Traffic Impact Report

# *Keauhou Lane*

Prepared for:
Stanford Carr Development LLC

Prepared by:
Wilson Okamoto Corporation

October 2013

# *TRAFFIC IMPACT REPORT*

# *FOR*

# *KEAUHOU LANE*

*Prepared for*:

Stanford Carr Development, LLC
1100 Alakea Street, Suite 2700
Honolulu, HI 96813

*Prepared by*:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #10009-01

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## TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF APPENDICIES

# I. INTRODUCTION

## A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from a proposed Keauhou Lane mixed-use development in Kakaako on the island of Oahu. The development is expected to include multi-family residential units, commercial uses, a parking structure, and amenities.

## B. Scope of Study

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

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

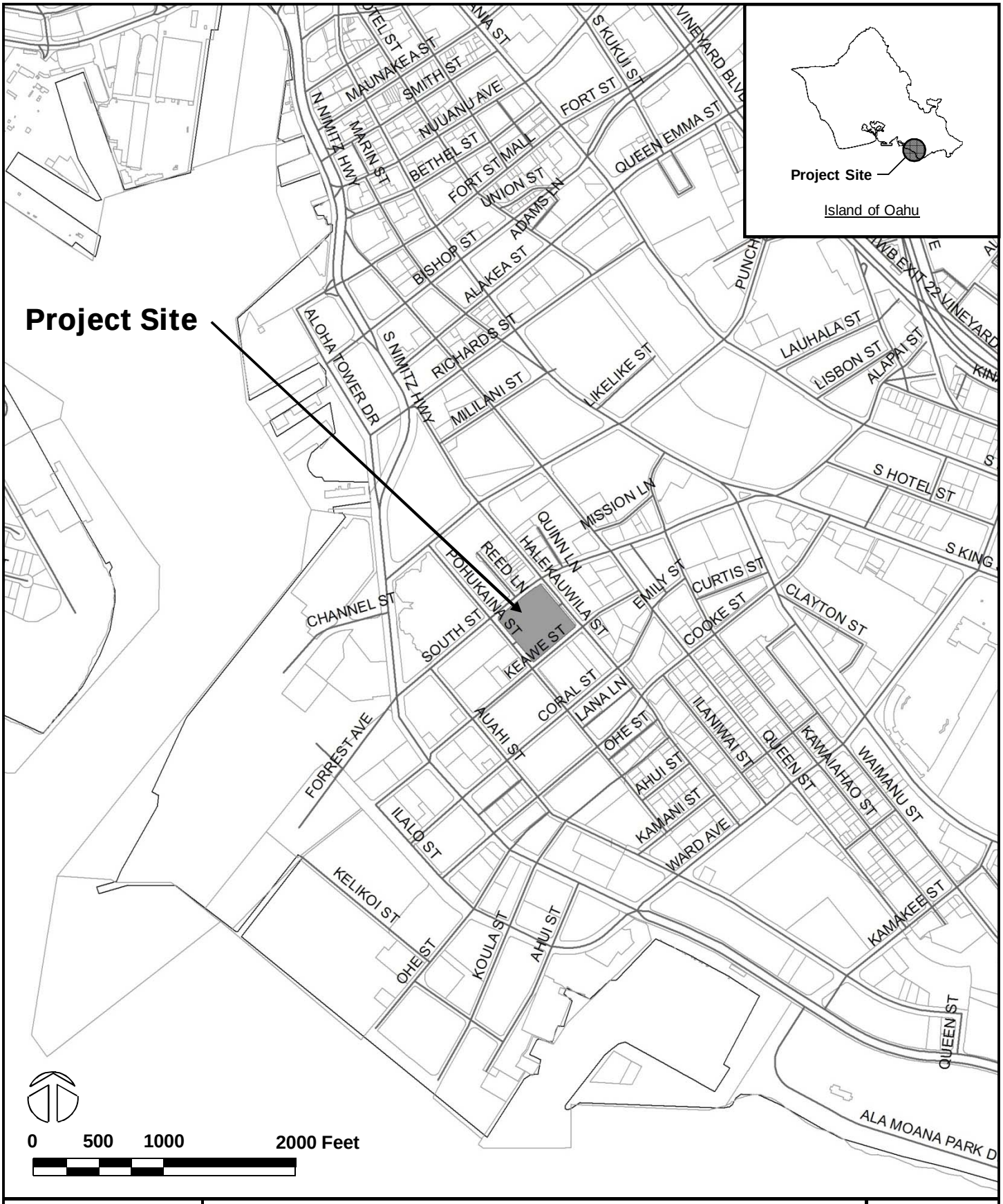
# II. PROJECT DESCRIPTION

## A. Location

The proposed project site is located adjacent to Halekauwila Street in Kakaako on the island of Oahu (see Figure 1). The site is bounded by Halekauwila Street to the north, South Street to the west, Pohukaina Street to the south, and Keawe Street to the east. Primary access for the development will be provided via driveways off South Street and Pohukaina Street.

