235						303	54	46		39	739
5	4:00 pm	93	294						355	50	59		76	927
6	4:15 pm	88	289						265	57	57		57	813
7	4:30 pm	91	299						325	54	51		66	886
8	4:45 pm	77	286						279	59	60		55	816
9	5:00 pm													0
10	5:15 pm													0
11	5:30 pm													0
12	5:45 pm													0
	Maximum:	115	356						418	71	89		88	1137

Hourly Volume of Each Movement

3:00 pm	4:00 pm	367	1178	0	0	0	0	0	1381	244	251	0	258	3679
3:15 pm	4:15 pm	358	1149	0	0	0	0	0	1381	234	242	0	259	3623
3:30 pm	4:30 pm	358	1174	0	0	0	0	0	1341	232	251	0	260	3616
3:45 pm	4:45 pm	334	1117	0	0	0	0	0	1248	215	213	0	238	3365
4:00 pm	5:00 pm	349	1168	0	0	0	0	0	1224	220	227	0	254	3442
4:15 pm	5:15 pm	256	874	0	0	0	0	0	869	170	168	0	178	2515
4:30 pm	5:30 pm	168	585	0	0	0	0	0	604	113	111	0	121	1702
4:45 pm	5:45 pm													
5:00 pm	6:00 pm													
Maximum Volume		367	1178	0	0	0	0	0	1381	244	251	0	258	3679
Per Cent of Approach		24%	76%	0%	0%	0%	0%	0%	85%	15%	49%	0%	51%	1
Peak Hour Factor:		0.8	0.83	0	0	0	0	0	0.83	0.86	0.71	0	0.73	0.81
Total Arrivals			1545			0			1625			509		
Total Departures			1639			0			1429			611		
Total			3184			0			3054			1120		

TRAFFIC COUNT SUMMARY WORKSHEET

PROJECT: Piilani Promenade 2013
INTERSECTION: Piilani Highway at Piikea Avenue
DAY & DATE: Saturday, November 23, 2013
START TIME: 10:00 am
END TIME: 2:00 pm

15-Minute Volumes Beginning at:

		North Approach			East Approach			South Approach			West Approach			
Interval	Start Time	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	10:00 am	58	185						227	43	47		69	629
2	10:15 am	94	213						228	57	46		75	713
3	10:30 am	57	191						202	43	57		65	615
4	10:45 am	98	216						186	46	58		66	670
5	11:00 am	107	273						302	68	94		88	932
6	11:15 am	54	147						160	28	31		42	462
7	11:30 am	68	228						237	53	63		68	717
8	11:45 am	102	228						267	59	64		75	795
9	12:00 pm	73	206						237	54	54		78	702
10	12:15 pm	82	194						236	44	51		64	671
11	12:30 pm	93	253						228	48	62		75	759
12	12:45 pm	90	213						196	60	54		66	679
13	1:00 pm	80	239						220	50	81		65	735
14	1:15 pm	91	241						254	54	56		56	752
15	1:30 pm	69	267						228	44	65		69	742
16	1:45 pm	80	262						261	42	68		68	781
	Maximum:	107	273						302	68	94		88	932

Hourly Volume of Each Movement

10:00 am	11:00 am	307	805	0	0	0	0	0	843	189	208	0	275	2627
10:15 am	11:15 am	356	893	0	0	0	0	0	918	214	255	0	294	2930
10:30 am	11:30 am	316	827	0	0	0	0	0	850	185	240	0	261	2679
10:45 am	11:45 am	327	864	0	0	0	0	0	885	195	246	0	264	2781
11:00 am	12:00 pm	331	876	0	0	0	0	0	966	208	252	0	273	2906
11:15 am	12:15 pm	297	809	0	0	0	0	0	901	194	212	0	263	2676
11:30 am	12:30 pm	325	856	0	0	0	0	0	977	210	232	0	285	2885
11:45 am	12:45 pm	350	881	0	0	0	0	0	968	205	231	0	292	2927
12:00 pm	1:00 pm	338	866	0	0	0	0	0	897	206	221	0	283	2811
12:15 pm	1:15 pm	345	899	0	0	0	0	0	880	202	248	0	270	2844
12:30 pm	1:30 pm	354	946	0	0	0	0	0	898	212	253	0	262	2925
12:45 pm	1:45 pm	330	960	0	0	0	0	0	898	208	256	0	256	2908
1:00 pm	2:00 pm	320	1009	0	0	0	0	0	963	190	270	0	258	3010
Peak Hour Volume		356	893	0	0	0	0	0	918	214	255	0	294	2930
Per Cent of Approach		29%	71%	0%	0%	0%	0%	0%	81%	19%	46%	0%	54%	
Peak Hour Factor:		0.83	0.82	0	0	0	0	0	0.76	0.79	0.68	0	0.84	0.79

Total Arrivals	1249	0	1132	549
Total Departures	1212	0	1148	570
Total	2461	0	2280	1119

Appendix B
Level-of-Service Worksheets for Existing (2013) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1826	1583		1789	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1826	1583		1789	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	77	88	79	210	40	177	25	1011	40	167	1363	44
Peak-hour factor, PHF	0.84	0.65	0.62	0.81	0.71	0.87	0.69	0.76	0.83	0.82	0.78	0.69
Adj. Flow (vph)	92	135	127	259	56	203	36	1330	48	204	1747	64
RTOR Reduction (vph)	0	0	109	0	0	169	0	0	21	0	0	20
Lane Group Flow (vph)	0	227	18	0	315	34	36	1330	27	204	1747	44
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		16.6	16.6		20.0	20.0	6.0	53.6	53.6	14.8	62.4	62.4
Effective Green, g (s)		17.6	17.6		21.0	21.0	7.0	54.6	54.6	15.8	63.4	63.4
Actuated g/C Ratio		0.14	0.14		0.17	0.17	0.06	0.44	0.44	0.13	0.51	0.51
Clearance Time (s)		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	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		257	223		301	266	99	1546	691	224	1795	803
v/s Ratio Prot		c0.12			c0.18		0.02	0.38		c0.12	c0.49	
v/s Ratio Perm			0.08			0.13			0.03			0.04
v/c Ratio		0.88	0.08		1.05	0.13	0.36	0.86	0.04	0.91	0.97	0.06
Uniform Delay, d1		52.7	46.7		52.0	44.2	56.9	31.8	20.2	53.9	30.0	15.6
Progression Factor		1.00	1.00		1.00	1.00	1.06	0.80	0.64	1.22	0.74	0.16
Incremental Delay, d2		27.9	0.2		64.6	0.2	0.8	6.1	0.1	34.2	15.0	0.1
Delay (s)		80.6	46.8		116.6	44.4	61.1	31.7	13.0	100.0	37.3	2.6
Level of Service		F	D		F	D	E	C	B	F	D	A
Approach Delay (s)		68.5			88.3			31.8			42.5	
Approach LOS		E			F			C			D	

Intersection Summary			
HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1782	1583		1802	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.60	1.00		0.50	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1112	1583		931	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	138	10	106	53	26	84	17	1227	46	29	1177	21
Peak-hour factor, PHF	0.80	0.54	0.60	0.70	0.72	0.84	0.85	0.86	0.77	0.60	0.87	0.88
Adj. Flow (vph)	172	19	177	76	36	100	20	1427	60	48	1353	24
RTOR Reduction (vph)	0	0	142	0	0	80	0	0	22	0	0	8
Lane Group Flow (vph)	0	191	35	0	112	20	20	1427	38	48	1353	16
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		23.7	23.7		23.7	23.7	4.0	78.3	78.3	8.0	82.3	82.3
Effective Green, g (s)		24.7	24.7		24.7	24.7	5.0	79.3	79.3	9.0	83.3	83.3
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.04	0.63	0.63	0.07	0.67	0.67
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		4.0	4.0		4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		220	313		184	313	71	2245	1004	127	2358	1055
v/s Ratio Prot							0.01	c0.40		c0.03	c0.38	
v/s Ratio Perm		c0.17	0.11		0.12	0.06			0.04			0.02
v/c Ratio		0.87	0.11		0.61	0.06	0.28	0.64	0.04	0.38	0.57	0.02
Uniform Delay, d1		48.6	41.1		45.7	40.7	58.3	14.0	8.6	55.3	11.3	7.0
Progression Factor		1.00	1.00		1.00	1.00	0.54	2.11	4.97	0.80	1.97	1.84
Incremental Delay, d2		29.1	0.2		6.5	0.1	0.4	0.8	0.0	0.6	0.9	0.0
Delay (s)		77.6	41.4		52.2	40.9	31.8	30.3	42.6	45.1	23.1	12.9
Level of Service		E	D		D	D	C	C	D	D	C	B
Approach Delay (s)		60.2			46.9			30.8			23.7	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1723	2787		1764		3433	3533		1770	3539	1583
Flt Permitted	0.95	0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1723	2787		1764		3433	3533		1770	3539	1583
Volume (vph)	191	20	298	14	2	4	341	1097	8	3	993	110
Peak-hour factor, PHF	0.73	0.25	0.86	0.70	0.50	1.00	0.66	0.85	0.50	0.38	0.90	0.95
Adj. Flow (vph)	262	80	347	20	4	4	517	1291	16	8	1103	116
RTOR Reduction (vph)	0	0	113	0	4	0	0	1	0	0	0	54
Lane Group Flow (vph)	167	175	234	0	24	0	517	1306	0	8	1103	62
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	15.6	15.6	47.5		3.6		25.9	83.0		0.8	57.4	57.4
Effective Green, g (s)	17.6	17.6	48.0		5.6		26.4	85.0		0.8	59.4	59.4
Actuated g/C Ratio	0.14	0.14	0.38		0.04		0.21	0.68		0.01	0.48	0.48
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	237	243	1070		79		725	2402		11	1682	752
v/s Ratio Prot	0.10	c0.10			c0.02		c0.15	0.37		0.00	c0.31	
v/s Ratio Perm			0.12									0.07
v/c Ratio	0.70	0.72	0.22		0.31		0.71	0.54		0.73	0.66	0.08
Uniform Delay, d1	51.2	51.3	25.9		57.8		45.8	10.2		62.0	25.0	17.9
Progression Factor	1.21	1.21	1.03		1.00		0.84	1.82		1.00	1.00	1.00
Incremental Delay, d2	9.1	10.0	0.1		2.2		2.7	0.7		110.3	2.0	0.2
Delay (s)	70.8	72.0	26.7		60.0		41.2	19.2		172.3	27.0	18.1
Level of Service	E	E	C		E		D	B		F	C	B
Approach Delay (s)		48.9			60.0			25.4			27.1	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	282	182	81	398	390	165
Peak-hour factor, PHF	0.85	0.84	0.92	0.85	0.91	0.79
Adj. Flow (vph)	332	217	88	468	429	209
RTOR Reduction (vph)	0	75	0	0	0	0
Lane Group Flow (vph)	332	142	88	468	429	209
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	80.1	80.1	10.5	94.6	19.4	125.0
Effective Green, g (s)	81.6	81.6	10.5	96.1	20.9	125.0
Actuated g/C Ratio	0.65	0.65	0.08	0.77	0.17	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	1216	1033	149	2721	574	1583
v/s Ratio Prot	c0.18		c0.05	0.13	c0.12	
v/s Ratio Perm		0.14				0.13
v/c Ratio	0.27	0.14	0.59	0.17	0.75	0.13
Uniform Delay, d1	9.2	8.3	55.2	3.8	49.5	0.0
Progression Factor	1.00	1.00	0.97	0.31	1.00	1.00
Incremental Delay, d2	0.6	0.3	3.7	0.1	4.6	0.0
Delay (s)	9.7	8.6	57.3	1.3	54.2	0.0
Level of Service	A	A	E	A	D	A
Approach Delay (s)	9.3			10.2	36.4	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.12	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	217	3539	3539	1583
Volume (vph)	259	180	101	1008	1479	358
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	282	196	110	1096	1608	389
RTOR Reduction (vph)	0	48	0	0	0	96
Lane Group Flow (vph)	282	148	110	1096	1608	293
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	22.9	22.9	94.1	94.1	94.1	94.1
Effective Green, g (s)	22.9	22.9	94.1	94.1	94.1	94.1
Actuated g/C Ratio	0.18	0.18	0.75	0.75	0.75	0.75
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	324	290	163	2664	2664	1192
v/s Ratio Prot	c0.16			0.31	0.45	
v/s Ratio Perm		0.12	c0.51			0.25
v/c Ratio	0.87	0.51	0.67	0.41	0.60	0.25
Uniform Delay, d1	49.6	46.0	7.8	5.5	7.0	4.7
Progression Factor	1.00	1.00	1.00	1.00	1.62	6.60
Incremental Delay, d2	21.6	1.4	20.1	0.5	0.7	0.3
Delay (s)	71.2	47.4	27.9	6.0	12.0	31.3
Level of Service	E	D	C	A	B	C
Approach Delay (s)	61.4			8.0	15.8	
Approach LOS	E			A	B	

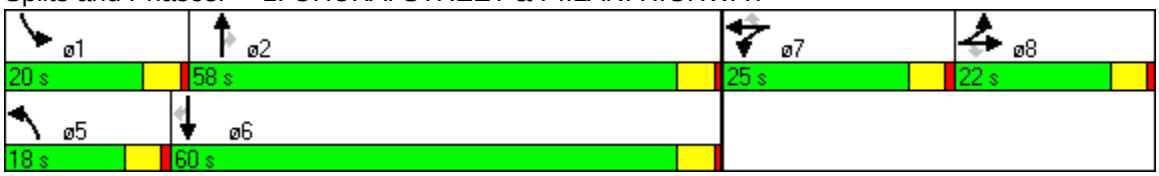
Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	88	79	40	177	25	1011	40	167	1363	44
Lane Group Flow (vph)	227	127	315	203	36	1330	48	204	1747	64
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	22.0	22.0
Minimum Split (s)	22.0	22.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (s)	22.0	22.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (%)	17.6%	17.6%	20.0%	20.0%	14.4%	46.4%	46.4%	16.0%	48.0%	48.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.88	0.38	1.05	0.47	0.23	0.86	0.07	0.91	0.94	0.08
Control Delay	82.2	11.5	114.7	9.8	58.8	32.4	5.6	101.0	33.8	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.2	11.5	114.7	9.8	58.8	32.4	5.6	101.0	33.8	1.5
Queue Length 50th (ft)	182	0	~277	0	28	394	1	148	~813	5
Queue Length 95th (ft)	188	9	#310	60	m46	370	m14	#272	451	3
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	263	337	301	435	198	1544	712	227	1850	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.38	1.05	0.47	0.18	0.86	0.07	0.90	0.94	0.08

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

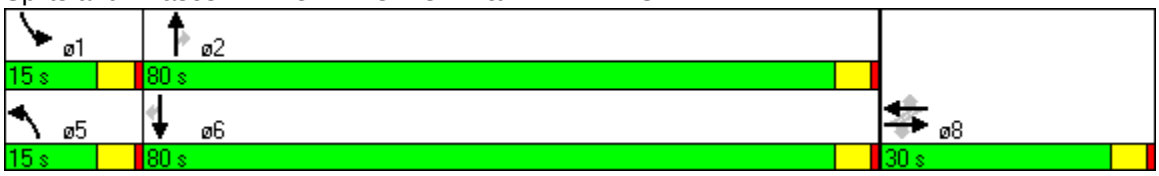


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	10	106	53	26	84	17	1227	46	29	1177	21
Lane Group Flow (vph)	0	191	177	0	112	100	20	1427	60	48	1353	24
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	25.0	25.0	10.0	25.0	25.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	64.0%	64.0%	12.0%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio		0.86	0.39		0.58	0.26	0.13	0.63	0.06	0.31	0.55	0.02
Control Delay		74.8	8.3		56.4	9.3	29.5	31.9	12.3	47.9	22.9	6.7
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		74.8	8.3		56.4	9.3	29.5	31.9	12.3	47.9	22.9	6.7
Queue Length 50th (ft)		149	0		82	0	15	490	16	33	508	5
Queue Length 95th (ft)		129	0		113	39	m16	557	m23	44	645	m12
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		234	469		203	408	156	2275	1039	156	2444	1101
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.82	0.38		0.55	0.25	0.13	0.63	0.06	0.31	0.55	0.02

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 50 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

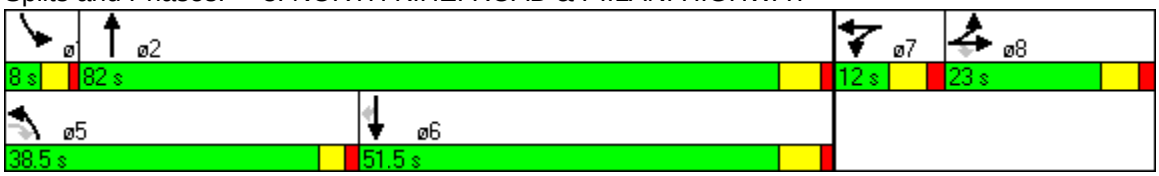


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	191	20	298	2	341	1097	3	993	110
Lane Group Flow (vph)	167	175	347	28	517	1307	8	1103	116
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	4.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	14.5	26.0	8.0	26.0	26.0
Total Split (s)	23.0	23.0	61.5	12.0	38.5	82.0	8.0	51.5	51.5
Total Split (%)	18.4%	18.4%	49.2%	9.6%	30.8%	65.6%	6.4%	41.2%	41.2%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.71	0.72	0.29	0.24	0.71	0.51	0.14	0.63	0.14
Control Delay	74.1	74.8	11.9	54.9	39.8	16.9	64.3	27.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	74.8	11.9	54.9	39.8	16.9	64.3	27.8	6.3
Queue Length 50th (ft)	144	151	34	19	226	414	6	358	6
Queue Length 95th (ft)	178	61	73	27	177	503	11	508	46
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	256	262	1341	117	948	2562	57	1752	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.67	0.26	0.24	0.55	0.51	0.14	0.63	0.14

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 40 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

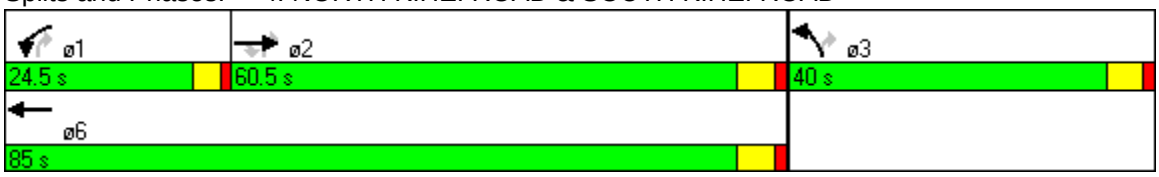


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	282	182	81	398	390	165
Lane Group Flow (vph)	332	217	88	468	429	209
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	15.5	15.5	9.0	15.5	12.5	
Total Split (s)	60.5	60.5	24.5	85.0	40.0	125.0
Total Split (%)	48.4%	48.4%	19.6%	68.0%	32.0%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	Min	C-Min	Min	
v/c Ratio	0.27	0.20	0.59	0.17	0.75	0.13
Control Delay	11.1	1.9	55.2	1.4	50.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	1.9	55.2	1.4	50.5	0.2
Queue Length 50th (ft)	104	0	75	10	173	0
Queue Length 95th (ft)	179	26	131	24	217	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1216	1109	290	2722	989	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.20	0.30	0.17	0.43	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 30 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD

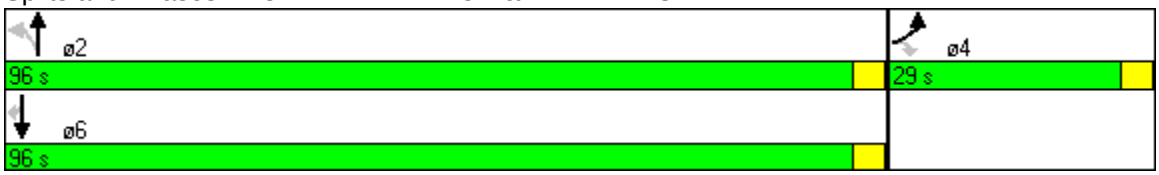


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	259	180	101	1008	1479	358
Lane Group Flow (vph)	282	196	110	1096	1608	389
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phases	4	4	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	29.0	29.0	96.0	96.0	96.0	96.0
Total Split (%)	23.2%	23.2%	76.8%	76.8%	76.8%	76.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.87	0.58	0.70	0.41	0.60	0.30
Control Delay	66.4	37.6	36.1	6.3	12.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	37.6	36.1	6.3	12.7	3.5
Queue Length 50th (ft)	219	99	43	156	443	55
Queue Length 95th (ft)	#353	180	#178	190	m465	m75
Internal Link Dist (ft)	682			1061	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	354	364	158	2666	2666	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.54	0.70	0.41	0.60	0.30

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 16 (13%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	31	181	68	1122	1520	19
Peak Hour Factor	0.52	0.59	0.68	0.74	0.84	0.68
Hourly flow rate (vph)	60	307	100	1516	1810	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	3					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2768	905	1837			
vC1, stage 1 conf vol	1810					
vC2, stage 2 conf vol	958					
vCu, unblocked vol	2768	905	1837			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	0	69			
cM capacity (veh/h)	109	279	328			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	60	307	100	758	758	905	905	28
Volume Left	60	0	100	0	0	0	0	0
Volume Right	0	307	0	0	0	0	0	28
cSH	109	279	328	1700	1700	1700	1700	1700
Volume to Capacity	0.55	1.10	0.31	0.45	0.45	0.53	0.53	0.02
Queue Length 95th (ft)	64	314	32	0	0	0	0	0
Control Delay (s)	72.3	122.6	20.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	F	C					
Approach Delay (s)	114.4		1.3			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	68	28	495	59	8	359
Peak Hour Factor	0.77	0.78	0.78	0.92	0.50	0.91
Hourly flow rate (vph)	88	36	635	64	16	395
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1093	667			699	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1093	667			699	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	92			98	
cM capacity (veh/h)	233	459			898	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	88	36	699	411
Volume Left	88	0	0	16
Volume Right	0	36	64	0
cSH	233	459	1700	898
Volume to Capacity	0.38	0.08	0.41	0.02
Queue Length 95th (ft)	42	6	0	1
Control Delay (s)	29.6	13.5	0.0	0.6
Lane LOS	D	B		A
Approach Delay (s)	25.0		0.0	0.6
Approach LOS	C			

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	49	124	31	1297	1826	36
Peak Hour Factor	0.72	0.84	0.43	0.89	0.89	0.64
Hourly flow rate (vph)	68	148	72	1457	2052	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2925	1026	2108			
vC1, stage 1 conf vol	2052					
vC2, stage 2 conf vol	873					
vCu, unblocked vol	2925	1026	2108			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	13	36	72			
cM capacity (veh/h)	78	232	257			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	68	148	72	729	729	1026	1026	56
Volume Left	68	0	72	0	0	0	0	0
Volume Right	0	148	0	0	0	0	0	56
cSH	78	232	257	1700	1700	1700	1700	1700
Volume to Capacity	0.87	0.64	0.28	0.43	0.43	0.60	0.60	0.03
Queue Length 95th (ft)	111	96	28	0	0	0	0	0
Control Delay (s)	159.2	44.2	24.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	E	C					
Approach Delay (s)	80.5		1.2			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	49	2	9	26	52	0	1	37	152	1	14
Peak Hour Factor	0.64	0.68	0.25	0.45	0.72	0.65	0.42	0.25	0.58	0.81	0.25	0.70
Hourly flow rate (vph)	36	72	8	20	36	80	0	4	64	188	4	20
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	116			80			246	304	76	326	268	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			80			246	304	76	326	268	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	99	94	67	99	98
cM capacity (veh/h)	1473			1518			670	586	985	567	614	985

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	36	80	20	116	0	68	188	24
Volume Left	36	0	20	0	0	0	188	0
Volume Right	0	8	0	80	0	64	0	20
cSH	1473	1700	1518	1700	1700	947	567	895
Volume to Capacity	0.02	0.05	0.01	0.07	0.00	0.07	0.33	0.03
Queue Length 95th (ft)	2	0	1	0	0	6	36	2
Control Delay (s)	7.5	0.0	7.4	0.0	0.0	9.1	14.5	9.1
Lane LOS	A		A		A	A	B	A
Approach Delay (s)	2.3		1.1		9.1		13.9	
Approach LOS					A		B	

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	17	66	13	4	51	2	9	0	2	3	0	33
Peak Hour Factor	0.47	0.92	0.65	0.50	0.91	0.50	0.56	0.25	0.25	0.38	0.25	0.75
Hourly flow rate (vph)	36	72	20	8	56	4	16	0	8	8	0	44
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	60			92			270	230	82	226	238	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			92			270	230	82	226	238	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			97	100	99	99	100	96
cM capacity (veh/h)	1543			1503			638	651	978	707	644	1008

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	36	92	8	60	24	52
Volume Left	36	0	8	0	16	8
Volume Right	0	20	0	4	8	44
cSH	1543	1700	1503	1700	722	947
Volume to Capacity	0.02	0.05	0.01	0.04	0.03	0.05
Queue Length 95th (ft)	2	0	0	0	3	4
Control Delay (s)	7.4	0.0	7.4	0.0	10.2	9.0
Lane LOS	A		A		B	A
Approach Delay (s)	2.1		0.9		10.2	9.0
Approach LOS					B	A

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1816	1583		1797	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1816	1583		1797	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	88	76	81	204	66	168	104	1379	56	138	1272	56
Peak-hour factor, PHF	0.92	0.83	0.92	0.86	0.75	0.89	0.79	0.95	0.64	0.93	0.88	0.64
Adj. Flow (vph)	96	92	88	237	88	189	132	1452	88	148	1445	88
RTOR Reduction (vph)	0	0	79	0	0	151	0	0	27	0	0	26
Lane Group Flow (vph)	0	188	9	0	325	38	132	1452	61	148	1445	62
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		15.0	15.0		28.9	28.9	15.0	69.6	69.6	16.5	71.1	71.1
Effective Green, g (s)		16.0	16.0		29.9	29.9	16.0	70.6	70.6	17.5	72.1	72.1
Actuated g/C Ratio		0.11	0.11		0.20	0.20	0.11	0.47	0.47	0.12	0.48	0.48
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.5	3.5		3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		194	169		358	316	189	1666	745	207	1701	761
v/s Ratio Prot		c0.10			c0.18		0.07	c0.41		c0.08	0.41	
v/s Ratio Perm			0.06			0.12			0.06			0.06
v/c Ratio		0.97	0.06		0.91	0.12	0.70	0.87	0.08	0.71	0.85	0.08
Uniform Delay, d1		66.8	60.2		58.7	49.3	64.7	35.6	21.9	63.8	34.2	21.0
Progression Factor		1.00	1.00		1.00	1.00	0.93	1.17	1.38	1.32	0.60	0.12
Incremental Delay, d2		55.2	0.2		25.7	0.2	7.6	5.8	0.2	8.5	5.0	0.2
Delay (s)		122.0	60.4		84.4	49.4	67.9	47.4	30.3	92.9	25.5	2.7
Level of Service		F	E		F	D	E	D	C	F	C	A
Approach Delay (s)		102.3			71.5			48.1			30.2	
Approach LOS		F			E			D			C	

Intersection Summary			
HCM Average Control Delay	47.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1789	1583		1831	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.59	1.00		0.77	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1094	1583		1441	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	78	12	79	23	39	53	48	1424	94	80	1343	64
Peak-hour factor, PHF	0.85	0.60	0.79	0.72	0.65	0.83	0.86	0.93	0.87	0.83	0.96	0.80
Adj. Flow (vph)	92	20	100	32	60	64	56	1531	108	96	1399	80
RTOR Reduction (vph)	0	0	87	0	0	56	0	0	29	0	0	21
Lane Group Flow (vph)	0	112	13	0	92	8	56	1531	79	96	1399	59
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		18.8	18.8		18.8	18.8	8.5	104.9	104.9	12.3	108.7	108.7
Effective Green, g (s)		18.8	18.8		18.8	18.8	9.5	105.9	105.9	13.3	109.7	109.7
Actuated g/C Ratio		0.13	0.13		0.13	0.13	0.06	0.71	0.71	0.09	0.73	0.73
Clearance Time (s)		4.0	4.0		4.0	4.0	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
Lane Grp Cap (vph)		137	198		181	198	112	2499	1118	157	2588	1158
v/s Ratio Prot							0.03	c0.43		c0.05	c0.40	
v/s Ratio Perm		c0.10	0.06		0.06	0.04			0.07			0.05
v/c Ratio		0.82	0.06		0.51	0.04	0.50	0.61	0.07	0.61	0.54	0.05
Uniform Delay, d1		63.9	57.8		61.3	57.7	68.0	11.4	6.8	65.9	9.0	5.6
Progression Factor		1.00	1.00		1.00	1.00	0.82	2.89	5.25	0.86	2.70	4.72
Incremental Delay, d2		30.0	0.1		2.2	0.1	1.9	0.6	0.1	4.4	0.5	0.1
Delay (s)		93.9	58.0		63.5	57.8	57.4	33.7	35.9	61.2	24.7	26.6
Level of Service		F	E		E	E	E	C	D	E	C	C
Approach Delay (s)		77.0			61.2			34.6			27.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1689	2787		1697		3433	3525		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1689	2787		1697		3433	3525		1770	3539	1583
Volume (vph)	359	9	196	33	12	44	376	1044	15	10	1125	179
Peak-hour factor, PHF	0.78	0.75	0.79	0.41	0.43	0.34	0.90	0.88	0.47	0.50	0.87	0.91
Adj. Flow (vph)	460	12	248	80	28	129	418	1186	32	20	1293	197
RTOR Reduction (vph)	0	0	207	0	29	0	0	1	0	0	0	73
Lane Group Flow (vph)	230	242	41	0	208	0	418	1217	0	20	1293	124
Turn Type	Split		Prot	Split			Prot			Prot		Perm
Protected Phases	8	8	8	7	7		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	22.9	22.9	22.9		19.9		20.1	82.2		3.0	64.6	64.6
Effective Green, g (s)	24.9	24.9	24.9		21.9		20.6	84.2		3.0	66.6	66.6
Actuated g/C Ratio	0.17	0.17	0.17		0.15		0.14	0.56		0.02	0.44	0.44
Clearance Time (s)	6.0	6.0	6.0		6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	279	280	463		248		471	1979		35	1571	703
v/s Ratio Prot	0.14	c0.14	0.09		c0.14		c0.12	0.35		0.01	c0.37	
v/s Ratio Perm												0.12
v/c Ratio	0.82	0.86	0.09		0.84		0.89	0.61		0.57	0.82	0.18
Uniform Delay, d1	60.4	60.9	52.9		62.3		63.6	22.0		72.9	36.5	25.1
Progression Factor	0.80	0.81	2.54		1.00		0.99	0.64		1.00	1.00	1.00
Incremental Delay, d2	16.8	22.1	0.1		21.2		14.8	1.2		13.2	5.0	0.5
Delay (s)	65.4	71.2	134.3		83.6		77.4	15.3		86.1	41.6	25.7
Level of Service	E	E	F		F		E	B		F	D	C
Approach Delay (s)		91.1			83.6			31.1			40.1	
Approach LOS		F			F			C			D	

Intersection Summary			
HCM Average Control Delay	48.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	386	449	141	340	246	168
Peak-hour factor, PHF	0.80	0.94	0.84	0.89	0.83	0.89
Adj. Flow (vph)	482	478	168	382	296	189
RTOR Reduction (vph)	0	229	0	0	0	0
Lane Group Flow (vph)	482	249	168	382	296	189
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	76.4	76.4	19.1	99.5	39.5	150.0
Effective Green, g (s)	77.9	77.9	19.1	101.0	41.0	150.0
Actuated g/C Ratio	0.52	0.52	0.13	0.67	0.27	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	968	822	225	2383	938	1583
v/s Ratio Prot	0.26		c0.09	0.11	c0.09	
v/s Ratio Perm		0.30				0.12
v/c Ratio	0.50	0.30	0.75	0.16	0.32	0.12
Uniform Delay, d1	23.4	20.6	63.1	9.0	43.3	0.0
Progression Factor	1.00	1.00	1.55	0.34	1.00	1.00
Incremental Delay, d2	1.8	0.9	8.6	0.1	0.9	0.0
Delay (s)	25.2	21.5	106.2	3.1	44.2	0.0
Level of Service	C	C	F	A	D	A
Approach Delay (s)	23.4			34.6	27.0	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.19	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	352	3539	3539	1583
Volume (vph)	258	251	244	1381	1178	367
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	273	265	1501	1280	399
RTOR Reduction (vph)	0	107	0	0	0	85
Lane Group Flow (vph)	280	166	265	1501	1280	314
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	24.0	24.0	118.0	118.0	118.0	118.0
Effective Green, g (s)	24.0	24.0	118.0	118.0	118.0	118.0
Actuated g/C Ratio	0.16	0.16	0.79	0.79	0.79	0.79
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	283	253	277	2784	2784	1245
v/s Ratio Prot	0.16			0.42	0.36	
v/s Ratio Perm		0.17	c0.75			0.25
v/c Ratio	0.99	0.66	0.96	0.54	0.46	0.25
Uniform Delay, d1	62.9	59.1	13.8	5.9	5.3	4.3
Progression Factor	1.00	1.00	1.00	1.00	0.23	0.10
Incremental Delay, d2	50.9	12.6	44.0	0.8	0.4	0.4
Delay (s)	113.8	71.8	57.8	6.7	1.7	0.8
Level of Service	F	E	E	A	A	A
Approach Delay (s)	93.0			14.4	1.4	
Approach LOS	F			B	A	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

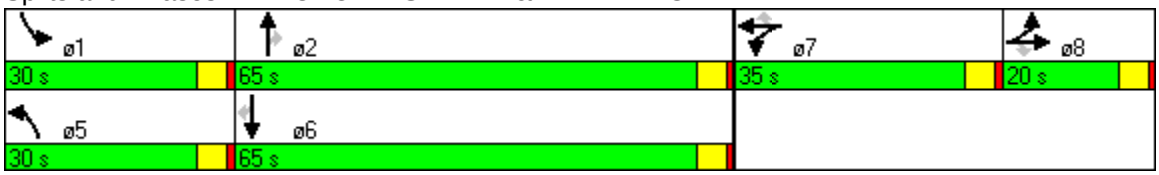
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	76	81	66	168	104	1379	56	138	1272	56
Lane Group Flow (vph)	188	88	325	189	132	1452	88	148	1445	88
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	20.0	20.0	35.0	35.0	30.0	65.0	65.0	30.0	65.0	65.0
Total Split (%)	13.3%	13.3%	23.3%	23.3%	20.0%	43.3%	43.3%	20.0%	43.3%	43.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.97	0.36	0.91	0.41	0.70	0.87	0.11	0.71	0.85	0.11
Control Delay	122.5	15.7	82.0	8.8	63.3	48.3	16.3	88.2	26.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.5	15.7	82.0	8.8	63.3	48.3	16.3	88.2	26.6	1.6
Queue Length 50th (ft)	186	0	311	0	129	713	27	126	768	9
Queue Length 95th (ft)	#305	55	345	64	m164	m#886	m38	228	#513	1
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	194	247	372	477	307	1666	772	307	1703	788
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.36	0.87	0.40	0.43	0.87	0.11	0.48	0.85	0.11

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

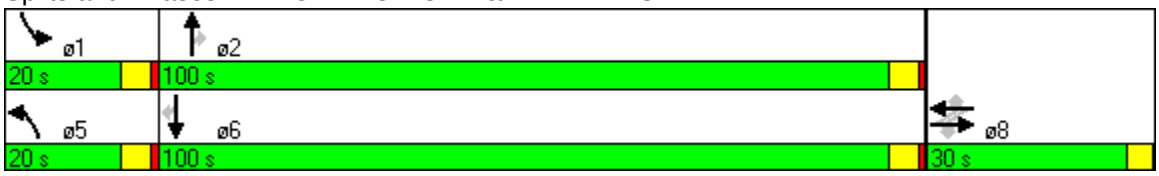


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	12	79	23	39	53	48	1424	94	80	1343	64
Lane Group Flow (vph)	0	112	100	0	92	64	56	1531	108	96	1399	80
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	20.0	100.0	100.0	20.0	100.0	100.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	13.3%	66.7%	66.7%	13.3%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.76	0.35		0.45	0.25	0.44	0.61	0.09	0.61	0.54	0.07
Control Delay		72.8	11.6		62.4	13.2	56.1	37.6	11.3	62.5	28.2	8.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		72.8	11.6		62.4	13.2	56.1	37.6	11.3	62.5	28.2	8.4
Queue Length 50th (ft)		107	0		85	0	48	761	38	80	684	20
Queue Length 95th (ft)		108	36		97	35	m55	m866	m63	m103	818	m42
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		203	357		281	327	189	2497	1146	189	2611	1189
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.55	0.28		0.33	0.20	0.30	0.61	0.09	0.51	0.54	0.07

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

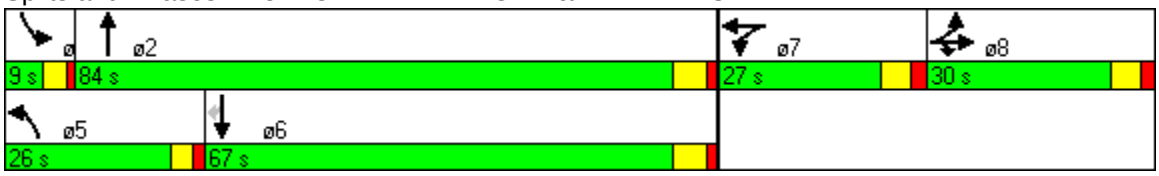


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	359	9	196	12	376	1044	10	1125	179
Lane Group Flow (vph)	230	242	248	237	418	1218	20	1293	197
Turn Type	Split		Prot		Prot		Prot		Perm
Protected Phases	8	8	8	7	5	2	1	6	
Permitted Phases									6
Detector Phases	8	8	8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0	7.0	5.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	22.0	22.0	22.0	11.0	22.5	26.0	9.0	33.0	33.0
Total Split (s)	30.0	30.0	30.0	27.0	26.0	84.0	9.0	67.0	67.0
Total Split (%)	20.0%	20.0%	20.0%	18.0%	17.3%	56.0%	6.0%	44.7%	44.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.82	0.86	0.37	0.86	0.89	0.60	0.34	0.82	0.25
Control Delay	67.3	71.0	16.5	75.4	74.5	15.3	86.4	42.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	71.0	16.5	75.4	74.5	15.3	86.4	42.9	10.4
Queue Length 50th (ft)	240	254	47	197	182	610	20	603	38
Queue Length 95th (ft)	295	295	72	110	#279	170	28	667	94
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	291	293	688	289	504	2016	59	1570	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.83	0.36	0.82	0.83	0.60	0.34	0.82	0.25

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

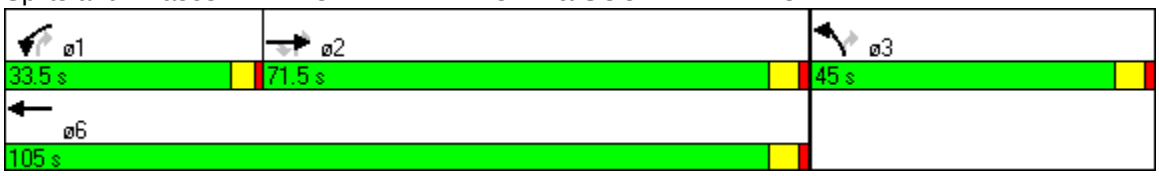


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	386	449	141	340	246	168
Lane Group Flow (vph)	482	478	168	382	296	189
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	4.0	4.0	5.0	4.0	4.0	
Minimum Split (s)	30.5	30.5	9.0	21.5	21.5	
Total Split (s)	71.5	71.5	33.5	105.0	45.0	150.0
Total Split (%)	47.7%	47.7%	22.3%	70.0%	30.0%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	Max	
v/c Ratio	0.50	0.45	0.74	0.16	0.32	0.12
Control Delay	26.4	3.3	100.2	3.2	44.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	3.3	100.2	3.2	44.5	0.2
Queue Length 50th (ft)	297	1	173	22	119	0
Queue Length 95th (ft)	370	61	m192	m23	148	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	967	1051	348	2383	938	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.45	0.48	0.16	0.32	0.12

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 30 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD

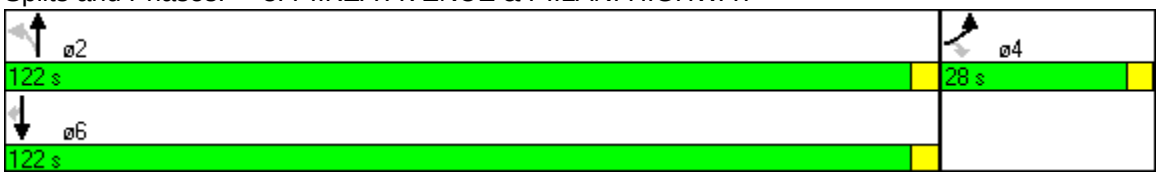


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	258	251	244	1381	1178	367
Lane Group Flow (vph)	280	273	265	1501	1280	399
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	28.0	28.0	122.0	122.0	122.0	122.0
Total Split (%)	18.7%	18.7%	81.3%	81.3%	81.3%	81.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
v/c Ratio	0.99	0.76	0.96	0.54	0.46	0.30
Control Delay	112.7	46.1	61.3	6.8	1.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.7	46.1	61.3	6.8	1.7	0.5
Queue Length 50th (ft)	277	141	194	248	31	0
Queue Length 95th (ft)	#471	#258	#165	287	33	m0
Internal Link Dist (ft)	502			1044	1040	
Turn Bay Length (ft)						
Base Capacity (vph)	283	360	277	2784	2784	1330
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.76	0.96	0.54	0.46	0.30

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 16 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	126	92	1536	1474	40
Peak Hour Factor	0.83	0.79	0.85	0.90	0.96	0.77
Hourly flow rate (vph)	24	159	108	1707	1535	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	3					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2605	768	1587			
vC1, stage 1 conf vol	1535					
vC2, stage 2 conf vol	1070					
vCu, unblocked vol	2605	768	1587			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	54	74			
cM capacity (veh/h)	140	344	410			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	159	108	853	853	768	768	52
Volume Left	24	0	108	0	0	0	0	0
Volume Right	0	159	0	0	0	0	0	52
cSH	140	344	410	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.46	0.26	0.50	0.50	0.45	0.45	0.03
Queue Length 95th (ft)	15	59	26	0	0	0	0	0
Control Delay (s)	36.0	24.2	16.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	C	C					
Approach Delay (s)	25.7		1.0			0.0		
Approach LOS	D							

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	49	24	501	125	46	497
Peak Hour Factor	0.82	0.86	0.91	0.95	0.68	0.83
Hourly flow rate (vph)	60	28	551	132	68	599
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1350	616			682	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1350	616			682	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	61	94			93	
cM capacity (veh/h)	153	490			911	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	60	28	682	666
Volume Left	60	0	0	68
Volume Right	0	28	132	0
cSH	153	490	1700	911
Volume to Capacity	0.39	0.06	0.40	0.07
Queue Length 95th (ft)	42	5	0	6
Control Delay (s)	42.7	12.8	0.0	1.9
Lane LOS	E	B		A
Approach Delay (s)	33.2		0.0	1.9
Approach LOS	D			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	41	90	80	1686	1508	61
Peak Hour Factor	0.73	0.80	0.87	0.88	0.88	0.81
Hourly flow rate (vph)	56	112	92	1916	1714	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	3					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2855	857	1789			
vC1, stage 1 conf vol	1714					
vC2, stage 2 conf vol	1142					
vCu, unblocked vol	2855	857	1789			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	51	63	73			
cM capacity (veh/h)	116	301	342			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	56	112	92	958	958	857	857	75
Volume Left	56	0	92	0	0	0	0	0
Volume Right	0	112	0	0	0	0	0	75
cSH	116	301	342	1700	1700	1700	1700	1700
Volume to Capacity	0.49	0.37	0.27	0.56	0.56	0.50	0.50	0.04
Queue Length 95th (ft)	55	42	27	0	0	0	0	0
Control Delay (s)	62.5	24.0	19.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	C					
Approach Delay (s)	36.8		0.9			0.0		
Approach LOS	E							

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	37	59	2	11	45	73	0	5	17	96	5	14
Peak Hour Factor	0.71	0.41	0.50	0.55	0.80	0.83	0.25	0.63	0.71	0.77	0.42	0.70
Hourly flow rate (vph)	52	144	4	20	56	88	0	8	24	125	12	20
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	144			148			372	434	146	416	392	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	144			148			372	434	146	416	392	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			100	98	97	75	98	98
cM capacity (veh/h)	1438			1434			541	489	901	506	517	955

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	52	148	20	144	0	32	125	32
Volume Left	52	0	20	0	0	0	125	0
Volume Right	0	4	0	88	0	24	0	20
cSH	1438	1700	1434	1700	1700	745	506	725
Volume to Capacity	0.04	0.09	0.01	0.08	0.00	0.04	0.25	0.04
Queue Length 95th (ft)	3	0	1	0	0	3	24	3
Control Delay (s)	7.6	0.0	7.5	0.0	0.0	10.0	14.4	10.2
Lane LOS	A		A		A	B	B	B
Approach Delay (s)	2.0		0.9		10.0		13.6	
Approach LOS					B		B	

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	61	91	16	2	56	6	3	1	2	3	1	30
Peak Hour Factor	0.90	0.78	0.57	0.25	0.67	0.38	0.25	0.26	0.25	0.75	0.25	0.68
Hourly flow rate (vph)	68	117	28	8	84	16	12	4	8	4	4	44
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	99			145			412	382	131	370	388	91
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99			145			412	382	131	370	388	91
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			98	99	99	99	99	95
cM capacity (veh/h)	1493			1438			502	523	919	556	519	966

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	68	145	8	99	24	52
Volume Left	68	0	8	0	12	4
Volume Right	0	28	0	16	8	44
cSH	1493	1700	1438	1700	597	860
Volume to Capacity	0.05	0.09	0.01	0.06	0.04	0.06
Queue Length 95th (ft)	4	0	0	0	3	5
Control Delay (s)	7.5	0.0	7.5	0.0	11.3	9.5
Lane LOS	A		A		B	A
Approach Delay (s)	2.4		0.6		11.3	9.5
Approach LOS					B	A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1799	1583		1809	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1799	1583		1809	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	145	45	137	67	62	37	38	893	102	95	943	58
Peak-hour factor, PHF	0.82	0.63	0.78	0.58	0.78	0.71	0.68	0.74	0.67	0.82	0.78	0.69
Adj. Flow (vph)	177	71	176	116	79	52	56	1207	152	116	1209	84
RTOR Reduction (vph)	0	0	148	0	0	44	0	0	96	0	0	49
Lane Group Flow (vph)	0	248	28	0	195	8	56	1207	56	116	1209	35
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		10.9	10.9		10.2	10.2	2.9	26.3	26.3	6.1	29.5	29.5
Effective Green, g (s)		11.9	11.9		11.2	11.2	3.9	27.3	27.3	7.1	30.5	30.5
Actuated g/C Ratio		0.16	0.16		0.15	0.15	0.05	0.37	0.37	0.10	0.41	0.41
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.5	3.5		3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		291	256		276	241	94	1314	588	171	1469	657
v/s Ratio Prot		c0.14			c0.11		0.03	c0.34		c0.07	c0.34	
v/s Ratio Perm			0.11			0.03			0.10			0.05
v/c Ratio		0.85	0.11		0.71	0.03	0.60	0.92	0.10	0.68	0.82	0.05
Uniform Delay, d1		29.9	26.3		29.6	26.5	34.0	22.0	15.1	32.1	19.1	12.9
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		21.1	0.2		8.0	0.1	6.6	10.8	0.1	8.1	4.3	0.1
Delay (s)		51.1	26.5		37.6	26.6	40.6	32.9	15.2	40.2	23.4	12.9
Level of Service		D	C		D	C	D	C	B	D	C	B
Approach Delay (s)		40.9			35.3			31.3			24.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1792	1583		1819	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.71	1.00		0.80	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1331	1583		1491	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	60	10	56	33	36	39	25	1005	46	63	1197	49
Peak-hour factor, PHF	0.79	0.50	0.78	0.83	0.82	0.81	0.52	0.93	0.88	0.88	0.92	0.58
Adj. Flow (vph)	76	20	72	40	44	48	48	1081	52	72	1301	84
RTOR Reduction (vph)	0	0	62	0	0	42	0	0	21	0	0	32
Lane Group Flow (vph)	0	96	10	0	84	6	48	1081	31	72	1301	52
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		7.4	7.4		7.4	7.4	2.5	37.4	37.4	3.7	38.6	38.6
Effective Green, g (s)		8.4	8.4		8.4	8.4	3.5	38.4	38.4	4.7	39.6	39.6
Actuated g/C Ratio		0.13	0.13		0.13	0.13	0.06	0.60	0.60	0.07	0.62	0.62
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		4.0	4.0		4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		176	209		197	209	98	2140	957	131	2207	987
v/s Ratio Prot							0.03	0.31		c0.04	c0.37	
v/s Ratio Perm		c0.07	0.05		0.06	0.03			0.03			0.05
v/c Ratio		0.55	0.05		0.43	0.03	0.49	0.51	0.03	0.55	0.59	0.05
Uniform Delay, d1		25.8	24.1		25.3	24.0	29.1	7.1	5.1	28.4	7.1	4.7
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		4.3	0.1		2.0	0.1	1.4	0.4	0.0	2.5	0.6	0.0
Delay (s)		30.0	24.2		27.4	24.1	30.5	7.5	5.1	30.9	7.7	4.7
Level of Service		C	C		C	C	C	A	A	C	A	A
Approach Delay (s)		27.5			26.2			8.4			8.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787		1667		3433	3535		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787		1667		3433	3535		1770	3539	1583
Volume (vph)	181	0	310	1	0	2	263	843	4	6	971	157
Peak-hour factor, PHF	0.75	0.25	0.85	0.25	0.25	0.25	0.83	0.91	0.50	0.50	0.91	0.93
Adj. Flow (vph)	241	0	365	4	0	8	317	926	8	12	1067	169
RTOR Reduction (vph)	0	0	212	0	8	0	0	1	0	0	0	97
Lane Group Flow (vph)	121	120	153	0	4	0	317	933	0	12	1067	72
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	7.1	7.1	24.5		0.8		11.4	37.8		0.8	27.2	27.2
Effective Green, g (s)	9.1	9.1	24.5		2.8		11.4	39.8		0.8	29.2	29.2
Actuated g/C Ratio	0.13	0.13	0.36		0.04		0.17	0.58		0.01	0.43	0.43
Clearance Time (s)	6.0	6.0			6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	223	223	997		68		571	2054		21	1509	675
v/s Ratio Prot	c0.07	0.07			c0.01		c0.09	0.26		0.01	c0.30	
v/s Ratio Perm			0.13									0.11
v/c Ratio	0.54	0.54	0.15		0.06		0.56	0.45		0.57	0.71	0.11
Uniform Delay, d1	27.8	27.7	15.0		31.6		26.2	8.2		33.7	16.1	11.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	2.5	0.0		0.4		0.7	0.3		21.2	1.8	0.1
Delay (s)	30.4	30.2	15.0		32.0		26.9	8.4		54.9	17.9	11.9
Level of Service	C	C	B		C		C	A		D	B	B
Approach Delay (s)		21.1			32.0			13.1			17.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	270	278	129	272	244	136
Peak-hour factor, PHF	0.90	0.89	0.79	0.92	0.80	0.81
Adj. Flow (vph)	300	312	163	296	305	168
RTOR Reduction (vph)	0	182	0	0	0	0
Lane Group Flow (vph)	300	130	163	296	305	168
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	17.6	17.6	6.0	27.6	7.1	45.7
Effective Green, g (s)	19.1	19.1	6.0	29.1	8.6	45.7
Actuated g/C Ratio	0.42	0.42	0.13	0.64	0.19	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	779	662	232	2253	646	1583
v/s Ratio Prot	0.16		c0.09	0.08	c0.09	
v/s Ratio Perm		0.20				0.11
v/c Ratio	0.39	0.20	0.70	0.13	0.47	0.11
Uniform Delay, d1	9.2	8.4	19.0	3.3	16.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3	7.6	0.1	0.2	0.0
Delay (s)	9.9	8.7	26.6	3.3	16.7	0.0
Level of Service	A	A	C	A	B	A
Approach Delay (s)	9.3			11.6	10.8	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	45.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	294	255	214	918	893	356
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	277	233	998	971	387
RTOR Reduction (vph)	0	211	0	0	0	237
Lane Group Flow (vph)	320	66	233	998	971	150
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	14.2	14.2	10.6	37.8	23.2	23.2
Effective Green, g (s)	14.2	14.2	10.6	37.8	23.2	23.2
Actuated g/C Ratio	0.24	0.24	0.18	0.63	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	419	375	313	2230	1368	612
v/s Ratio Prot	c0.18		c0.13	0.28	c0.27	
v/s Ratio Perm		0.17				0.24
v/c Ratio	0.76	0.17	0.74	0.45	0.71	0.24
Uniform Delay, d1	21.3	18.2	23.4	5.7	15.6	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.2	9.2	0.7	3.1	0.9
Delay (s)	29.4	18.5	32.7	6.4	18.7	13.4
Level of Service	C	B	C	A	B	B
Approach Delay (s)	24.3			11.3	17.2	
Approach LOS	C			B	B	

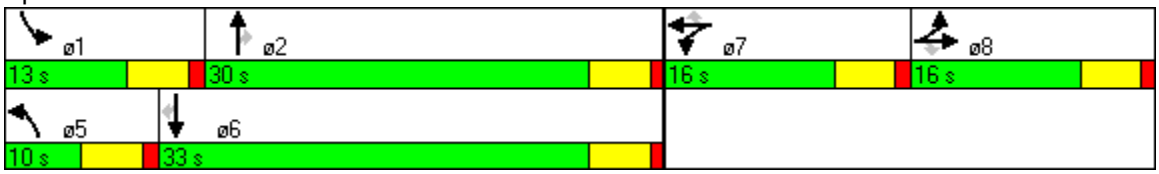
Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	45	137	62	37	38	893	102	95	943	58
Lane Group Flow (vph)	248	176	195	52	56	1207	152	116	1209	84
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	16.0	16.0	16.0	16.0	10.0	30.0	30.0	13.0	33.0	33.0
Total Split (%)	21.3%	21.3%	21.3%	21.3%	13.3%	40.0%	40.0%	17.3%	44.0%	44.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.82	0.43	0.69	0.18	0.39	0.93	0.22	0.54	0.80	0.12
Control Delay	53.7	8.6	41.0	10.2	42.0	37.5	4.3	41.2	24.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	8.6	41.0	10.2	42.0	37.5	4.3	41.2	24.2	4.4
Queue Length 50th (ft)	114	0	87	0	25	287	0	52	268	0
Queue Length 95th (ft)	125	33	129	18	44	280	14	92	283	13
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	304	414	302	308	142	1301	678	215	1527	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.43	0.65	0.17	0.39	0.93	0.22	0.54	0.79	0.11

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 71.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

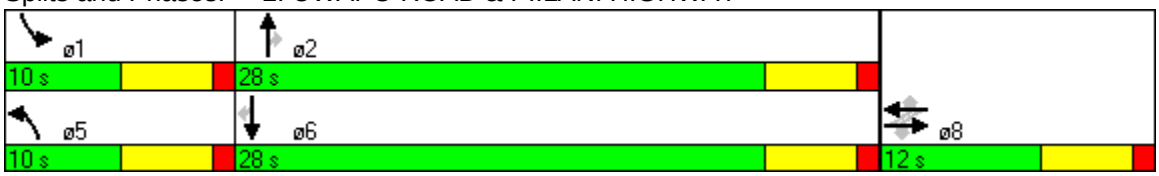


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	10	56	33	36	39	25	1005	46	63	1197	49
Lane Group Flow (vph)	0	96	72	0	84	48	48	1081	52	72	1301	84
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	28.0	28.0	10.0	28.0	28.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	20.0%	56.0%	56.0%	20.0%	56.0%	56.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio		0.49	0.24		0.38	0.17	0.27	0.50	0.05	0.39	0.57	0.08
Control Delay		27.4	8.1		23.6	8.7	24.9	8.7	2.8	26.4	8.5	2.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		27.4	8.1		23.6	8.7	24.9	8.7	2.8	26.4	8.5	2.4
Queue Length 50th (ft)		26	0		22	0	13	114	0	20	75	0
Queue Length 95th (ft)		32	20		49	18	21	166	12	49	220	6
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		197	296		220	276	179	2152	983	186	2293	1055
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.49	0.24		0.38	0.17	0.27	0.50	0.05	0.39	0.57	0.08

Intersection Summary

Cycle Length: 50
Actuated Cycle Length: 62
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

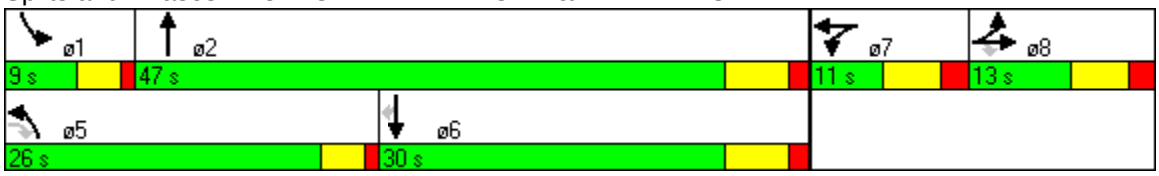


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	181	0	310	0	263	843	6	971	157
Lane Group Flow (vph)	121	120	365	12	317	934	12	1067	169
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	5.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	26.0	26.0	9.0	26.0	26.0
Total Split (s)	13.0	13.0	39.0	11.0	26.0	47.0	9.0	30.0	30.0
Total Split (%)	16.3%	16.3%	48.8%	13.8%	32.5%	58.8%	11.3%	37.5%	37.5%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.0	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	Min	None	Min	Min
v/c Ratio	0.48	0.47	0.27	0.07	0.49	0.40	0.09	0.70	0.22
Control Delay	33.2	33.1	3.0	21.7	23.5	6.6	32.7	18.3	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	33.1	3.0	21.7	23.5	6.6	32.7	18.3	3.6
Queue Length 50th (ft)	40	40	3	1	51	51	4	140	0
Queue Length 95th (ft)	90	27	27	2	93	194	12	#315	36
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	254	254	1549	176	1071	2408	132	1538	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.47	0.24	0.07	0.30	0.39	0.09	0.69	0.22

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 60.3
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

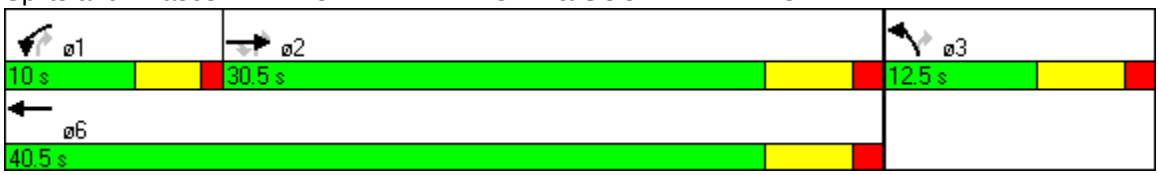


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	270	278	129	272	244	136
Lane Group Flow (vph)	300	312	163	296	305	168
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	30.5	30.5	9.0	15.5	12.5	
Total Split (s)	30.5	30.5	10.0	40.5	12.5	53.0
Total Split (%)	57.5%	57.5%	18.9%	76.4%	23.6%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	
v/c Ratio	0.39	0.37	0.70	0.13	0.47	0.11
Control Delay	9.9	2.3	42.1	3.2	21.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	2.3	42.1	3.2	21.0	0.1
Queue Length 50th (ft)	51	0	43	12	38	0
Queue Length 95th (ft)	93	29	#112	21	68	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	933	948	234	2437	646	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.33	0.70	0.12	0.47	0.11

Intersection Summary

Cycle Length: 53
Actuated Cycle Length: 45.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD

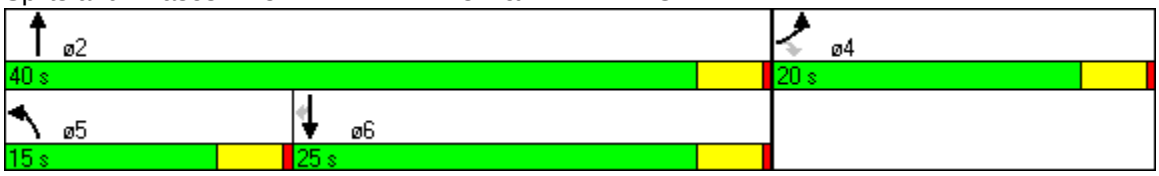


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	294	255	214	918	893	356
Lane Group Flow (vph)	320	277	233	998	971	387
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	15.0	40.0	25.0	25.0
Total Split (%)	33.3%	33.3%	25.0%	66.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.76	0.47	0.74	0.45	0.71	0.46
Control Delay	29.4	5.3	37.7	6.9	20.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	5.3	37.7	6.9	20.1	3.8
Queue Length 50th (ft)	103	0	80	91	161	0
Queue Length 95th (ft)	#200	48	#173	128	227	49
Internal Link Dist (ft)	658			1062	1738	
Turn Bay Length (ft)						
Base Capacity (vph)	472	625	328	2227	1366	849
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.44	0.71	0.45	0.71	0.46

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	37	101	74	947	1094	43
Peak Hour Factor	0.77	0.81	0.77	0.87	0.96	0.83
Hourly flow rate (vph)	48	125	96	1089	1140	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	3					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1876	570	1191			
vC1, stage 1 conf vol	1140					
vC2, stage 2 conf vol	736					
vCu, unblocked vol	1876	570	1191			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	73	83			
cM capacity (veh/h)	237	465	582			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	48	125	96	544	544	570	570	52
Volume Left	48	0	96	0	0	0	0	0
Volume Right	0	125	0	0	0	0	0	52
cSH	237	465	582	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.27	0.17	0.32	0.32	0.34	0.34	0.03
Queue Length 95th (ft)	18	27	15	0	0	0	0	0
Control Delay (s)	24.0	15.6	12.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	B					
Approach Delay (s)	17.9		1.0			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	78	14	489	86	15	440
Peak Hour Factor	0.75	0.70	0.89	0.90	0.75	0.96
Hourly flow rate (vph)	104	20	549	96	20	458
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1096	597			645	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1096	597			645	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	55	96			98	
cM capacity (veh/h)	231	503			940	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	104	20	645	478
Volume Left	104	0	0	20
Volume Right	0	20	96	0
cSH	231	503	1700	940
Volume to Capacity	0.45	0.04	0.38	0.02
Queue Length 95th (ft)	54	3	0	2
Control Delay (s)	32.7	12.5	0.0	0.6
Lane LOS	D	B		A
Approach Delay (s)	29.4		0.0	0.6
Approach LOS	D			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	44	81	35	1074	1023	66
Peak Hour Factor	0.73	0.72	0.88	0.88	0.91	0.75
Hourly flow rate (vph)	60	112	40	1220	1124	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh)	3					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1814	562	1212			
vC1, stage 1 conf vol	1124					
vC2, stage 2 conf vol	690					
vCu, unblocked vol	1814	562	1212			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	76	93			
cM capacity (veh/h)	252	470	571			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	60	112	40	610	610	562	562	88
Volume Left	60	0	40	0	0	0	0	0
Volume Right	0	112	0	0	0	0	0	88
cSH	252	470	571	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.24	0.07	0.36	0.36	0.33	0.33	0.05
Queue Length 95th (ft)	23	23	6	0	0	0	0	0
Control Delay (s)	23.7	15.0	11.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	B					
Approach Delay (s)	18.1		0.4			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	43	2	8	22	52	0	6	11	86	2	17
Peak Hour Factor	0.55	0.77	0.50	0.40	0.50	0.65	0.25	0.50	0.39	0.83	0.50	0.61
Hourly flow rate (vph)	44	56	4	20	44	80	0	12	28	104	4	28
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	124			60			259	309	58	301	271	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124			60			259	309	58	301	271	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			100	98	97	83	99	97
cM capacity (veh/h)	1463			1544			649	580	1008	603	609	975

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	44	60	20	124	0	40	104	32
Volume Left	44	0	20	0	0	0	104	0
Volume Right	0	4	0	80	0	28	0	28
cSH	1463	1700	1544	1700	1700	826	603	907
Volume to Capacity	0.03	0.04	0.01	0.07	0.00	0.05	0.17	0.04
Queue Length 95th (ft)	2	0	1	0	0	4	15	3
Control Delay (s)	7.5	0.0	7.4	0.0	0.0	9.6	12.2	9.1
Lane LOS	A		A		A	A	B	A
Approach Delay (s)	3.2		1.0		9.6		11.5	
Approach LOS					A		B	

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	45	71	10	6	37	8	5	4	7	7	3	43
Peak Hour Factor	0.70	0.74	0.63	0.38	0.71	0.40	0.63	0.33	0.58	0.25	0.38	0.63
Hourly flow rate (vph)	64	96	16	16	52	20	8	12	12	28	8	68
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	72			112			388	336	104	336	334	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	72			112			388	336	104	336	334	62
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			98	98	99	95	99	93
cM capacity (veh/h)	1528			1478			505	554	951	575	555	1003

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	64	112	16	72	32	104
Volume Left	64	0	16	0	8	28
Volume Right	0	16	0	20	12	68
cSH	1528	1700	1478	1700	639	795
Volume to Capacity	0.04	0.07	0.01	0.04	0.05	0.13
Queue Length 95th (ft)	3	0	1	0	4	11
Control Delay (s)	7.5	0.0	7.5	0.0	10.9	10.2
Lane LOS	A		A		B	B
Approach Delay (s)	2.7		1.3		10.9	10.2
Approach LOS					B	B

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		601										
pX, platoon unblocked												
vC, conflicting volume	0			0			0	0	0	0	0	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			0			0	0	0	0	0	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1622			1622			1023	896	1084	1023	896	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	0	0	0	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							A	A	A
Approach Delay (s)	0.0			0.0			0.0	0.0	
Approach LOS							A	A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	751					
pX, platoon unblocked						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C
Level-of-Service Worksheets for 2018 Background Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1816	1583		1787	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1816	1583		1787	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	93	88	79	211	40	177	25	1110	40	167	1494	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	96	86	229	43	192	27	1207	43	182	1624	84
RTOR Reduction (vph)	0	0	74	0	0	160	0	0	21	0	0	27
Lane Group Flow (vph)	0	197	12	0	272	32	27	1207	22	182	1624	57
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		16.5	16.5		19.8	19.8	6.0	54.1	54.1	14.6	62.7	62.7
Effective Green, g (s)		17.5	17.5		20.8	20.8	7.0	55.1	55.1	15.6	63.7	63.7
Actuated g/C Ratio		0.14	0.14		0.17	0.17	0.06	0.44	0.44	0.12	0.51	0.51
Clearance Time (s)		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	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		254	222		297	263	99	1560	698	221	1803	807
v/s Ratio Prot		c0.11			c0.15		0.02	0.34		c0.10	c0.46	
v/s Ratio Perm			0.05			0.12			0.03			0.05
v/c Ratio		0.78	0.05		0.92	0.12	0.27	0.77	0.03	0.82	0.90	0.07
Uniform Delay, d1		51.9	46.6		51.2	44.3	56.6	29.7	19.8	53.4	27.8	15.6
Progression Factor		1.00	1.00		1.00	1.00	1.33	0.60	0.15	1.22	0.70	0.17
Incremental Delay, d2		13.8	0.1		31.0	0.2	0.5	3.6	0.1	18.6	7.0	0.2
Delay (s)		65.6	46.7		82.3	44.5	75.5	21.4	3.1	83.7	26.6	2.8
Level of Service		E	D		F	D	E	C	A	F	C	A
Approach Delay (s)		59.9			66.7			22.0			31.0	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1783	1583		1798	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.61	1.00		0.52	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1128	1583		960	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	138	17	106	70	28	106	17	1333	55	34	1324	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	18	115	76	30	115	18	1449	60	37	1439	23
RTOR Reduction (vph)	0	0	94	0	0	94	0	0	20	0	0	7
Lane Group Flow (vph)	0	168	21	0	106	21	18	1449	40	37	1439	16
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		22.1	22.1		22.1	22.1	4.0	81.9	81.9	6.0	83.9	83.9
Effective Green, g (s)		23.1	23.1		23.1	23.1	5.0	82.9	82.9	7.0	84.9	84.9
Actuated g/C Ratio		0.18	0.18		0.18	0.18	0.04	0.66	0.66	0.06	0.68	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
Vehicle Extension (s)		4.0	4.0		4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		208	293		177	293	71	2347	1050	99	2404	1075
v/s Ratio Prot							0.01	c0.41		c0.02	0.41	
v/s Ratio Perm		c0.15	0.07		0.11	0.07			0.04			0.01
v/c Ratio		0.81	0.07		0.60	0.07	0.25	0.62	0.04	0.37	0.60	0.01
Uniform Delay, d1		48.8	42.1		46.7	42.1	58.2	12.0	7.3	56.9	10.8	6.5
Progression Factor		1.00	1.00		1.00	1.00	0.60	2.14	4.91	0.76	1.99	2.39
Incremental Delay, d2		21.0	0.1		6.3	0.1	0.5	0.8	0.0	0.7	0.9	0.0
Delay (s)		69.9	42.2		53.0	42.2	35.2	26.5	35.7	44.0	22.5	15.6
Level of Service		E	D		D	D	D	C	D	D	C	B
Approach Delay (s)		58.6			47.4			27.0			22.9	
Approach LOS		E			D			C			C	

Intersection Summary

HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Volume (vph)	211	20	315	14	2	4	372	1194	8	3	1128	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	22	342	15	2	4	404	1298	9	3	1226	120
RTOR Reduction (vph)	0	0	142	0	4	0	0	0	0	0	0	51
Lane Group Flow (vph)	122	129	200	0	17	0	404	1307	0	3	1226	69
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	14.0	14.0	40.3		4.1		20.3	83.8		1.1	64.1	64.1
Effective Green, g (s)	16.0	16.0	40.8		6.1		20.8	85.8		1.1	66.1	66.1
Actuated g/C Ratio	0.13	0.13	0.33		0.05		0.17	0.69		0.01	0.53	0.53
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	215	217	910		85		571	2427		16	1871	837
v/s Ratio Prot	0.07	c0.08			c0.01		c0.12	0.37		0.00	c0.35	
v/s Ratio Perm			0.12									0.08
v/c Ratio	0.57	0.59	0.22		0.20		0.71	0.54		0.19	0.66	0.08
Uniform Delay, d1	51.2	51.4	30.5		57.1		49.2	9.7		61.5	21.2	14.5
Progression Factor	1.10	1.10	1.96		1.00		0.79	1.88		1.00	1.00	1.00
Incremental Delay, d2	3.4	4.3	0.1		1.2		3.3	0.7		2.1	1.8	0.2
Delay (s)	59.7	60.9	59.9		58.3		42.1	19.0		63.6	23.0	14.7
Level of Service	E	E	E		E		D	B		E	C	B
Approach Delay (s)		60.1			58.3			24.4			22.4	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	299	265	81	429	418	185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	325	288	88	466	454	201
RTOR Reduction (vph)	0	101	0	0	0	0
Lane Group Flow (vph)	325	187	88	466	454	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	79.5	79.5	10.5	94.0	20.0	125.0
Effective Green, g (s)	81.0	81.0	10.5	95.5	21.5	125.0
Actuated g/C Ratio	0.65	0.65	0.08	0.76	0.17	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	1207	1026	149	2704	590	1583
v/s Ratio Prot	0.17		c0.05	0.13	c0.13	
v/s Ratio Perm		0.18				0.13
v/c Ratio	0.27	0.18	0.59	0.17	0.77	0.13
Uniform Delay, d1	9.4	8.8	55.2	4.0	49.4	0.0
Progression Factor	1.00	1.00	1.18	0.24	1.00	1.00
Incremental Delay, d2	0.5	0.4	3.7	0.1	5.4	0.0
Delay (s)	9.9	9.2	68.9	1.1	54.8	0.0
Level of Service	A	A	E	A	D	A
Approach Delay (s)	9.6			11.8	38.0	
Approach LOS	A			B	D	

Intersection Summary

HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	50	236	111	1077	1575	68
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	257	121	1171	1712	74
RTOR Reduction (vph)	0	201	0	0	0	19
Lane Group Flow (vph)	54	56	121	1171	1712	55
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	10.6	10.6	13.7	106.4	88.7	88.7
Effective Green, g (s)	10.6	10.6	13.7	106.4	88.7	88.7
Actuated g/C Ratio	0.08	0.08	0.11	0.85	0.71	0.71
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	134	194	3012	2511	1123
v/s Ratio Prot	0.03		c0.07	0.33	c0.48	
v/s Ratio Perm		0.16				0.05
v/c Ratio	0.36	0.42	0.62	0.39	0.68	0.05
Uniform Delay, d1	54.0	54.3	53.2	2.1	10.2	5.5
Progression Factor	1.00	1.00	0.71	3.65	1.17	2.45
Incremental Delay, d2	1.5	2.1	5.3	0.3	0.8	0.0
Delay (s)	55.5	56.3	43.2	7.9	12.7	13.4
Level of Service	E	E	D	A	B	B
Approach Delay (s)	56.2			11.2	12.7	
Approach LOS	E			B	B	

Intersection Summary

HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.39	1.00
Satd. Flow (perm)	1770	1583	1863	1583	731	1863
Volume (vph)	94	37	558	89	31	374
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	40	607	97	34	407
RTOR Reduction (vph)	0	35	0	27	0	0
Lane Group Flow (vph)	102	5	607	70	34	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	7.8	7.8	41.4	41.4	41.4	41.4
Effective Green, g (s)	7.8	7.8	41.4	41.4	41.4	41.4
Actuated g/C Ratio	0.14	0.14	0.72	0.72	0.72	0.72
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	241	216	1348	1146	529	1348
v/s Ratio Prot	c0.06		c0.33			0.22
v/s Ratio Perm		0.03		0.06	0.05	
v/c Ratio	0.42	0.03	0.45	0.06	0.06	0.30
Uniform Delay, d1	22.6	21.4	3.2	2.3	2.3	2.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.0	0.2	0.0	0.1	0.1
Delay (s)	23.8	21.5	3.5	2.3	2.3	2.9
Level of Service	C	C	A	A	A	A
Approach Delay (s)	23.2		3.3			2.9
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1826	1583		1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.86	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1594	1583		1298	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	22	32	124	68	5	24	31	1298	123	50	1890	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	35	135	74	5	26	34	1411	134	54	2054	34
RTOR Reduction (vph)	0	0	92	0	0	23	0	0	34	0	0	8
Lane Group Flow (vph)	0	59	43	0	79	3	34	1411	100	54	2054	26
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		12.4	12.4		12.4	12.4	4.7	93.1	93.1	7.5	95.9	95.9
Effective Green, g (s)		12.4	12.4		12.4	12.4	4.7	93.1	93.1	7.5	95.9	95.9
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.04	0.74	0.74	0.06	0.77	0.77
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		158	157		129	157	67	2636	1179	106	2715	1214
v/s Ratio Prot							0.02	0.40		c0.03	c0.58	
v/s Ratio Perm		0.04	0.09		0.06	0.02			0.08			0.02
v/c Ratio		0.37	0.27		0.61	0.02	0.51	0.54	0.08	0.51	0.76	0.02
Uniform Delay, d1		52.7	52.1		54.0	50.8	59.0	6.8	4.3	57.0	8.1	3.4
Progression Factor		1.00	1.00		1.00	1.00	1.17	1.33	0.95	1.05	1.34	1.59
Incremental Delay, d2		1.5	1.0		8.3	0.0	5.2	0.7	0.1	3.0	1.6	0.0
Delay (s)		54.2	53.1		62.3	50.8	74.1	9.7	4.3	63.0	12.4	5.5
Level of Service		D	D		E	D	E	A	A	E	B	A
Approach Delay (s)		53.4			59.5			10.6			13.6	
Approach LOS		D			E			B			B	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	271	180	101	1121	1597	371
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	295	196	110	1218	1736	403
RTOR Reduction (vph)	0	147	0	0	0	126
Lane Group Flow (vph)	295	49	110	1218	1736	277
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	24.3	24.3	11.6	92.7	77.1	77.1
Effective Green, g (s)	24.3	24.3	11.6	92.7	77.1	77.1
Actuated g/C Ratio	0.19	0.19	0.09	0.74	0.62	0.62
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	344	308	164	2625	2183	976
v/s Ratio Prot	c0.17		c0.06	0.34	c0.49	
v/s Ratio Perm		0.12				0.25
v/c Ratio	0.86	0.16	0.67	0.46	0.80	0.28
Uniform Delay, d1	48.7	41.9	54.9	6.4	18.0	11.1
Progression Factor	1.00	1.00	1.00	1.00	0.84	0.90
Incremental Delay, d2	18.6	0.2	10.3	0.6	2.1	0.5
Delay (s)	67.2	42.1	65.1	7.0	17.2	10.5
Level of Service	E	D	E	A	B	B
Approach Delay (s)	57.2			11.8	15.9	
Approach LOS	E			B	B	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

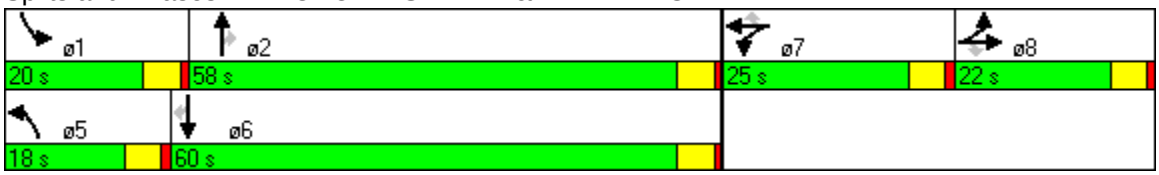
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	88	79	40	177	25	1110	40	167	1494	77
Lane Group Flow (vph)	197	86	272	192	27	1207	43	182	1624	84
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	22.0	22.0
Minimum Split (s)	22.0	22.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (s)	22.0	22.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (%)	17.6%	17.6%	20.0%	20.0%	14.4%	46.4%	46.4%	16.0%	48.0%	48.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.78	0.29	0.92	0.45	0.17	0.77	0.06	0.82	0.87	0.10
Control Delay	70.2	12.3	84.3	9.8	72.1	21.8	1.3	87.7	25.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	12.3	84.3	9.8	72.1	21.8	1.3	87.7	25.7	1.5
Queue Length 50th (ft)	155	0	218	0	0	473	1	127	727	6
Queue Length 95th (ft)	#266	48	#380	66	56	105	1	#270	#818	m3
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	262	302	300	426	198	1561	719	227	1861	859
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.28	0.91	0.45	0.14	0.77	0.06	0.80	0.87	0.10

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

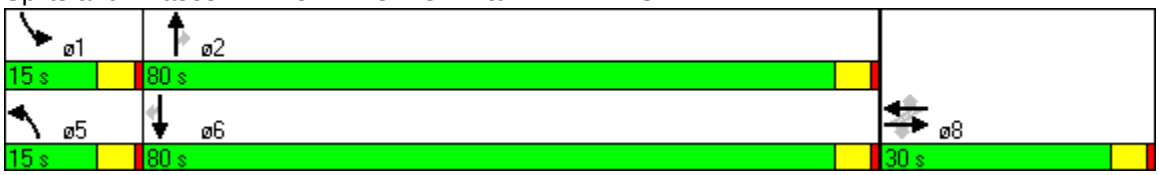


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	17	106	70	28	106	17	1333	55	34	1324	21
Lane Group Flow (vph)	0	168	115	0	106	115	18	1449	60	37	1439	23
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	25.0	25.0	10.0	25.0	25.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	64.0%	64.0%	12.0%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio		0.79	0.30		0.55	0.30	0.12	0.60	0.05	0.24	0.58	0.02
Control Delay		64.4	9.0		53.3	9.0	32.6	28.4	12.2	43.9	23.1	8.8
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		64.4	9.0		53.3	9.0	32.6	28.4	12.2	43.9	23.1	8.8
Queue Length 50th (ft)		127	0		76	0	14	486	15	25	566	5
Queue Length 95th (ft)		#226	50		138	50	m18	590	m27	m44	714	m15
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		239	420		219	420	156	2404	1095	156	2489	1120
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.70	0.27		0.48	0.27	0.12	0.60	0.05	0.24	0.58	0.02

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 50 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

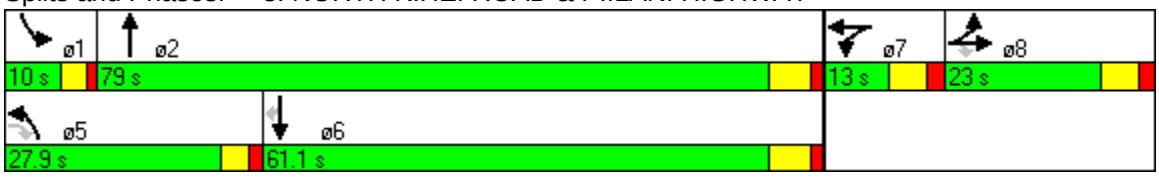


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	211	20	315	2	372	1194	3	1128	110
Lane Group Flow (vph)	122	129	342	21	404	1307	3	1226	120
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	4.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	14.5	26.0	8.0	26.0	26.0
Total Split (s)	23.0	23.0	50.9	13.0	27.9	79.0	10.0	61.1	61.1
Total Split (%)	18.4%	18.4%	40.7%	10.4%	22.3%	63.2%	8.0%	48.9%	48.9%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.56	0.59	0.33	0.17	0.71	0.51	0.04	0.63	0.13
Control Delay	62.0	62.8	21.6	50.1	42.1	17.7	58.7	23.9	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	62.8	21.6	50.1	42.1	17.7	58.7	23.9	4.7
Queue Length 50th (ft)	105	112	34	13	169	420	2	406	5
Queue Length 95th (ft)	173	181	125	40	210	590	13	513	39
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	256	258	1109	130	656	2584	85	1939	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.31	0.16	0.62	0.51	0.04	0.63	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 40 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

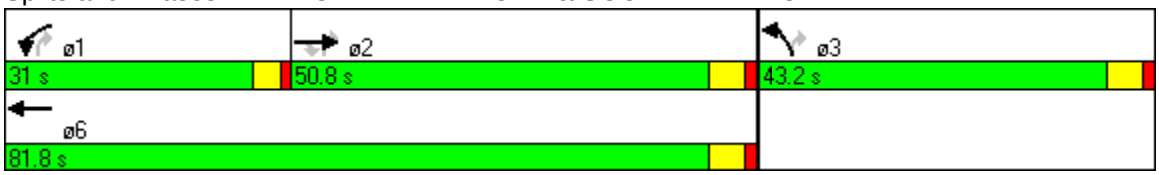


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	299	265	81	429	418	185
Lane Group Flow (vph)	325	288	88	466	454	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	15.5	15.5	9.0	15.5	12.5	
Total Split (s)	50.8	50.8	31.0	81.8	43.2	125.0
Total Split (%)	40.6%	40.6%	24.8%	65.4%	34.6%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	Min	C-Min	Min	
v/c Ratio	0.27	0.26	0.59	0.17	0.77	0.13
Control Delay	11.3	1.9	65.5	1.2	50.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	1.9	65.5	1.2	50.1	0.2
Queue Length 50th (ft)	102	0	74	11	183	0
Queue Length 95th (ft)	192	38	m124	17	227	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1207	1127	382	2703	1077	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.26	0.23	0.17	0.42	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 30 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	50	236	111	1077	1575	68
Lane Group Flow (vph)	54	257	121	1171	1712	74
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	25.0	25.0	21.0	100.0	79.0	79.0
Total Split (%)	20.0%	20.0%	16.8%	80.0%	63.2%	63.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.36	0.76	0.62	0.39	0.68	0.06
Control Delay	53.4	16.1	43.2	9.2	14.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	16.1	43.2	9.2	14.8	6.4
Queue Length 50th (ft)	43	29	91	267	391	10
Queue Length 95th (ft)	80	114	139	466	450	m14
Internal Link Dist (ft)	253			2017	2865	
Turn Bay Length (ft)						
Base Capacity (vph)	297	449	247	3012	2511	1142
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.57	0.49	0.39	0.68	0.06

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

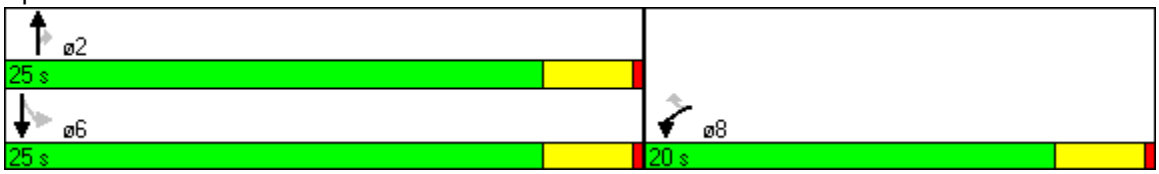
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	94	37	558	89	31	374
Lane Group Flow (vph)	102	40	607	97	34	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	25.0	25.0	25.0	25.0
Total Split (%)	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.35	0.14	0.44	0.08	0.09	0.29
Control Delay	12.1	5.4	5.5	1.5	4.9	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	5.4	5.5	1.5	4.9	4.4
Queue Length 50th (ft)	19	0	60	0	2	34
Queue Length 95th (ft)	43	14	143	12	12	83
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	489	467	1380	1197	366	1380
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.09	0.44	0.08	0.09	0.29

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 57.6
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

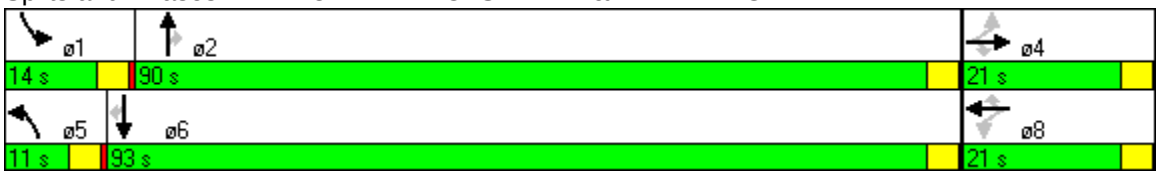


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	32	124	68	5	24	31	1298	123	50	1890	31
Lane Group Flow (vph)	0	59	135	0	79	26	34	1411	134	54	2054	34
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	11.0	90.0	90.0	14.0	93.0	93.0
Total Split (%)	16.8%	16.8%	16.8%	16.8%	16.8%	16.8%	8.8%	72.0%	72.0%	11.2%	74.4%	74.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.37	0.54		0.61	0.14	0.33	0.53	0.11	0.44	0.74	0.03
Control Delay		54.2	20.6		61.1	17.8	73.1	10.9	1.2	64.4	14.0	2.7
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		54.2	20.6		61.1	17.8	73.1	10.9	1.2	64.4	14.0	2.7
Queue Length 50th (ft)		45	25		62	0	27	365	3	45	495	1
Queue Length 95th (ft)		87	87		112	28	m56	475	m13	m66	796	m6
Internal Link Dist (ft)		212			349			829			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		221	303		177	238	107	2659	1223	144	2759	1242
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.27	0.45		0.45	0.11	0.32	0.53	0.11	0.38	0.74	0.03