## B. Project Characteristics

The project site for the proposed Keauhou Lane development currently houses an at-grade parking lot with driveways off Halekauwila Street, South Street, and Keawe Street. The existing parking lot is expected to be replaced by a new multi-use development that includes the following:




| | | |
|---|---|---|
| WILSON OKAMOTO CORPORATION<br>ENGINEERS - PLANNERS | **KEAUHOU LANE**<br>LOCATION MAP AND VICINITY MAP | FIGURE<br>1 |

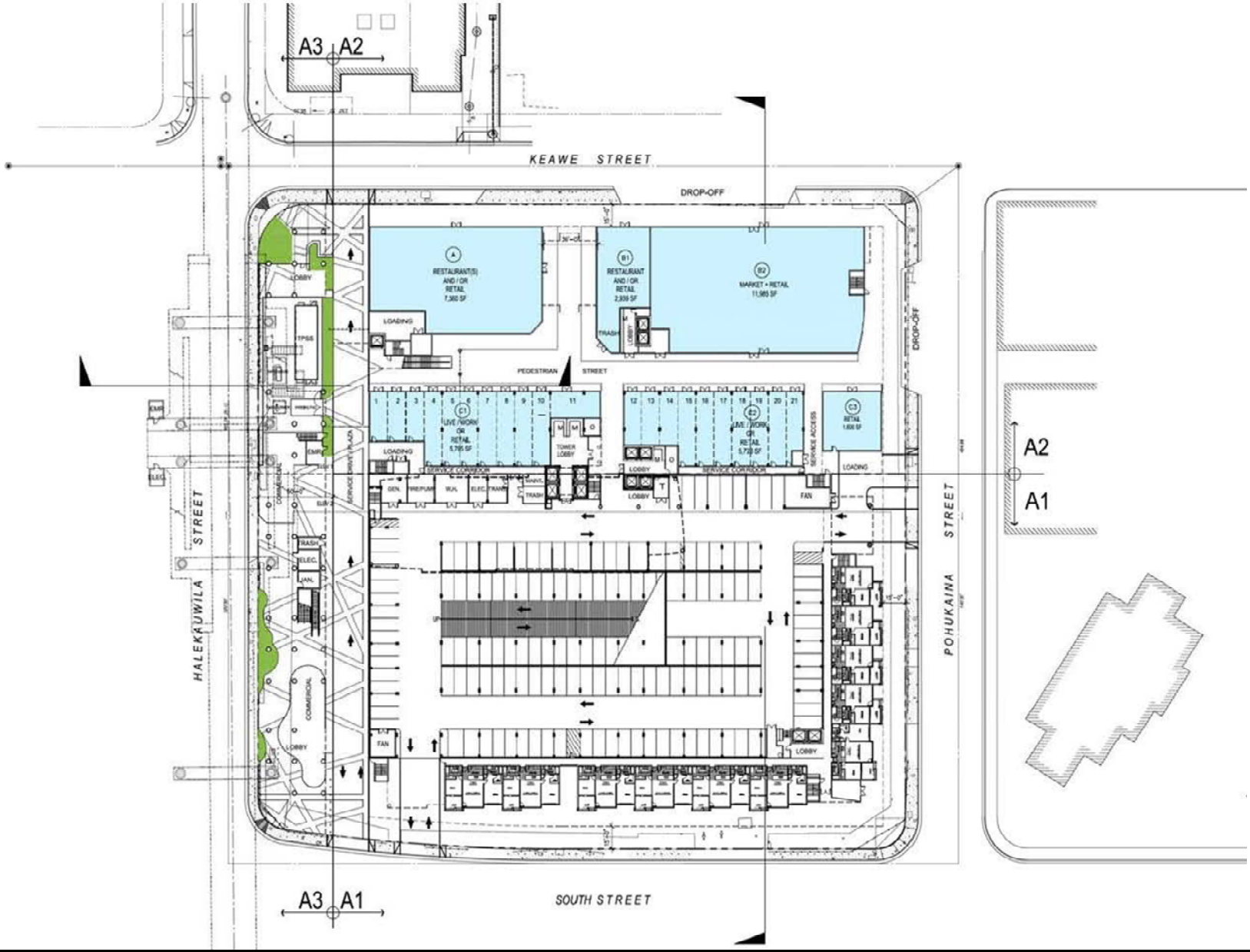
- 35 townhouse residential units
- 388 one- to three-bedroom condominium residential units
- 167 studio to three-bedroom rental apartments
- Approximately 34,822 square feet of commercial uses including a neighborhood market and restaurants
- Parking structure
- Amenities such as recreational and storage areas