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

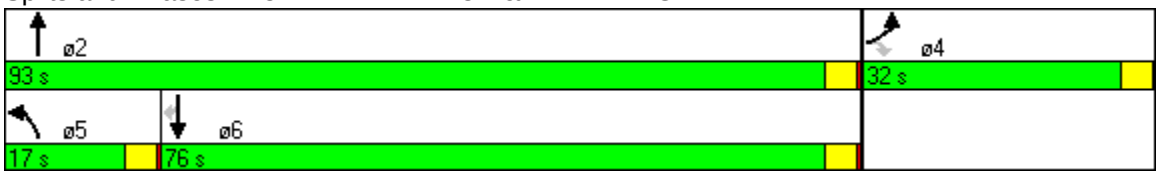


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	271	180	101	1121	1597	371
Lane Group Flow (vph)	295	196	110	1218	1736	403
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	32.0	32.0	17.0	93.0	76.0	76.0
Total Split (%)	25.6%	25.6%	13.6%	74.4%	60.8%	60.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.86	0.43	0.67	0.46	0.80	0.37
Control Delay	60.4	9.6	68.4	7.4	18.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	9.6	68.4	7.4	18.5	3.1
Queue Length 50th (ft)	229	9	86	187	669	40
Queue Length 95th (ft)	#335	73	150	246	476	33
Internal Link Dist (ft)	652			1058	2861	
Turn Bay Length (ft)						
Base Capacity (vph)	396	496	184	2624	2183	1102
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.40	0.60	0.46	0.80	0.37

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	96	7	20	107	52	13	6	63	152	3	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	104	8	22	116	57	14	7	68	165	3	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		817			333							
pX, platoon unblocked												
vC, conflicting volume	173			112			335	374	108	414	350	145
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173			112			335	374	108	414	350	145
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			98	99	93	66	99	98
cM capacity (veh/h)	1404			1478			591	538	946	492	556	903

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	112	22	173	14	75	165	18
Volume Left	25	0	22	0	14	0	165	0
Volume Right	0	8	0	57	0	68	0	15
cSH	1404	1700	1478	1700	591	887	492	813
Volume to Capacity	0.02	0.07	0.01	0.10	0.02	0.08	0.34	0.02
Queue Length 95th (ft)	1	0	1	0	2	7	37	2
Control Delay (s)	7.6	0.0	7.5	0.0	11.2	9.4	16.0	9.5
Lane LOS	A		A		B	A	C	A
Approach Delay (s)	1.4		0.8		9.7		15.3	
Approach LOS					A		C	

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	118	30	4	100	2	9	0	2	3	0	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	128	33	4	109	2	10	0	2	3	0	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		370			780							
pX, platoon unblocked												
vC, conflicting volume	111			161			399	329	145	314	345	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	111			161			399	329	145	314	345	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	100	99	100	92
cM capacity (veh/h)	1479			1418			509	575	903	625	564	944

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	161	4	111	12	75
Volume Left	33	0	4	0	10	3
Volume Right	0	33	0	2	2	72
cSH	1479	1700	1418	1700	553	923
Volume to Capacity	0.02	0.09	0.00	0.07	0.02	0.08
Queue Length 95th (ft)	2	0	0	0	2	7
Control Delay (s)	7.5	0.0	7.5	0.0	11.7	9.2
Lane LOS	A		A		B	A
Approach Delay (s)	1.3		0.3		11.7	9.2
Approach LOS					B	A

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	19.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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)		1808	1583		1795	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1808	1583		1795	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	115	76	81	204	66	168	104	1486	56	138	1398	84
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	83	88	222	72	183	113	1615	61	150	1520	91
RTOR Reduction (vph)	0	0	77	0	0	151	0	0	19	0	0	30
Lane Group Flow (vph)	0	208	11	0	294	32	113	1615	42	150	1520	61
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		18.0	18.0		25.4	25.4	11.4	73.6	73.6	13.0	75.2	75.2
Effective Green, g (s)		19.0	19.0		26.4	26.4	12.4	74.6	74.6	14.0	76.2	76.2
Actuated g/C Ratio		0.13	0.13		0.18	0.18	0.08	0.50	0.50	0.09	0.51	0.51
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.5	3.5		3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		229	201		316	279	146	1760	787	165	1798	804
v/s Ratio Prot		c0.12			c0.16		0.06	c0.46		c0.08	0.43	
v/s Ratio Perm			0.06			0.12			0.04			0.06
v/c Ratio		0.91	0.06		0.93	0.12	0.77	0.92	0.05	0.91	0.85	0.08
Uniform Delay, d1		64.6	57.6		60.9	52.0	67.4	34.9	19.5	67.4	31.8	18.9
Progression Factor		1.00	1.00		1.00	1.00	1.10	0.66	0.31	0.80	1.36	2.66
Incremental Delay, d2		35.8	0.1		32.9	0.2	17.7	8.0	0.1	38.0	4.2	0.2
Delay (s)		100.5	57.7		93.8	52.2	92.0	30.9	6.2	92.3	47.4	50.4
Level of Service		F	E		F	D	F	C	A	F	D	D
Approach Delay (s)		87.8			77.9			34.0			51.4	
Approach LOS		F			E			C			D	

Intersection Summary

HCM Average Control Delay	49.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1791	1583		1823	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.62	1.00		0.72	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1155	1583		1335	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	78	19	79	33	42	67	48	1544	108	100	1487	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	21	86	36	46	73	52	1678	117	109	1616	70
RTOR Reduction (vph)	0	0	76	0	0	64	0	0	25	0	0	15
Lane Group Flow (vph)	0	106	10	0	82	9	52	1678	92	109	1616	55
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		17.7	17.7		17.7	17.7	8.4	104.7	104.7	13.6	109.9	109.9
Effective Green, g (s)		17.7	17.7		17.7	17.7	9.4	105.7	105.7	14.6	110.9	110.9
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.06	0.70	0.70	0.10	0.74	0.74
Clearance Time (s)		4.0	4.0		4.0	4.0	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
Lane Grp Cap (vph)		136	187		158	187	111	2494	1115	172	2617	1170
v/s Ratio Prot							0.03	c0.47		c0.06	0.46	
v/s Ratio Perm		c0.09	0.05		0.06	0.05			0.07			0.04
v/c Ratio		0.78	0.05		0.52	0.05	0.47	0.67	0.08	0.63	0.62	0.05
Uniform Delay, d1		64.3	58.7		62.2	58.7	67.9	12.4	6.9	65.1	9.4	5.3
Progression Factor		1.00	1.00		1.00	1.00	1.24	1.22	1.05	1.11	1.63	1.39
Incremental Delay, d2		24.0	0.1		2.9	0.1	1.5	0.7	0.1	5.8	0.9	0.1
Delay (s)		88.3	58.8		65.0	58.8	85.7	15.8	7.3	77.8	16.1	7.4
Level of Service		F	E		E	E	F	B	A	E	B	A
Approach Delay (s)		75.1			62.1			17.2			19.5	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Volume (vph)	369	9	217	33	12	44	396	1158	15	10	1269	179
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	401	10	236	36	13	48	430	1259	16	11	1379	195
RTOR Reduction (vph)	0	0	112	0	24	0	0	0	0	0	0	65
Lane Group Flow (vph)	201	210	124	0	73	0	430	1275	0	11	1379	130
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	21.9	21.9	49.8		9.1		21.9	95.0		2.0	74.6	74.6
Effective Green, g (s)	23.9	23.9	50.3		11.1		22.4	97.0		2.0	76.6	76.6
Actuated g/C Ratio	0.16	0.16	0.34		0.07		0.15	0.65		0.01	0.51	0.51
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	268	269	935		126		513	2285		24	1807	808
v/s Ratio Prot	0.12	c0.12			c0.06		c0.13	0.36		0.01	c0.39	
v/s Ratio Perm			0.08									0.12
v/c Ratio	0.75	0.78	0.13		0.58		0.84	0.56		0.46	0.76	0.16
Uniform Delay, d1	60.2	60.5	34.7		67.2		62.0	14.6		73.5	29.4	19.6
Progression Factor	0.76	0.77	1.68		1.00		1.04	1.10		1.00	1.00	1.00
Incremental Delay, d2	10.8	13.2	0.0		6.3		8.6	0.8		5.0	3.1	0.4
Delay (s)	56.8	59.6	58.2		73.5		72.9	16.9		78.4	32.5	20.0
Level of Service	E	E	E		E		E	B		E	C	B
Approach Delay (s)		58.2			73.5			31.0			31.3	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	407	518	141	360	275	178
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	442	563	153	391	299	193
RTOR Reduction (vph)	0	244	0	0	0	0
Lane Group Flow (vph)	442	319	153	391	299	193
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	83.4	83.4	18.2	105.6	33.4	150.0
Effective Green, g (s)	84.9	84.9	18.2	107.1	34.9	150.0
Actuated g/C Ratio	0.57	0.57	0.12	0.71	0.23	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	1054	896	215	2527	799	1583
v/s Ratio Prot	0.24		c0.09	0.11	c0.09	
v/s Ratio Perm		0.36				0.12
v/c Ratio	0.42	0.36	0.71	0.15	0.37	0.12
Uniform Delay, d1	18.5	17.7	63.4	6.9	48.4	0.0
Progression Factor	1.00	1.00	1.44	0.28	1.00	1.00
Incremental Delay, d2	1.2	1.1	7.3	0.1	1.3	0.0
Delay (s)	19.8	18.8	98.7	2.1	49.7	0.0
Level of Service	B	B	F	A	D	A
Approach Delay (s)	19.2			29.2	30.2	
Approach LOS	B			C	C	

Intersection Summary

HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	49	189	135	1594	1522	92
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	205	147	1733	1654	100
RTOR Reduction (vph)	0	191	0	0	0	19
Lane Group Flow (vph)	53	14	147	1733	1654	81
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	9.9	9.9	17.3	132.1	110.8	110.8
Effective Green, g (s)	9.9	9.9	17.3	132.1	110.8	110.8
Actuated g/C Ratio	0.07	0.07	0.12	0.88	0.74	0.74
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	117	104	204	3117	2614	1169
v/s Ratio Prot	0.03		c0.08	0.49	c0.47	
v/s Ratio Perm		0.13				0.06
v/c Ratio	0.45	0.13	0.72	0.56	0.63	0.07
Uniform Delay, d1	67.4	66.0	64.0	2.1	9.6	5.4
Progression Factor	1.00	1.00	0.98	1.70	0.87	1.40
Incremental Delay, d2	2.8	0.6	9.3	0.6	0.6	0.1
Delay (s)	70.2	66.6	71.9	4.1	9.0	7.6
Level of Service	E	E	E	A	A	A
Approach Delay (s)	67.3			9.4	8.9	
Approach LOS	E			A	A	

Intersection Summary

HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	80	37	544	157	67	522
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	40	591	171	73	567
RTOR Reduction (vph)	0	36	0	61	0	0
Lane Group Flow (vph)	87	4	591	110	73	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	6.7	6.7	40.8	40.8	3.7	48.5
Effective Green, g (s)	6.7	6.7	40.8	40.8	3.7	48.5
Actuated g/C Ratio	0.11	0.11	0.65	0.65	0.06	0.77
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	168	1203	1022	104	1430
v/s Ratio Prot	c0.05		c0.32		c0.04	0.30
v/s Ratio Perm		0.03		0.11		
v/c Ratio	0.46	0.03	0.49	0.11	0.70	0.40
Uniform Delay, d1	26.6	25.3	5.8	4.3	29.2	2.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	0.3	0.0	19.2	0.2
Delay (s)	28.4	25.4	6.1	4.3	48.5	2.6
Level of Service	C	C	A	A	D	A
Approach Delay (s)	27.4		5.7			7.9
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1787	1583		1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.73	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1359	1583		1319	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	36	6	90	35	3	12	80	1783	27	11	1611	78
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	7	98	38	3	13	87	1938	29	12	1751	85
RTOR Reduction (vph)	0	0	91	0	0	12	0	0	4	0	0	15
Lane Group Flow (vph)	0	46	7	0	41	1	87	1938	25	12	1751	70
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		10.0	10.0		10.0	10.0	12.4	124.9	124.9	3.1	115.6	115.6
Effective Green, g (s)		10.0	10.0		10.0	10.0	12.4	124.9	124.9	3.1	115.6	115.6
Actuated g/C Ratio		0.07	0.07		0.07	0.07	0.08	0.83	0.83	0.02	0.77	0.77
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		91	106		88	106	146	2947	1318	37	2727	1220
v/s Ratio Prot							c0.05	c0.55		0.01	0.49	
v/s Ratio Perm		0.03	0.06		0.03	0.01			0.02			0.05
v/c Ratio		0.51	0.06		0.47	0.01	0.60	0.66	0.02	0.32	0.64	0.06
Uniform Delay, d1		67.6	65.6		67.4	65.4	66.4	4.6	2.1	72.4	7.8	4.1
Progression Factor		1.00	1.00		1.00	1.00	0.93	0.79	0.99	0.74	0.96	1.87
Incremental Delay, d2		4.4	0.2		3.9	0.0	5.3	1.0	0.0	4.0	0.9	0.1
Delay (s)		72.0	65.8		71.3	65.4	67.0	4.6	2.1	57.3	8.4	7.8
Level of Service		E	E		E	E	E	A	A	E	A	A
Approach Delay (s)		67.8			69.9			7.2			8.7	
Approach LOS		E			E			A			A	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	270	251	244	1491	1296	386
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	273	265	1621	1409	420
RTOR Reduction (vph)	0	220	0	0	0	127
Lane Group Flow (vph)	293	53	265	1621	1409	293
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	29.0	29.0	26.3	113.0	82.7	82.7
Effective Green, g (s)	29.0	29.0	26.3	113.0	82.7	82.7
Actuated g/C Ratio	0.19	0.19	0.18	0.75	0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	342	306	310	2666	1951	873
v/s Ratio Prot	0.17		c0.15	0.46	c0.40	
v/s Ratio Perm		0.17				0.27
v/c Ratio	0.86	0.17	0.85	0.61	0.72	0.34
Uniform Delay, d1	58.5	50.5	60.0	8.4	25.1	18.5
Progression Factor	1.00	1.00	1.00	1.00	1.21	1.66
Incremental Delay, d2	18.6	0.3	19.9	1.0	1.9	0.8
Delay (s)	77.1	50.8	79.9	9.5	32.3	31.6
Level of Service	E	D	E	A	C	C
Approach Delay (s)	64.4			19.4	32.2	
Approach LOS	E			B	C	

Intersection Summary

HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

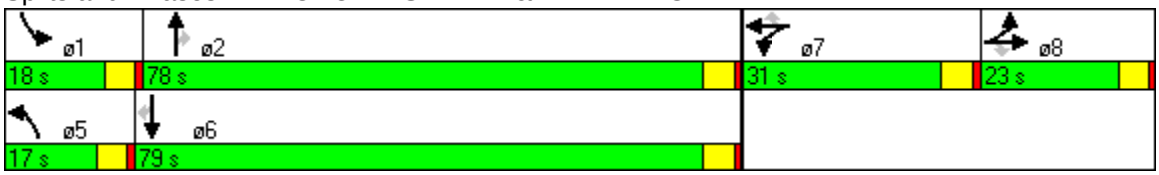
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	76	81	66	168	104	1486	56	138	1398	84
Lane Group Flow (vph)	208	88	294	183	113	1615	61	150	1520	91
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	23.0	23.0	31.0	31.0	17.0	78.0	78.0	18.0	79.0	79.0
Total Split (%)	15.3%	15.3%	20.7%	20.7%	11.3%	52.0%	52.0%	12.0%	52.7%	52.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.91	0.32	0.93	0.43	0.77	0.92	0.08	0.91	0.84	0.11
Control Delay	103.7	14.1	92.0	9.9	97.2	31.6	3.1	98.0	48.5	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.7	14.1	92.0	9.9	97.2	31.6	3.1	98.0	48.5	21.3
Queue Length 50th (ft)	204	0	286	0	105	597	9	154	592	33
Queue Length 95th (ft)	#360	54	#461	69	#202	748	m13	#286	863	m105
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	229	277	323	435	153	1760	806	165	1799	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.32	0.91	0.42	0.74	0.92	0.08	0.91	0.84	0.11

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

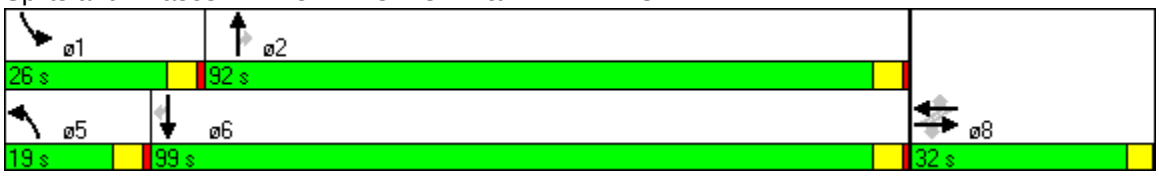


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	19	79	33	42	67	48	1544	108	100	1487	64
Lane Group Flow (vph)	0	106	86	0	82	73	52	1678	117	109	1616	70
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	19.0	92.0	92.0	26.0	99.0	99.0
Total Split (%)	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	12.7%	61.3%	61.3%	17.3%	66.0%	66.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.72	0.33		0.44	0.29	0.41	0.67	0.10	0.63	0.61	0.06
Control Delay		68.7	11.8		62.3	12.6	83.8	18.1	3.6	74.9	18.5	3.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		68.7	11.8		62.3	12.6	83.8	18.1	3.6	74.9	18.5	3.6
Queue Length 50th (ft)		102	0		76	0	46	834	15	94	763	10
Queue Length 95th (ft)		161	50		126	47	m51	914	m38	m125	921	m27
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		234	365		293	355	177	2494	1141	260	2640	1196
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.45	0.24		0.28	0.21	0.29	0.67	0.10	0.42	0.61	0.06

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

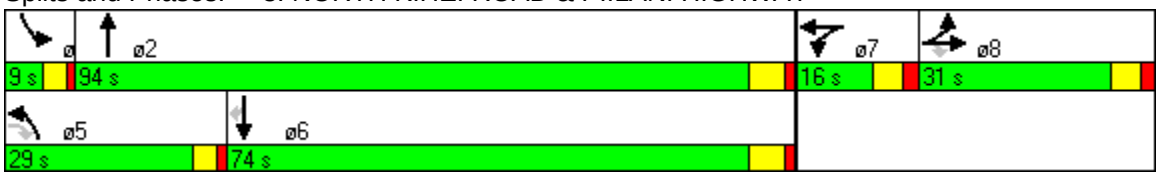


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	369	9	217	12	396	1158	10	1269	179
Lane Group Flow (vph)	201	210	236	97	430	1275	11	1379	195
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	22.0	22.0		11.0	22.5	26.0	9.0	33.0	33.0
Total Split (s)	31.0	31.0	60.0	16.0	29.0	94.0	9.0	74.0	74.0
Total Split (%)	20.7%	20.7%	40.0%	10.7%	19.3%	62.7%	6.0%	49.3%	49.3%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.75	0.78	0.23	0.64	0.84	0.55	0.19	0.76	0.22
Control Delay	56.3	57.9	16.8	65.3	70.9	17.0	77.9	34.4	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	57.9	16.8	65.3	70.9	17.0	77.9	34.4	8.3
Queue Length 50th (ft)	196	206	55	68	221	233	11	595	32
Queue Length 95th (ft)	292	304	98	132	278	528	34	712	83
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	303	304	1080	160	572	2339	59	1805	873
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.69	0.22	0.61	0.75	0.55	0.19	0.76	0.22

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

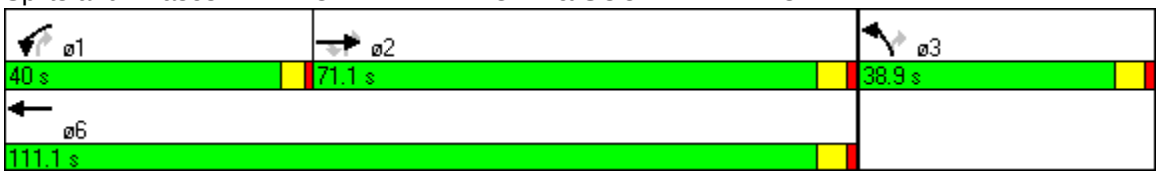


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	407	518	141	360	275	178
Lane Group Flow (vph)	442	563	153	391	299	193
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	4.0	4.0	5.0	4.0	4.0	
Minimum Split (s)	30.5	30.5	9.0	21.5	21.5	
Total Split (s)	71.1	71.1	40.0	111.1	38.9	150.0
Total Split (%)	47.4%	47.4%	26.7%	74.1%	25.9%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	Max	
v/c Ratio	0.42	0.49	0.71	0.15	0.37	0.12
Control Delay	21.3	3.1	91.1	2.1	50.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	3.1	91.1	2.1	50.0	0.2
Queue Length 50th (ft)	236	0	156	16	127	0
Queue Length 95th (ft)	382	61	m144	17	173	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1054	1140	425	2527	799	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.49	0.36	0.15	0.37	0.12

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 30 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	49	189	135	1594	1522	92
Lane Group Flow (vph)	53	205	147	1733	1654	100
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	29.0	29.0	30.0	121.0	91.0	91.0
Total Split (%)	19.3%	19.3%	20.0%	80.7%	60.7%	60.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.45	0.69	0.72	0.56	0.63	0.08
Control Delay	67.8	11.7	65.8	4.5	10.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	11.7	65.8	4.5	10.1	3.8
Queue Length 50th (ft)	51	0	145	130	275	7
Queue Length 95th (ft)	96	81	202	472	304	m11
Internal Link Dist (ft)	253			2017	2865	
Turn Bay Length (ft)						
Base Capacity (vph)	295	435	307	3116	2613	1187
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.47	0.48	0.56	0.63	0.08

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

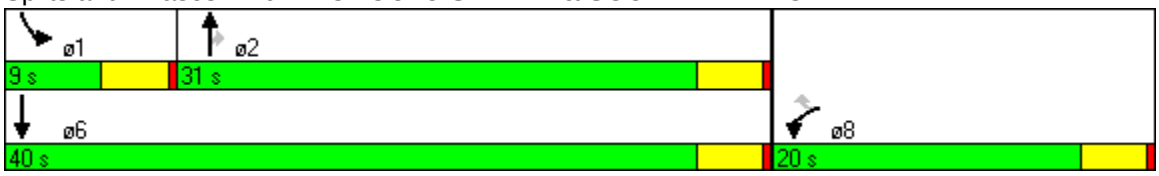
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	80	37	544	157	67	522
Lane Group Flow (vph)	87	40	591	171	73	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phases	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	31.0	31.0	9.0	40.0
Total Split (%)	33.3%	33.3%	51.7%	51.7%	15.0%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Min	Min	None	Min
v/c Ratio	0.35	0.15	0.46	0.15	0.46	0.38
Control Delay	18.0	8.1	9.1	1.9	30.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.1	9.1	1.9	30.4	4.1
Queue Length 50th (ft)	20	0	111	0	18	54
Queue Length 95th (ft)	56	20	224	23	#59	124
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	435	419	1314	1167	157	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.10	0.45	0.15	0.46	0.38

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 61.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

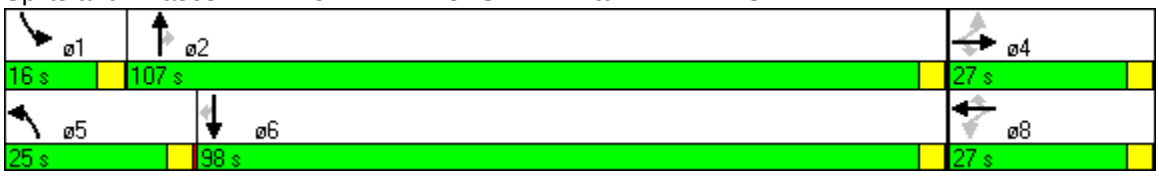


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	6	90	35	3	12	80	1783	27	11	1611	78
Lane Group Flow (vph)	0	46	98	0	41	13	87	1938	29	12	1751	85
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	25.0	107.0	107.0	16.0	98.0	98.0
Total Split (%)	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	16.7%	71.3%	71.3%	10.7%	65.3%	65.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.48	0.50		0.44	0.11	0.59	0.65	0.02	0.15	0.64	0.07
Control Delay		68.7	13.8		68.3	27.2	64.2	4.9	1.5	51.4	9.4	3.7
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		68.7	13.8		68.3	27.2	64.2	4.9	1.5	51.4	9.4	3.7
Queue Length 50th (ft)		44	0		39	0	85	138	0	11	208	3
Queue Length 95th (ft)		88	58		80	23	m136	435	m5	m20	321	m21
Internal Link Dist (ft)		212			261			1847			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		219	326		214	254	248	3003	1347	142	2727	1234
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.21	0.30		0.19	0.05	0.35	0.65	0.02	0.08	0.64	0.07

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 40 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

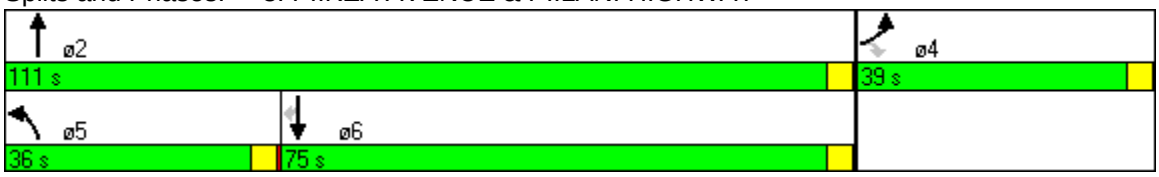


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	251	244	1491	1296	386
Lane Group Flow (vph)	293	273	265	1621	1409	420
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	39.0	39.0	36.0	111.0	75.0	75.0
Total Split (%)	26.0%	26.0%	24.0%	74.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.86	0.52	0.85	0.61	0.72	0.42
Control Delay	67.8	7.8	69.8	10.3	35.3	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	7.8	69.8	10.3	35.3	12.8
Queue Length 50th (ft)	277	0	253	353	566	121
Queue Length 95th (ft)	376	76	347	469	739	135
Internal Link Dist (ft)	745			1063	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	413	579	378	2666	1950	1000
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.47	0.70	0.61	0.72	0.42

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	37	134	16	39	113	73	9	8	34	96	10	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	146	17	42	123	79	10	9	37	104	11	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		817			333							
pX, platoon unblocked												
vC, conflicting volume	202			163			463	522	154	515	491	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202			163			463	522	154	515	491	162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			98	98	96	75	98	98
cM capacity (veh/h)	1370			1416			469	433	892	424	450	882

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	163	42	202	10	46	104	26
Volume Left	40	0	42	0	10	0	104	0
Volume Right	0	17	0	79	0	37	0	15
cSH	1370	1700	1416	1700	469	742	424	630
Volume to Capacity	0.03	0.10	0.03	0.12	0.02	0.06	0.25	0.04
Queue Length 95th (ft)	2	0	2	0	2	5	24	3
Control Delay (s)	7.7	0.0	7.6	0.0	12.8	10.2	16.2	11.0
Lane LOS	A		A		B	B	C	B
Approach Delay (s)	1.5		1.3		10.6		15.2	
Approach LOS					B		C	

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	82	179	16	2	133	6	2	1	3	3	1	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	195	17	2	145	7	2	1	3	3	1	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		370			780							
pX, platoon unblocked												
vC, conflicting volume	151			212			594	537	203	529	542	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151			212			594	537	203	529	542	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	100	100	99	100	93
cM capacity (veh/h)	1430			1358			368	422	837	435	419	899

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	89	212	2	151	7	67
Volume Left	89	0	2	0	2	3
Volume Right	0	17	0	7	3	63
cSH	1430	1700	1358	1700	527	840
Volume to Capacity	0.06	0.12	0.00	0.09	0.01	0.08
Queue Length 95th (ft)	5	0	0	0	1	7
Control Delay (s)	7.7	0.0	7.7	0.0	11.9	9.7
Lane LOS	A		A		B	A
Approach Delay (s)	2.3		0.1		11.9	9.7
Approach LOS					B	A

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1791	1583		1815	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1791	1583		1815	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	177	45	137	67	62	37	38	1007	102	95	1089	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	49	149	73	67	40	41	1095	111	103	1184	114
RTOR Reduction (vph)	0	0	124	0	0	37	0	0	65	0	0	61
Lane Group Flow (vph)	0	241	25	0	140	3	41	1095	46	103	1184	53
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)		10.9	10.9		4.6	4.6	2.8	28.0	28.0	6.1	31.3	31.3
Effective Green, g (s)		11.9	11.9		5.6	5.6	3.8	29.0	29.0	7.1	32.3	32.3
Actuated g/C Ratio		0.17	0.17		0.08	0.08	0.05	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.5	3.5		3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		306	271		146	127	97	1475	660	181	1642	735
v/s Ratio Prot		c0.13			c0.08		0.02	0.31		c0.06	c0.33	
v/s Ratio Perm			0.09			0.03			0.07			0.07
v/c Ratio		0.79	0.09		0.96	0.03	0.42	0.74	0.07	0.57	0.72	0.07
Uniform Delay, d1		27.6	24.3		31.9	29.5	31.8	17.1	12.2	29.8	15.0	10.3
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		12.9	0.2		61.3	0.1	1.1	2.5	0.1	2.4	2.0	0.1
Delay (s)		40.6	24.5		93.2	29.6	32.9	19.6	12.3	32.2	17.0	10.4
Level of Service		D	C		F	C	C	B	B	C	B	B
Approach Delay (s)		34.4			79.1			19.4			17.6	
Approach LOS		C			E			B			B	

Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1789	1583		1815	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.70	1.00		0.79	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1312	1583		1479	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	60	13	56	42	39	51	25	1137	60	68	1381	49
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	14	61	46	42	55	27	1236	65	74	1501	53
RTOR Reduction (vph)	0	0	54	0	0	49	0	0	22	0	0	17
Lane Group Flow (vph)	0	79	7	0	88	6	27	1236	43	74	1501	36
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)		6.9	6.9		6.9	6.9	2.3	46.9	46.9	3.5	48.1	48.1
Effective Green, g (s)		7.9	7.9		7.9	7.9	3.3	47.9	47.9	4.5	49.1	49.1
Actuated g/C Ratio		0.11	0.11		0.11	0.11	0.05	0.66	0.66	0.06	0.68	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
Vehicle Extension (s)		4.0	4.0		4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		143	173		162	173	81	2345	1049	110	2403	1075
v/s Ratio Prot							0.02	0.35		c0.04	c0.42	
v/s Ratio Perm		c0.06	0.04		0.06	0.03			0.04			0.03
v/c Ratio		0.55	0.04		0.54	0.03	0.33	0.53	0.04	0.67	0.62	0.03
Uniform Delay, d1		30.5	28.8		30.5	28.8	33.4	6.3	4.2	33.2	6.5	3.8
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		5.6	0.1		4.6	0.1	0.9	0.4	0.0	12.0	0.7	0.0
Delay (s)		36.1	28.9		35.1	28.9	34.3	6.7	4.3	45.2	7.2	3.8
Level of Service		D	C		D	C	C	A	A	D	A	A
Approach Delay (s)		33.0			32.7			7.2			8.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Volume (vph)	186	0	328	1	0	2	282	968	4	6	1143	157
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	0	357	1	0	2	307	1052	4	7	1242	171
RTOR Reduction (vph)	0	0	216	0	2	0	0	0	0	0	0	96
Lane Group Flow (vph)	101	101	141	0	1	0	307	1056	0	7	1242	75
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	7.1	7.1	24.7		0.8		11.6	39.5		0.8	28.7	28.7
Effective Green, g (s)	9.1	9.1	24.7		2.8		11.6	41.5		0.8	30.7	30.7
Actuated g/C Ratio	0.13	0.13	0.35		0.04		0.17	0.59		0.01	0.44	0.44
Clearance Time (s)	6.0	6.0			6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	218	218	981		66		567	2091		20	1548	692
v/s Ratio Prot	c0.06	0.06			c0.00		c0.09	0.30		0.00	c0.35	
v/s Ratio Perm			0.13									0.11
v/c Ratio	0.46	0.46	0.14		0.02		0.54	0.50		0.35	0.80	0.11
Uniform Delay, d1	28.3	28.3	15.5		32.4		26.9	8.4		34.4	17.1	11.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	1.6	0.0		0.1		0.6	0.3		3.8	3.5	0.1
Delay (s)	29.8	29.8	15.6		32.5		27.4	8.7		38.3	20.6	11.8
Level of Service	C	C	B		C		C	A		D	C	B
Approach Delay (s)		20.7			32.5			12.9			19.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	288	389	129	292	299	141
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	423	140	317	325	153
RTOR Reduction (vph)	0	243	0	0	0	0
Lane Group Flow (vph)	313	180	140	317	325	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	18.8	18.8	6.6	29.4	7.2	47.6
Effective Green, g (s)	20.3	20.3	6.6	30.9	8.7	47.6
Actuated g/C Ratio	0.43	0.43	0.14	0.65	0.18	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	795	675	245	2297	627	1583
v/s Ratio Prot	0.17		c0.08	0.09	c0.09	
v/s Ratio Perm		0.27				0.10
v/c Ratio	0.39	0.27	0.57	0.14	0.52	0.10
Uniform Delay, d1	9.4	8.8	19.2	3.2	17.6	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.4	2.0	0.1	0.3	0.0
Delay (s)	10.1	9.3	21.2	3.3	17.9	0.0
Level of Service	B	A	C	A	B	A
Approach Delay (s)	9.6			8.8	12.1	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.18	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	342	3539	3539	1583
Volume (vph)	74	170	129	1024	1166	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	185	140	1113	1267	127
RTOR Reduction (vph)	0	62	0	0	0	39
Lane Group Flow (vph)	80	123	140	1113	1267	88
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	9.6	9.6	39.1	39.1	39.1	39.1
Effective Green, g (s)	9.6	9.6	39.1	39.1	39.1	39.1
Actuated g/C Ratio	0.17	0.17	0.69	0.69	0.69	0.69
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	268	236	2440	2440	1092
v/s Ratio Prot	0.05			0.31	0.36	
v/s Ratio Perm		0.12	c0.41			0.08
v/c Ratio	0.27	0.46	0.59	0.46	0.52	0.08
Uniform Delay, d1	20.5	21.2	4.6	4.0	4.3	2.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	1.2	4.0	0.1	0.2	0.0
Delay (s)	21.0	22.4	8.6	4.1	4.4	2.9
Level of Service	C	C	A	A	A	A
Approach Delay (s)	22.0			4.6	4.3	
Approach LOS	C			A	A	

Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.40	1.00
Satd. Flow (perm)	1770	1583	1863	1583	752	1863
Volume (vph)	112	28	536	127	48	455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	30	583	138	52	495
RTOR Reduction (vph)	0	26	0	39	0	0
Lane Group Flow (vph)	122	4	583	99	52	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	8.1	8.1	40.3	40.3	40.3	40.3
Effective Green, g (s)	8.1	8.1	40.3	40.3	40.3	40.3
Actuated g/C Ratio	0.14	0.14	0.71	0.71	0.71	0.71
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254	227	1331	1131	537	1331
v/s Ratio Prot	c0.07		c0.31			0.27
v/s Ratio Perm		0.02		0.09	0.07	
v/c Ratio	0.48	0.02	0.44	0.09	0.10	0.37
Uniform Delay, d1	22.2	20.7	3.3	2.5	2.5	3.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.0	0.2	0.0	0.1	0.2
Delay (s)	23.6	20.8	3.6	2.5	2.5	3.3
Level of Service	C	C	A	A	A	A
Approach Delay (s)	23.1		3.4			3.2
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	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				1770	3539			3539	1583
Flt Permitted		0.76	1.00				0.95	1.00			1.00	1.00
Satd. Flow (perm)		1410	1583				1770	3539			3539	1583
Volume (vph)	44	0	81	0	0	0	35	1206	0	0	1165	66
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	88	0	0	0	38	1311	0	0	1266	72
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	48	10	0	0	0	38	1311	0	0	1266	49
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		7.9	7.9				2.0	51.6			45.6	45.6
Effective Green, g (s)		7.9	7.9				2.0	51.6			45.6	45.6
Actuated g/C Ratio		0.12	0.12				0.03	0.76			0.68	0.68
Clearance Time (s)		4.0	4.0				4.0	4.0			4.0	4.0
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		165	185				52	2705			2391	1069
v/s Ratio Prot							0.02	c0.37			c0.36	
v/s Ratio Perm		0.03	0.06									0.05
v/c Ratio		0.29	0.06				0.73	0.48			0.53	0.05
Uniform Delay, d1		27.2	26.5				32.5	3.0			5.5	3.7
Progression Factor		1.00	1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2		1.0	0.1				40.9	0.1			0.2	0.0
Delay (s)		28.2	26.6				73.4	3.1			5.7	3.7
Level of Service		C	C				E	A			A	A
Approach Delay (s)		27.2			0.0			5.1			5.6	
Approach LOS		C			A			A			A	

Intersection Summary

HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	310	255	214	1033	1016	375
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	277	233	1123	1104	408
RTOR Reduction (vph)	0	210	0	0	0	250
Lane Group Flow (vph)	337	67	233	1123	1104	158
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	14.5	14.5	10.2	37.5	23.3	23.3
Effective Green, g (s)	14.5	14.5	10.2	37.5	23.3	23.3
Actuated g/C Ratio	0.24	0.24	0.17	0.62	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	428	383	301	2212	1374	615
v/s Ratio Prot	c0.19		c0.13	0.32	c0.31	
v/s Ratio Perm		0.17				0.26
v/c Ratio	0.79	0.17	0.77	0.51	0.80	0.26
Uniform Delay, d1	21.3	18.0	23.8	6.2	16.3	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	0.2	11.7	0.8	5.1	1.0
Delay (s)	30.6	18.2	35.5	7.0	21.4	13.5
Level of Service	C	B	D	A	C	B
Approach Delay (s)	25.0			11.9	19.3	
Approach LOS	C			B	B	

Intersection Summary

HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	45	137	62	37	38	1007	102	95	1089	105
Lane Group Flow (vph)	241	149	140	40	41	1095	111	103	1184	114
Turn Type		Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases	8		7		5	2		1	6	
Permitted Phases		8		7			2			6
Detector Phases	8	8	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	16.0	16.0	11.0	11.0	10.0	30.0	30.0	13.0	33.0	33.0
Total Split (%)	22.9%	22.9%	15.7%	15.7%	14.3%	42.9%	42.9%	18.6%	47.1%	47.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.75	0.37	0.75	0.20	0.27	0.73	0.15	0.45	0.69	0.14
Control Delay	43.0	8.1	57.7	13.3	35.2	22.2	4.1	34.9	18.0	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	8.1	57.7	13.3	35.2	22.2	4.1	34.9	18.0	3.5
Queue Length 50th (ft)	101	0	60	0	17	220	0	42	227	0
Queue Length 95th (ft)	#210	45	#148	26	45	#306	29	87	307	27
Internal Link Dist (ft)	459		456			2865			2675	
Turn Bay Length (ft)										
Base Capacity (vph)	327	411	186	198	152	1500	735	231	1723	829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.36	0.75	0.20	0.27	0.73	0.15	0.45	0.69	0.14

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 66.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

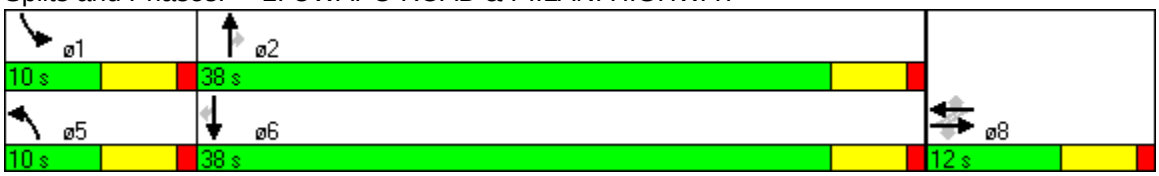
Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	13	56	42	39	51	25	1137	60	68	1381	49
Lane Group Flow (vph)	0	79	61	0	88	55	27	1236	65	74	1501	53
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	38.0	38.0	10.0	38.0	38.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	16.7%	63.3%	63.3%	16.7%	63.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio		0.49	0.24		0.48	0.23	0.18	0.52	0.06	0.47	0.60	0.05
Control Delay		34.1	10.2		32.6	10.4	28.5	7.7	2.0	35.3	7.8	2.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.1	10.2		32.6	10.4	28.5	7.7	2.0	35.3	7.8	2.2
Queue Length 50th (ft)		27	0		30	0	9	138	0	26	95	0
Queue Length 95th (ft)		64	28		68	27	29	193	13	61	266	11
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)		163	250		184	245	153	2392	1091	158	2510	1138
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.48	0.24		0.48	0.22	0.18	0.52	0.06	0.47	0.60	0.05

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 70
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

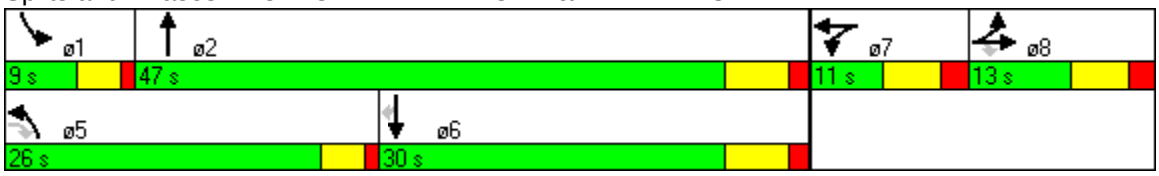


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	186	0	328	0	282	968	6	1143	157
Lane Group Flow (vph)	101	101	357	3	307	1056	7	1242	171
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	5.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	26.0	26.0	9.0	26.0	26.0
Total Split (s)	13.0	13.0	39.0	11.0	26.0	47.0	9.0	30.0	30.0
Total Split (%)	16.3%	16.3%	48.8%	13.8%	32.5%	58.8%	11.3%	37.5%	37.5%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.0	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	Min	None	Min	Min
v/c Ratio	0.41	0.41	0.27	0.02	0.48	0.45	0.05	0.80	0.22
Control Delay	32.0	32.0	2.9	25.7	24.1	6.7	33.5	21.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	32.0	2.9	25.7	24.1	6.7	33.5	21.1	3.4
Queue Length 50th (ft)	32	32	2	0	49	60	2	175	0
Queue Length 95th (ft)	#103	#103	32	8	106	225	16	#431	36
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	248	248	1531	168	1053	2407	129	1559	793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.41	0.23	0.02	0.29	0.44	0.05	0.80	0.22

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 61.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

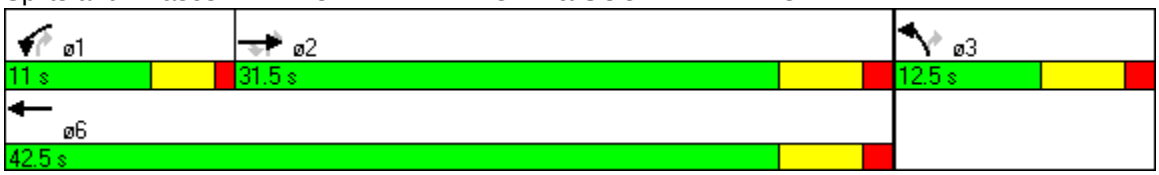


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	288	389	129	292	299	141
Lane Group Flow (vph)	313	423	140	317	325	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	30.5	30.5	9.0	15.5	12.5	
Total Split (s)	31.5	31.5	11.0	42.5	12.5	55.0
Total Split (%)	57.3%	57.3%	20.0%	77.3%	22.7%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	
v/c Ratio	0.40	0.46	0.58	0.14	0.52	0.10
Control Delay	10.2	2.5	31.6	3.1	23.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	2.5	31.6	3.1	23.0	0.1
Queue Length 50th (ft)	56	0	38	13	44	0
Queue Length 95th (ft)	100	35	#110	22	86	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	940	1008	261	2477	624	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.54	0.13	0.52	0.10

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 47.8
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	74	170	129	1024	1166	117
Lane Group Flow (vph)	80	185	140	1113	1267	127
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phases	4	4	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	45.0	45.0	45.0	45.0
Total Split (%)	30.8%	30.8%	69.2%	69.2%	69.2%	69.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.27	0.56	0.66	0.46	0.52	0.11
Control Delay	20.4	15.3	25.7	5.2	5.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	15.3	25.7	5.2	5.7	1.2
Queue Length 50th (ft)	21	30	20	65	79	0
Queue Length 95th (ft)	57	87	#133	141	171	14
Internal Link Dist (ft)	253			2017	2865	
Turn Bay Length (ft)						
Base Capacity (vph)	455	463	218	2516	2516	1162
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.40	0.64	0.44	0.50	0.11

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 57
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

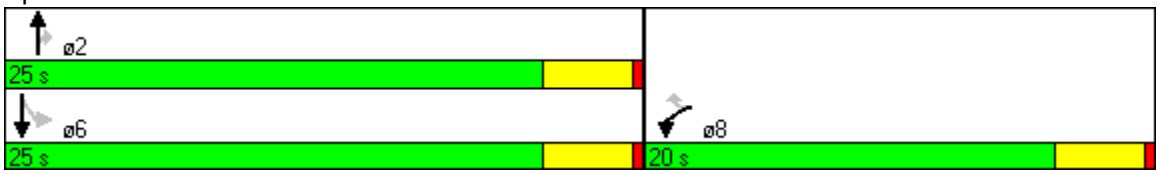
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	112	28	536	127	48	455
Lane Group Flow (vph)	122	30	583	138	52	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	25.0	25.0	25.0	25.0
Total Split (%)	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.39	0.10	0.43	0.12	0.13	0.36
Control Delay	12.2	5.7	5.7	1.4	5.5	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	5.7	5.7	1.4	5.5	5.1
Queue Length 50th (ft)	22	0	59	0	4	47
Queue Length 95th (ft)	50	12	144	15	18	113
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	498	467	1366	1198	391	1366
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.43	0.12	0.13	0.36

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 56.7
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

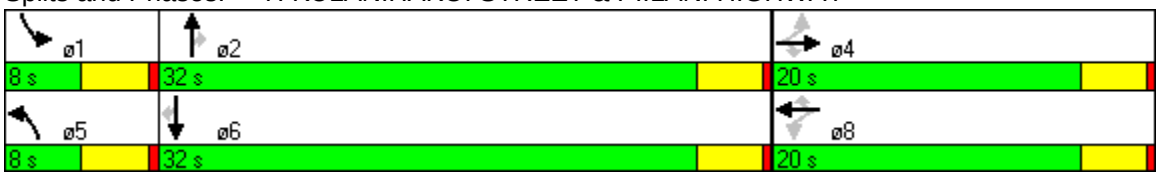


Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR	ø1	ø8
Lane Configurations									
Volume (vph)	44	0	81	35	1206	1165	66		
Lane Group Flow (vph)	0	48	88	38	1311	1266	72		
Turn Type	Perm		Perm	Prot			Perm		
Protected Phases		4		5	2	6		1	8
Permitted Phases	4		4				6		
Detector Phases	4	4	4	5	2	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	8.0	32.0	32.0	32.0	8.0	20.0
Total Split (%)	33.3%	33.3%	33.3%	13.3%	53.3%	53.3%	53.3%	13%	33%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag				Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min	None	None
v/c Ratio		0.27	0.32	0.34	0.49	0.51	0.06		
Control Delay		19.0	6.6	30.8	4.2	6.9	2.2		
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay		19.0	6.6	30.8	4.2	6.9	2.2		
Queue Length 50th (ft)		10	0	9	67	63	0		
Queue Length 95th (ft)		37	30	35	128	204	14		
Internal Link Dist (ft)		212			1953	2017			
Turn Bay Length (ft)									
Base Capacity (vph)		332	441	113	2680	2467	1125		
Starvation Cap Reductn		0	0	0	0	0	0		
Spillback Cap Reductn		0	0	0	0	0	0		
Storage Cap Reductn		0	0	0	0	0	0		
Reduced v/c Ratio		0.14	0.20	0.34	0.49	0.51	0.06		

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 66.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

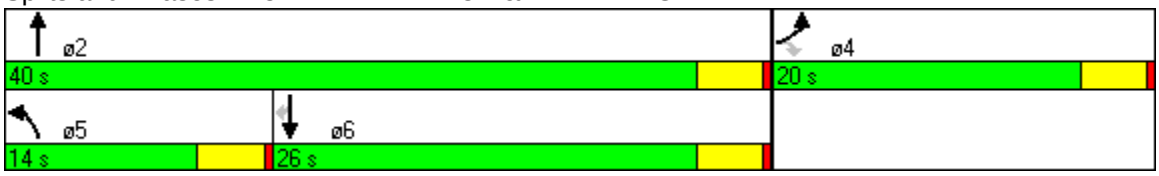


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	310	255	214	1033	1016	375
Lane Group Flow (vph)	337	277	233	1123	1104	408
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	14.0	40.0	26.0	26.0
Total Split (%)	33.3%	33.3%	23.3%	66.7%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.79	0.47	0.77	0.51	0.80	0.47
Control Delay	31.1	5.3	42.9	7.5	23.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	5.3	42.9	7.5	23.1	3.8
Queue Length 50th (ft)	110	0	82	108	187	0
Queue Length 95th (ft)	#216	48	#184	151	#297	48
Internal Link Dist (ft)	620			1070	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	472	625	307	2210	1373	864
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.44	0.76	0.51	0.80	0.47

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	132	11	25	134	52	9	9	28	86	5	17
Peak Hour Factor	0.55	0.77	0.50	0.40	0.50	0.65	0.25	0.50	0.39	0.83	0.50	0.61
Hourly flow rate (vph)	44	171	22	62	268	80	36	18	72	104	10	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		817			333							
pX, platoon unblocked												
vC, conflicting volume	348			193			696	743	182	772	714	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			193			696	743	182	772	714	308
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			95			89	94	92	60	97	96
cM capacity (veh/h)	1211			1380			314	316	860	261	328	732

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	44	193	62	348	36	90	104	38
Volume Left	44	0	62	0	36	0	104	0
Volume Right	0	22	0	80	0	72	0	28
cSH	1211	1700	1380	1700	314	639	261	553
Volume to Capacity	0.04	0.11	0.05	0.20	0.11	0.14	0.40	0.07
Queue Length 95th (ft)	3	0	4	0	10	12	45	5
Control Delay (s)	8.1	0.0	7.7	0.0	17.9	11.5	27.7	12.0
Lane LOS	A		A		C	B	D	B
Approach Delay (s)	1.5		1.2		13.4		23.5	
Approach LOS					B		C	

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	70	169	10	6	158	8	5	4	7	7	3	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	184	11	7	172	9	5	4	8	8	3	98
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		370			780							
pX, platoon unblocked												
vC, conflicting volume	180			195			626	535	189	535	536	176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180			195			626	535	189	535	536	176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			98	99	99	98	99	89
cM capacity (veh/h)	1395			1379			334	425	853	428	424	867

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	76	195	7	180	17	109
Volume Left	76	0	7	0	5	8
Volume Right	0	11	0	9	8	98
cSH	1395	1700	1379	1700	491	786
Volume to Capacity	0.05	0.11	0.00	0.11	0.04	0.14
Queue Length 95th (ft)	4	0	0	0	3	12
Control Delay (s)	7.7	0.0	7.6	0.0	12.6	10.3
Lane LOS	A		A		B	B
Approach Delay (s)	2.2		0.3		12.6	10.3
Approach LOS					B	B

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D
Level-of-Service Worksheets for 2018 Background Conditions With Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1770	1583	1681	1710	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1770	1583	1681	1710	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	93	88	79	211	40	177	25	1110	40	167	1494	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	96	86	229	43	192	27	1207	43	182	1624	84
RTOR Reduction (vph)	0	0	75	0	0	167	0	0	19	0	0	25
Lane Group Flow (vph)	101	96	11	132	140	25	27	1207	24	182	1624	59
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	15.4	15.4	15.4	15.3	15.3	15.3	6.0	61.0	61.0	13.3	68.3	68.3
Effective Green, g (s)	16.4	16.4	16.4	16.3	16.3	16.3	7.0	62.0	62.0	14.3	69.3	69.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.50	0.50	0.11	0.55	0.55
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	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	221	232	208	219	223	206	99	1755	785	393	1962	878
v/s Ratio Prot	c0.06	0.05		0.08	0.08		0.02	0.34		c0.05	c0.46	
v/s Ratio Perm			0.05			0.12			0.03			0.05
v/c Ratio	0.46	0.41	0.05	0.60	0.63	0.12	0.27	0.69	0.03	0.46	0.83	0.07
Uniform Delay, d1	50.2	49.9	47.5	51.3	51.5	48.0	56.6	24.1	16.1	51.8	22.9	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.31	0.50	0.13	1.25	0.67	0.18
Incremental Delay, d2	1.5	1.2	0.1	4.6	5.4	0.3	0.5	2.1	0.1	0.3	3.8	0.1
Delay (s)	51.7	51.1	47.6	55.9	56.9	48.3	74.8	14.1	2.2	65.0	19.1	2.4
Level of Service	D	D	D	E	E	D	E	B	A	E	B	A
Approach Delay (s)		50.2			53.1			15.0			22.8	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1374	1863	1583	1389	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	138	17	106	70	28	106	17	1333	55	34	1324	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	18	115	76	30	115	18	1449	60	37	1439	23
RTOR Reduction (vph)	0	0	96	0	0	96	0	0	19	0	0	7
Lane Group Flow (vph)	150	18	19	76	30	19	18	1449	41	37	1439	16
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6	19.6	4.0	84.4	84.4	6.0	86.4	86.4
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	5.0	85.4	85.4	7.0	87.4	87.4
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.04	0.68	0.68	0.06	0.70	0.70
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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	226	307	261	229	307	261	71	2418	1082	99	2474	1107
v/s Ratio Prot		0.01			0.02		0.01	c0.41		c0.02	0.41	
v/s Ratio Perm	c0.11		0.07	0.05		0.07			0.04			0.01
v/c Ratio	0.66	0.06	0.07	0.33	0.10	0.07	0.25	0.60	0.04	0.37	0.58	0.01
Uniform Delay, d1	49.0	44.0	44.1	46.1	44.3	44.1	58.2	10.6	6.4	56.9	9.5	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.64	1.77	4.13	0.77	2.04	2.32
Incremental Delay, d2	7.8	0.1	0.2	1.2	0.2	0.2	0.5	0.9	0.1	0.7	0.8	0.0
Delay (s)	56.8	44.1	44.3	47.3	44.5	44.3	38.0	19.7	26.7	44.4	20.3	13.3
Level of Service	E	D	D	D	D	D	D	B	C	D	C	B
Approach Delay (s)		50.9			45.3			20.2			20.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

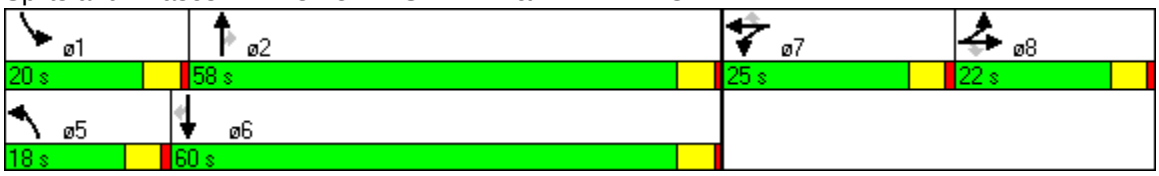
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	88	79	211	40	177	25	1110	40	167	1494	77
Lane Group Flow (vph)	101	96	86	132	140	192	27	1207	43	182	1624	84
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	22.0	22.0
Minimum Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (%)	17.6%	17.6%	17.6%	20.0%	20.0%	20.0%	14.4%	46.4%	46.4%	16.0%	48.0%	48.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.46	0.41	0.30	0.60	0.62	0.51	0.17	0.69	0.05	0.46	0.80	0.09
Control Delay	55.9	54.5	12.4	56.1	56.6	9.9	71.4	14.7	1.0	67.6	19.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	54.5	12.4	56.1	56.6	9.9	71.4	14.7	1.0	67.6	19.9	1.4
Queue Length 50th (ft)	81	76	0	107	114	0	19	433	1	67	714	5
Queue Length 95th (ft)	141	133	48	171	181	66	56	105	1	118	#818	4
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	242	255	302	282	287	426	198	1755	804	439	2018	927
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.38	0.28	0.47	0.49	0.45	0.14	0.69	0.05	0.41	0.80	0.09

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

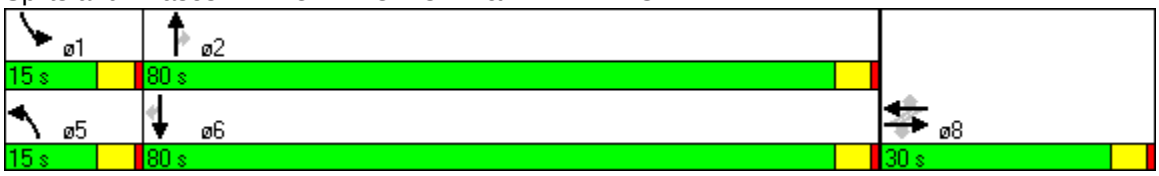


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	17	106	70	28	106	17	1333	55	34	1324	21
Lane Group Flow (vph)	150	18	115	76	30	115	18	1449	60	37	1439	23
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	25.0	25.0	10.0	25.0	25.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	64.0%	64.0%	12.0%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio	0.66	0.06	0.32	0.33	0.10	0.32	0.12	0.59	0.05	0.24	0.56	0.02
Control Delay	54.8	41.4	9.0	46.8	42.2	9.0	35.4	21.8	10.2	44.2	21.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	41.4	9.0	46.8	42.2	9.0	35.4	21.8	10.2	44.2	21.7	8.5
Queue Length 50th (ft)	114	12	0	55	21	0	14	343	7	23	557	4
Queue Length 95th (ft)	180	33	50	99	47	50	m22	588	m35	m44	714	m15
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	286	388	420	289	388	420	156	2475	1125	156	2560	1151
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.05	0.27	0.26	0.08	0.27	0.12	0.59	0.05	0.24	0.56	0.02

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 50 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1750	1583	1681	1724	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1750	1583	1681	1724	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	115	76	81	204	66	168	104	1486	56	138	1398	84
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	83	88	222	72	183	113	1615	61	150	1520	91
RTOR Reduction (vph)	0	0	79	0	0	137	0	0	17	0	0	26
Lane Group Flow (vph)	101	107	9	143	151	46	113	1615	44	150	1520	65
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	13.5	13.5	13.5	17.4	17.4	17.4	12.9	89.6	89.6	9.5	86.2	86.2
Effective Green, g (s)	14.5	14.5	14.5	18.4	18.4	18.4	13.9	90.6	90.6	10.5	87.2	87.2
Actuated g/C Ratio	0.10	0.10	0.10	0.12	0.12	0.12	0.09	0.60	0.60	0.07	0.58	0.58
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	162	169	153	206	211	194	164	2138	956	240	2057	920
v/s Ratio Prot	0.06	c0.06		0.09	0.09		c0.06	c0.46		0.04	0.43	
v/s Ratio Perm			0.06			0.12			0.04			0.06
v/c Ratio	0.62	0.63	0.06	0.69	0.72	0.24	0.69	0.76	0.05	0.62	0.74	0.07
Uniform Delay, d1	65.1	65.2	61.5	63.1	63.3	59.5	66.0	21.6	12.1	67.8	23.0	13.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.18	0.54	0.18	0.74	1.38	2.59
Incremental Delay, d2	7.6	7.9	0.2	9.7	11.0	0.6	7.9	2.2	0.1	3.0	2.0	0.1
Delay (s)	72.7	73.1	61.7	72.8	74.2	60.1	85.4	13.9	2.3	53.4	33.8	35.6
Level of Service	E	E	E	E	E	E	F	B	A	D	C	D
Approach Delay (s)		69.6			68.4			18.1			35.5	
Approach LOS		E			E			B			D	

Intersection Summary

HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1354	1863	1583	1385	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	78	19	79	33	42	67	48	1544	108	100	1487	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	21	86	36	46	73	52	1678	117	109	1616	70
RTOR Reduction (vph)	0	0	78	0	0	66	0	0	23	0	0	14
Lane Group Flow (vph)	85	21	8	36	46	7	52	1678	94	109	1616	56
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	14.5	14.5	14.5	14.5	14.5	14.5	8.3	107.9	107.9	13.6	113.2	113.2
Effective Green, g (s)	14.5	14.5	14.5	14.5	14.5	14.5	9.3	108.9	108.9	14.6	114.2	114.2
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.06	0.73	0.73	0.10	0.76	0.76
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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)	131	180	153	134	180	153	110	2569	1149	172	2694	1205
v/s Ratio Prot		0.01			0.02		0.03	c0.47		c0.06	0.46	
v/s Ratio Perm	c0.06		0.05	0.03		0.05			0.07			0.04
v/c Ratio	0.65	0.12	0.05	0.27	0.26	0.05	0.47	0.65	0.08	0.63	0.60	0.05
Uniform Delay, d1	65.3	61.9	61.5	62.8	62.8	61.5	68.0	10.7	6.0	65.1	7.9	4.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.13	1.62	1.68	1.19	1.47	1.12
Incremental Delay, d2	10.6	0.3	0.1	1.1	0.8	0.1	2.2	0.9	0.1	5.8	0.8	0.1
Delay (s)	75.9	62.2	61.7	63.9	63.5	61.6	79.2	18.2	10.2	83.5	12.3	5.0
Level of Service	E	E	E	E	E	E	E	B	B	F	B	A
Approach Delay (s)		68.0			62.7			19.4			16.3	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

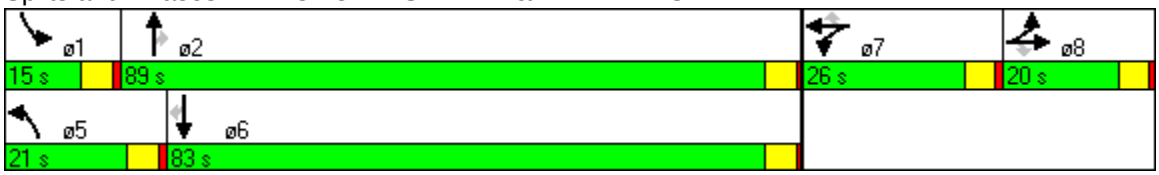
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	76	81	204	66	168	104	1486	56	138	1398	84
Lane Group Flow (vph)	101	107	88	143	151	183	113	1615	61	150	1520	91
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	20.0	20.0	20.0	26.0	26.0	26.0	21.0	89.0	89.0	15.0	83.0	83.0
Total Split (%)	13.3%	13.3%	13.3%	17.3%	17.3%	17.3%	14.0%	59.3%	59.3%	10.0%	55.3%	55.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.62	0.63	0.38	0.69	0.71	0.55	0.69	0.76	0.06	0.62	0.74	0.10
Control Delay	77.4	77.4	15.7	72.2	72.8	17.7	86.4	14.7	1.1	58.8	36.4	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.4	77.4	15.7	72.2	72.8	17.7	86.4	14.7	1.1	58.8	36.4	16.9
Queue Length 50th (ft)	101	106	0	143	151	24	106	484	3	74	473	23
Queue Length 95th (ft)	170	177	55	220	230	101	168	590	m1	109	813	99
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	179	187	247	247	253	365	201	2136	973	252	2057	947
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.57	0.36	0.58	0.60	0.50	0.56	0.76	0.06	0.60	0.74	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

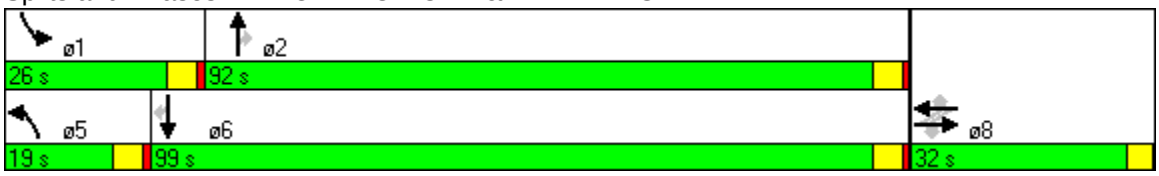


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	19	79	33	42	67	48	1544	108	100	1487	64
Lane Group Flow (vph)	85	21	86	36	46	73	52	1678	117	109	1616	70
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	32.0	32.0	32.0	32.0	32.0	32.0	19.0	92.0	92.0	26.0	99.0	99.0
Total Split (%)	21.3%	21.3%	21.3%	21.3%	21.3%	21.3%	12.7%	61.3%	61.3%	17.3%	66.0%	66.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.65	0.12	0.37	0.27	0.25	0.33	0.42	0.65	0.10	0.63	0.59	0.06
Control Delay	67.7	59.5	12.6	61.8	61.5	13.3	77.6	20.8	4.9	80.5	14.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	59.5	12.6	61.8	61.5	13.3	77.6	20.8	4.9	80.5	14.1	2.5
Queue Length 50th (ft)	82	19	0	33	43	0	45	795	19	96	694	4
Queue Length 95th (ft)	136	46	52	68	81	49	m63	915	m55	m125	864	m23
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	253	348	365	259	348	355	177	2569	1172	260	2716	1228
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.06	0.24	0.14	0.13	0.21	0.29	0.65	0.10	0.42	0.59	0.06

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1718	1583	1681	1770	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1718	1583	1681	1770	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	177	45	137	67	62	37	38	1007	102	95	1089	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	49	149	73	67	40	41	1095	111	103	1184	114
RTOR Reduction (vph)	0	0	131	0	0	37	0	0	54	0	0	50
Lane Group Flow (vph)	117	124	18	73	67	3	41	1095	57	103	1184	64
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	9.1	9.1	9.1	4.6	4.6	4.6	3.4	41.1	41.1	7.3	45.0	45.0
Effective Green, g (s)	10.1	10.1	10.1	5.6	5.6	5.6	4.4	42.1	42.1	8.3	46.0	46.0
Actuated g/C Ratio	0.12	0.12	0.12	0.07	0.07	0.07	0.05	0.51	0.51	0.10	0.56	0.56
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	207	211	195	115	121	108	95	1815	812	347	1983	887
v/s Ratio Prot	0.07	0.07		c0.04	0.04		c0.02	0.31		0.03	c0.33	
v/s Ratio Perm			0.09			0.03			0.07			0.07
v/c Ratio	0.57	0.59	0.09	0.63	0.55	0.03	0.43	0.60	0.07	0.30	0.60	0.07
Uniform Delay, d1	33.9	34.0	31.9	37.3	37.0	35.7	37.6	14.1	10.1	34.2	11.9	8.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	4.4	0.2	10.9	5.4	0.1	1.1	0.8	0.1	0.2	0.7	0.1
Delay (s)	37.7	38.4	32.2	48.2	42.4	35.8	38.8	14.9	10.2	34.4	12.7	8.3
Level of Service	D	D	C	D	D	D	D	B	B	C	B	A
Approach Delay (s)		35.8			43.3			15.3			13.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1359	1863	1583	1394	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	60	13	56	42	39	51	25	1137	60	68	1381	49
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	14	61	46	42	55	27	1236	65	74	1501	53
RTOR Reduction (vph)	0	0	54	0	0	49	0	0	22	0	0	17
Lane Group Flow (vph)	65	14	7	46	42	6	27	1236	43	74	1501	36
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	6.9	6.9	6.9	6.9	6.9	6.9	2.3	46.9	46.9	3.5	48.1	48.1
Effective Green, g (s)	7.9	7.9	7.9	7.9	7.9	7.9	3.3	47.9	47.9	4.5	49.1	49.1
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.11	0.11	0.05	0.66	0.66	0.06	0.68	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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	148	204	173	152	204	173	81	2345	1049	110	2403	1075
v/s Ratio Prot		0.01			0.02		0.02	0.35		c0.04	c0.42	
v/s Ratio Perm	c0.05		0.04	0.03		0.03			0.04			0.03
v/c Ratio	0.44	0.07	0.04	0.30	0.21	0.03	0.33	0.53	0.04	0.67	0.62	0.03
Uniform Delay, d1	30.1	28.9	28.8	29.7	29.3	28.8	33.4	6.3	4.2	33.2	6.5	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	0.2	0.1	1.5	0.7	0.1	0.9	0.4	0.0	12.0	0.7	0.0
Delay (s)	33.0	29.1	28.9	31.2	30.0	28.9	34.3	6.7	4.3	45.2	7.2	3.8
Level of Service	C	C	C	C	C	C	C	A	A	D	A	A
Approach Delay (s)		30.8			30.0			7.2			8.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	10.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

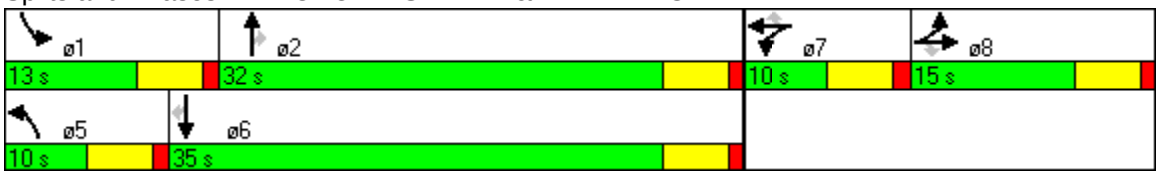
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	45	137	67	62	37	38	1007	102	95	1089	105
Lane Group Flow (vph)	117	124	149	73	67	40	41	1095	111	103	1184	114
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	32.0	32.0	13.0	35.0	35.0
Total Split (%)	21.4%	21.4%	21.4%	14.3%	14.3%	14.3%	14.3%	45.7%	45.7%	18.6%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.49	0.51	0.42	0.56	0.49	0.25	0.31	0.59	0.13	0.26	0.57	0.12
Control Delay	33.3	33.7	9.1	47.2	42.1	15.1	36.7	17.5	3.5	28.2	14.4	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	33.7	9.1	47.2	42.1	15.1	36.7	17.5	3.5	28.2	14.4	2.9
Queue Length 50th (ft)	48	51	0	32	29	0	17	208	0	21	214	0
Queue Length 95th (ft)	98	103	46	#82	68	27	45	283	27	41	290	25
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	239	244	352	131	138	160	134	1841	877	399	2063	970
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.51	0.42	0.56	0.49	0.25	0.31	0.59	0.13	0.26	0.57	0.12

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 80
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

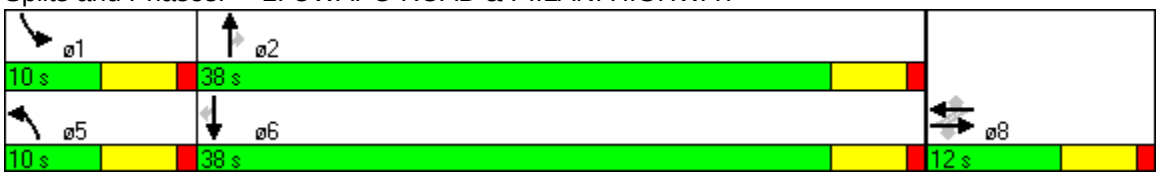


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	13	56	42	39	51	25	1137	60	68	1381	49
Lane Group Flow (vph)	65	14	61	46	42	55	27	1236	65	74	1501	53
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	38.0	38.0	10.0	38.0	38.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	16.7%	63.3%	63.3%	16.7%	63.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.39	0.06	0.24	0.27	0.18	0.23	0.18	0.52	0.06	0.47	0.60	0.05
Control Delay	30.4	23.5	10.2	27.3	24.9	10.4	28.5	7.7	2.0	35.3	7.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	23.5	10.2	27.3	24.9	10.4	28.5	7.7	2.0	35.3	7.8	2.2
Queue Length 50th (ft)	22	5	0	15	14	0	9	138	0	26	95	0
Queue Length 95th (ft)	54	18	28	42	38	27	29	193	13	61	266	11
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	169	231	250	173	231	245	153	2392	1091	158	2510	1138
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.06	0.24	0.27	0.18	0.22	0.18	0.52	0.06	0.47	0.60	0.05

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 70
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY



Appendix E
Level-of-Service Worksheets for With Promenade Without Honuaula Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1770	1583	1681	1709	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1770	1583	1681	1709	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	93	88	95	227	40	177	38	1188	53	167	1589	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	96	103	247	43	192	41	1291	58	182	1727	84
RTOR Reduction (vph)	0	0	89	0	0	166	0	0	24	0	0	25
Lane Group Flow (vph)	101	96	14	141	149	26	41	1291	34	182	1727	59
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	15.4	15.4	15.4	15.7	15.7	15.7	8.1	60.6	60.6	13.3	65.8	65.8
Effective Green, g (s)	16.4	16.4	16.4	16.7	16.7	16.7	9.1	61.6	61.6	14.3	66.8	66.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.07	0.49	0.49	0.11	0.53	0.53
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	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	221	232	208	225	228	211	129	1744	780	393	1891	846
v/s Ratio Prot	0.06	0.05		0.08	0.09		0.02	0.36		c0.05	c0.49	
v/s Ratio Perm			0.07			0.12			0.04			0.05
v/c Ratio	0.46	0.41	0.06	0.63	0.65	0.12	0.32	0.74	0.04	0.46	0.91	0.07
Uniform Delay, d1	50.2	49.9	47.6	51.2	51.4	47.7	55.0	25.3	16.4	51.8	26.5	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.06	0.60	1.07	1.28	0.65	0.25
Incremental Delay, d2	1.5	1.2	0.1	5.4	6.6	0.3	0.5	2.6	0.1	0.3	7.4	0.1
Delay (s)	51.7	51.1	47.7	56.6	58.0	47.9	58.7	17.9	17.6	66.5	24.6	3.7
Level of Service	D	D	D	E	E	D	E	B	B	E	C	A
Approach Delay (s)		50.1			53.6			19.1			27.5	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1374	1863	1583	1389	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	138	17	122	86	28	106	30	1384	68	34	1387	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	18	133	93	30	115	33	1504	74	37	1508	23
RTOR Reduction (vph)	0	0	111	0	0	96	0	0	23	0	0	7
Lane Group Flow (vph)	150	18	22	93	30	19	33	1504	51	37	1508	16
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6	19.6	6.0	84.4	84.4	6.0	84.4	84.4
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	7.0	85.4	85.4	7.0	85.4	85.4
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.06	0.68	0.68	0.06	0.68	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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	226	307	261	229	307	261	99	2418	1082	99	2418	1082
v/s Ratio Prot		0.01			0.02		0.02	0.42		c0.02	c0.43	
v/s Ratio Perm	c0.11		0.08	0.07		0.07			0.05			0.01
v/c Ratio	0.66	0.06	0.08	0.41	0.10	0.07	0.33	0.62	0.05	0.37	0.62	0.01
Uniform Delay, d1	49.0	44.0	44.2	46.7	44.3	44.1	56.8	10.9	6.5	56.9	10.9	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.57	1.93	4.18	0.78	1.98	2.58
Incremental Delay, d2	7.8	0.1	0.2	1.6	0.2	0.2	0.5	0.9	0.1	0.7	1.0	0.0
Delay (s)	56.8	44.1	44.4	48.3	44.5	44.3	32.8	21.9	27.1	44.9	22.6	16.4
Level of Service	E	D	D	D	D	D	C	C	C	D	C	B
Approach Delay (s)		50.6			45.9			22.4			23.1	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Volume (vph)	211	20	346	14	2	4	398	1220	8	3	1159	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	22	376	15	2	4	433	1326	9	3	1260	120
RTOR Reduction (vph)	0	0	122	0	4	0	0	0	0	0	0	51
Lane Group Flow (vph)	122	129	254	0	17	0	433	1335	0	3	1260	69
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	13.7	13.7	40.7		3.6		21.0	84.7		1.0	64.2	64.2
Effective Green, g (s)	15.7	15.7	41.2		5.6		21.5	86.7		1.0	66.2	66.2
Actuated g/C Ratio	0.13	0.13	0.33		0.04		0.17	0.69		0.01	0.53	0.53
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	211	213	919		78		590	2453		14	1874	838
v/s Ratio Prot	0.07	c0.08			c0.01		c0.13	0.38		0.00	c0.36	
v/s Ratio Perm			0.13									0.08
v/c Ratio	0.58	0.61	0.28		0.22		0.73	0.54		0.21	0.67	0.08
Uniform Delay, d1	51.5	51.7	30.9		57.6		49.0	9.4		61.6	21.5	14.5
Progression Factor	1.08	1.08	1.77		1.00		0.83	1.87		1.00	1.00	1.00
Incremental Delay, d2	3.8	4.7	0.2		1.4		3.9	0.7		2.8	1.9	0.2
Delay (s)	59.4	60.5	54.8		59.0		44.7	18.3		64.4	23.4	14.7
Level of Service	E	E	D		E		D	B		E	C	B
Approach Delay (s)		56.8			59.0			24.8			22.8	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	330	281	81	455	431	185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	305	88	495	468	201
RTOR Reduction (vph)	0	109	0	0	0	0
Lane Group Flow (vph)	359	196	88	495	468	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	78.9	78.9	10.5	93.4	20.6	125.0
Effective Green, g (s)	80.4	80.4	10.5	94.9	22.1	125.0
Actuated g/C Ratio	0.64	0.64	0.08	0.76	0.18	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	1198	1018	149	2687	607	1583
v/s Ratio Prot	c0.19		c0.05	0.14	c0.14	
v/s Ratio Perm		0.19				0.13
v/c Ratio	0.30	0.19	0.59	0.18	0.77	0.13
Uniform Delay, d1	9.9	9.1	55.2	4.2	49.0	0.0
Progression Factor	1.00	1.00	1.21	0.22	1.00	1.00
Incremental Delay, d2	0.6	0.4	3.6	0.1	5.5	0.0
Delay (s)	10.5	9.5	70.2	1.1	54.5	0.0
Level of Service	B	A	E	A	D	A
Approach Delay (s)	10.0			11.5	38.2	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	1.00	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Volume (vph)	50	73	236	152	75	152	111	1067	145	154	1560	68
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	79	257	165	82	165	121	1160	158	167	1696	74
RTOR Reduction (vph)	0	0	12	0	0	135	0	0	49	0	0	22
Lane Group Flow (vph)	54	79	245	165	82	30	121	1160	109	167	1696	52
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.9	10.9	26.4	8.1	11.1	22.6	15.5	78.5	86.6	11.5	74.5	74.5
Effective Green, g (s)	7.9	10.9	26.4	8.1	11.1	22.6	15.5	78.5	86.6	11.5	74.5	74.5
Actuated g/C Ratio	0.06	0.09	0.21	0.06	0.09	0.18	0.12	0.63	0.69	0.09	0.60	0.60
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	112	309	385	222	165	593	219	2222	2020	316	2109	943
v/s Ratio Prot	0.03	0.02	c0.08	c0.05	0.04	0.03	0.07	c0.33	0.01	0.05	c0.48	
v/s Ratio Perm			0.08			0.03			0.05			0.05
v/c Ratio	0.48	0.26	0.64	0.74	0.50	0.05	0.55	0.52	0.05	0.53	0.80	0.05
Uniform Delay, d1	56.6	53.3	44.9	57.4	54.3	42.3	51.5	12.9	6.1	54.2	19.6	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.70	2.03	5.97	0.75	1.24	2.39
Incremental Delay, d2	3.2	0.4	3.4	12.6	2.3	0.0	2.5	0.7	0.0	0.9	1.8	0.1
Delay (s)	59.8	53.7	48.4	70.0	56.6	42.4	38.7	26.9	36.6	41.5	26.1	25.2
Level of Service	E	D	D	E	E	D	D	C	D	D	C	C
Approach Delay (s)		51.0			56.3			28.9			27.4	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1770	1583	1863	1583	701	1863
Volume (vph)	117	60	558	117	59	374
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	65	607	127	64	407
RTOR Reduction (vph)	0	53	0	41	0	0
Lane Group Flow (vph)	127	12	607	86	64	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.9	9.9	38.0	38.0	38.0	38.0
Effective Green, g (s)	9.9	9.9	38.0	38.0	38.0	38.0
Actuated g/C Ratio	0.18	0.18	0.68	0.68	0.68	0.68
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	313	280	1266	1076	477	1266
v/s Ratio Prot	c0.07		c0.33			0.22
v/s Ratio Perm		0.04		0.08	0.09	
v/c Ratio	0.41	0.04	0.48	0.08	0.13	0.32
Uniform Delay, d1	20.4	19.1	4.3	3.0	3.2	3.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.3	0.0	0.1	0.1
Delay (s)	21.3	19.1	4.5	3.1	3.3	3.8
Level of Service	C	B	A	A	A	A
Approach Delay (s)	20.5		4.3			3.7
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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)		1815	1583		1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.76	1.00		0.64	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1409	1583		1201	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	35	32	124	68	5	24	31	1408	123	50	1979	42
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	35	135	74	5	26	34	1530	134	54	2151	46
RTOR Reduction (vph)	0	0	79	0	0	23	0	0	34	0	0	10
Lane Group Flow (vph)	0	73	56	0	79	3	34	1530	100	54	2151	36
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		12.4	12.4		12.4	12.4	4.0	93.6	93.6	7.0	96.6	96.6
Effective Green, g (s)		12.4	12.4		12.4	12.4	4.0	93.6	93.6	7.0	96.6	96.6
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.03	0.75	0.75	0.06	0.77	0.77
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		140	157		119	157	57	2650	1185	99	2735	1223
v/s Ratio Prot							0.02	0.43		c0.03	c0.61	
v/s Ratio Perm		0.05	0.09		0.07	0.02			0.08			0.03
v/c Ratio		0.52	0.35		0.66	0.02	0.60	0.58	0.08	0.55	0.79	0.03
Uniform Delay, d1		53.5	52.6		54.3	50.8	59.7	6.9	4.2	57.5	8.2	3.3
Progression Factor		1.00	1.00		1.00	1.00	1.21	1.31	0.70	0.92	1.51	2.35
Incremental Delay, d2		3.5	1.4		13.1	0.0	13.4	0.8	0.1	4.0	1.6	0.0
Delay (s)		57.0	53.9		67.4	50.8	85.9	9.9	3.1	56.6	14.0	7.8
Level of Service		E	D		E	D	F	A	A	E	B	A
Approach Delay (s)		55.0			63.3			10.9			14.9	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	302	180	101	1200	1661	397
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	328	196	110	1304	1805	432
RTOR Reduction (vph)	0	114	0	0	0	137
Lane Group Flow (vph)	328	82	110	1304	1805	295
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.3	26.3	10.2	90.7	76.5	76.5
Effective Green, g (s)	26.3	26.3	10.2	90.7	76.5	76.5
Actuated g/C Ratio	0.21	0.21	0.08	0.73	0.61	0.61
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	333	144	2568	2166	969
v/s Ratio Prot	c0.19		c0.06	0.37	c0.51	
v/s Ratio Perm		0.12				0.27
v/c Ratio	0.88	0.24	0.76	0.51	0.83	0.30
Uniform Delay, d1	47.8	41.1	56.2	7.5	19.2	11.6
Progression Factor	1.00	1.00	1.00	1.00	0.86	0.98
Incremental Delay, d2	20.9	0.4	21.1	0.7	2.6	0.5
Delay (s)	68.8	41.5	77.3	8.2	19.2	11.8
Level of Service	E	D	E	A	B	B
Approach Delay (s)	58.6			13.5	17.7	
Approach LOS	E			B	B	

Intersection Summary

HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.71	1.00	1.00		1.00		0.75	1.00			1.00	1.00
Satd. Flow (perm)	2555	3539	1583		3539		2714	1863			1863	1583
Volume (vph)	131	33	90	0	67	0	67	12	0	0	9	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	36	98	0	73	0	73	13	0	0	10	64
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	0	0	0	38
Lane Group Flow (vph)	142	36	39	0	73	0	73	13	0	0	10	26
Turn Type	Perm		Perm	Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	16.0	16.0	16.0		16.0		16.0	16.0			16.0	16.0
Effective Green, g (s)	16.0	16.0	16.0		16.0		16.0	16.0			16.0	16.0
Actuated g/C Ratio	0.40	0.40	0.40		0.40		0.40	0.40			0.40	0.40
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	1022	1416	633		1416		1086	745			745	633
v/s Ratio Prot		0.01			0.02			0.01			0.01	
v/s Ratio Perm	0.06		0.06				0.03					0.04
v/c Ratio	0.14	0.03	0.06		0.05		0.07	0.02			0.01	0.04
Uniform Delay, d1	7.6	7.3	7.4		7.4		7.4	7.3			7.2	7.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.0	0.2		0.1		0.1	0.0			0.0	0.1
Delay (s)	7.9	7.3	7.6		7.4		7.5	7.3			7.3	7.4
Level of Service	A	A	A		A		A	A			A	A
Approach Delay (s)		7.7			7.4			7.5			7.4	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

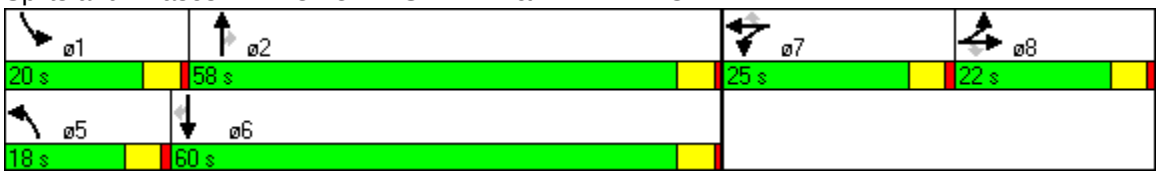
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	88	95	227	40	177	38	1188	53	167	1589	77
Lane Group Flow (vph)	101	96	103	141	149	192	41	1291	58	182	1727	84
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	22.0	22.0
Minimum Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (%)	17.6%	17.6%	17.6%	20.0%	20.0%	20.0%	14.4%	46.4%	46.4%	16.0%	48.0%	48.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.46	0.41	0.35	0.63	0.65	0.51	0.26	0.74	0.07	0.46	0.90	0.10
Control Delay	55.9	54.5	12.0	56.7	57.3	9.8	59.0	18.7	7.5	69.1	25.6	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	54.5	12.0	56.7	57.3	9.8	59.0	18.7	7.5	69.1	25.6	2.1
Queue Length 50th (ft)	81	76	0	114	122	0	33	95	1	79	768	1
Queue Length 95th (ft)	141	133	52	182	191	66	m67	335	m24	119	#918	m8
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	242	255	316	282	287	426	198	1743	804	439	1919	883
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.38	0.33	0.50	0.52	0.45	0.21	0.74	0.07	0.41	0.90	0.10