It should be noted that a future rail transit station is expected to be built along the north edge of the project site. This station will include an access roadway for service and/or maintenance with additional driveways off South Street and Keawe Street. Primary access to the Keauhou Lane development will be provided via new driveways off South Street and Pohukaina Street. The proposed development is expected to be completed and occupied by the Year 2016. Figure 2 shows the proposed project site plan.

## III. EXISTING TRAFFIC CONDITIONS

### A. Area Roadway System

The proposed project site is located adjacent to Halekauwila Street in Kakaako. Halekauwila Street originates at Nimitz Highway as a one-lane, one-way (eastbound) roadway that transitions to a two-lane, two-way roadway at Punchbowl Street and terminates at Ward Avenue. At the northwest corner of the project site, Halekauwila Street intersects with South Street. At this signalized intersection, the eastbound approach of Halekauwila Street has one lane that serves left-turn and through traffic movements while the westbound approach has one exclusive right-turn lane (see Figure 3). South Street is a two-lane, two-way roadway generally oriented in the north-south direction between Ala Moana Boulevard and Pohukaina Street. Between Ala Moana Boulevard and Pohukaina Street, South Street is a predominantly four-lane, two-way roadway that transitions to a four-lane, one-way (northbound) roadway at Pohukaina Street. At the intersection with Halekauwila Street, the northbound approach of South Street has a shared left-turn and through lane, two through lanes, and a shared through and right-turn lane.