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

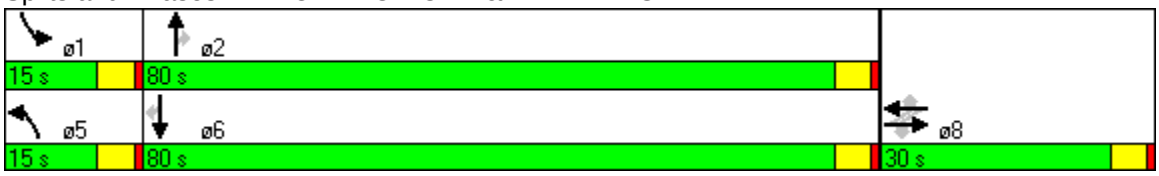


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	17	122	86	28	106	30	1384	68	34	1387	21
Lane Group Flow (vph)	150	18	133	93	30	115	33	1504	74	37	1508	23
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	25.0	25.0	10.0	25.0	25.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	64.0%	64.0%	12.0%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio	0.66	0.06	0.36	0.41	0.10	0.32	0.21	0.61	0.07	0.24	0.61	0.02
Control Delay	54.8	41.4	8.7	48.4	42.2	9.0	32.7	24.3	9.3	44.7	25.1	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	41.4	8.7	48.4	42.2	9.0	32.7	24.3	9.3	44.7	25.1	9.4
Queue Length 50th (ft)	114	12	0	68	21	0	21	556	22	23	636	6
Queue Length 95th (ft)	180	33	54	117	47	50	m36	618	m37	m44	746	m14
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	286	388	435	289	388	420	156	2475	1129	156	2475	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.05	0.31	0.32	0.08	0.27	0.21	0.61	0.07	0.24	0.61	0.02

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 50 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

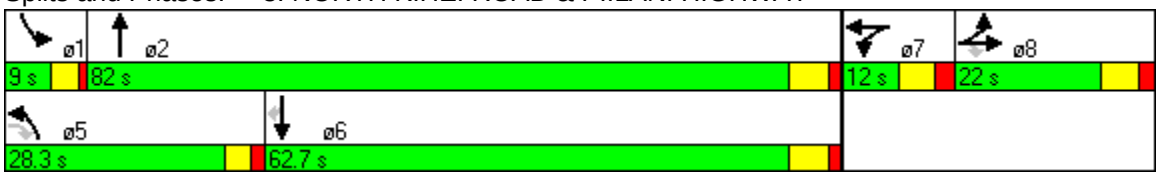


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	211	20	346	2	398	1220	3	1159	110
Lane Group Flow (vph)	122	129	376	21	433	1335	3	1260	120
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	4.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	14.5	26.0	8.0	26.0	26.0
Total Split (s)	22.0	22.0	50.3	12.0	28.3	82.0	9.0	62.7	62.7
Total Split (%)	17.6%	17.6%	40.2%	9.6%	22.6%	65.6%	7.2%	50.2%	50.2%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.58	0.60	0.36	0.19	0.73	0.51	0.05	0.65	0.13
Control Delay	62.6	63.3	27.3	51.6	44.5	16.5	59.0	24.0	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	63.3	27.3	51.6	44.5	16.5	59.0	24.0	4.6
Queue Length 50th (ft)	106	112	52	13	188	463	2	422	5
Queue Length 95th (ft)	173	182	154	41	212	598	13	520	39
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	242	245	1086	116	667	2611	71	1942	918
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.53	0.35	0.18	0.65	0.51	0.04	0.65	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 40 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

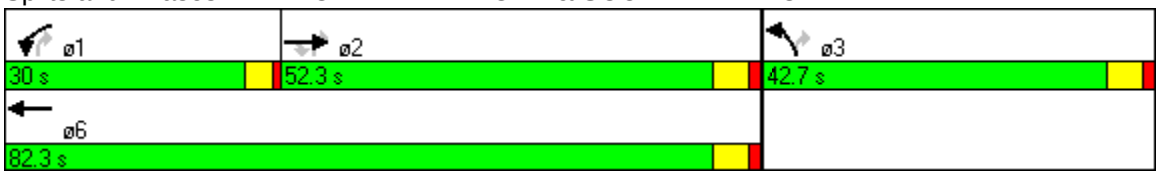


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	330	281	81	455	431	185
Lane Group Flow (vph)	359	305	88	495	468	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	15.5	15.5	9.0	15.5	12.5	
Total Split (s)	52.3	52.3	30.0	82.3	42.7	125.0
Total Split (%)	41.8%	41.8%	24.0%	65.8%	34.2%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	Min	C-Min	Min	
v/c Ratio	0.30	0.27	0.59	0.18	0.77	0.13
Control Delay	11.9	2.0	67.0	1.2	49.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	2.0	67.0	1.2	49.9	0.2
Queue Length 50th (ft)	118	0	74	11	188	0
Queue Length 95th (ft)	216	40	m120	18	233	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1199	1127	368	2687	1063	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.24	0.18	0.44	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 30 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD

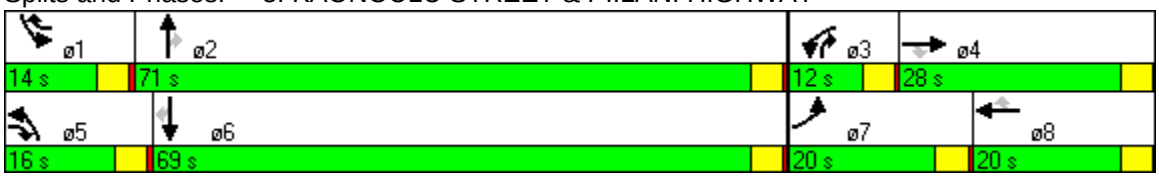


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	73	236	152	75	152	111	1067	145	154	1560	68
Lane Group Flow (vph)	54	79	257	165	82	165	121	1160	158	167	1696	74
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	28.0	16.0	12.0	20.0	14.0	16.0	71.0	12.0	14.0	69.0	69.0
Total Split (%)	16.0%	22.4%	12.8%	9.6%	16.0%	11.2%	12.8%	56.8%	9.6%	11.2%	55.2%	55.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.42	0.23	0.66	0.74	0.50	0.23	0.55	0.52	0.08	0.53	0.80	0.08
Control Delay	57.2	50.6	47.8	77.5	57.8	6.0	44.5	29.5	7.4	43.4	27.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.2	50.6	47.8	77.5	57.8	6.0	44.5	29.5	7.4	43.4	27.7	12.7
Queue Length 50th (ft)	43	31	177	69	64	0	89	465	17	71	457	14
Queue Length 95th (ft)	84	53	243	#121	115	29	142	579	51	m79	#582	m25
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	227	679	387	223	238	729	220	2246	2081	325	2131	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.12	0.66	0.74	0.34	0.23	0.55	0.52	0.08	0.51	0.80	0.08

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

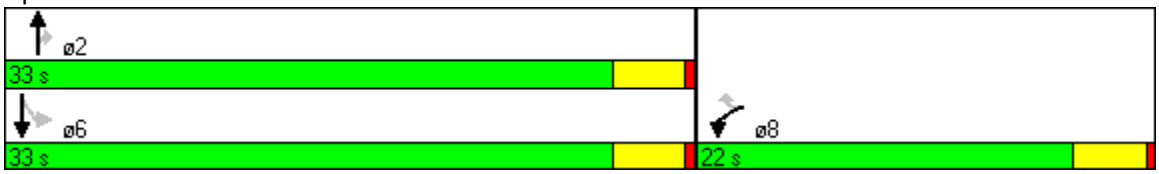


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	117	60	558	117	59	374
Lane Group Flow (vph)	127	65	607	127	64	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	22.0	33.0	33.0	33.0	33.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.39	0.19	0.49	0.12	0.17	0.33
Control Delay	13.6	5.4	6.3	1.3	5.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	5.4	6.3	1.3	5.6	5.0
Queue Length 50th (ft)	21	0	61	0	5	35
Queue Length 95th (ft)	65	22	155	14	22	91
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	553	539	1314	1154	390	1314
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.12	0.46	0.11	0.16	0.31

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 57.2
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

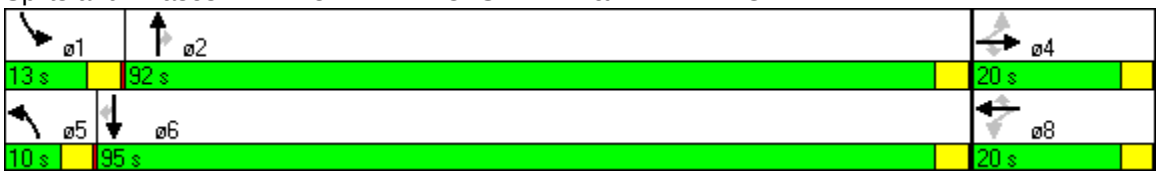


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	32	124	68	5	24	31	1408	123	50	1979	42
Lane Group Flow (vph)	0	73	135	0	79	26	34	1530	134	54	2151	46
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	92.0	92.0	13.0	95.0	95.0
Total Split (%)	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	8.0%	73.6%	73.6%	10.4%	76.0%	76.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.48	0.57		0.64	0.14	0.37	0.57	0.11	0.47	0.77	0.04
Control Delay		57.7	26.3		64.3	18.1	79.5	11.0	0.8	58.2	15.7	3.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		57.7	26.3		64.3	18.1	79.5	11.0	0.8	58.2	15.7	3.2
Queue Length 50th (ft)		56	36		62	0	0	420	1	41	552	1
Queue Length 95th (ft)		104	100		114	28	m52	521	m6	m53	821	m10
Internal Link Dist (ft)		212			349			829			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		195	279		158	225	93	2671	1228	128	2779	1253
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.37	0.48		0.50	0.12	0.37	0.57	0.11	0.42	0.77	0.04

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

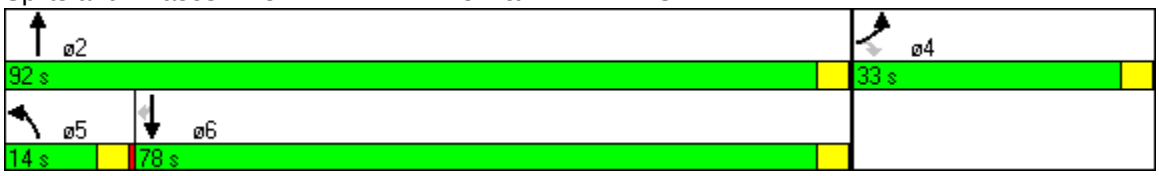


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	302	180	101	1200	1661	397
Lane Group Flow (vph)	328	196	110	1304	1805	432
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	14.0	92.0	78.0	78.0
Total Split (%)	26.4%	26.4%	11.2%	73.6%	62.4%	62.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.88	0.44	0.76	0.51	0.83	0.39
Control Delay	62.6	14.8	85.1	8.6	20.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	14.8	85.1	8.6	20.2	3.2
Queue Length 50th (ft)	252	33	89	232	746	38
Queue Length 95th (ft)	#393	102	#189	282	516	37
Internal Link Dist (ft)	652			1058	2861	
Turn Bay Length (ft)						
Base Capacity (vph)	411	479	148	2568	2166	1106
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.41	0.74	0.51	0.83	0.39

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

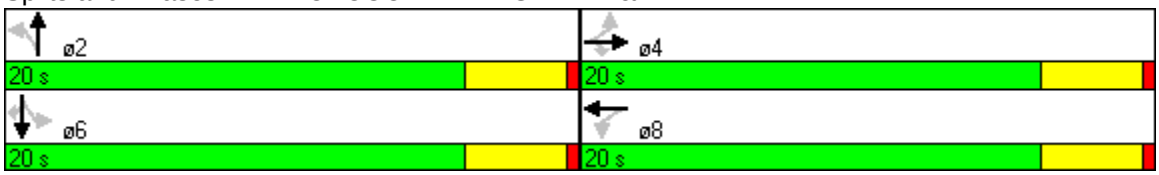


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	131	33	90	67	67	12	9	59
Lane Group Flow (vph)	142	36	98	73	73	13	10	64
Turn Type	Perm		Perm		Perm			Perm
Protected Phases		4		8		2	6	
Permitted Phases	4		4		2			6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.14	0.03	0.14	0.05	0.07	0.02	0.01	0.10
Control Delay	8.1	7.4	3.0	7.5	7.7	7.4	7.3	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	7.4	3.0	7.5	7.7	7.4	7.3	3.2
Queue Length 50th (ft)	9	2	0	4	4	2	1	0
Queue Length 95th (ft)	21	7	18	13	12	8	7	14
Internal Link Dist (ft)		86		521		103	80	
Turn Bay Length (ft)								
Base Capacity (vph)	1022	1416	692	1416	1086	745	745	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.05	0.07	0.02	0.01	0.10

Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 40
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Pretimed

Splits and Phases: 12: UPCOUNTRY HIGHWAY & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	153	7	20	153	60	13	6	63	162	3	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	166	8	22	166	65	14	7	68	176	3	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.99						0.99	0.99		0.99	0.99	0.99
vC, conflicting volume	232			174			447	495	170	530	466	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			174			443	492	170	527	463	193
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			97	99	92	57	99	98
cM capacity (veh/h)	1333			1403			496	458	874	407	476	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	174	22	232	14	75	176	18
Volume Left	25	0	22	0	14	0	176	0
Volume Right	0	8	0	65	0	68	0	15
cSH	1333	1700	1403	1700	496	810	407	742
Volume to Capacity	0.02	0.10	0.02	0.14	0.03	0.09	0.43	0.02
Queue Length 95th (ft)	1	0	1	0	2	8	53	2
Control Delay (s)	7.8	0.0	7.6	0.0	12.5	9.9	20.4	10.0
Lane LOS	A		A		B	A	C	A
Approach Delay (s)	1.0		0.7		10.3		19.4	
Approach LOS					B		C	

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	30	175	13	4	146	2	9	0	2	3	0	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	190	14	4	159	2	10	0	2	3	0	72
Approach Volume (veh/h)		237			165			12			75	
Crossing Volume (veh/h)		8			42			226			173	
High Capacity (veh/h)		1376			1340			1160			1210	
High v/c (veh/h)		0.17			0.12			0.01			0.06	
Low Capacity (veh/h)		1154			1120			957			1002	
Low v/c (veh/h)		0.21			0.15			0.01			0.07	

Intersection Summary			
Maximum v/c High	0.17		
Maximum v/c Low	0.21		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	255	86	0	279	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	277	93	0	303	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked						
vC, conflicting volume			371		429	139
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			371		429	139
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1184		554	884

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	139	139	93	152	152	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	93	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.08	0.08	0.05	0.09	0.09	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	255	192	0	0	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	277	209	0	0	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		435	166			
pX, platoon unblocked						
vC, conflicting volume	209				347	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				347	104
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	90
cM capacity (veh/h)	1359				624	930

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	139	139	104	104	0	95
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	95
cSH	1700	1700	1700	1700	1700	930
Volume to Capacity	0.08	0.08	0.06	0.06	0.00	0.10
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS						A
Approach Delay (s)	0.0		0.0			9.3
Approach LOS						A

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	3	32	0	3	64	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	35	0	3	70	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	601					
pX, platoon unblocked						
vC, conflicting volume			38		5	3
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		5	3
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1570		1016	1079

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	3	35	0	2	2	70
Volume Left	0	0	0	0	0	70
Volume Right	0	35	0	0	0	0
cSH	1700	1700	1700	1700	1700	1016
Volume to Capacity	0.00	0.02	0.00	0.00	0.00	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS						A
Approach Delay (s)	0.0		0.0			8.8
Approach LOS						A

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	3	0	0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	0	0	3	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	751					
pX, platoon unblocked						
vC, conflicting volume			3		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1619		1023	1085

Direction, Lane #	EB 1	NB 1
Volume Total	3	3
Volume Left	0	3
Volume Right	3	0
cSH	1700	1023
Volume to Capacity	0.00	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	8.5
Lane LOS		A
Approach Delay (s)	0.0	8.5
Approach LOS		A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1751	1583	1681	1720	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1751	1583	1681	1720	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	115	76	120	243	66	168	147	1742	99	138	1632	84
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	83	130	264	72	183	160	1893	108	150	1774	91
RTOR Reduction (vph)	0	0	119	0	0	100	0	0	28	0	0	25
Lane Group Flow (vph)	102	106	11	164	172	83	160	1893	80	150	1774	66
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.6	11.6	11.6	17.7	17.7	17.7	15.6	92.7	92.7	8.0	85.1	85.1
Effective Green, g (s)	12.6	12.6	12.6	18.7	18.7	18.7	16.6	93.7	93.7	9.0	86.1	86.1
Actuated g/C Ratio	0.08	0.08	0.08	0.12	0.12	0.12	0.11	0.62	0.62	0.06	0.57	0.57
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	141	147	133	210	214	197	196	2211	989	206	2031	909
v/s Ratio Prot	0.06	0.06		0.10	0.10		c0.09	c0.53		0.04	0.50	
v/s Ratio Perm			0.08			0.12			0.07			0.06
v/c Ratio	0.72	0.72	0.08	0.78	0.80	0.42	0.82	0.86	0.08	0.73	0.87	0.07
Uniform Delay, d1	67.0	67.0	63.4	63.7	63.9	60.7	65.2	22.7	11.1	69.3	27.3	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.38	2.38
Incremental Delay, d2	17.2	16.5	0.3	17.0	19.2	1.5	21.3	4.5	0.2	8.0	4.3	0.1
Delay (s)	84.2	83.4	63.7	80.7	83.1	62.1	86.6	27.2	11.3	65.1	41.9	34.0
Level of Service	F	F	E	F	F	E	F	C	B	E	D	C
Approach Delay (s)		76.1			74.9			30.8			43.3	
Approach LOS		E			E			C			D	

Intersection Summary

HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1354	1863	1583	1385	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	78	19	118	72	42	67	91	1715	151	100	1643	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	21	128	78	46	73	99	1864	164	109	1786	70
RTOR Reduction (vph)	0	0	115	0	0	66	0	0	34	0	0	15
Lane Group Flow (vph)	85	21	13	78	46	7	99	1864	130	109	1786	55
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	15.0	15.0	15.0	15.0	15.0	15.0	12.6	107.4	107.4	13.6	108.4	108.4
Effective Green, g (s)	15.0	15.0	15.0	15.0	15.0	15.0	13.6	108.4	108.4	14.6	109.4	109.4
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.72	0.72	0.10	0.73	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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)	135	186	158	139	186	158	160	2558	1144	172	2581	1155
v/s Ratio Prot		0.01			0.02		0.06	c0.53		c0.06	0.50	
v/s Ratio Perm	0.06		0.08	0.06		0.05			0.10			0.04
v/c Ratio	0.63	0.11	0.08	0.56	0.25	0.05	0.62	0.73	0.11	0.63	0.69	0.05
Uniform Delay, d1	64.8	61.4	61.2	64.4	62.3	61.0	65.7	12.2	6.3	65.1	11.1	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.11	1.79	2.13	1.20	1.40	1.20
Incremental Delay, d2	8.9	0.3	0.2	5.1	0.7	0.1	3.8	1.0	0.1	5.4	1.1	0.1
Delay (s)	73.7	61.7	61.5	69.5	63.0	61.2	76.7	22.9	13.5	83.3	16.6	6.9
Level of Service	E	E	E	E	E	E	E	C	B	F	B	A
Approach Delay (s)		65.9			64.9			24.6			20.0	
Approach LOS		E			E			C			B	

Intersection Summary

HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Volume (vph)	369	9	295	33	12	44	482	1244	15	10	1347	179
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	401	10	321	36	13	48	524	1352	16	11	1464	195
RTOR Reduction (vph)	0	0	105	0	24	0	0	0	0	0	0	63
Lane Group Flow (vph)	201	210	216	0	73	0	524	1368	0	11	1464	132
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	21.9	21.9	52.0		9.1		24.1	95.0		2.0	72.4	72.4
Effective Green, g (s)	23.9	23.9	52.5		11.1		24.6	97.0		2.0	74.4	74.4
Actuated g/C Ratio	0.16	0.16	0.35		0.07		0.16	0.65		0.01	0.50	0.50
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	268	269	975		126		563	2285		24	1755	785
v/s Ratio Prot	0.12	c0.12			c0.06		c0.15	0.39		0.01	c0.41	
v/s Ratio Perm			0.12									0.12
v/c Ratio	0.75	0.78	0.22		0.58		0.93	0.60		0.46	0.83	0.17
Uniform Delay, d1	60.2	60.5	34.3		67.2		61.9	15.3		73.5	32.5	20.8
Progression Factor	0.77	0.77	1.19		1.00		1.10	1.14		1.00	1.00	1.00
Incremental Delay, d2	10.2	12.5	0.0		6.3		17.1	0.8		5.0	4.8	0.5
Delay (s)	56.6	59.2	40.9		73.5		84.9	18.2		78.4	37.3	21.2
Level of Service	E	E	D		E		F	B		E	D	C
Approach Delay (s)		50.5			73.5			36.7			35.7	
Approach LOS		D			E			D			D	

Intersection Summary

HCM Average Control Delay	39.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	485	557	141	446	318	178
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	527	605	153	485	346	193
RTOR Reduction (vph)	0	239	0	0	0	148
Lane Group Flow (vph)	527	366	153	485	346	45
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	83.0	83.0	18.5	105.5	33.5	33.5
Effective Green, g (s)	84.5	84.5	18.5	107.0	35.0	35.0
Actuated g/C Ratio	0.56	0.56	0.12	0.71	0.23	0.23
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	2.0
Lane Grp Cap (vph)	1049	892	218	2524	801	369
v/s Ratio Prot	0.28		c0.09	0.14	0.10	
v/s Ratio Perm		0.38				0.12
v/c Ratio	0.50	0.41	0.70	0.19	0.43	0.12
Uniform Delay, d1	19.9	18.6	63.1	7.1	49.0	45.4
Progression Factor	1.00	1.00	1.47	0.23	1.00	1.00
Incremental Delay, d2	1.7	1.4	5.5	0.1	1.7	0.7
Delay (s)	21.7	20.0	98.4	1.8	50.7	46.1
Level of Service	C	B	F	A	D	D
Approach Delay (s)	20.8			25.0	49.1	
Approach LOS	C			C	D	

Intersection Summary

HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	3433	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	3433	3539	2787	3433	3539	1583
Volume (vph)	49	164	189	490	179	506	135	1430	468	470	1365	92
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	173	199	516	188	533	142	1505	493	495	1437	97
RTOR Reduction (vph)	0	0	24	0	0	103	0	0	27	0	0	25
Lane Group Flow (vph)	52	173	175	516	188	430	142	1505	466	495	1437	72
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.3	14.5	27.5	30.5	35.7	67.3	13.0	87.4	117.9	31.6	106.0	106.0
Effective Green, g (s)	9.3	14.5	27.5	30.5	35.7	67.3	13.0	87.4	117.9	31.6	106.0	106.0
Actuated g/C Ratio	0.05	0.08	0.15	0.17	0.20	0.37	0.07	0.49	0.66	0.18	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	91	285	277	582	369	1104	248	1718	1887	603	2084	932
v/s Ratio Prot	0.03	0.05	c0.05	c0.15	0.10	0.08	0.04	c0.43	0.04	c0.14	0.41	
v/s Ratio Perm			0.07			0.11			0.13			0.06
v/c Ratio	0.57	0.61	0.63	0.89	0.51	0.39	0.57	0.88	0.25	0.82	0.69	0.08
Uniform Delay, d1	83.4	80.0	71.5	73.1	64.3	41.3	80.8	41.4	12.8	71.5	25.6	15.9
Progression Factor	1.00	1.00	1.00	0.86	1.02	1.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	3.6	4.7	14.1	1.0	0.2	3.2	6.6	0.1	8.8	1.9	0.2
Delay (s)	91.8	83.6	76.2	77.1	66.4	45.4	84.0	48.1	12.8	80.3	27.5	16.1
Level of Service	F	F	E	E	E	D	F	D	B	F	C	B
Approach Delay (s)		81.1			61.8			42.3			39.8	
Approach LOS		F			E			D			D	

Intersection Summary

HCM Average Control Delay	48.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	157	114	544	227	137	522
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	124	591	247	149	567
RTOR Reduction (vph)	0	102	0	114	0	0
Lane Group Flow (vph)	171	22	591	133	149	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	10.8	10.8	33.0	33.0	5.5	42.5
Effective Green, g (s)	10.8	10.8	33.0	33.0	5.5	42.5
Actuated g/C Ratio	0.18	0.18	0.54	0.54	0.09	0.69
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	312	279	1003	852	159	1292
v/s Ratio Prot	c0.10		c0.32		c0.08	0.30
v/s Ratio Perm		0.08		0.16		
v/c Ratio	0.55	0.08	0.59	0.16	0.94	0.44
Uniform Delay, d1	23.0	21.1	9.6	7.1	27.7	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1	0.9	0.1	52.5	0.2
Delay (s)	25.0	21.2	10.5	7.2	80.2	4.4
Level of Service	C	C	B	A	F	A
Approach Delay (s)	23.4		9.5			20.2
Approach LOS	C		A			C

Intersection Summary

HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.71	1.00		0.61	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1332	1583		1127	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	67	6	90	35	3	12	80	2056	27	11	1910	112
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	7	98	38	3	13	87	2235	29	12	2076	122
RTOR Reduction (vph)	0	0	89	0	0	12	0	0	4	0	0	20
Lane Group Flow (vph)	0	80	9	0	41	1	87	2235	25	12	2076	102
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		14.1	14.1		14.1	14.1	12.4	120.8	120.8	3.1	111.5	111.5
Effective Green, g (s)		14.1	14.1		14.1	14.1	12.4	120.8	120.8	3.1	111.5	111.5
Actuated g/C Ratio		0.09	0.09		0.09	0.09	0.08	0.81	0.81	0.02	0.74	0.74
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		125	149		106	149	146	2850	1275	37	2631	1177
v/s Ratio Prot							c0.05	c0.63		0.01	0.59	
v/s Ratio Perm		0.06	0.06		0.04	0.01			0.02			0.08
v/c Ratio		0.64	0.06		0.39	0.01	0.60	0.78	0.02	0.32	0.79	0.09
Uniform Delay, d1		65.5	61.9		63.9	61.6	66.4	7.7	2.9	72.4	11.9	5.3
Progression Factor		1.00	1.00		1.00	1.00	0.91	0.86	1.34	1.00	1.00	1.00
Incremental Delay, d2		10.7	0.2		2.3	0.0	4.5	1.6	0.0	5.1	2.5	0.1
Delay (s)		76.2	62.1		66.2	61.6	64.8	8.2	3.9	77.5	14.4	5.4
Level of Service		E	E		E	E	E	A	A	E	B	A
Approach Delay (s)		68.4			65.1			10.2			14.3	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	348	251	244	1686	1510	472
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	378	273	265	1833	1641	513
RTOR Reduction (vph)	0	193	0	0	0	143
Lane Group Flow (vph)	378	80	265	1833	1641	370
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	33.8	33.8	26.3	108.2	77.9	77.9
Effective Green, g (s)	33.8	33.8	26.3	108.2	77.9	77.9
Actuated g/C Ratio	0.23	0.23	0.18	0.72	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	399	357	310	2553	1838	822
v/s Ratio Prot	c0.21		c0.15	0.52	c0.46	
v/s Ratio Perm		0.17				0.32
v/c Ratio	0.95	0.22	0.85	0.72	0.89	0.45
Uniform Delay, d1	57.2	47.4	60.0	12.1	32.3	22.6
Progression Factor	1.00	1.00	1.00	1.00	0.76	0.70
Incremental Delay, d2	31.5	0.3	19.9	1.8	4.7	1.1
Delay (s)	88.7	47.7	79.9	13.9	29.3	17.0
Level of Service	F	D	E	B	C	B
Approach Delay (s)	71.5			22.2	26.3	
Approach LOS	E			C	C	

Intersection Summary

HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	3433	3539	1583		3539		3433	1863			1863	1583
Volume (vph)	376	130	287	0	390	0	390	37	0	0	60	171
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	141	312	0	424	0	424	40	0	0	65	186
RTOR Reduction (vph)	0	0	103	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	409	141	209	0	424	0	424	40	0	0	65	45
Turn Type	Prot		pt+ov	Prot			Prot			Perm		Perm
Protected Phases	7	4	4 5	3	8		5	2			6	
Permitted Phases										6		6
Actuated Green, G (s)	17.7	37.2	60.2		15.5		19.0	44.8			21.8	21.8
Effective Green, g (s)	17.7	37.2	60.2		15.5		19.0	44.8			21.8	21.8
Actuated g/C Ratio	0.20	0.41	0.67		0.17		0.21	0.50			0.24	0.24
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	675	1463	1059		609		725	927			451	383
v/s Ratio Prot	c0.12	0.04	0.20		c0.12		c0.12	0.02			0.03	
v/s Ratio Perm												0.12
v/c Ratio	0.61	0.10	0.20		0.70		0.58	0.04			0.14	0.12
Uniform Delay, d1	33.0	16.1	5.7		35.0		32.0	11.6			26.8	26.6
Progression Factor	1.20	1.26	5.22		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.4	0.0	0.1		3.5		1.2	0.1			0.7	0.6
Delay (s)	40.9	20.3	29.7		38.5		33.2	11.7			27.4	27.2
Level of Service	D	C	C		D		C	B			C	C
Approach Delay (s)		33.5			38.5			31.3			27.3	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

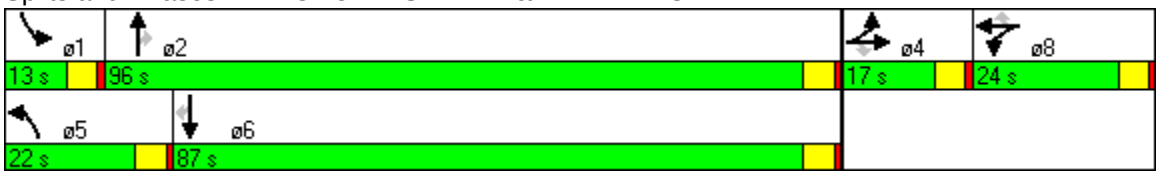
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	76	120	243	66	168	147	1742	99	138	1632	84
Lane Group Flow (vph)	102	106	130	164	172	183	160	1893	108	150	1774	91
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	17.0	17.0	17.0	24.0	24.0	24.0	22.0	96.0	96.0	13.0	87.0	87.0
Total Split (%)	11.3%	11.3%	11.3%	16.0%	16.0%	16.0%	14.7%	64.0%	64.0%	8.7%	58.0%	58.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.72	0.72	0.52	0.78	0.80	0.62	0.82	0.86	0.11	0.73	0.87	0.10
Control Delay	91.2	90.3	17.2	82.5	83.8	32.1	86.6	28.2	4.6	73.1	43.4	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.2	90.3	17.2	82.5	83.8	32.1	86.6	28.2	4.6	73.1	43.4	15.8
Queue Length 50th (ft)	104	108	0	165	173	62	154	774	13	77	654	26
Queue Length 95th (ft)	#196	#201	67	#273	#289	148	#263	895	38	m#118	980	m74
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	146	152	256	224	229	310	212	2212	1017	206	2031	933
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.70	0.51	0.73	0.75	0.59	0.75	0.86	0.11	0.73	0.87	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

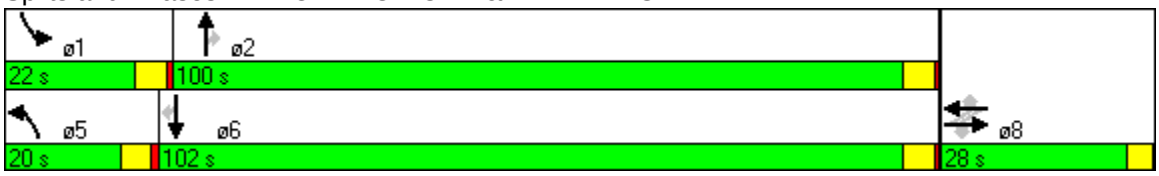


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	19	118	72	42	67	91	1715	151	100	1643	64
Lane Group Flow (vph)	85	21	128	78	46	73	99	1864	164	109	1786	70
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	28.0	20.0	100.0	100.0	22.0	102.0	102.0
Total Split (%)	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	13.3%	66.7%	66.7%	14.7%	68.0%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.63	0.11	0.47	0.56	0.25	0.33	0.62	0.73	0.14	0.63	0.69	0.06
Control Delay	68.8	58.9	11.7	67.3	61.1	13.6	78.1	26.0	5.5	83.7	18.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	58.9	11.7	67.3	61.1	13.6	78.1	26.0	5.5	83.7	18.6	3.2
Queue Length 50th (ft)	82	19	0	74	43	0	88	916	26	98	817	5
Queue Length 95th (ft)	135	45	61	125	81	48	m109	1084	m56	m123	1006	m22
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	217	298	361	222	298	315	189	2558	1178	212	2582	1170
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.07	0.35	0.35	0.15	0.23	0.52	0.73	0.14	0.51	0.69	0.06

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

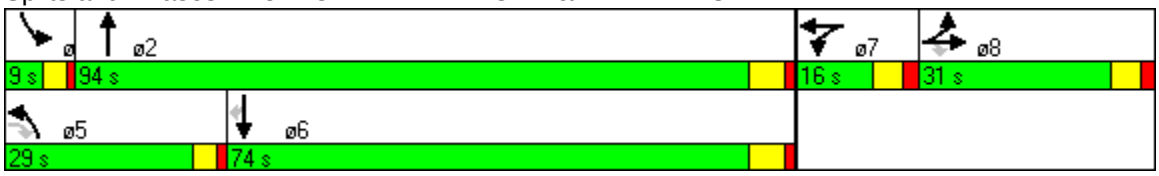


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	369	9	295	12	482	1244	10	1347	179
Lane Group Flow (vph)	201	210	321	97	524	1368	11	1464	195
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	22.0	22.0		11.0	22.5	26.0	9.0	33.0	33.0
Total Split (s)	31.0	31.0	60.0	16.0	29.0	94.0	9.0	74.0	74.0
Total Split (%)	20.7%	20.7%	40.0%	10.7%	19.3%	62.7%	6.0%	49.3%	49.3%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.75	0.78	0.30	0.64	0.93	0.58	0.19	0.83	0.23
Control Delay	56.2	57.7	20.0	65.3	83.9	18.3	77.9	38.8	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	57.7	20.0	65.3	83.9	18.3	77.9	38.8	9.3
Queue Length 50th (ft)	195	205	97	68	280	234	11	670	37
Queue Length 95th (ft)	294	308	140	132	#372	535	34	785	88
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	303	304	1076	160	572	2340	59	1754	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.69	0.30	0.61	0.92	0.58	0.19	0.83	0.23

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

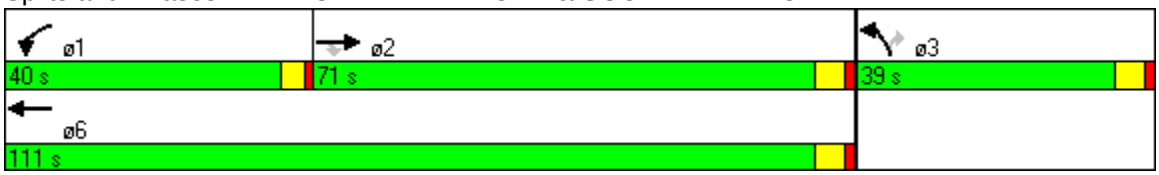


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	485	557	141	446	318	178
Lane Group Flow (vph)	527	605	153	485	346	193
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Detector Phases	2	2	1	6	3	3
Minimum Initial (s)	4.0	4.0	5.0	4.0	4.0	4.0
Minimum Split (s)	30.5	30.5	9.0	21.5	21.5	21.5
Total Split (s)	71.0	71.0	40.0	111.0	39.0	39.0
Total Split (%)	47.3%	47.3%	26.7%	74.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	1.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
v/c Ratio	0.50	0.53	0.70	0.19	0.43	0.37
Control Delay	23.1	4.4	93.0	1.8	51.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	4.4	93.0	1.8	51.0	8.0
Queue Length 50th (ft)	298	24	156	16	150	0
Queue Length 95th (ft)	467	112	m134	m16	200	66
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1049	1131	425	2524	801	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.53	0.36	0.19	0.43	0.37

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 30 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	164	189	490	179	506	135	1430	468	470	1365	92
Lane Group Flow (vph)	52	173	199	516	188	533	142	1505	493	495	1437	97
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	23.0	36.0	36.0	35.0	23.0	89.0	36.0	35.0	101.0	101.0
Total Split (%)	11.1%	11.1%	12.8%	20.0%	20.0%	19.4%	12.8%	49.4%	20.0%	19.4%	56.1%	56.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.50	0.64	0.68	0.89	0.51	0.44	0.57	0.87	0.26	0.82	0.68	0.10
Control Delay	87.0	87.3	66.1	75.4	71.1	30.4	83.4	47.9	9.7	81.0	28.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.0	87.3	66.1	75.4	71.1	30.4	83.4	47.9	9.7	81.0	28.3	7.6
Queue Length 50th (ft)	61	106	193	322	224	205	85	851	103	291	606	18
Queue Length 95th (ft)	111	150	278	#394	316	273	123	961	133	#368	761	51
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	157	315	345	610	370	1223	362	1745	1947	628	2099	964
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.55	0.58	0.85	0.51	0.44	0.39	0.86	0.25	0.79	0.68	0.10

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

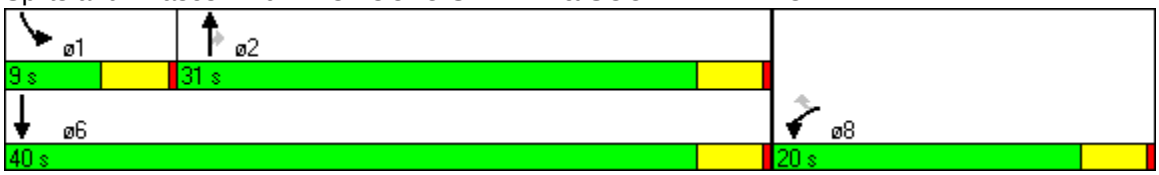
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	157	114	544	227	137	522
Lane Group Flow (vph)	171	124	591	247	149	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phases	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	31.0	31.0	9.0	40.0
Total Split (%)	33.3%	33.3%	51.7%	51.7%	15.0%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Min	Min	None	Min
v/c Ratio	0.52	0.31	0.60	0.26	0.94	0.44
Control Delay	19.9	5.5	13.4	2.3	87.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	5.5	13.4	2.3	87.0	6.2
Queue Length 50th (ft)	42	0	125	0	42	67
Queue Length 95th (ft)	97	33	270	32	#157	169
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	455	499	1054	1003	159	1343
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.25	0.56	0.25	0.94	0.42

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 61.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

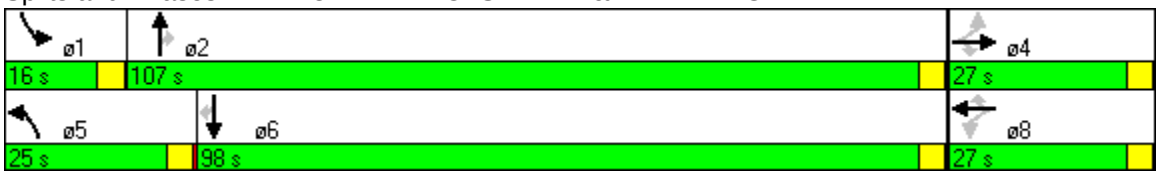


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	6	90	35	3	12	80	2056	27	11	1910	112
Lane Group Flow (vph)	0	80	98	0	41	13	87	2235	29	12	2076	122
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	25.0	107.0	107.0	16.0	98.0	98.0
Total Split (%)	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	16.7%	71.3%	71.3%	10.7%	65.3%	65.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.64	0.41		0.32	0.08	0.59	0.77	0.02	0.16	0.79	0.10
Control Delay		70.0	12.8		63.9	25.0	62.3	9.0	3.1	69.8	16.4	3.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		70.0	12.8		63.9	25.0	62.3	9.0	3.1	69.8	16.4	3.0
Queue Length 50th (ft)		77	0		38	0	85	283	1	12	593	10
Queue Length 95th (ft)		131	56		77	22	m113	682	m6	35	925	36
Internal Link Dist (ft)		212			261			1847			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		205	326		209	254	248	2908	1304	142	2631	1197
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.39	0.30		0.20	0.05	0.35	0.77	0.02	0.08	0.79	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 40 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

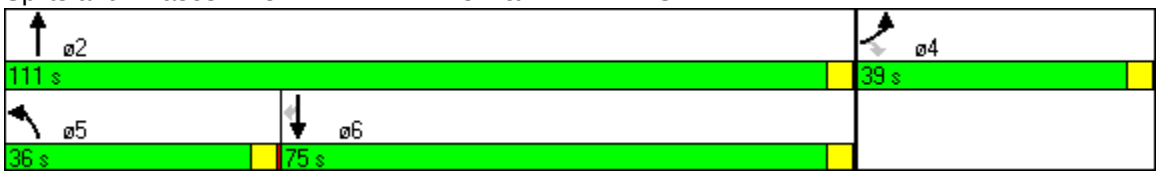


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	348	251	244	1686	1510	472
Lane Group Flow (vph)	378	273	265	1833	1641	513
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	39.0	39.0	36.0	111.0	75.0	75.0
Total Split (%)	26.0%	26.0%	24.0%	74.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.95	0.50	0.85	0.72	0.89	0.53
Control Delay	84.1	10.6	69.8	14.4	30.8	8.4
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	84.1	10.6	69.8	14.7	30.8	8.4
Queue Length 50th (ft)	364	18	253	514	668	57
Queue Length 95th (ft)	#559	101	347	594	#984	189
Internal Link Dist (ft)	745			1063	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	413	560	378	2551	1836	964
Starvation Cap Reductn	0	0	0	233	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.49	0.70	0.79	0.89	0.53

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

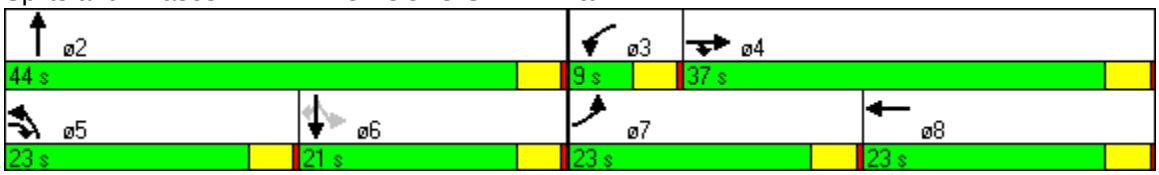


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	ø3
Lane Configurations									
Volume (vph)	376	130	287	390	390	37	60	171	
Lane Group Flow (vph)	409	141	312	424	424	40	65	186	
Turn Type	Prot		pt+ov		Prot			Perm	
Protected Phases	7	4	4 5	8	5	2	6		3
Permitted Phases								6	
Detector Phases	7	4	4 5	8	5	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		20.0	8.0	20.0	20.0	20.0	8.0
Total Split (s)	23.0	37.0	60.0	23.0	23.0	44.0	21.0	21.0	9.0
Total Split (%)	25.6%	41.1%	66.7%	25.6%	25.6%	48.9%	23.3%	23.3%	10%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lag	Lead		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.61	0.10	0.27	0.70	0.59	0.04	0.14	0.35	
Control Delay	42.2	19.5	2.2	37.9	34.9	13.5	31.2	7.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.2	19.5	2.2	37.9	34.9	13.5	31.2	7.2	
Queue Length 50th (ft)	199	48	13	120	107	12	31	0	
Queue Length 95th (ft)	247	m65	m84	163	160	31	67	54	
Internal Link Dist (ft)		146		432		103	80		
Turn Bay Length (ft)									
Base Capacity (vph)	725	1492	1174	747	759	929	453	526	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.56	0.09	0.27	0.57	0.56	0.04	0.14	0.35	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 8 (9%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: KAONOULU STREET & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	37	274	16	39	267	98	9	8	34	120	10	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	298	17	42	290	107	10	9	37	130	11	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	397			315			783	868	307	848	824	343
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343			315			763	857	307	834	808	285
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			96	97	95	44	96	98
cM capacity (veh/h)	1117			1245			265	252	733	231	269	692

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	315	42	397	10	46	130	26
Volume Left	40	0	42	0	10	0	130	0
Volume Right	0	17	0	107	0	37	0	15
cSH	1117	1700	1245	1700	265	538	231	418
Volume to Capacity	0.04	0.19	0.03	0.23	0.04	0.08	0.56	0.06
Queue Length 95th (ft)	3	0	3	0	3	7	78	5
Control Delay (s)	8.3	0.0	8.0	0.0	19.1	12.3	39.0	14.2
Lane LOS	A		A		C	B	E	B
Approach Delay (s)	0.9		0.8		13.5		34.8	
Approach LOS					B		D	

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	82	319	16	2	287	6	2	1	3	3	1	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	347	17	2	312	7	2	1	3	3	1	63
Approach Volume (veh/h)		453			321			7			67	
Crossing Volume (veh/h)		7			92			439			316	
High Capacity (veh/h)		1378			1288			980			1080	
High v/c (veh/h)		0.33			0.25			0.01			0.06	
Low Capacity (veh/h)		1155			1074			796			886	
Low v/c (veh/h)		0.39			0.30			0.01			0.08	

Intersection Summary			
Maximum v/c High	0.33		
Maximum v/c Low	0.39		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	791	311	0	1177	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	860	338	0	1279	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked			0.98		0.91	0.98
vC, conflicting volume			1198		1499	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1185		1394	404
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			576		120	586

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	430	430	338	640	640	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	338	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.25	0.20	0.38	0.38	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	791	950	0	0	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	860	1033	0	0	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		375	226			
pX, platoon unblocked	0.89				0.90	0.89
vC, conflicting volume	1033				1462	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918				1375	340
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	58
cM capacity (veh/h)	661				123	586

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	430	430	516	516	0	247
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	247
cSH	1700	1700	1700	1700	1700	586
Volume to Capacity	0.25	0.25	0.30	0.30	0.00	0.42
Queue Length 95th (ft)	0	0	0	0	0	52
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	15.5
Lane LOS						C
Approach Delay (s)	0.0		0.0			15.5
Approach LOS						C

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	20	109	0	40	350	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	118	0	43	380	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	512					
pX, platoon unblocked						
vC, conflicting volume			140		43	22
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			140		43	22
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		60	100
cM capacity (veh/h)			1441		962	1050

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	22	118	0	22	22	380
Volume Left	0	0	0	0	0	380
Volume Right	0	118	0	0	0	0
cSH	1700	1700	1700	1700	1700	962
Volume to Capacity	0.01	0.07	0.00	0.01	0.01	0.40
Queue Length 95th (ft)	0	0	0	0	0	48
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.2
Lane LOS						B
Approach Delay (s)	0.0		0.0			11.2
Approach LOS						B

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	20	0	0	40	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	0	0	43	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	712					
pX, platoon unblocked						
vC, conflicting volume			22		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			22		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	100
cM capacity (veh/h)			1594		1023	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	22	0	43
Volume Left	0	0	43
Volume Right	22	0	0
cSH	1700	1700	1023
Volume to Capacity	0.01	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1718	1583	1681	1740	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.97	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1718	1583	1681	1740	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	177	45	191	121	62	37	86	1297	150	95	1412	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	49	208	132	67	40	93	1410	163	103	1535	114
RTOR Reduction (vph)	0	0	129	0	0	37	0	0	77	0	0	52
Lane Group Flow (vph)	117	124	79	97	102	3	93	1410	86	103	1535	62
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	10.3	10.3	10.3	5.2	5.2	5.2	4.5	44.5	44.5	6.0	46.0	46.0
Effective Green, g (s)	11.3	11.3	11.3	6.2	6.2	6.2	5.5	45.5	45.5	7.0	47.0	47.0
Actuated g/C Ratio	0.13	0.13	0.13	0.07	0.07	0.07	0.06	0.53	0.53	0.08	0.55	0.55
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	221	226	208	121	125	114	113	1872	838	279	1934	865
v/s Ratio Prot	0.07	0.07		0.06	c0.06		c0.05	0.40		0.03	c0.43	
v/s Ratio Perm			0.13			0.03			0.10			0.07
v/c Ratio	0.53	0.55	0.38	0.80	0.82	0.03	0.82	0.75	0.10	0.37	0.79	0.07
Uniform Delay, d1	34.9	35.0	34.2	39.3	39.3	37.1	39.8	15.9	10.1	37.4	15.6	9.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	3.0	1.4	30.5	32.0	0.1	34.8	2.1	0.1	0.3	2.7	0.1
Delay (s)	37.5	38.0	35.5	69.8	71.4	37.2	74.6	18.0	10.2	37.7	18.3	9.3
Level of Service	D	D	D	E	E	D	E	B	B	D	B	A
Approach Delay (s)		36.7			65.0			20.4			18.9	
Approach LOS		D			E			C			B	

Intersection Summary

HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1359	1863	1583	1394	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	60	13	110	96	39	51	73	1331	108	68	1596	49
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	14	120	104	42	55	79	1447	117	74	1735	53
RTOR Reduction (vph)	0	0	104	0	0	47	0	0	41	0	0	19
Lane Group Flow (vph)	65	14	16	104	42	8	79	1447	76	74	1735	34
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	11.3	11.3	11.3	11.3	11.3	11.3	6.2	57.7	57.7	6.1	57.6	57.6
Effective Green, g (s)	12.3	12.3	12.3	12.3	12.3	12.3	7.2	58.7	58.7	7.1	58.6	58.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.65	0.65	0.08	0.65	0.65
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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	186	254	216	190	254	216	141	2306	1031	139	2302	1030
v/s Ratio Prot		0.01			0.02		c0.04	0.41		0.04	c0.49	
v/s Ratio Perm	0.05		0.08	0.07		0.03			0.07			0.03
v/c Ratio	0.35	0.06	0.08	0.55	0.17	0.03	0.56	0.63	0.07	0.53	0.75	0.03
Uniform Delay, d1	35.3	33.8	33.9	36.3	34.4	33.7	39.9	9.3	5.7	39.9	10.8	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1	0.2	4.0	0.4	0.1	3.0	0.8	0.1	2.0	1.7	0.0
Delay (s)	36.8	34.0	34.1	40.3	34.8	33.8	42.9	10.0	5.8	41.9	12.5	5.7
Level of Service	D	C	C	D	C	C	D	B	A	D	B	A
Approach Delay (s)		35.0			37.4			11.3			13.5	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Volume (vph)	186	0	436	1	0	2	179	1065	4	6	1251	157
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	0	474	1	0	2	195	1158	4	7	1360	171
RTOR Reduction (vph)	0	0	181	0	2	0	0	0	0	0	0	83
Lane Group Flow (vph)	101	101	293	0	1	0	195	1162	0	7	1360	88
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	7.1	7.1	23.9		0.8		10.8	49.1		0.8	39.1	39.1
Effective Green, g (s)	9.1	9.1	23.9		2.8		10.8	51.1		0.8	41.1	41.1
Actuated g/C Ratio	0.11	0.11	0.30		0.04		0.14	0.64		0.01	0.52	0.52
Clearance Time (s)	6.0	6.0			6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	192	192	835		58		465	2265		18	1823	815
v/s Ratio Prot	0.06	0.06			c0.00		0.06	0.33		0.00	c0.38	
v/s Ratio Perm			0.17									0.11
v/c Ratio	0.53	0.53	0.35		0.02		0.42	0.51		0.39	0.75	0.11
Uniform Delay, d1	33.3	33.3	21.9		37.2		31.6	7.7		39.3	15.2	9.9
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	2.6	0.1		0.1		0.2	0.3		5.0	1.9	0.1
Delay (s)	35.9	35.9	22.0		37.3		31.8	8.0		44.3	17.2	10.0
Level of Service	D	D	C		D		C	A		D	B	B
Approach Delay (s)		26.1			37.3			11.4			16.5	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	396	443	129	389	347	141
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	430	482	140	423	377	153
RTOR Reduction (vph)	0	272	0	0	0	0
Lane Group Flow (vph)	430	210	140	423	377	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	25.3	25.3	9.5	38.8	11.6	61.4
Effective Green, g (s)	26.8	26.8	9.5	40.3	13.1	61.4
Actuated g/C Ratio	0.44	0.44	0.15	0.66	0.21	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	813	691	274	2323	732	1583
v/s Ratio Prot	0.23		c0.08	0.12	c0.11	
v/s Ratio Perm		0.30				0.10
v/c Ratio	0.53	0.30	0.51	0.18	0.52	0.10
Uniform Delay, d1	12.7	11.2	23.8	4.1	21.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	0.7	0.1	0.3	0.0
Delay (s)	13.9	11.8	24.5	4.2	21.6	0.0
Level of Service	B	B	C	A	C	A
Approach Delay (s)	12.8			9.2	15.4	
Approach LOS	B			A	B	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	1.00	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Volume (vph)	74	226	170	619	204	601	129	810	634	673	924	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	246	185	673	222	653	140	880	689	732	1004	127
RTOR Reduction (vph)	0	0	21	0	0	164	0	0	28	0	0	77
Lane Group Flow (vph)	80	246	164	673	222	489	140	880	661	732	1004	50
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.0	10.5	20.1	19.0	21.5	42.5	9.6	23.9	42.9	21.0	35.3	35.3
Effective Green, g (s)	8.0	10.5	20.1	19.0	21.5	42.5	9.6	23.9	42.9	21.0	35.3	35.3
Actuated g/C Ratio	0.09	0.12	0.22	0.21	0.24	0.47	0.11	0.26	0.47	0.23	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	157	411	422	722	443	1434	188	936	1446	797	1382	618
v/s Ratio Prot	0.05	0.07	0.05	c0.20	0.12	c0.11	0.08	c0.25	0.10	c0.21	0.28	
v/s Ratio Perm			0.07			0.13			0.15			0.08
v/c Ratio	0.51	0.60	0.39	0.93	0.50	0.34	0.74	0.94	0.46	0.92	0.73	0.08
Uniform Delay, d1	39.3	37.9	29.9	35.1	29.8	15.1	39.2	32.6	15.9	33.9	23.4	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	2.3	0.6	18.8	0.9	0.1	14.8	16.8	0.2	15.4	1.9	0.1
Delay (s)	41.9	40.3	30.5	53.9	30.7	15.3	54.0	49.4	16.2	49.2	25.4	17.4
Level of Service	D	D	C	D	C	B	D	D	B	D	C	B
Approach Delay (s)		37.0			34.3			36.4			34.2	
Approach LOS		D			C			D			C	

Intersection Summary

HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.36	1.00
Satd. Flow (perm)	1770	1583	1863	1583	676	1863
Volume (vph)	200	116	536	224	145	455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	126	583	243	158	495
RTOR Reduction (vph)	0	97	0	102	0	0
Lane Group Flow (vph)	217	29	583	141	158	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.7	9.7	24.3	24.3	24.3	24.3
Effective Green, g (s)	9.7	9.7	24.3	24.3	24.3	24.3
Actuated g/C Ratio	0.23	0.23	0.58	0.58	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	409	366	1078	916	391	1078
v/s Ratio Prot	c0.12		c0.31			0.27
v/s Ratio Perm		0.08		0.15	0.23	
v/c Ratio	0.53	0.08	0.54	0.15	0.40	0.46
Uniform Delay, d1	14.2	12.7	5.4	4.1	4.9	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.1	0.6	0.1	0.7	0.3
Delay (s)	15.5	12.7	6.0	4.2	5.6	5.4
Level of Service	B	B	A	A	A	A
Approach Delay (s)	14.5		5.5			5.4
Approach LOS	B		A			A

Intersection Summary

HCM Average Control Delay	7.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	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				1770	3539			3539	1583
Flt Permitted		0.76	1.00				0.95	1.00			1.00	1.00
Satd. Flow (perm)		1410	1583				1770	3539			3539	1583
Volume (vph)	87	0	81	0	0	0	35	1583	0	0	1504	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	88	0	0	0	38	1721	0	0	1635	114
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	0	0	0	35
Lane Group Flow (vph)	0	95	10	0	0	0	38	1721	0	0	1635	79
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		10.3	10.3				4.3	68.8			60.5	60.5
Effective Green, g (s)		10.3	10.3				4.3	68.8			60.5	60.5
Actuated g/C Ratio		0.12	0.12				0.05	0.79			0.69	0.69
Clearance Time (s)		4.0	4.0				4.0	4.0			4.0	4.0
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		167	187				87	2795			2458	1100
v/s Ratio Prot							0.02	c0.49			c0.46	
v/s Ratio Perm		c0.07	0.06									0.07
v/c Ratio		0.57	0.06				0.44	0.62			0.67	0.07
Uniform Delay, d1		36.3	34.1				40.2	3.7			7.6	4.3
Progression Factor		1.00	1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2		4.4	0.1				3.5	0.4			0.7	0.0
Delay (s)		40.7	34.2				43.7	4.2			8.2	4.3
Level of Service		D	C				D	A			A	A
Approach Delay (s)		37.6			0.0			5.0			8.0	
Approach LOS		D			A			A			A	

Intersection Summary

HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	87.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	418	255	214	1303	1258	472
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	454	277	233	1416	1367	513
RTOR Reduction (vph)	0	197	0	0	0	291
Lane Group Flow (vph)	454	80	233	1416	1367	222
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.0	26.0	13.0	56.0	39.0	39.0
Effective Green, g (s)	26.0	26.0	13.0	56.0	39.0	39.0
Actuated g/C Ratio	0.29	0.29	0.14	0.62	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	511	457	256	2202	1534	686
v/s Ratio Prot	c0.26		c0.13	0.40	c0.39	
v/s Ratio Perm		0.17				0.32
v/c Ratio	0.89	0.18	0.91	0.64	0.89	0.32
Uniform Delay, d1	30.6	24.0	37.9	10.7	23.5	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	0.8	37.1	1.5	8.2	1.3
Delay (s)	50.7	24.8	75.1	12.2	31.8	18.1
Level of Service	D	C	E	B	C	B
Approach Delay (s)	40.9			21.1	28.0	
Approach LOS	D			C	C	

Intersection Summary

HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	3433	3539	1583		3539		3433	1863			1863	1583
Volume (vph)	414	199	442	0	518	0	518	60	0	0	55	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	450	216	480	0	563	0	563	65	0	0	60	185
RTOR Reduction (vph)	0	0	278	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	450	216	202	0	563	0	563	65	0	0	60	44
Turn Type	Prot		Prot	Prot			Prot			Prot		Perm
Protected Phases	7	4	4	3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.6	37.9	37.9		18.3		18.8	44.1			21.3	21.3
Effective Green, g (s)	15.6	37.9	37.9		18.3		18.8	44.1			21.3	21.3
Actuated g/C Ratio	0.17	0.42	0.42		0.20		0.21	0.49			0.24	0.24
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	595	1490	667		720		717	913			441	375
v/s Ratio Prot	0.13	0.06	c0.30		0.16		c0.16	0.03			0.03	
v/s Ratio Perm												0.12
v/c Ratio	0.76	0.14	0.30		0.78		0.79	0.07			0.14	0.12
Uniform Delay, d1	35.4	16.1	17.3		34.0		33.7	12.1			27.1	27.0
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.5	0.0	0.3		5.5		5.7	0.2			0.6	0.6
Delay (s)	40.8	16.1	17.5		39.5		39.3	12.3			27.7	27.6
Level of Service	D	B	B		D		D	B			C	C
Approach Delay (s)		26.4			39.5			36.5			27.6	
Approach LOS		C			D			D			C	

Intersection Summary

HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

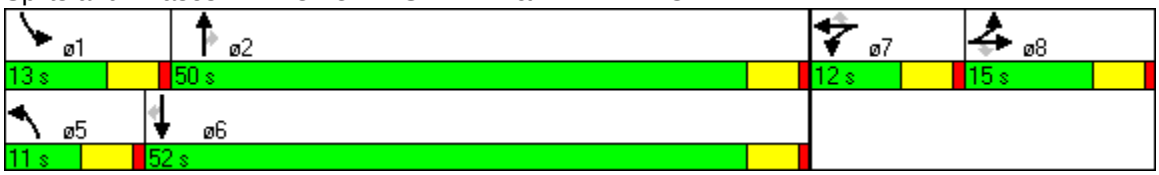
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	45	191	121	62	37	86	1297	150	95	1412	105
Lane Group Flow (vph)	117	124	208	97	102	40	93	1410	163	103	1535	114
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	15.0	15.0	15.0	12.0	12.0	12.0	11.0	50.0	50.0	13.0	52.0	52.0
Total Split (%)	16.7%	16.7%	16.7%	13.3%	13.3%	13.3%	12.2%	55.6%	55.6%	14.4%	57.8%	57.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.52	0.53	0.61	0.64	0.65	0.22	0.66	0.73	0.17	0.29	0.77	0.12
Control Delay	46.0	46.4	21.3	58.0	57.8	15.8	61.5	19.0	2.5	39.6	19.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	46.4	21.3	58.0	57.8	15.8	61.5	19.0	2.5	39.6	19.0	2.5
Queue Length 50th (ft)	67	71	32	56	60	0	53	325	0	28	356	0
Queue Length 95th (ft)	#127	#140	103	#131	#136	30	#126	415	29	53	455	24
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	227	232	342	157	163	185	146	1948	945	361	2017	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.53	0.61	0.62	0.63	0.22	0.64	0.72	0.17	0.29	0.76	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 83.7
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

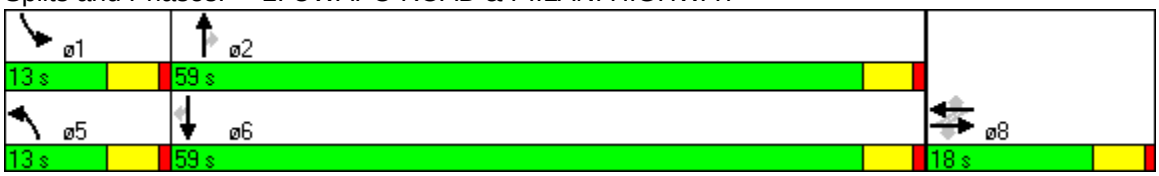


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	13	110	96	39	51	73	1331	108	68	1596	49
Lane Group Flow (vph)	65	14	120	104	42	55	79	1447	117	74	1735	53
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	18.0	18.0	18.0	18.0	18.0	18.0	13.0	59.0	59.0	13.0	59.0	59.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	14.4%	65.6%	65.6%	14.4%	65.6%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.35	0.05	0.37	0.54	0.16	0.21	0.49	0.62	0.11	0.47	0.75	0.05
Control Delay	38.4	33.0	9.8	42.7	34.4	11.5	46.9	11.5	1.7	45.9	14.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	33.0	9.8	42.7	34.4	11.5	46.9	11.5	1.7	45.9	14.2	2.2
Queue Length 50th (ft)	33	7	0	55	21	0	43	258	0	40	360	0
Queue Length 95th (ft)	72	24	47	106	50	32	88	331	19	84	461	13
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	210	288	346	215	288	291	174	2329	1082	174	2327	1059
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.05	0.35	0.48	0.15	0.19	0.45	0.62	0.11	0.43	0.75	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

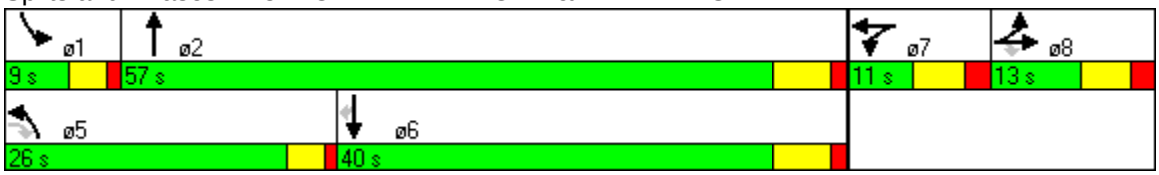


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	186	0	436	0	179	1065	6	1251	157
Lane Group Flow (vph)	101	101	474	3	195	1162	7	1360	171
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	5.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	26.0	26.0	9.0	26.0	26.0
Total Split (s)	13.0	13.0	39.0	11.0	26.0	57.0	9.0	40.0	40.0
Total Split (%)	14.4%	14.4%	43.3%	12.2%	28.9%	63.3%	10.0%	44.4%	44.4%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.0	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	Min	None	Min	Min
v/c Ratio	0.47	0.47	0.43	0.02	0.38	0.46	0.06	0.73	0.19
Control Delay	39.7	39.7	9.6	29.3	29.2	6.1	38.5	16.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	39.7	9.6	29.3	29.2	6.1	38.5	16.6	2.5
Queue Length 50th (ft)	41	41	35	0	37	70	3	202	0
Queue Length 95th (ft)	#127	#127	100	9	84	252	18	415	31
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	214	214	1336	148	920	2559	113	1865	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.35	0.02	0.21	0.45	0.06	0.73	0.19

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 71.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

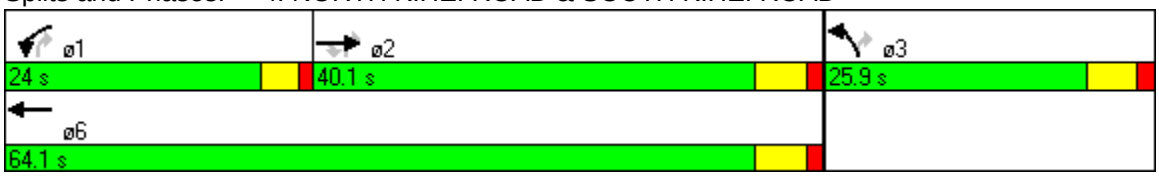


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	396	443	129	389	347	141
Lane Group Flow (vph)	430	482	140	423	377	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	30.5	30.5	9.0	15.5	12.5	
Total Split (s)	40.1	40.1	24.0	64.1	25.9	90.0
Total Split (%)	44.6%	44.6%	26.7%	71.2%	28.8%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	
v/c Ratio	0.54	0.51	0.52	0.18	0.52	0.10
Control Delay	15.8	3.1	29.6	4.5	25.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	3.1	29.6	4.5	25.0	0.1
Queue Length 50th (ft)	109	0	51	26	68	0
Queue Length 95th (ft)	246	53	120	54	128	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	955	1047	504	2618	1097	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.46	0.28	0.16	0.34	0.10

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62.3
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	226	170	619	204	601	129	810	634	673	924	117
Lane Group Flow (vph)	80	246	185	673	222	653	140	880	689	732	1004	127
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	16.0	14.0	14.0	23.0	21.0	25.0	14.0	28.0	23.0	25.0	39.0	39.0
Total Split (%)	17.8%	15.6%	15.6%	25.6%	23.3%	27.8%	15.6%	31.1%	25.6%	27.8%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
v/c Ratio	0.45	0.65	0.43	0.92	0.50	0.41	0.74	0.93	0.46	0.91	0.72	0.18
Control Delay	41.8	45.9	27.0	55.0	35.8	8.1	59.7	49.5	13.6	50.5	26.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	45.9	27.0	55.0	35.8	8.1	59.7	49.5	13.6	50.5	26.7	4.1
Queue Length 50th (ft)	43	71	73	194	113	60	78	256	121	209	251	0
Queue Length 95th (ft)	86	111	135	#300	193	111	#166	#376	170	#314	325	34
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	226	394	422	729	447	1596	197	948	1485	805	1395	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.62	0.44	0.92	0.50	0.41	0.71	0.93	0.46	0.91	0.72	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

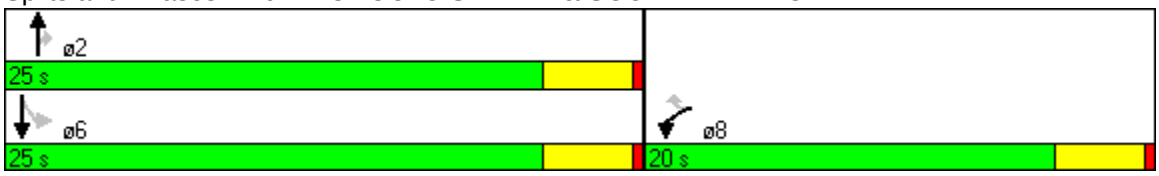
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	200	116	536	224	145	455
Lane Group Flow (vph)	217	126	583	243	158	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	25.0	25.0	25.0	25.0
Total Split (%)	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.49	0.26	0.53	0.23	0.50	0.45
Control Delay	12.6	3.7	8.8	1.8	16.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	3.7	8.8	1.8	16.1	7.9
Queue Length 50th (ft)	32	0	67	0	18	53
Queue Length 95th (ft)	80	24	186	25	#103	148
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	609	627	1160	1077	332	1160
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.50	0.23	0.48	0.43

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 41.9
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

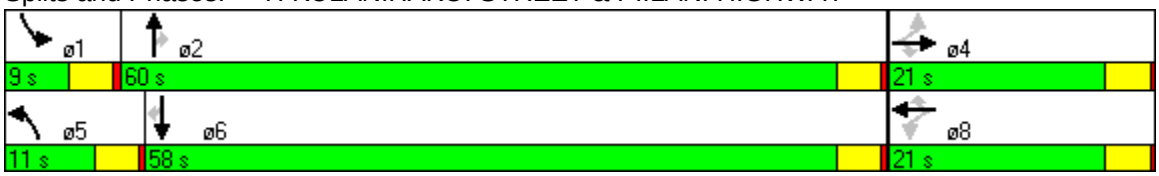


Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR	ø1	ø8
Lane Configurations									
Volume (vph)	87	0	81	35	1583	1504	105		
Lane Group Flow (vph)	0	95	88	38	1721	1635	114		
Turn Type	Perm		Perm	Prot			Perm		
Protected Phases		4		5	2	6		1	8
Permitted Phases	4		4				6		
Detector Phases	4	4	4	5	2	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	21.0	11.0	60.0	58.0	58.0	9.0	21.0
Total Split (%)	23.3%	23.3%	23.3%	12.2%	66.7%	64.4%	64.4%	10%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag				Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min	None	None
v/c Ratio		0.52	0.31	0.28	0.61	0.65	0.10		
Control Delay		33.9	9.1	40.7	5.5	10.2	1.7		
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay		33.9	9.1	40.7	5.5	10.2	1.7		
Queue Length 50th (ft)		42	0	17	151	258	0		
Queue Length 95th (ft)		94	39	51	284	413	19		
Internal Link Dist (ft)		212			1953	2017			
Turn Bay Length (ft)									
Base Capacity (vph)		271	376	145	2850	2590	1189		
Starvation Cap Reductn		0	0	0	0	0	0		
Spillback Cap Reductn		0	0	0	0	0	0		
Storage Cap Reductn		0	0	0	0	0	0		
Reduced v/c Ratio		0.35	0.23	0.26	0.60	0.63	0.10		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 85.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	418	255	214	1303	1258	472
Lane Group Flow (vph)	454	277	233	1416	1367	513
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	17.0	60.0	43.0	43.0
Total Split (%)	33.3%	33.3%	18.9%	66.7%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.89	0.42	0.91	0.64	0.89	0.53
Control Delay	52.2	5.4	77.3	12.4	32.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	5.4	77.3	12.4	32.5	3.7
Queue Length 50th (ft)	246	0	132	242	366	0
Queue Length 95th (ft)	#421	56	#269	308	#509	56
Internal Link Dist (ft)	620			1070	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	511	654	256	2202	1534	977
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.42	0.91	0.64	0.89	0.53

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

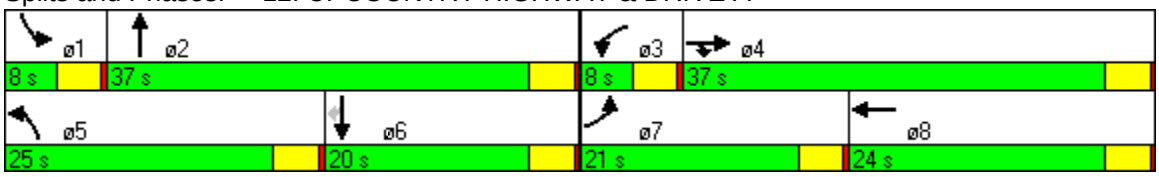
Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations										
Volume (vph)	414	199	442	518	518	60	55	170		
Lane Group Flow (vph)	450	216	480	563	563	65	60	185		
Turn Type	Prot		Prot		Prot			Perm		
Protected Phases	7	4	4	8	5	2	6		1	3
Permitted Phases								6		
Detector Phases	7	4	4	8	5	2	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	8.0
Total Split (s)	21.0	37.0	37.0	24.0	25.0	37.0	20.0	20.0	8.0	8.0
Total Split (%)	23.3%	41.1%	41.1%	26.7%	27.8%	41.1%	22.2%	22.2%	9%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	None	None
v/c Ratio	0.76	0.15	0.51	0.78	0.78	0.07	0.14	0.36		
Control Delay	41.4	15.6	3.5	39.4	38.6	13.9	31.7	7.4		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	41.4	15.6	3.5	39.4	38.6	13.9	31.7	7.4		
Queue Length 50th (ft)	124	36	0	156	153	20	29	0		
Queue Length 95th (ft)	175	57	52	214	208	43	64	55		
Internal Link Dist (ft)		86		399		103	80			
Turn Bay Length (ft)										
Base Capacity (vph)	648	1508	950	788	801	914	441	516		
Starvation Cap Reductn	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.69	0.14	0.51	0.71	0.70	0.07	0.14	0.36		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 8 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 12: UPCOUNTRY HIGHWAY & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	326	11	25	308	81	9	9	28	118	5	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	354	12	27	335	88	10	10	30	128	5	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	423			366			823	890	360	875	852	379
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	376			366			808	881	360	865	840	328
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	96	96	43	98	97
cM capacity (veh/h)	1094			1192			255	252	684	227	266	659

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	26	366	27	423	10	40	128	24
Volume Left	26	0	27	0	10	0	128	0
Volume Right	0	12	0	88	0	30	0	18
cSH	1094	1700	1192	1700	255	483	227	494
Volume to Capacity	0.02	0.22	0.02	0.25	0.04	0.08	0.57	0.05
Queue Length 95th (ft)	2	0	2	0	3	7	78	4
Control Delay (s)	8.4	0.0	8.1	0.0	19.7	13.1	39.7	12.7
Lane LOS	A		A		C	B	E	B
Approach Delay (s)	0.6		0.5		14.4		35.5	
Approach LOS					B		E	

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	70	363	10	6	332	8	5	4	7	7	3	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	395	11	7	361	9	5	4	8	8	3	98
Approach Volume (veh/h)		482			376			17			109	
Crossing Volume (veh/h)		17			86			478			373	
High Capacity (veh/h)		1366			1295			950			1033	
High v/c (veh/h)		0.35			0.29			0.02			0.11	
Low Capacity (veh/h)		1144			1080			769			843	
Low v/c (veh/h)		0.42			0.35			0.02			0.13	

Intersection Summary			
Maximum v/c High	0.35		
Maximum v/c Low	0.42		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1056	479	0	1415	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1148	521	0	1538	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked					0.86	
vC, conflicting volume			1668		1917	574
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1668		1903	574
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			381		52	462

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	574	574	521	769	769	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	521	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.34	0.31	0.45	0.45	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1056	1206	0	0	219
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1148	1311	0	0	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		435	166			
pX, platoon unblocked	0.85				0.85	0.85
vC, conflicting volume	1311				1885	655
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1191				1865	422
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	52
cM capacity (veh/h)	496				55	494

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	574	574	655	655	0	238
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	238
cSH	1700	1700	1700	1700	1700	494
Volume to Capacity	0.34	0.34	0.39	0.39	0.00	0.48
Queue Length 95th (ft)	0	0	0	0	0	64
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	18.9
Lane LOS						C
Approach Delay (s)	0.0		0.0			18.9
Approach LOS						C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	31	168	0	62	456	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	183	0	67	496	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	479					
pX, platoon unblocked						
vC, conflicting volume			216		67	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216		67	34
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		47	100
cM capacity (veh/h)			1351		930	1032

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	34	183	0	34	34	496
Volume Left	0	0	0	0	0	496
Volume Right	0	183	0	0	0	0
cSH	1700	1700	1700	1700	1700	930
Volume to Capacity	0.02	0.11	0.00	0.02	0.02	0.53
Queue Length 95th (ft)	0	0	0	0	0	81
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.2
Lane LOS						B
Approach Delay (s)	0.0		0.0			13.2
Approach LOS						B

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	31	0	0	62	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	34	0	0	67	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	629					
pX, platoon unblocked						
vC, conflicting volume			34		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			34		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1578		1023	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	34	0	67
Volume Left	0	0	67
Volume Right	34	0	0
cSH	1700	1700	1023
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	6.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F
Level-of-Service Worksheets for With Promenade With Honuaula Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1770	1583	1681	1709	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1770	1583	1681	1709	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	93	88	95	227	40	177	38	1226	53	167	1602	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	96	103	247	43	192	41	1333	58	182	1741	84
RTOR Reduction (vph)	0	0	89	0	0	166	0	0	23	0	0	25
Lane Group Flow (vph)	101	96	14	141	149	26	41	1333	35	182	1741	59
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	15.4	15.4	15.4	15.7	15.7	15.7	8.1	60.6	60.6	13.3	65.8	65.8
Effective Green, g (s)	16.4	16.4	16.4	16.7	16.7	16.7	9.1	61.6	61.6	14.3	66.8	66.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.07	0.49	0.49	0.11	0.53	0.53
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	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	221	232	208	225	228	211	129	1744	780	393	1891	846
v/s Ratio Prot	0.06	0.05		0.08	0.09		0.02	0.38		c0.05	c0.49	
v/s Ratio Perm			0.07			0.12			0.04			0.05
v/c Ratio	0.46	0.41	0.06	0.63	0.65	0.12	0.32	0.76	0.04	0.46	0.92	0.07
Uniform Delay, d1	50.2	49.9	47.6	51.2	51.4	47.7	55.0	25.8	16.4	51.8	26.7	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.06	0.61	1.03	1.28	0.67	0.28
Incremental Delay, d2	1.5	1.2	0.1	5.4	6.6	0.3	0.5	3.0	0.1	0.3	7.9	0.1
Delay (s)	51.7	51.1	47.7	56.6	58.0	47.9	58.9	18.6	17.1	66.4	25.8	4.1
Level of Service	D	D	D	E	E	D	E	B	B	E	C	A
Approach Delay (s)		50.1			53.6			19.7			28.6	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1374	1863	1583	1389	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	138	17	122	86	28	106	30	1424	68	34	1400	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	18	133	93	30	115	33	1548	74	37	1522	23
RTOR Reduction (vph)	0	0	111	0	0	96	0	0	23	0	0	7
Lane Group Flow (vph)	150	18	22	93	30	19	33	1548	51	37	1522	16
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6	19.6	6.0	84.4	84.4	6.0	84.4	84.4
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	7.0	85.4	85.4	7.0	85.4	85.4
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.06	0.68	0.68	0.06	0.68	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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	226	307	261	229	307	261	99	2418	1082	99	2418	1082
v/s Ratio Prot		0.01			0.02		0.02	c0.44		c0.02	0.43	
v/s Ratio Perm	c0.11		0.08	0.07		0.07			0.05			0.01
v/c Ratio	0.66	0.06	0.08	0.41	0.10	0.07	0.33	0.64	0.05	0.37	0.63	0.01
Uniform Delay, d1	49.0	44.0	44.2	46.7	44.3	44.1	56.8	11.1	6.5	56.9	11.0	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.56	1.93	4.05	0.79	1.96	2.51
Incremental Delay, d2	7.8	0.1	0.2	1.6	0.2	0.2	0.5	0.9	0.1	0.7	1.0	0.0
Delay (s)	56.8	44.1	44.4	48.3	44.5	44.3	32.5	22.5	26.3	45.5	22.6	15.9
Level of Service	E	D	D	D	D	D	C	C	C	D	C	B
Approach Delay (s)		50.6			45.9			22.9			23.0	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1699	2787		1752		3433	3536		1770	3539	1583
Volume (vph)	211	20	349	14	2	4	408	1250	8	3	1169	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	22	379	15	2	4	443	1359	9	3	1271	120
RTOR Reduction (vph)	0	0	121	0	4	0	0	0	0	0	0	51
Lane Group Flow (vph)	122	129	258	0	17	0	443	1368	0	3	1271	69
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	13.8	13.8	41.0		3.6		21.2	84.6		1.0	63.9	63.9
Effective Green, g (s)	15.8	15.8	41.5		5.6		21.7	86.6		1.0	65.9	65.9
Actuated g/C Ratio	0.13	0.13	0.33		0.04		0.17	0.69		0.01	0.53	0.53
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	212	215	925		78		596	2450		14	1866	835
v/s Ratio Prot	0.07	c0.08			c0.01		c0.13	0.39		0.00	c0.36	
v/s Ratio Perm			0.14									0.08
v/c Ratio	0.58	0.60	0.28		0.22		0.74	0.56		0.21	0.68	0.08
Uniform Delay, d1	51.4	51.6	30.7		57.6		49.0	9.6		61.6	21.8	14.6
Progression Factor	1.07	1.07	1.76		1.00		0.82	1.87		1.00	1.00	1.00
Incremental Delay, d2	3.7	4.4	0.2		1.4		4.1	0.7		2.8	2.0	0.2
Delay (s)	58.9	59.8	54.4		59.0		44.5	18.7		64.4	23.8	14.8
Level of Service	E	E	D		E		D	B		E	C	B
Approach Delay (s)		56.4			59.0			25.0			23.1	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	333	281	81	465	431	185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	305	88	505	468	201
RTOR Reduction (vph)	0	109	0	0	0	0
Lane Group Flow (vph)	362	196	88	505	468	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	78.9	78.9	10.5	93.4	20.6	125.0
Effective Green, g (s)	80.4	80.4	10.5	94.9	22.1	125.0
Actuated g/C Ratio	0.64	0.64	0.08	0.76	0.18	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	1198	1018	149	2687	607	1583
v/s Ratio Prot	c0.19		c0.05	0.14	c0.14	
v/s Ratio Perm		0.19				0.13
v/c Ratio	0.30	0.19	0.59	0.19	0.77	0.13
Uniform Delay, d1	9.9	9.1	55.2	4.2	49.0	0.0
Progression Factor	1.00	1.00	1.21	0.22	1.00	1.00
Incremental Delay, d2	0.6	0.4	3.6	0.1	5.5	0.0
Delay (s)	10.5	9.5	70.5	1.1	54.5	0.0
Level of Service	B	A	E	A	D	A
Approach Delay (s)	10.1			11.4	38.2	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	1.00	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Volume (vph)	50	73	236	152	75	152	111	1067	145	154	1560	68
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	79	257	165	82	165	121	1160	158	167	1696	74
RTOR Reduction (vph)	0	0	12	0	0	135	0	0	49	0	0	22
Lane Group Flow (vph)	54	79	245	165	82	30	121	1160	109	167	1696	52
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.9	10.9	26.4	8.1	11.1	22.6	15.5	78.5	86.6	11.5	74.5	74.5
Effective Green, g (s)	7.9	10.9	26.4	8.1	11.1	22.6	15.5	78.5	86.6	11.5	74.5	74.5
Actuated g/C Ratio	0.06	0.09	0.21	0.06	0.09	0.18	0.12	0.63	0.69	0.09	0.60	0.60
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	112	309	385	222	165	593	219	2222	2020	316	2109	943
v/s Ratio Prot	0.03	0.02	c0.08	c0.05	0.04	0.03	0.07	c0.33	0.01	0.05	c0.48	
v/s Ratio Perm			0.08			0.03			0.05			0.05
v/c Ratio	0.48	0.26	0.64	0.74	0.50	0.05	0.55	0.52	0.05	0.53	0.80	0.05
Uniform Delay, d1	56.6	53.3	44.9	57.4	54.3	42.3	51.5	12.9	6.1	54.2	19.6	10.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.70	2.03	5.94	0.75	1.24	2.38
Incremental Delay, d2	3.2	0.4	3.4	12.6	2.3	0.0	2.5	0.7	0.0	0.8	1.8	0.1
Delay (s)	59.8	53.7	48.4	70.0	56.6	42.4	38.6	26.8	36.4	41.3	26.1	25.2
Level of Service	E	D	D	E	E	D	D	C	D	D	C	C
Approach Delay (s)		51.0			56.3			28.9			27.4	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.37	1.00
Satd. Flow (perm)	1770	1583	1863	1583	695	1863
Volume (vph)	127	70	558	121	62	374
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	76	607	132	67	407
RTOR Reduction (vph)	0	62	0	44	0	0
Lane Group Flow (vph)	138	14	607	88	67	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.2	10.2	37.0	37.0	37.0	37.0
Effective Green, g (s)	10.2	10.2	37.0	37.0	37.0	37.0
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.67	0.67
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	327	293	1249	1061	466	1249
v/s Ratio Prot	c0.08		c0.33			0.22
v/s Ratio Perm		0.05		0.08	0.10	
v/c Ratio	0.42	0.05	0.49	0.08	0.14	0.33
Uniform Delay, d1	19.9	18.5	4.4	3.2	3.3	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.3	0.0	0.1	0.2
Delay (s)	20.8	18.6	4.7	3.2	3.5	4.0
Level of Service	C	B	A	A	A	A
Approach Delay (s)	20.0		4.5			3.9
Approach LOS	B		A			A

Intersection Summary

HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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)		1815	1583		1779	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.76	1.00		0.64	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1409	1583		1201	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	35	32	124	68	5	24	31	1420	123	50	2018	42
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	35	135	74	5	26	34	1543	134	54	2193	46
RTOR Reduction (vph)	0	0	77	0	0	23	0	0	34	0	0	10
Lane Group Flow (vph)	0	73	58	0	79	3	34	1543	100	54	2193	36
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		12.4	12.4		12.4	12.4	4.0	93.6	93.6	7.0	96.6	96.6
Effective Green, g (s)		12.4	12.4		12.4	12.4	4.0	93.6	93.6	7.0	96.6	96.6
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.03	0.75	0.75	0.06	0.77	0.77
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		140	157		119	157	57	2650	1185	99	2735	1223
v/s Ratio Prot							0.02	0.44		c0.03	c0.62	
v/s Ratio Perm		0.05	0.09		0.07	0.02			0.08			0.03
v/c Ratio		0.52	0.37		0.66	0.02	0.60	0.58	0.08	0.55	0.80	0.03
Uniform Delay, d1		53.5	52.6		54.3	50.8	59.7	7.0	4.2	57.5	8.5	3.3
Progression Factor		1.00	1.00		1.00	1.00	1.21	1.32	0.71	0.92	1.50	2.31
Incremental Delay, d2		3.5	1.5		13.1	0.0	13.3	0.8	0.1	4.1	1.8	0.0
Delay (s)		57.0	54.1		67.4	50.8	85.6	10.0	3.1	56.9	14.5	7.7
Level of Service		E	D		E	D	F	A	A	E	B	A
Approach Delay (s)		55.1			63.3			11.0			15.4	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	308	180	101	1206	1661	416
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	335	196	110	1311	1805	452
RTOR Reduction (vph)	0	114	0	0	0	144
Lane Group Flow (vph)	335	82	110	1311	1805	308
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.5	26.5	10.2	90.5	76.3	76.3
Effective Green, g (s)	26.5	26.5	10.2	90.5	76.3	76.3
Actuated g/C Ratio	0.21	0.21	0.08	0.72	0.61	0.61
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	375	336	144	2562	2160	966
v/s Ratio Prot	c0.19		c0.06	0.37	c0.51	
v/s Ratio Perm		0.12				0.29
v/c Ratio	0.89	0.24	0.76	0.51	0.84	0.32
Uniform Delay, d1	47.9	40.9	56.2	7.6	19.4	11.8
Progression Factor	1.00	1.00	1.00	1.00	0.86	0.94
Incremental Delay, d2	22.5	0.4	21.1	0.7	2.6	0.5
Delay (s)	70.4	41.3	77.3	8.3	19.3	11.6
Level of Service	E	D	E	A	B	B
Approach Delay (s)	59.7			13.6	17.7	
Approach LOS	E			B	B	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.64	1.00	1.00		1.00		0.75	1.00			1.00	1.00
Satd. Flow (perm)	2307	3539	1583		3539		2714	1863			1863	1583
Volume (vph)	131	65	90	0	166	0	67	12	0	0	9	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	71	98	0	180	0	73	13	0	0	10	64
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	0	0	0	38
Lane Group Flow (vph)	142	71	39	0	180	0	73	13	0	0	10	26
Turn Type	Perm		Perm	Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	16.0	16.0	16.0		16.0		16.0	16.0			16.0	16.0
Effective Green, g (s)	16.0	16.0	16.0		16.0		16.0	16.0			16.0	16.0
Actuated g/C Ratio	0.40	0.40	0.40		0.40		0.40	0.40			0.40	0.40
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	923	1416	633		1416		1086	745			745	633
v/s Ratio Prot		0.02			0.05			0.01			0.01	
v/s Ratio Perm	0.06		0.06				0.03					0.04
v/c Ratio	0.15	0.05	0.06		0.13		0.07	0.02			0.01	0.04
Uniform Delay, d1	7.7	7.3	7.4		7.6		7.4	7.3			7.2	7.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.4	0.1	0.2		0.2		0.1	0.0			0.0	0.1
Delay (s)	8.0	7.4	7.6		7.8		7.5	7.3			7.3	7.4
Level of Service	A	A	A		A		A	A			A	A
Approach Delay (s)		7.7			7.8			7.5			7.4	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

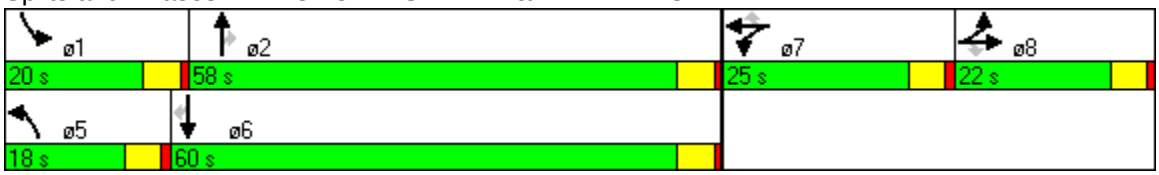
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	88	95	227	40	177	38	1226	53	167	1602	77
Lane Group Flow (vph)	101	96	103	141	149	192	41	1333	58	182	1741	84
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	22.0	22.0
Minimum Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (s)	22.0	22.0	22.0	25.0	25.0	25.0	18.0	58.0	58.0	20.0	60.0	60.0
Total Split (%)	17.6%	17.6%	17.6%	20.0%	20.0%	20.0%	14.4%	46.4%	46.4%	16.0%	48.0%	48.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.46	0.41	0.35	0.63	0.65	0.51	0.26	0.76	0.07	0.46	0.91	0.10
Control Delay	55.9	54.5	12.0	56.7	57.3	9.8	59.3	19.5	7.7	68.9	26.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	54.5	12.0	56.7	57.3	9.8	59.3	19.5	7.7	68.9	26.6	2.4
Queue Length 50th (ft)	81	76	0	114	122	0	34	104	1	79	776	1
Queue Length 95th (ft)	141	133	52	182	191	66	m67	350	m24	119	#929	m8
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	242	255	316	282	287	426	198	1743	803	439	1920	883
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.38	0.33	0.50	0.52	0.45	0.21	0.76	0.07	0.41	0.91	0.10

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 135
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

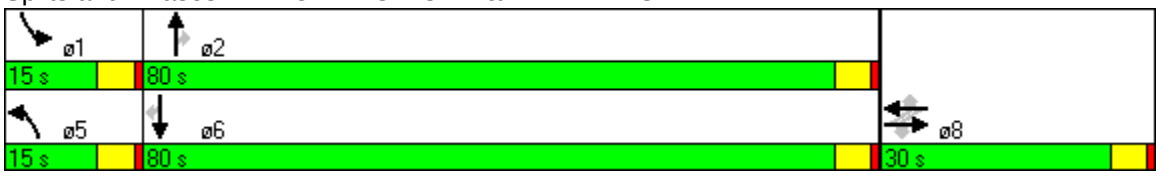


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	17	122	86	28	106	30	1424	68	34	1400	21
Lane Group Flow (vph)	150	18	133	93	30	115	33	1548	74	37	1522	23
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	25.0	25.0	10.0	25.0	25.0
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	80.0	80.0	15.0	80.0	80.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	12.0%	64.0%	64.0%	12.0%	64.0%	64.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
v/c Ratio	0.66	0.06	0.36	0.41	0.10	0.32	0.21	0.63	0.07	0.24	0.61	0.02
Control Delay	54.8	41.4	8.7	48.4	42.2	9.0	32.4	25.0	9.3	45.2	25.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	41.4	8.7	48.4	42.2	9.0	32.4	25.0	9.3	45.2	25.0	9.2
Queue Length 50th (ft)	114	12	0	68	21	0	21	565	22	24	643	6
Queue Length 95th (ft)	180	33	54	117	47	50	m34	636	m37	m44	752	m14
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	286	388	435	289	388	420	156	2475	1129	156	2475	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.05	0.31	0.32	0.08	0.27	0.21	0.63	0.07	0.24	0.61	0.02

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 50 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 125
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

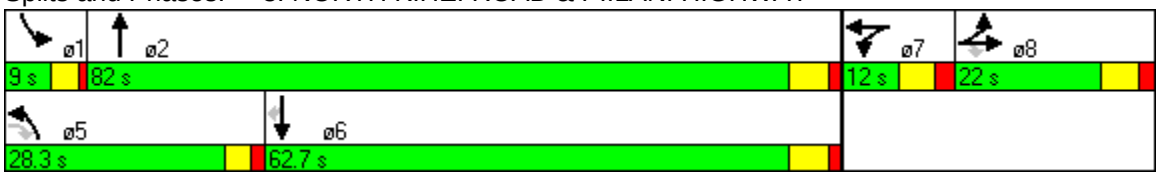


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	211	20	349	2	408	1250	3	1169	110
Lane Group Flow (vph)	122	129	379	21	443	1368	3	1271	120
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	4.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	14.5	26.0	8.0	26.0	26.0
Total Split (s)	22.0	22.0	50.3	12.0	28.3	82.0	9.0	62.7	62.7
Total Split (%)	17.6%	17.6%	40.2%	9.6%	22.6%	65.6%	7.2%	50.2%	50.2%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.58	0.60	0.36	0.19	0.74	0.52	0.05	0.66	0.13
Control Delay	62.2	63.0	27.5	51.6	44.4	16.9	59.0	24.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	63.0	27.5	51.6	44.4	16.9	59.0	24.4	4.7
Queue Length 50th (ft)	106	112	54	13	194	451	2	428	5
Queue Length 95th (ft)	174	182	156	41	212	619	13	526	39
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	242	245	1085	116	667	2608	71	1933	913
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.53	0.35	0.18	0.66	0.52	0.04	0.66	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 40 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

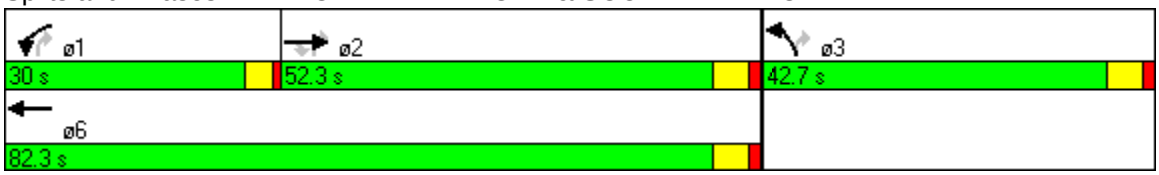


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	333	281	81	465	431	185
Lane Group Flow (vph)	362	305	88	505	468	201
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	15.5	15.5	9.0	15.5	12.5	
Total Split (s)	52.3	52.3	30.0	82.3	42.7	125.0
Total Split (%)	41.8%	41.8%	24.0%	65.8%	34.2%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Min	C-Min	Min	C-Min	Min	
v/c Ratio	0.30	0.27	0.59	0.19	0.77	0.13
Control Delay	11.9	2.0	67.3	1.1	49.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	2.0	67.3	1.1	49.9	0.2
Queue Length 50th (ft)	119	0	75	11	188	0
Queue Length 95th (ft)	219	40	m118	17	233	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1199	1127	368	2687	1063	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.24	0.19	0.44	0.13

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 30 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD

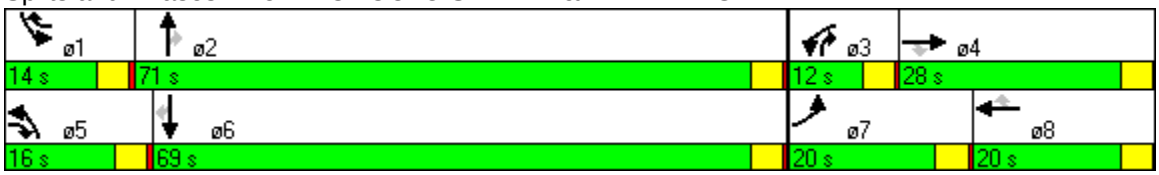


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	73	236	152	75	152	111	1067	145	154	1560	68
Lane Group Flow (vph)	54	79	257	165	82	165	121	1160	158	167	1696	74
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	28.0	16.0	12.0	20.0	14.0	16.0	71.0	12.0	14.0	69.0	69.0
Total Split (%)	16.0%	22.4%	12.8%	9.6%	16.0%	11.2%	12.8%	56.8%	9.6%	11.2%	55.2%	55.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.42	0.23	0.66	0.74	0.50	0.23	0.55	0.52	0.08	0.53	0.80	0.08
Control Delay	57.2	50.6	47.8	77.5	57.8	6.0	44.4	29.5	7.4	43.2	27.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.2	50.6	47.8	77.5	57.8	6.0	44.4	29.5	7.4	43.2	27.8	12.6
Queue Length 50th (ft)	43	31	177	69	64	0	88	466	18	70	460	14
Queue Length 95th (ft)	84	53	243	#121	115	29	142	580	51	m78	#580	m25
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	227	679	387	223	238	729	220	2246	2081	325	2131	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.12	0.66	0.74	0.34	0.23	0.55	0.52	0.08	0.51	0.80	0.08

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

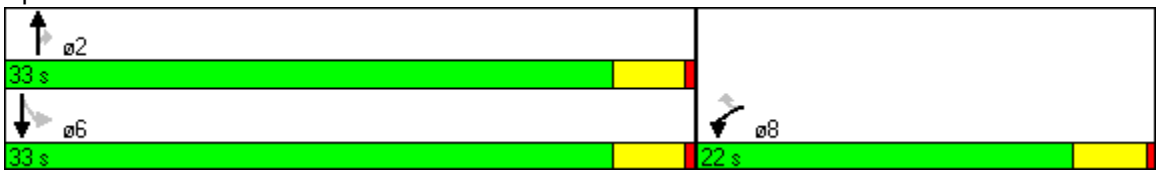


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	127	70	558	121	62	374
Lane Group Flow (vph)	138	76	607	132	67	407
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	22.0	33.0	33.0	33.0	33.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.41	0.21	0.49	0.12	0.18	0.33
Control Delay	13.6	5.1	6.6	1.4	5.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	5.1	6.6	1.4	5.9	5.2
Queue Length 50th (ft)	21	0	62	0	5	36
Queue Length 95th (ft)	70	24	161	15	24	94
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	562	555	1309	1151	389	1309
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.14	0.46	0.11	0.17	0.31

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 56.6
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

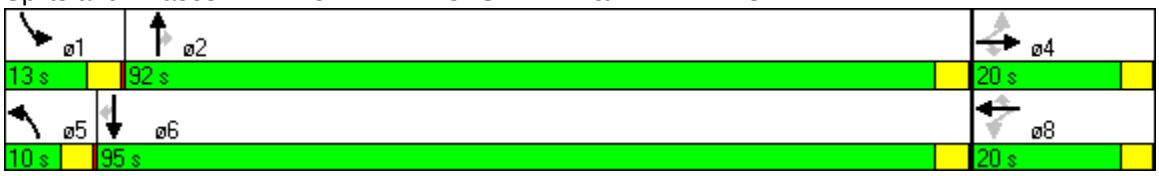


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	32	124	68	5	24	31	1420	123	50	2018	42
Lane Group Flow (vph)	0	73	135	0	79	26	34	1543	134	54	2193	46
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	92.0	92.0	13.0	95.0	95.0
Total Split (%)	16.0%	16.0%	16.0%	16.0%	16.0%	16.0%	8.0%	73.6%	73.6%	10.4%	76.0%	76.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.48	0.57		0.64	0.14	0.37	0.58	0.11	0.47	0.79	0.04
Control Delay		57.7	27.0		64.3	18.1	79.2	11.1	0.8	58.5	16.2	3.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		57.7	27.0		64.3	18.1	79.2	11.1	0.8	58.5	16.2	3.2
Queue Length 50th (ft)		56	37		62	0	0	427	1	41	578	1
Queue Length 95th (ft)		104	102		114	28	m52	528	m6	m54	837	m9
Internal Link Dist (ft)		212			349			829			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		195	278		158	225	93	2671	1228	128	2779	1253
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.37	0.49		0.50	0.12	0.37	0.58	0.11	0.42	0.79	0.04

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

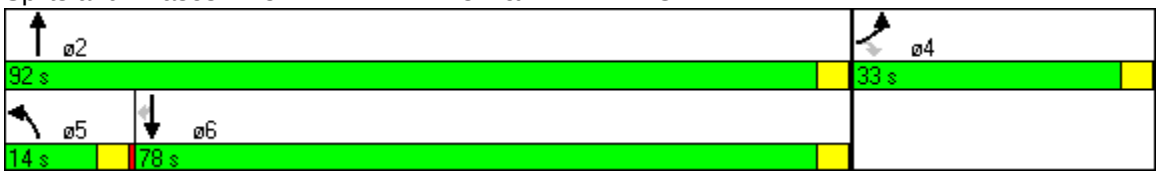


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	308	180	101	1206	1661	416
Lane Group Flow (vph)	335	196	110	1311	1805	452
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	14.0	92.0	78.0	78.0
Total Split (%)	26.4%	26.4%	11.2%	73.6%	62.4%	62.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.89	0.44	0.76	0.51	0.84	0.41
Control Delay	63.9	14.8	85.4	8.7	20.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	14.8	85.4	8.7	20.2	3.1
Queue Length 50th (ft)	258	33	89	235	740	39
Queue Length 95th (ft)	#406	102	#189	284	532	m36
Internal Link Dist (ft)	652			1058	2861	
Turn Bay Length (ft)						
Base Capacity (vph)	411	479	147	2562	2161	1111
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.41	0.75	0.51	0.84	0.41

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

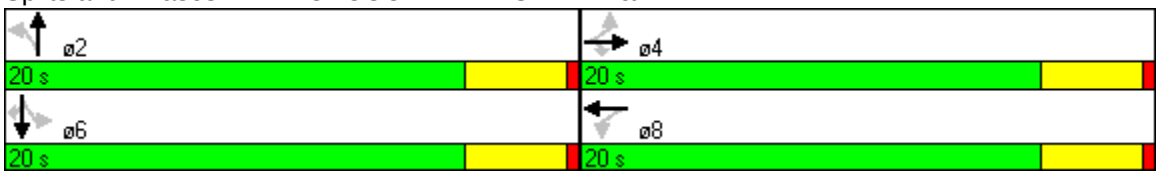


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	131	65	90	166	67	12	9	59
Lane Group Flow (vph)	142	71	98	180	73	13	10	64
Turn Type	Perm		Perm		Perm			Perm
Protected Phases		4		8		2	6	
Permitted Phases	4		4		2			6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.15	0.05	0.14	0.13	0.07	0.02	0.01	0.10
Control Delay	8.3	7.5	3.0	7.9	7.7	7.4	7.3	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	7.5	3.0	7.9	7.7	7.4	7.3	3.2
Queue Length 50th (ft)	9	4	0	12	4	2	1	0
Queue Length 95th (ft)	21	12	18	25	12	8	7	14
Internal Link Dist (ft)		86		521		103	80	
Turn Bay Length (ft)								
Base Capacity (vph)	922	1416	692	1416	1086	745	745	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.05	0.14	0.13	0.07	0.02	0.01	0.10

Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 40
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Pretimed

Splits and Phases: 12: UPCOUNTRY HIGHWAY & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	160	7	20	174	60	13	6	63	162	3	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	174	8	22	189	65	14	7	68	176	3	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.98						0.98	0.98		0.98	0.98	0.98
vC, conflicting volume	254			182			477	526	178	561	497	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			182			469	518	178	554	488	209
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			97	99	92	54	99	98
cM capacity (veh/h)	1303			1394			472	439	865	387	456	818

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	182	22	254	14	75	176	18
Volume Left	25	0	22	0	14	0	176	0
Volume Right	0	8	0	65	0	68	0	15
cSH	1303	1700	1394	1700	472	798	387	717
Volume to Capacity	0.02	0.11	0.02	0.15	0.03	0.09	0.46	0.03
Queue Length 95th (ft)	1	0	1	0	2	8	58	2
Control Delay (s)	7.8	0.0	7.6	0.0	12.9	10.0	21.9	10.2
Lane LOS	A		A		B	A	C	B
Approach Delay (s)	0.9		0.6		10.4		20.8	
Approach LOS					B		C	

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	30	182	13	4	167	2	9	0	2	3	0	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	198	14	4	182	2	10	0	2	3	0	72
Approach Volume (veh/h)		245			188			12			75	
Crossing Volume (veh/h)		8			42			234			196	
High Capacity (veh/h)		1376			1340			1153			1188	
High v/c (veh/h)		0.18			0.14			0.01			0.06	
Low Capacity (veh/h)		1154			1120			951			983	
Low v/c (veh/h)		0.21			0.17			0.01			0.08	

Intersection Summary			
Maximum v/c High	0.18		
Maximum v/c Low	0.21		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	287	86	0	378	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	312	93	0	411	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked						
vC, conflicting volume			405		517	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			405		517	156
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1150		488	862

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	156	156	93	205	205	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	93	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.09	0.05	0.12	0.12	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	287	291	0	0	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	312	316	0	0	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		435	166			
pX, platoon unblocked						
vC, conflicting volume	316				472	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				472	158
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	89
cM capacity (veh/h)	1241				521	859

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	156	156	158	158	0	95
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	95
cSH	1700	1700	1700	1700	1700	859
Volume to Capacity	0.09	0.09	0.09	0.09	0.00	0.11
Queue Length 95th (ft)	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS						A
Approach Delay (s)	0.0		0.0			9.7
Approach LOS						A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	32	3	32	0	3	0	64	0	0	0	0	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	3	35	0	3	0	70	0	0	0	0	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		601										
pX, platoon unblocked												
vC, conflicting volume	3			38			182	76	3	76	111	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3			38			182	76	3	76	111	2
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			90	100	100	100	100	90
cM capacity (veh/h)	1617			1570			675	796	1079	890	762	1082

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	35	3	35	0	2	1	70	0	0	108
Volume Left	35	0	0	0	0	0	70	0	0	0
Volume Right	0	0	35	0	0	0	0	0	0	108
cSH	1617	1700	1700	1700	1700	1700	675	1700	1700	1082
Volume to Capacity	0.02	0.00	0.02	0.00	0.00	0.00	0.10	0.00	0.00	0.10
Queue Length 95th (ft)	2	0	0	0	0	0	9	0	0	8
Control Delay (s)	7.3	0.0	0.0	0.0	0.0	0.0	10.9	0.0	0.0	8.7
Lane LOS	A						B	A	A	A
Approach Delay (s)	3.5			0.0			10.9		8.7	
Approach LOS							B		A	

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	3	0	0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	0	0	3	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	751					
pX, platoon unblocked						
vC, conflicting volume			3		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1619		1023	1085

Direction, Lane #	EB 1	NB 1
Volume Total	3	3
Volume Left	0	3
Volume Right	3	0
cSH	1700	1023
Volume to Capacity	0.00	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	8.5
Lane LOS		A
Approach Delay (s)	0.0	8.5
Approach LOS		A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1751	1583	1681	1720	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1751	1583	1681	1720	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	115	76	120	243	66	168	147	1767	99	138	1674	84
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	83	130	264	72	183	160	1921	108	150	1820	91
RTOR Reduction (vph)	0	0	119	0	0	99	0	0	27	0	0	24
Lane Group Flow (vph)	102	106	11	164	172	84	160	1921	81	150	1820	67
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.6	11.6	11.6	17.7	17.7	17.7	15.6	92.7	92.7	8.0	85.1	85.1
Effective Green, g (s)	12.6	12.6	12.6	18.7	18.7	18.7	16.6	93.7	93.7	9.0	86.1	86.1
Actuated g/C Ratio	0.08	0.08	0.08	0.12	0.12	0.12	0.11	0.62	0.62	0.06	0.57	0.57
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	141	147	133	210	214	197	196	2211	989	206	2031	909
v/s Ratio Prot	0.06	0.06		0.10	0.10		c0.09	0.54		0.04	c0.51	
v/s Ratio Perm			0.08			0.12			0.07			0.06
v/c Ratio	0.72	0.72	0.08	0.78	0.80	0.43	0.82	0.87	0.08	0.73	0.90	0.07
Uniform Delay, d1	67.0	67.0	63.4	63.7	63.9	60.7	65.2	23.1	11.1	69.3	28.0	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.83	1.38	2.31
Incremental Delay, d2	17.2	16.5	0.3	17.0	19.2	1.5	21.3	5.0	0.2	7.8	5.1	0.1
Delay (s)	84.2	83.4	63.7	80.7	83.1	62.2	86.6	28.1	11.3	65.2	43.7	33.0
Level of Service	F	F	E	F	F	E	F	C	B	E	D	C
Approach Delay (s)		76.1			75.0			31.5			44.8	
Approach LOS		E			E			C			D	

Intersection Summary

HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1354	1863	1583	1385	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	78	19	118	72	42	67	91	1740	151	100	1685	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	21	128	78	46	73	99	1891	164	109	1832	70
RTOR Reduction (vph)	0	0	115	0	0	66	0	0	34	0	0	15
Lane Group Flow (vph)	85	21	13	78	46	7	99	1891	130	109	1832	55
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	15.0	15.0	15.0	15.0	15.0	15.0	12.6	107.4	107.4	13.6	108.4	108.4
Effective Green, g (s)	15.0	15.0	15.0	15.0	15.0	15.0	13.6	108.4	108.4	14.6	109.4	109.4
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.72	0.72	0.10	0.73	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	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)	135	186	158	139	186	158	160	2558	1144	172	2581	1155
v/s Ratio Prot		0.01			0.02		0.06	c0.53		c0.06	0.52	
v/s Ratio Perm	0.06		0.08	0.06		0.05			0.10			0.04
v/c Ratio	0.63	0.11	0.08	0.56	0.25	0.05	0.62	0.74	0.11	0.63	0.71	0.05
Uniform Delay, d1	64.8	61.4	61.2	64.4	62.3	61.0	65.7	12.4	6.3	65.1	11.4	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.11	1.82	2.09	1.19	1.40	1.16
Incremental Delay, d2	8.9	0.3	0.2	5.1	0.7	0.1	3.7	1.0	0.1	5.3	1.2	0.1
Delay (s)	73.7	61.7	61.5	69.5	63.0	61.2	76.5	23.5	13.2	82.9	17.2	6.7
Level of Service	E	E	E	E	E	E	E	C	B	F	B	A
Approach Delay (s)		65.9			64.9			25.2			20.4	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1689	2787		1707		3433	3533		1770	3539	1583
Volume (vph)	369	9	306	33	12	44	488	1263	15	10	1379	179
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	401	10	333	36	13	48	530	1373	16	11	1499	195
RTOR Reduction (vph)	0	0	103	0	24	0	0	0	0	0	0	62
Lane Group Flow (vph)	201	210	230	0	73	0	530	1389	0	11	1499	133
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	22.1	22.1	52.3		9.1		24.2	94.8		2.0	72.1	72.1
Effective Green, g (s)	24.1	24.1	52.8		11.1		24.7	96.8		2.0	74.1	74.1
Actuated g/C Ratio	0.16	0.16	0.35		0.07		0.16	0.65		0.01	0.49	0.49
Clearance Time (s)	6.0	6.0			6.0		4.5	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	270	271	981		126		565	2280		24	1748	782
v/s Ratio Prot	0.12	c0.12			c0.06		c0.15	0.39		0.01	c0.42	
v/s Ratio Perm			0.12									0.12
v/c Ratio	0.74	0.77	0.23		0.58		0.94	0.61		0.46	0.86	0.17
Uniform Delay, d1	60.0	60.3	34.3		67.2		61.9	15.5		73.5	33.3	21.0
Progression Factor	0.77	0.77	1.15		1.00		1.08	1.15		1.00	1.00	1.00
Incremental Delay, d2	9.6	11.7	0.0		6.3		17.8	0.8		5.0	5.7	0.5
Delay (s)	55.6	58.1	39.5		73.5		85.0	18.7		78.4	39.0	21.4
Level of Service	E	E	D		E		F	B		E	D	C
Approach Delay (s)		49.1			73.5			37.0			37.3	
Approach LOS		D			E			D			D	

Intersection Summary

HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	496	557	141	452	318	178
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	539	605	153	491	346	193
RTOR Reduction (vph)	0	234	0	0	0	148
Lane Group Flow (vph)	539	371	153	491	346	45
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	83.1	83.1	18.4	105.5	33.5	33.5
Effective Green, g (s)	84.6	84.6	18.4	107.0	35.0	35.0
Actuated g/C Ratio	0.56	0.56	0.12	0.71	0.23	0.23
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	2.0
Lane Grp Cap (vph)	1051	893	217	2524	801	369
v/s Ratio Prot	0.29		c0.09	0.14	0.10	
v/s Ratio Perm		0.38				0.12
v/c Ratio	0.51	0.42	0.71	0.19	0.43	0.12
Uniform Delay, d1	20.1	18.6	63.2	7.2	49.0	45.4
Progression Factor	1.00	1.00	1.49	0.23	1.00	1.00
Incremental Delay, d2	1.8	1.4	5.5	0.1	1.7	0.7
Delay (s)	21.8	20.1	99.7	1.8	50.7	46.1
Level of Service	C	C	F	A	D	D
Approach Delay (s)	20.9			25.0	49.1	
Approach LOS	C			C	D	

Intersection Summary

HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	3433	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	3433	3539	2787	3433	3539	1583
Volume (vph)	49	186	189	515	192	531	135	1430	509	512	1365	92
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	196	199	542	202	559	142	1505	536	539	1437	97
RTOR Reduction (vph)	0	0	23	0	0	101	0	0	19	0	0	26
Lane Group Flow (vph)	52	196	176	542	202	458	142	1505	517	539	1437	71
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.3	15.2	28.2	31.4	37.3	69.2	13.0	85.5	116.9	31.9	104.4	104.4
Effective Green, g (s)	9.3	15.2	28.2	31.4	37.3	69.2	13.0	85.5	116.9	31.9	104.4	104.4
Actuated g/C Ratio	0.05	0.08	0.16	0.17	0.21	0.38	0.07	0.48	0.65	0.18	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	91	299	283	599	386	1133	248	1681	1872	608	2053	918
v/s Ratio Prot	0.03	0.06	c0.05	c0.16	0.11	0.09	0.04	c0.43	0.05	c0.16	0.41	
v/s Ratio Perm			0.07			0.11			0.14			0.06
v/c Ratio	0.57	0.66	0.62	0.90	0.52	0.40	0.57	0.90	0.28	0.89	0.70	0.08
Uniform Delay, d1	83.4	79.9	70.9	72.8	63.4	40.4	80.8	43.2	13.5	72.3	26.7	16.6
Progression Factor	1.00	1.00	1.00	0.86	1.03	1.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	5.1	4.2	15.8	1.2	0.2	3.2	7.8	0.1	14.5	2.0	0.2
Delay (s)	91.8	85.0	75.1	78.7	66.4	44.8	84.0	51.0	13.6	86.8	28.7	16.8
Level of Service	F	F	E	E	E	D	F	D	B	F	C	B
Approach Delay (s)		81.4			62.3			44.0			43.3	
Approach LOS		F			E			D			D	

Intersection Summary

HCM Average Control Delay	50.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	163	120	544	239	148	522
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	130	591	260	161	567
RTOR Reduction (vph)	0	107	0	129	0	0
Lane Group Flow (vph)	177	23	591	131	161	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.4	9.4	27.0	27.0	5.1	36.1
Effective Green, g (s)	9.4	9.4	27.0	27.0	5.1	36.1
Actuated g/C Ratio	0.18	0.18	0.50	0.50	0.10	0.67
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	278	940	799	169	1257
v/s Ratio Prot	c0.10		c0.32		c0.09	0.30
v/s Ratio Perm		0.08		0.16		
v/c Ratio	0.57	0.08	0.63	0.16	0.95	0.45
Uniform Delay, d1	20.2	18.4	9.6	7.2	24.1	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.1	1.3	0.1	55.0	0.3
Delay (s)	22.6	18.6	10.9	7.3	79.1	4.3
Level of Service	C	B	B	A	E	A
Approach Delay (s)	20.9		9.8			20.9
Approach LOS	C		A			C

Intersection Summary

HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	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		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1780	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.71	1.00		0.61	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1332	1583		1127	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	67	6	90	35	3	12	80	2097	27	11	1935	112
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	7	98	38	3	13	87	2279	29	12	2103	122
RTOR Reduction (vph)	0	0	89	0	0	12	0	0	4	0	0	20
Lane Group Flow (vph)	0	80	9	0	41	1	87	2279	25	12	2103	102
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		14.1	14.1		14.1	14.1	12.4	120.8	120.8	3.1	111.5	111.5
Effective Green, g (s)		14.1	14.1		14.1	14.1	12.4	120.8	120.8	3.1	111.5	111.5
Actuated g/C Ratio		0.09	0.09		0.09	0.09	0.08	0.81	0.81	0.02	0.74	0.74
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		125	149		106	149	146	2850	1275	37	2631	1177
v/s Ratio Prot							c0.05	c0.64		0.01	0.59	
v/s Ratio Perm		0.06	0.06		0.04	0.01			0.02			0.08
v/c Ratio		0.64	0.06		0.39	0.01	0.60	0.80	0.02	0.32	0.80	0.09
Uniform Delay, d1		65.5	61.9		63.9	61.6	66.4	8.0	2.9	72.4	12.2	5.3
Progression Factor		1.00	1.00		1.00	1.00	0.91	0.86	1.35	1.00	1.00	1.00
Incremental Delay, d2		10.7	0.2		2.3	0.0	4.3	1.6	0.0	5.1	2.6	0.1
Delay (s)		76.2	62.1		66.2	61.6	64.7	8.5	3.9	77.5	14.8	5.4
Level of Service		E	E		E	E	E	A	A	E	B	A
Approach Delay (s)		68.4			65.1			10.5			14.6	
Approach LOS		E			E			B			B	

Intersection Summary

HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	368	251	244	1707	1523	484
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	273	265	1855	1655	526
RTOR Reduction (vph)	0	180	0	0	0	148
Lane Group Flow (vph)	400	93	265	1855	1655	378
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	34.9	34.9	26.3	107.1	76.8	76.8
Effective Green, g (s)	34.9	34.9	26.3	107.1	76.8	76.8
Actuated g/C Ratio	0.23	0.23	0.18	0.71	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	368	310	2527	1812	810
v/s Ratio Prot	c0.23		c0.15	0.52	c0.47	
v/s Ratio Perm		0.17				0.33
v/c Ratio	0.97	0.25	0.85	0.73	0.91	0.47
Uniform Delay, d1	57.0	46.9	60.0	12.9	33.6	23.5
Progression Factor	1.00	1.00	1.00	1.00	0.77	0.70
Incremental Delay, d2	36.6	0.4	19.9	1.9	5.7	1.2
Delay (s)	93.6	47.3	79.9	14.8	31.5	17.7
Level of Service	F	D	E	B	C	B
Approach Delay (s)	74.8			23.0	28.2	
Approach LOS	E			C	C	

Intersection Summary

HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	3433	3539	1583		3539		3433	1863			1863	1583
Volume (vph)	376	235	287	0	453	0	390	37	0	0	60	171
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	255	312	0	492	0	424	40	0	0	65	186
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	409	255	208	0	492	0	424	40	0	0	65	45
Turn Type	Prot		pt+ov	Prot			Prot			Perm		Perm
Protected Phases	7	4	4 5	3	8		5	2			6	
Permitted Phases										6		6
Actuated Green, G (s)	17.4	38.1	60.1		16.7		18.0	43.9			21.9	21.9
Effective Green, g (s)	17.4	38.1	60.1		16.7		18.0	43.9			21.9	21.9
Actuated g/C Ratio	0.19	0.42	0.67		0.19		0.20	0.49			0.24	0.24
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	664	1498	1057		657		687	909			453	385
v/s Ratio Prot	c0.12	0.07	0.20		c0.14		c0.12	0.02			0.03	
v/s Ratio Perm												0.12
v/c Ratio	0.62	0.17	0.20		0.75		0.62	0.04			0.14	0.12
Uniform Delay, d1	33.2	16.1	5.7		34.7		32.9	12.1			26.7	26.5
Progression Factor	1.19	1.27	5.98		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.4	0.0	0.1		4.7		1.7	0.1			0.7	0.6
Delay (s)	40.9	20.5	34.3		39.3		34.5	12.2			27.4	27.1
Level of Service	D	C	C		D		C	B			C	C
Approach Delay (s)		33.5			39.3			32.6			27.2	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

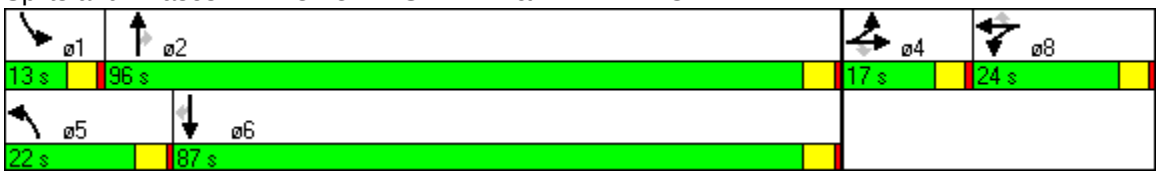
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	76	120	243	66	168	147	1767	99	138	1674	84
Lane Group Flow (vph)	102	106	130	164	172	183	160	1921	108	150	1820	91
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	17.0	17.0	17.0	24.0	24.0	24.0	22.0	96.0	96.0	13.0	87.0	87.0
Total Split (%)	11.3%	11.3%	11.3%	16.0%	16.0%	16.0%	14.7%	64.0%	64.0%	8.7%	58.0%	58.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.72	0.72	0.52	0.78	0.80	0.62	0.82	0.87	0.11	0.73	0.90	0.10
Control Delay	91.2	90.3	17.2	82.5	83.8	32.5	86.6	29.0	4.7	73.0	44.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.2	90.3	17.2	82.5	83.8	32.5	86.6	29.0	4.7	73.0	44.9	16.0
Queue Length 50th (ft)	104	108	0	165	173	63	154	798	13	76	694	28
Queue Length 95th (ft)	#196	#201	67	#273	#289	149	#263	923	39	m#113	1005	m68
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	146	152	256	224	229	309	212	2212	1017	206	2031	932
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.70	0.51	0.73	0.75	0.59	0.75	0.87	0.11	0.73	0.90	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

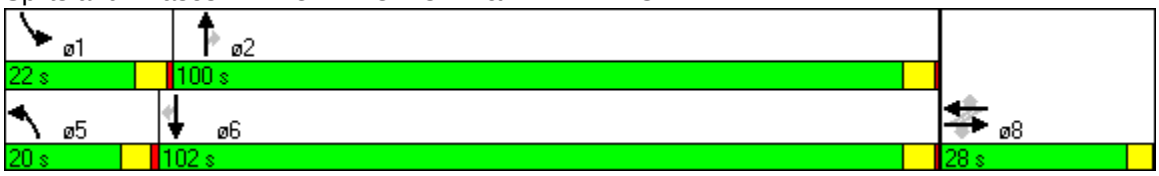


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	19	118	72	42	67	91	1740	151	100	1685	64
Lane Group Flow (vph)	85	21	128	78	46	73	99	1891	164	109	1832	70
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	28.0	20.0	100.0	100.0	22.0	102.0	102.0
Total Split (%)	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	13.3%	66.7%	66.7%	14.7%	68.0%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.63	0.11	0.47	0.56	0.25	0.33	0.62	0.74	0.14	0.63	0.71	0.06
Control Delay	68.8	58.9	11.7	67.3	61.1	13.6	77.8	26.8	5.6	83.2	19.3	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	58.9	11.7	67.3	61.1	13.6	77.8	26.8	5.6	83.2	19.3	3.2
Queue Length 50th (ft)	82	19	0	74	43	0	88	931	27	97	838	5
Queue Length 95th (ft)	135	45	61	125	81	48	m107	1100	m56	m121	1033	m22
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	217	298	361	222	298	315	189	2557	1177	212	2582	1170
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.07	0.35	0.35	0.15	0.23	0.52	0.74	0.14	0.51	0.71	0.06

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

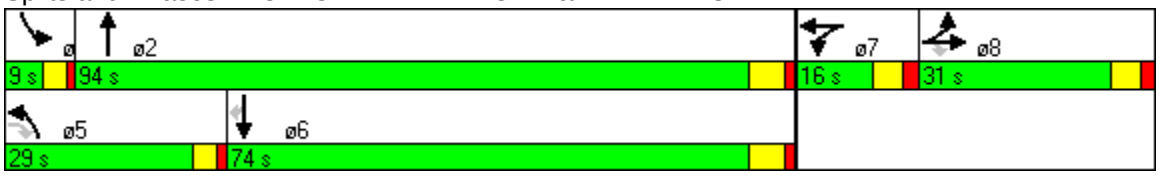


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	369	9	306	12	488	1263	10	1379	179
Lane Group Flow (vph)	201	210	333	97	530	1389	11	1499	195
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	22.0	22.0		11.0	22.5	26.0	9.0	33.0	33.0
Total Split (s)	31.0	31.0	60.0	16.0	29.0	94.0	9.0	74.0	74.0
Total Split (%)	20.7%	20.7%	40.0%	10.7%	19.3%	62.7%	6.0%	49.3%	49.3%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.5	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	C-Min	None	C-Min	C-Min
v/c Ratio	0.74	0.77	0.31	0.64	0.94	0.59	0.19	0.86	0.23
Control Delay	55.7	57.2	20.5	65.3	84.3	18.8	77.9	40.4	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	57.2	20.5	65.3	84.3	18.8	77.9	40.4	9.6
Queue Length 50th (ft)	195	205	105	68	283	261	11	698	39
Queue Length 95th (ft)	295	307	147	132	#379	546	34	817	90
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	303	304	1077	160	572	2335	59	1747	843
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.69	0.31	0.61	0.93	0.59	0.19	0.86	0.23

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

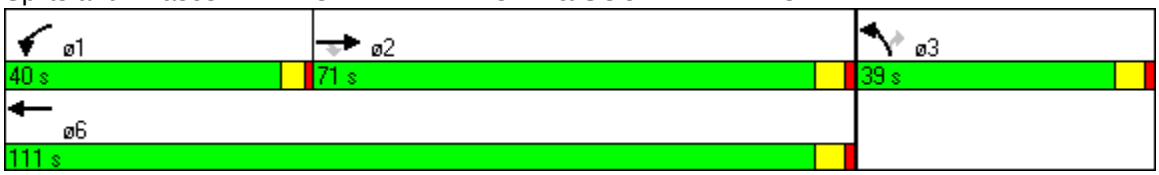


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	496	557	141	452	318	178
Lane Group Flow (vph)	539	605	153	491	346	193
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Detector Phases	2	2	1	6	3	3
Minimum Initial (s)	4.0	4.0	5.0	4.0	4.0	4.0
Minimum Split (s)	30.5	30.5	9.0	21.5	21.5	21.5
Total Split (s)	71.0	71.0	40.0	111.0	39.0	39.0
Total Split (%)	47.3%	47.3%	26.7%	74.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	1.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
v/c Ratio	0.51	0.54	0.71	0.19	0.43	0.37
Control Delay	23.3	4.7	94.1	1.8	51.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	4.7	94.1	1.8	51.0	8.0
Queue Length 50th (ft)	308	29	156	16	150	0
Queue Length 95th (ft)	480	124	m132	m16	200	66
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	1050	1127	425	2524	801	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.54	0.36	0.19	0.43	0.37

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 30 (20%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	186	189	515	192	531	135	1430	509	512	1365	92
Lane Group Flow (vph)	52	196	199	542	202	559	142	1505	536	539	1437	97
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	23.0	36.0	36.0	35.0	23.0	89.0	36.0	35.0	101.0	101.0
Total Split (%)	11.1%	11.1%	12.8%	20.0%	20.0%	19.4%	12.8%	49.4%	20.0%	19.4%	56.1%	56.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.50	0.69	0.67	0.90	0.52	0.45	0.57	0.89	0.28	0.89	0.70	0.10
Control Delay	87.0	89.5	65.7	78.3	71.3	31.0	83.4	49.9	10.9	87.5	29.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.0	89.5	65.7	78.3	71.3	31.0	83.4	49.9	10.9	87.5	29.3	7.8
Queue Length 50th (ft)	61	120	193	340	242	215	85	851	123	325	617	18
Queue Length 95th (ft)	111	167	279	#429	339	294	122	961	155	#432	762	51
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	157	315	350	613	387	1238	362	1714	1913	617	2067	950
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.62	0.57	0.88	0.52	0.45	0.39	0.88	0.28	0.87	0.70	0.10

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

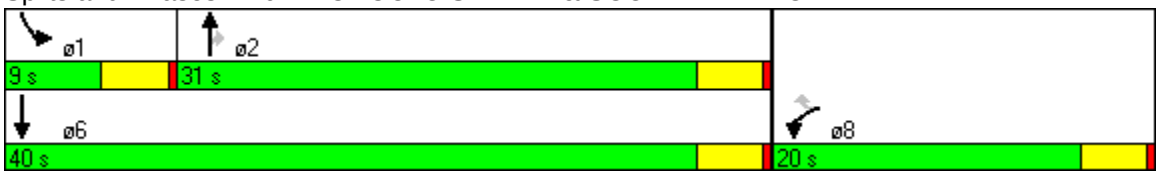
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	163	120	544	239	148	522
Lane Group Flow (vph)	177	130	591	260	161	567
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phases	8	8	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	31.0	31.0	9.0	40.0
Total Split (%)	33.3%	33.3%	51.7%	51.7%	15.0%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Min	Min	None	Min
v/c Ratio	0.51	0.31	0.62	0.28	0.94	0.44
Control Delay	20.0	5.5	14.0	2.4	87.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	5.5	14.0	2.4	87.2	6.4
Queue Length 50th (ft)	44	0	126	0	46	68
Queue Length 95th (ft)	100	34	270	33	#169	169
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	480	524	1017	982	171	1340
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.25	0.58	0.26	0.94	0.42

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 53
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

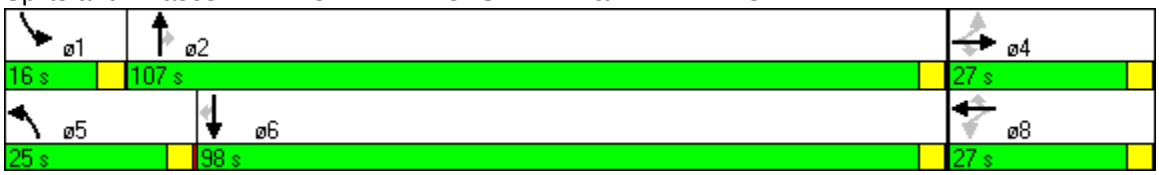


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	6	90	35	3	12	80	2097	27	11	1935	112
Lane Group Flow (vph)	0	80	98	0	41	13	87	2279	29	12	2103	122
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	25.0	107.0	107.0	16.0	98.0	98.0
Total Split (%)	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	16.7%	71.3%	71.3%	10.7%	65.3%	65.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio		0.64	0.41		0.32	0.08	0.60	0.78	0.02	0.16	0.80	0.10
Control Delay		70.0	12.8		63.9	25.0	62.3	9.4	3.2	69.8	16.8	3.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		70.0	12.8		63.9	25.0	62.3	9.4	3.2	69.8	16.8	3.0
Queue Length 50th (ft)		77	0		38	0	85	303	1	12	613	10
Queue Length 95th (ft)		131	56		77	22	m112	m715	m6	35	956	37
Internal Link Dist (ft)		212			261			1847			2017	
Turn Bay Length (ft)												
Base Capacity (vph)		205	326		209	254	248	2908	1304	142	2632	1197
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.39	0.30		0.20	0.05	0.35	0.78	0.02	0.08	0.80	0.10

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 40 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

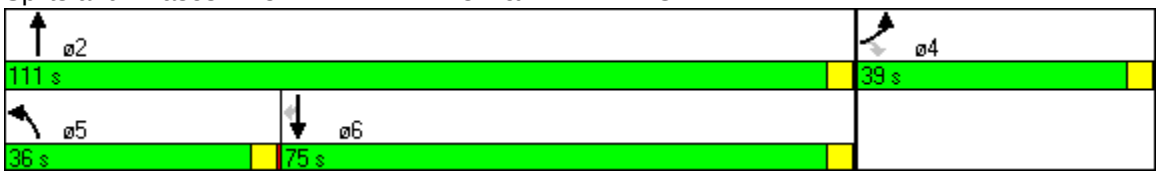


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	368	251	244	1707	1523	484
Lane Group Flow (vph)	400	273	265	1855	1655	526
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	39.0	39.0	36.0	111.0	75.0	75.0
Total Split (%)	26.0%	26.0%	24.0%	74.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
v/c Ratio	0.97	0.50	0.85	0.73	0.91	0.55
Control Delay	93.5	12.3	69.8	15.1	32.6	8.7
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	93.5	12.3	69.8	15.5	32.6	8.7
Queue Length 50th (ft)	391	30	253	527	671	60
Queue Length 95th (ft)	#606	115	347	609	#1002	194
Internal Link Dist (ft)	745			1063	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	413	550	378	2527	1812	958
Starvation Cap Reductn	0	0	0	230	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.50	0.70	0.81	0.91	0.55

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

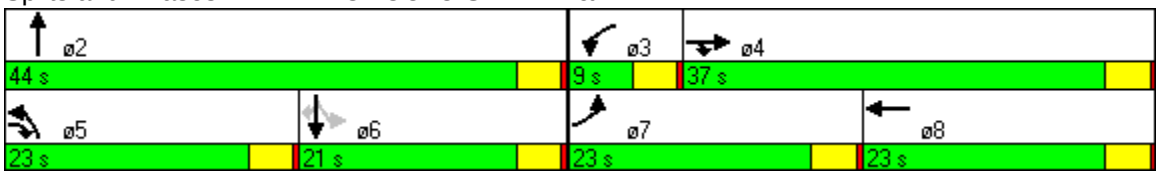


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	ø3
Lane Configurations									
Volume (vph)	376	235	287	453	390	37	60	171	
Lane Group Flow (vph)	409	255	312	492	424	40	65	186	
Turn Type	Prot		pt+ov		Prot			Perm	
Protected Phases	7	4	4 5	8	5	2	6		3
Permitted Phases								6	
Detector Phases	7	4	4 5	8	5	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		20.0	8.0	20.0	20.0	20.0	8.0
Total Split (s)	23.0	37.0	60.0	23.0	23.0	44.0	21.0	21.0	9.0
Total Split (%)	25.6%	41.1%	66.7%	25.6%	25.6%	48.9%	23.3%	23.3%	10%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lag	Lead		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.62	0.17	0.27	0.75	0.62	0.04	0.14	0.35	
Control Delay	41.9	20.0	2.5	39.0	36.0	14.0	31.2	7.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.9	20.0	2.5	39.0	36.0	14.0	31.2	7.2	
Queue Length 50th (ft)	200	91	20	139	109	12	31	0	
Queue Length 95th (ft)	m241	m111	m66	190	160	31	67	54	
Internal Link Dist (ft)		146		432		103	80		
Turn Bay Length (ft)									
Base Capacity (vph)	725	1523	1177	747	739	909	452	525	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.56	0.17	0.27	0.66	0.57	0.04	0.14	0.35	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 8 (9%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: KAONOULU STREET & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	37	296	16	39	280	98	9	8	34	120	10	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	322	17	42	304	107	10	9	37	130	11	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	411			339			821	907	330	886	862	358
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	354			339			803	897	330	875	849	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			96	96	95	39	96	98
cM capacity (veh/h)	1098			1220			246	237	711	215	253	678

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	339	42	411	10	46	130	26
Volume Left	40	0	42	0	10	0	130	0
Volume Right	0	17	0	107	0	37	0	15
cSH	1098	1700	1220	1700	246	515	215	399
Volume to Capacity	0.04	0.20	0.03	0.24	0.04	0.09	0.61	0.07
Queue Length 95th (ft)	3	0	3	0	3	7	87	5
Control Delay (s)	8.4	0.0	8.1	0.0	20.2	12.7	44.8	14.7
Lane LOS	A		A		C	B	E	B
Approach Delay (s)	0.9		0.8		14.0		39.8	
Approach LOS					B		E	

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	82	341	16	2	300	6	2	1	3	3	1	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	371	17	2	326	7	2	1	3	3	1	63
Approach Volume (veh/h)		477			335			7			67	
Crossing Volume (veh/h)		7			92			463			330	
High Capacity (veh/h)		1378			1288			961			1068	
High v/c (veh/h)		0.35			0.26			0.01			0.06	
Low Capacity (veh/h)		1155			1074			779			875	
Low v/c (veh/h)		0.41			0.31			0.01			0.08	

Intersection Summary			
Maximum v/c High	0.35		
Maximum v/c Low	0.41		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	896	311	0	1240	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	974	338	0	1348	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked			0.97		0.89	0.97
vC, conflicting volume			1312		1648	487
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1293		1515	446
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			518		98	545

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	487	487	338	674	674	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	338	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.29	0.29	0.20	0.40	0.40	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	896	1013	0	0	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	974	1101	0	0	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		375	226			
pX, platoon unblocked	0.87				0.88	0.87
vC, conflicting volume	1101				1588	551
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	971				1467	341
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	57
cM capacity (veh/h)	616				105	572

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	487	487	551	551	0	247
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	247
cSH	1700	1700	1700	1700	1700	572
Volume to Capacity	0.29	0.29	0.32	0.32	0.00	0.43
Queue Length 95th (ft)	0	0	0	0	0	54
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	16.0
Lane LOS						C
Approach Delay (s)	0.0		0.0			16.0
Approach LOS						C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	105	20	109	0	40	0	350	0	0	0	0	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	22	118	0	43	0	380	0	0	0	0	68
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		512										
pX, platoon unblocked												
vC, conflicting volume	43			140			340	293	22	293	412	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			140			340	293	22	293	412	22
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			27	100	100	100	100	93
cM capacity (veh/h)	1563			1441			520	571	1050	601	490	1050

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	114	22	118	0	29	14	380	0	0	68
Volume Left	114	0	0	0	0	0	380	0	0	0
Volume Right	0	0	118	0	0	0	0	0	0	68
cSH	1563	1700	1700	1700	1700	1700	520	1700	1700	1050
Volume to Capacity	0.07	0.01	0.07	0.00	0.02	0.01	0.73	0.00	0.00	0.07
Queue Length 95th (ft)	6	0	0	0	0	0	151	0	0	5
Control Delay (s)	7.5	0.0	0.0	0.0	0.0	0.0	28.5	0.0	0.0	8.7
Lane LOS	A						D	A	A	A
Approach Delay (s)	3.4			0.0			28.5		8.7	
Approach LOS							D		A	

Intersection Summary			
Average Delay	16.4		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	20	0	0	40	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	0	0	43	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	712					
pX, platoon unblocked						
vC, conflicting volume			22		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			22		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	100
cM capacity (veh/h)			1594		1023	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	22	0	43
Volume Left	0	0	43
Volume Right	22	0	0
cSH	1700	1700	1023
Volume to Capacity	0.01	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1718	1583	1681	1740	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	0.97	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1718	1583	1681	1740	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	177	45	191	121	62	37	86	1325	150	95	1443	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	49	208	132	67	40	93	1440	163	103	1568	114
RTOR Reduction (vph)	0	0	128	0	0	37	0	0	76	0	0	51
Lane Group Flow (vph)	117	124	80	97	102	3	93	1440	87	103	1568	63
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Actuated Green, G (s)	10.2	10.2	10.2	5.3	5.3	5.3	4.5	45.2	45.2	6.0	46.7	46.7
Effective Green, g (s)	11.2	11.2	11.2	6.3	6.3	6.3	5.5	46.2	46.2	7.0	47.7	47.7
Actuated g/C Ratio	0.13	0.13	0.13	0.07	0.07	0.07	0.06	0.53	0.53	0.08	0.55	0.55
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)	3.5	3.5	3.5	3.0	3.0	3.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	217	222	204	122	126	115	112	1886	844	277	1947	871
v/s Ratio Prot	0.07	0.07		0.06	c0.06		c0.05	0.41		0.03	c0.44	
v/s Ratio Perm			0.13			0.03			0.10			0.07
v/c Ratio	0.54	0.56	0.39	0.80	0.81	0.03	0.83	0.76	0.10	0.37	0.81	0.07
Uniform Delay, d1	35.3	35.4	34.6	39.6	39.6	37.3	40.1	15.9	10.0	37.8	15.8	9.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	3.3	1.5	29.0	30.5	0.1	36.8	2.2	0.1	0.3	2.9	0.1
Delay (s)	38.2	38.8	36.1	68.6	70.1	37.4	77.0	18.2	10.1	38.1	18.6	9.2
Level of Service	D	D	D	E	E	D	E	B	B	D	B	A
Approach Delay (s)		37.4			64.0			20.6			19.2	
Approach LOS		D			E			C			B	

Intersection Summary

HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1359	1863	1583	1394	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	60	13	110	96	39	51	73	1359	108	68	1627	49
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	14	120	104	42	55	79	1477	117	74	1768	53
RTOR Reduction (vph)	0	0	104	0	0	48	0	0	41	0	0	18
Lane Group Flow (vph)	65	14	16	104	42	7	79	1477	76	74	1768	35
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Actuated Green, G (s)	11.3	11.3	11.3	11.3	11.3	11.3	6.2	58.3	58.3	6.2	58.3	58.3
Effective Green, g (s)	12.3	12.3	12.3	12.3	12.3	12.3	7.2	59.3	59.3	7.2	59.3	59.3
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.65	0.65	0.08	0.65	0.65
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)	4.0	4.0	4.0	4.0	4.0	4.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	184	252	214	189	252	214	140	2311	1034	140	2311	1034
v/s Ratio Prot		0.01			0.02		c0.04	0.42		0.04	c0.50	
v/s Ratio Perm	0.05		0.08	0.07		0.03			0.07			0.03
v/c Ratio	0.35	0.06	0.08	0.55	0.17	0.03	0.56	0.64	0.07	0.53	0.77	0.03
Uniform Delay, d1	35.6	34.2	34.3	36.7	34.7	34.1	40.3	9.4	5.7	40.2	10.9	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1	0.2	4.2	0.4	0.1	3.1	0.8	0.1	1.7	1.8	0.0
Delay (s)	37.2	34.3	34.5	40.9	35.1	34.2	43.4	10.2	5.8	41.8	12.8	5.6
Level of Service	D	C	C	D	D	C	D	B	A	D	B	A
Approach Delay (s)		35.4			37.9			11.5			13.7	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787		1667		3433	3537		1770	3539	1583
Volume (vph)	186	0	444	1	0	2	386	1086	4	6	1274	157
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	0	483	1	0	2	420	1180	4	7	1385	171
RTOR Reduction (vph)	0	0	170	0	2	0	0	0	0	0	0	88
Lane Group Flow (vph)	101	101	313	0	1	0	420	1184	0	7	1385	83
Turn Type	Split		custom	Split			Prot			Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			5 8									6
Actuated Green, G (s)	7.1	7.1	27.7		0.8		14.6	51.5		0.8	37.7	37.7
Effective Green, g (s)	9.1	9.1	27.7		2.8		14.6	53.5		0.8	39.7	39.7
Actuated g/C Ratio	0.11	0.11	0.34		0.03		0.18	0.65		0.01	0.48	0.48
Clearance Time (s)	6.0	6.0			6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0		2.0	4.5		2.0	4.5	4.5
Lane Grp Cap (vph)	186	186	939		57		610	2302		17	1709	765
v/s Ratio Prot	0.06	0.06			c0.00		c0.12	0.33		0.00	c0.39	
v/s Ratio Perm			0.17									0.11
v/c Ratio	0.54	0.54	0.33		0.02		0.69	0.51		0.41	0.81	0.11
Uniform Delay, d1	34.6	34.6	20.4		38.4		31.7	7.5		40.5	18.1	11.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	3.2	0.1		0.1		2.6	0.3		5.8	3.3	0.1
Delay (s)	37.8	37.8	20.4		38.5		34.3	7.9		46.3	21.4	11.7
Level of Service	D	D	C		D		C	A		D	C	B
Approach Delay (s)		25.6			38.5			14.8			20.4	
Approach LOS		C			D			B			C	

Intersection Summary

HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	3539	3433	1583
Volume (vph)	404	443	129	396	347	141
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	439	482	140	430	377	153
RTOR Reduction (vph)	0	270	0	0	0	0
Lane Group Flow (vph)	439	212	140	430	377	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Actuated Green, G (s)	25.7	25.7	9.5	39.2	11.7	61.9
Effective Green, g (s)	27.2	27.2	9.5	40.7	13.2	61.9
Actuated g/C Ratio	0.44	0.44	0.15	0.66	0.21	1.00
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	
Vehicle Extension (s)	5.0	5.0	2.0	5.0	2.0	
Lane Grp Cap (vph)	819	696	272	2327	732	1583
v/s Ratio Prot	0.24		c0.08	0.12	c0.11	
v/s Ratio Perm		0.30				0.10
v/c Ratio	0.54	0.30	0.51	0.18	0.52	0.10
Uniform Delay, d1	12.7	11.2	24.1	4.1	21.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	0.7	0.1	0.3	0.0
Delay (s)	14.0	11.7	24.8	4.2	21.8	0.0
Level of Service	B	B	C	A	C	A
Approach Delay (s)	12.8			9.3	15.5	
Approach LOS	B			A	B	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.88	1.00	0.95	0.88	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	2787	1770	3539	2787	3433	3539	1583
Volume (vph)	74	242	170	647	219	629	129	810	664	704	924	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	263	185	703	238	684	140	880	722	765	1004	127
RTOR Reduction (vph)	0	0	20	0	0	164	0	0	23	0	0	77
Lane Group Flow (vph)	80	263	165	703	238	520	140	880	699	765	1004	50
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.0	10.5	20.1	19.0	21.5	42.5	9.6	23.9	42.9	21.0	35.3	35.3
Effective Green, g (s)	8.0	10.5	20.1	19.0	21.5	42.5	9.6	23.9	42.9	21.0	35.3	35.3
Actuated g/C Ratio	0.09	0.12	0.22	0.21	0.24	0.47	0.11	0.26	0.47	0.23	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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)	157	411	422	722	443	1434	188	936	1446	797	1382	618
v/s Ratio Prot	0.05	0.07	0.05	c0.20	c0.13	0.11	0.08	c0.25	0.10	c0.22	0.28	
v/s Ratio Perm			0.07			0.13			0.15			0.08
v/c Ratio	0.51	0.64	0.39	0.97	0.54	0.36	0.74	0.94	0.48	0.96	0.73	0.08
Uniform Delay, d1	39.3	38.1	29.9	35.5	30.1	15.3	39.2	32.6	16.2	34.3	23.4	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	3.3	0.6	26.9	1.3	0.2	14.8	16.8	0.3	22.3	1.9	0.1
Delay (s)	41.9	41.4	30.5	62.3	31.4	15.5	54.0	49.4	16.5	56.5	25.4	17.4
Level of Service	D	D	C	E	C	B	D	D	B	E	C	B
Approach Delay (s)		37.7			38.1			36.1			37.4	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	37.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.36	1.00
Satd. Flow (perm)	1770	1583	1863	1583	673	1863
Volume (vph)	207	123	536	233	153	455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	134	583	253	166	495
RTOR Reduction (vph)	0	103	0	108	0	0
Lane Group Flow (vph)	225	31	583	145	166	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.6	9.6	23.6	23.6	23.6	23.6
Effective Green, g (s)	9.6	9.6	23.6	23.6	23.6	23.6
Actuated g/C Ratio	0.23	0.23	0.57	0.57	0.57	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	369	1067	907	386	1067
v/s Ratio Prot	c0.13		c0.31			0.27
v/s Ratio Perm		0.08		0.16	0.25	
v/c Ratio	0.55	0.08	0.55	0.16	0.43	0.46
Uniform Delay, d1	13.9	12.4	5.5	4.1	5.0	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.1	0.6	0.1	0.8	0.3
Delay (s)	15.4	12.5	6.0	4.2	5.8	5.4
Level of Service	B	B	A	A	A	A
Approach Delay (s)	14.3		5.5			5.5
Approach LOS	B		A			A

Intersection Summary

HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	41.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0				4.0	4.0			4.0	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				1770	3539			3539	1583
Flt Permitted		0.76	1.00				0.95	1.00			1.00	1.00
Satd. Flow (perm)		1410	1583				1770	3539			3539	1583
Volume (vph)	87	0	81	0	0	0	35	1613	0	0	1532	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	0	88	0	0	0	38	1753	0	0	1665	114
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	0	0	0	35
Lane Group Flow (vph)	0	95	10	0	0	0	38	1753	0	0	1665	79
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		10.3	10.3				4.3	69.3			61.0	61.0
Effective Green, g (s)		10.3	10.3				4.3	69.3			61.0	61.0
Actuated g/C Ratio		0.12	0.12				0.05	0.79			0.70	0.70
Clearance Time (s)		4.0	4.0				4.0	4.0			4.0	4.0
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		166	186				87	2800			2464	1102
v/s Ratio Prot							0.02	c0.50			c0.47	
v/s Ratio Perm		c0.07	0.06									0.07
v/c Ratio		0.57	0.06				0.44	0.63			0.68	0.07
Uniform Delay, d1		36.6	34.3				40.5	3.8			7.6	4.3
Progression Factor		1.00	1.00				1.00	1.00			1.00	1.00
Incremental Delay, d2		4.7	0.1				3.5	0.4			0.7	0.0
Delay (s)		41.3	34.5				44.0	4.2			8.4	4.3
Level of Service		D	C				D	A			A	A
Approach Delay (s)		38.0			0.0			5.1			8.1	
Approach LOS		D			A			A			A	

Intersection Summary

HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	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	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	433	255	214	1319	1272	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	471	277	233	1434	1383	527
RTOR Reduction (vph)	0	197	0	0	0	299
Lane Group Flow (vph)	471	80	233	1434	1383	228
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.0	26.0	13.0	56.0	39.0	39.0
Effective Green, g (s)	26.0	26.0	13.0	56.0	39.0	39.0
Actuated g/C Ratio	0.29	0.29	0.14	0.62	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	511	457	256	2202	1534	686
v/s Ratio Prot	c0.27		c0.13	0.41	c0.39	
v/s Ratio Perm		0.17				0.33
v/c Ratio	0.92	0.18	0.91	0.65	0.90	0.33
Uniform Delay, d1	31.0	24.0	37.9	10.8	23.7	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.5	0.8	37.1	1.5	8.9	1.3
Delay (s)	55.5	24.8	75.1	12.3	32.7	18.2
Level of Service	E	C	E	B	C	B
Approach Delay (s)	44.1			21.1	28.7	
Approach LOS	D			C	C	

Intersection Summary

HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00		0.95		0.97	1.00			1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	3433	3539	1583		3539		3433	1863			1863	1583
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	3433	3539	1583		3539		3433	1863			1863	1583
Volume (vph)	414	277	442	0	589	0	518	60	0	0	55	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	450	301	480	0	640	0	563	65	0	0	60	185
RTOR Reduction (vph)	0	0	273	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	450	301	207	0	640	0	563	65	0	0	60	42
Turn Type	Prot		Prot	Prot			Prot			Prot		Perm
Protected Phases	7	4	4	3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.6	38.9	38.9		19.3		18.8	43.1			20.3	20.3
Effective Green, g (s)	15.6	38.9	38.9		19.3		18.8	43.1			20.3	20.3
Actuated g/C Ratio	0.17	0.43	0.43		0.21		0.21	0.48			0.23	0.23
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	595	1530	684		759		717	892			420	357
v/s Ratio Prot	0.13	0.09	c0.30		c0.18		c0.16	0.03			0.03	
v/s Ratio Perm												0.12
v/c Ratio	0.76	0.20	0.30		0.84		0.79	0.07			0.14	0.12
Uniform Delay, d1	35.4	15.9	16.7		33.9		33.7	12.7			27.9	27.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.5	0.1	0.3		8.5		5.7	0.2			0.7	0.7
Delay (s)	40.8	15.9	16.9		42.4		39.3	12.8			28.6	28.4
Level of Service	D	B	B		D		D	B			C	C
Approach Delay (s)		25.4			42.4			36.6			28.4	
Approach LOS		C			D			D			C	

Intersection Summary

HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

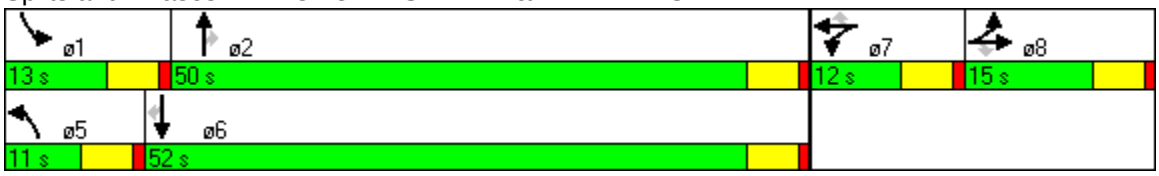
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	45	191	121	62	37	86	1325	150	95	1443	105
Lane Group Flow (vph)	117	124	208	97	102	40	93	1440	163	103	1568	114
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	8	8		7	7		5	2		1	6	
Permitted Phases			8			7			2			6
Detector Phases	8	8	8	7	7	7	5	2	2	1	6	6
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	5.0	5.0	20.0	20.0	8.0	20.0	20.0
Minimum Split (s)	15.0	15.0	15.0	10.0	10.0	10.0	10.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	15.0	15.0	15.0	12.0	12.0	12.0	11.0	50.0	50.0	13.0	52.0	52.0
Total Split (%)	16.7%	16.7%	16.7%	13.3%	13.3%	13.3%	12.2%	55.6%	55.6%	14.4%	57.8%	57.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.52	0.54	0.61	0.64	0.65	0.22	0.66	0.74	0.17	0.29	0.78	0.12
Control Delay	46.2	46.7	21.7	58.5	58.3	15.8	62.1	19.4	2.5	39.6	19.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	46.7	21.7	58.5	58.3	15.8	62.1	19.4	2.5	39.6	19.5	2.5
Queue Length 50th (ft)	67	71	32	56	60	0	53	337	0	28	371	0
Queue Length 95th (ft)	#127	#140	104	#131	#136	30	#126	431	29	53	472	24
Internal Link Dist (ft)		459			456			2865			2675	
Turn Bay Length (ft)												
Base Capacity (vph)	224	229	339	156	162	183	144	1948	945	357	2017	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.54	0.61	0.62	0.63	0.22	0.65	0.74	0.17	0.29	0.78	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 84.4
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: OHUKAI STREET & PIILANI HIGHWAY

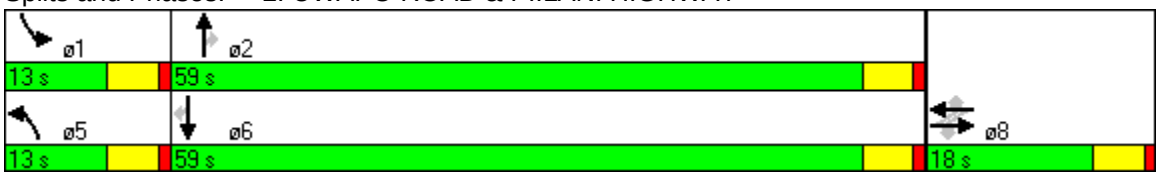


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	13	110	96	39	51	73	1359	108	68	1627	49
Lane Group Flow (vph)	65	14	120	104	42	55	79	1477	117	74	1768	53
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		8			8		5	2		1	6	
Permitted Phases	8		8	8		8			2			6
Detector Phases	8	8	8	8	8	8	5	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0	10.0	27.0	27.0
Total Split (s)	18.0	18.0	18.0	18.0	18.0	18.0	13.0	59.0	59.0	13.0	59.0	59.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	14.4%	65.6%	65.6%	14.4%	65.6%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
v/c Ratio	0.35	0.05	0.37	0.54	0.16	0.21	0.50	0.63	0.11	0.47	0.76	0.05
Control Delay	38.4	33.0	9.8	42.8	34.4	11.5	47.0	11.6	1.7	46.0	14.6	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	33.0	9.8	42.8	34.4	11.5	47.0	11.6	1.7	46.0	14.6	2.2
Queue Length 50th (ft)	33	7	0	55	21	0	43	267	0	40	373	0
Queue Length 95th (ft)	72	24	47	106	50	32	88	343	19	84	480	13
Internal Link Dist (ft)		530			620			2675			2120	
Turn Bay Length (ft)												
Base Capacity (vph)	208	285	344	214	285	289	173	2336	1085	173	2334	1062
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.05	0.35	0.49	0.15	0.19	0.46	0.63	0.11	0.43	0.76	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: UWAPO ROAD & PIILANI HIGHWAY

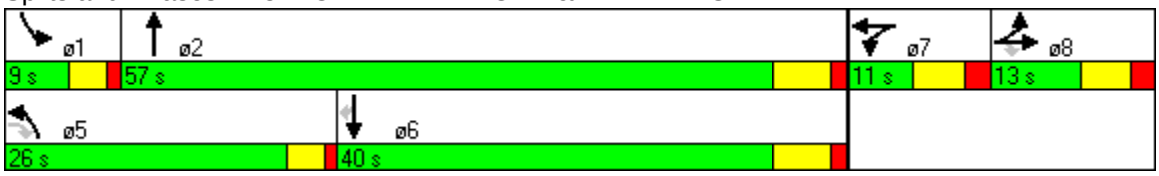


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	186	0	444	0	386	1086	6	1274	157
Lane Group Flow (vph)	101	101	483	3	420	1184	7	1385	171
Turn Type	Split		custom		Prot		Prot		Perm
Protected Phases	8	8		7	5	2	1	6	
Permitted Phases			5 8						6
Detector Phases	8	8	5 8	7	5	2	1	6	6
Minimum Initial (s)	7.0	7.0		5.0	10.0	20.0	5.0	20.0	20.0
Minimum Split (s)	13.0	13.0		11.0	26.0	26.0	9.0	26.0	26.0
Total Split (s)	13.0	13.0	39.0	11.0	26.0	57.0	9.0	40.0	40.0
Total Split (%)	14.4%	14.4%	43.3%	12.2%	28.9%	63.3%	10.0%	44.4%	44.4%
Yellow Time (s)	4.0	4.0		4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0		2.0	1.0	1.5	1.0	1.5	1.5
Lead/Lag	Lag	Lag		Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None		None	None	Min	None	Min	Min
v/c Ratio	0.49	0.49	0.40	0.02	0.62	0.46	0.06	0.80	0.20
Control Delay	42.0	42.0	8.5	30.0	29.0	6.1	39.8	22.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	42.0	8.5	30.0	29.0	6.1	39.8	22.1	3.3
Queue Length 50th (ft)	44	44	36	0	87	71	3	238	0
Queue Length 95th (ft)	#127	#127	88	9	151	258	18	#557	38
Internal Link Dist (ft)		1420		460		2120		1468	
Turn Bay Length (ft)									
Base Capacity (vph)	207	207	1350	143	933	2569	109	1740	865
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.49	0.36	0.02	0.45	0.46	0.06	0.80	0.20

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: NORTH KIHEI ROAD & PIILANI HIGHWAY

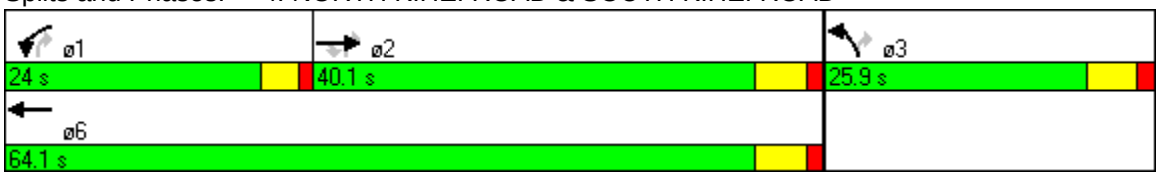


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	404	443	129	396	347	141
Lane Group Flow (vph)	439	482	140	430	377	153
Turn Type		Perm	Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases		2				1 2 3
Detector Phases	2	2	1	6	3	1 2 3
Minimum Initial (s)	10.0	10.0	5.0	10.0	7.0	
Minimum Split (s)	30.5	30.5	9.0	15.5	12.5	
Total Split (s)	40.1	40.1	24.0	64.1	25.9	90.0
Total Split (%)	44.6%	44.6%	26.7%	71.2%	28.8%	100.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.5	1.5	1.0	1.5	1.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	Min	
v/c Ratio	0.55	0.50	0.52	0.19	0.52	0.10
Control Delay	15.9	3.1	29.8	4.5	25.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.1	29.8	4.5	25.1	0.1
Queue Length 50th (ft)	114	0	53	26	70	0
Queue Length 95th (ft)	252	53	120	55	128	0
Internal Link Dist (ft)	714			1420	691	
Turn Bay Length (ft)						
Base Capacity (vph)	955	1046	502	2617	1091	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.46	0.28	0.16	0.35	0.10

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62.7
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: NORTH KIHEI ROAD & SOUTH KIHEI ROAD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	242	170	647	219	629	129	810	664	704	924	117
Lane Group Flow (vph)	80	263	185	703	238	684	140	880	722	765	1004	127
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	16.0	14.0	14.0	23.0	21.0	25.0	14.0	28.0	23.0	25.0	39.0	39.0
Total Split (%)	17.8%	15.6%	15.6%	25.6%	23.3%	27.8%	15.6%	31.1%	25.6%	27.8%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
v/c Ratio	0.45	0.69	0.43	0.97	0.53	0.43	0.74	0.93	0.49	0.95	0.72	0.18
Control Delay	41.8	47.5	27.2	62.4	36.8	8.5	59.8	49.6	14.2	57.0	26.8	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	47.5	27.2	62.4	36.8	8.5	59.8	49.6	14.2	57.0	26.8	4.1
Queue Length 50th (ft)	43	76	74	205	122	67	78	256	132	222	251	0
Queue Length 95th (ft)	86	118	136	#319	#212	121	#166	#376	184	#337	325	34
Internal Link Dist (ft)		253			225			2017			2865	
Turn Bay Length (ft)												
Base Capacity (vph)	226	393	422	728	448	1596	197	947	1479	804	1394	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.67	0.44	0.97	0.53	0.43	0.71	0.93	0.49	0.95	0.72	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

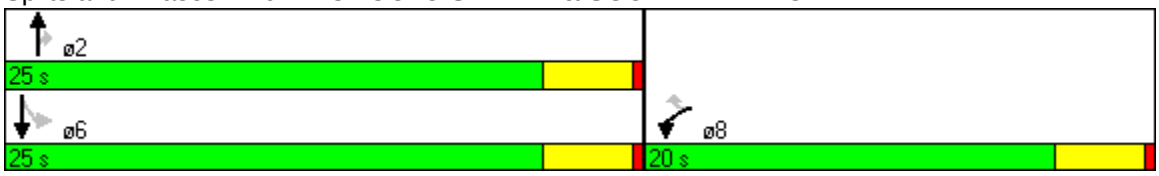
Splits and Phases: 5: KAONOULU STREET & PIILANI HIGHWAY

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	207	123	536	233	153	455
Lane Group Flow (vph)	225	134	583	253	166	495
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phases	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	25.0	25.0	25.0	25.0
Total Split (%)	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
v/c Ratio	0.50	0.27	0.53	0.24	0.53	0.45
Control Delay	12.7	3.6	9.0	1.9	17.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	3.6	9.0	1.9	17.5	8.0
Queue Length 50th (ft)	35	0	69	0	19	55
Queue Length 95th (ft)	83	25	190	26	#110	151
Internal Link Dist (ft)	290		106			222
Turn Bay Length (ft)						
Base Capacity (vph)	613	636	1155	1078	331	1155
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.50	0.23	0.50	0.43

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 41
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: KAONOULU STREET & SOUTH KIHEI ROAD

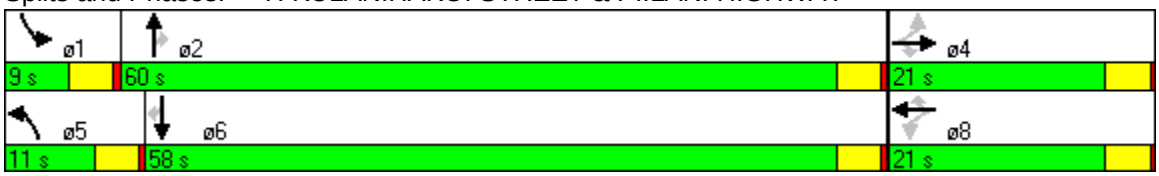


Lane Group	EBL	EBT	EBR	NBL	NBT	SBT	SBR	ø1	ø8
Lane Configurations									
Volume (vph)	87	0	81	35	1613	1532	105		
Lane Group Flow (vph)	0	95	88	38	1753	1665	114		
Turn Type	Perm		Perm	Prot			Perm		
Protected Phases		4		5	2	6		1	8
Permitted Phases	4		4				6		
Detector Phases	4	4	4	5	2	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	21.0	11.0	60.0	58.0	58.0	9.0	21.0
Total Split (%)	23.3%	23.3%	23.3%	12.2%	66.7%	64.4%	64.4%	10%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag				Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min	None	None
v/c Ratio		0.52	0.31	0.28	0.62	0.66	0.10		
Control Delay		34.2	9.1	40.9	5.6	10.4	1.7		
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay		34.2	9.1	40.9	5.6	10.4	1.7		
Queue Length 50th (ft)		43	0	17	157	269	0		
Queue Length 95th (ft)		94	39	51	295	428	19		
Internal Link Dist (ft)		212			1953	2017			
Turn Bay Length (ft)									
Base Capacity (vph)		269	373	144	2850	2589	1188		
Starvation Cap Reductn		0	0	0	0	0	0		
Spillback Cap Reductn		0	0	0	0	0	0		
Storage Cap Reductn		0	0	0	0	0	0		
Reduced v/c Ratio		0.35	0.24	0.26	0.62	0.64	0.10		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 85.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 7: KULANIHAKOI STREET & PIILANI HIGHWAY

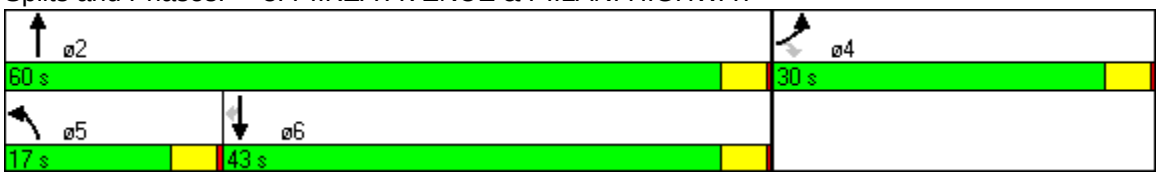


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	433	255	214	1319	1272	485
Lane Group Flow (vph)	471	277	233	1434	1383	527
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	17.0	60.0	43.0	43.0
Total Split (%)	33.3%	33.3%	18.9%	66.7%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.92	0.42	0.91	0.65	0.90	0.54
Control Delay	57.2	5.4	77.3	12.6	33.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.2	5.4	77.3	12.6	33.5	3.8
Queue Length 50th (ft)	259	0	132	246	373	0
Queue Length 95th (ft)	#444	56	#269	315	#519	56
Internal Link Dist (ft)	620			1070	1739	
Turn Bay Length (ft)						
Base Capacity (vph)	511	654	256	2202	1534	985
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.42	0.91	0.65	0.90	0.54

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: PIIKEA AVENUE & PIILANI HIGHWAY

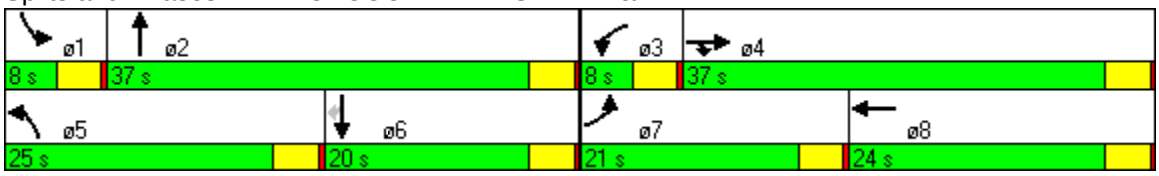


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations										
Volume (vph)	414	277	442	589	518	60	55	170		
Lane Group Flow (vph)	450	301	480	640	563	65	60	185		
Turn Type	Prot		Prot		Prot			Perm		
Protected Phases	7	4	4	8	5	2	6		1	3
Permitted Phases								6		
Detector Phases	7	4	4	8	5	2	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	8.0
Total Split (s)	21.0	37.0	37.0	24.0	25.0	37.0	20.0	20.0	8.0	8.0
Total Split (%)	23.3%	41.1%	41.1%	26.7%	27.8%	41.1%	22.2%	22.2%	9%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	None	None
v/c Ratio	0.76	0.20	0.50	0.84	0.78	0.07	0.14	0.37		
Control Delay	41.4	15.7	3.5	43.1	38.6	14.1	32.1	7.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	41.4	15.7	3.5	43.1	38.6	14.1	32.1	7.6		
Queue Length 50th (ft)	124	51	0	182	153	20	29	0		
Queue Length 95th (ft)	175	77	52	#264	208	43	64	55		
Internal Link Dist (ft)		86		399		103	80			
Turn Bay Length (ft)										
Base Capacity (vph)	648	1535	958	791	801	892	419	500		
Starvation Cap Reductn	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.69	0.20	0.50	0.81	0.70	0.07	0.14	0.37		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 8 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: UPCOUNTRY HIGHWAY & DRIVE A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	342	11	25	323	81	9	9	28	118	5	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	372	12	27	351	88	10	10	30	128	5	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					333							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	439			384			857	923	378	909	885	395
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	390			384			844	917	378	901	875	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	96	95	40	98	97
cM capacity (veh/h)	1075			1175			240	239	669	213	252	644

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	26	384	27	439	10	40	128	24
Volume Left	26	0	27	0	10	0	128	0
Volume Right	0	12	0	88	0	30	0	18
cSH	1075	1700	1175	1700	240	465	213	476
Volume to Capacity	0.02	0.23	0.02	0.26	0.04	0.09	0.60	0.05
Queue Length 95th (ft)	2	0	2	0	3	7	86	4
Control Delay (s)	8.4	0.0	8.1	0.0	20.6	13.5	44.8	13.0
Lane LOS	A		A		C	B	E	B
Approach Delay (s)	0.5		0.5		14.9		39.8	
Approach LOS					B		E	

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	70	379	10	6	347	8	5	4	7	7	3	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	412	11	7	377	9	5	4	8	8	3	98
Approach Volume (veh/h)		499			392			17			109	
Crossing Volume (veh/h)		17			86			496			389	
High Capacity (veh/h)		1366			1295			937			1020	
High v/c (veh/h)		0.37			0.30			0.02			0.11	
Low Capacity (veh/h)		1144			1080			757			831	
Low v/c (veh/h)		0.44			0.36			0.02			0.13	

Intersection Summary			
Maximum v/c High	0.37		
Maximum v/c Low	0.44		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1134	479	0	1496	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1233	521	0	1626	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	305			296		
pX, platoon unblocked					0.83	
vC, conflicting volume			1753		2046	616
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1753		2055	616
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			353		40	433

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	616	616	521	813	813	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	521	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.36	0.36	0.31	0.48	0.48	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1234	1277	0	0	219
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1341	1388	0	0	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		435	166			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	1388				2059	694
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1261				2071	424
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	50
cM capacity (veh/h)	453				39	479

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	671	671	694	694	0	238
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	238
cSH	1700	1700	1700	1700	1700	479
Volume to Capacity	0.39	0.39	0.41	0.41	0.00	0.50
Queue Length 95th (ft)	0	0	0	0	0	68
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	19.7
Lane LOS						C
Approach Delay (s)	0.0		0.0			19.7
Approach LOS						C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	78	31	168	0	62	0	456	0	0	0	0	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	34	183	0	67	0	496	0	0	0	0	77
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		479										
pX, platoon unblocked												
vC, conflicting volume	67			216			314	271	34	271	453	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			216			314	271	34	271	453	34
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			9	100	100	100	100	93
cM capacity (veh/h)	1532			1351			545	600	1032	632	473	1032

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	85	34	183	0	45	22	496	0	0	77
Volume Left	85	0	0	0	0	0	496	0	0	0
Volume Right	0	0	183	0	0	0	0	0	0	77
cSH	1532	1700	1700	1700	1700	1700	545	1700	1700	1032
Volume to Capacity	0.06	0.02	0.11	0.00	0.03	0.01	0.91	0.00	0.00	0.07
Queue Length 95th (ft)	4	0	0	0	0	0	272	0	0	6
Control Delay (s)	7.5	0.0	0.0	0.0	0.0	0.0	47.0	0.0	0.0	8.8
Lane LOS	A						E	A	A	A
Approach Delay (s)	2.1			0.0			47.0		8.8	
Approach LOS							E		A	

Intersection Summary			
Average Delay	26.2		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	31	0	0	62	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	34	0	0	67	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	629					
pX, platoon unblocked						
vC, conflicting volume			34		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			34		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	100
cM capacity (veh/h)			1578		1023	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	34	0	67
Volume Left	0	0	67
Volume Right	34	0	0
cSH	1700	1700	1023
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	6.8%	ICU Level of Service	A
Analysis Period (min)	15		