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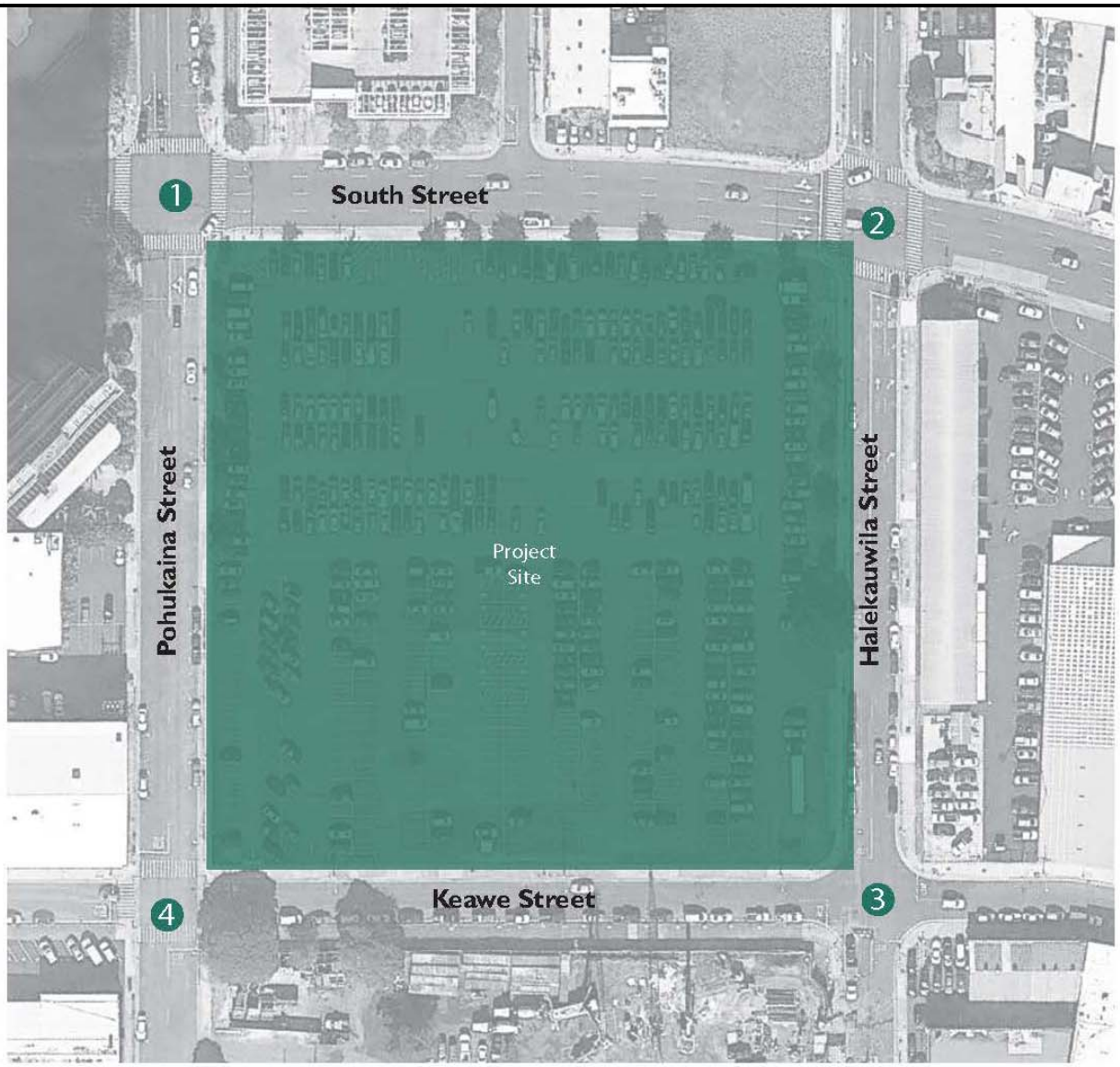
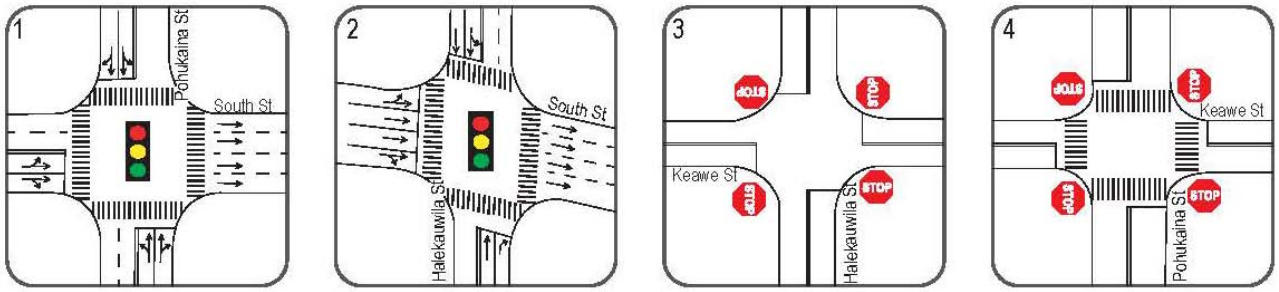
| **WILSON OKAMOTO CORPORATION**<br>ENGINEERS - PLANNERS | KEAUHOU LANE<br>PROJECT SITE PLAN | FIGURE<br>2 |




LEGEND
● Study Intersection

North
Not to Scale

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**KEAUHOU LANE**

EXISTING LANE CONFIGURATIONS

FIGURE 3

East of the intersection with South Street, Halekauwila Street intersects Keawe Street. At this all-way stop intersection, both approaches of Halekauwila Street have one lane that serves all traffic movements. Keawe Street is a predominantly two-lane, two-way roadway generally oriented in the north-south direction between Ilalo Street and Queen Street. At the intersection with Halekauwila Street, the Keawe Street approaches have one lane that serves all traffic movements.

South of the intersection with Halekauwila Street, Keawe Street intersects Pohukaina Street. Pohukaina Street is a two-lane, two-way roadway generally oriented in the east-west direction between Punchbowl Street and Kamani Street. At this all-way stop intersection, all approaches have one lane that serves all traffic movements.

West of the intersection with Keawe Street, Pohukaina Street intersects South Street. At this signalized intersection, both approaches of Pohukaina Street have two lanes that serve all traffic movements. Along South Street, the northbound approach also has two lanes that serve all traffic movements.

## B. Traffic Volumes and Conditions

### 1. General

#### a. Field Investigation

Field investigations were conducted on September 19, 2013 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 8:00 AM, and the afternoon peak hours between 3:30 PM and 5:30 PM at the following intersections:

- Halekauwila Street and South Street
- Halekauwila Street and Keawe Street
- Pohukaina Street and South Street
- Pohukaina Street and Keawe Street

In addition, supplemental traffic data was collected at the driveways for the existing surface parking lot that occupies the project site on October 1, 2013. Appendix A includes the existing traffic count data.

**b. Capacity Analysis Methodology**

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

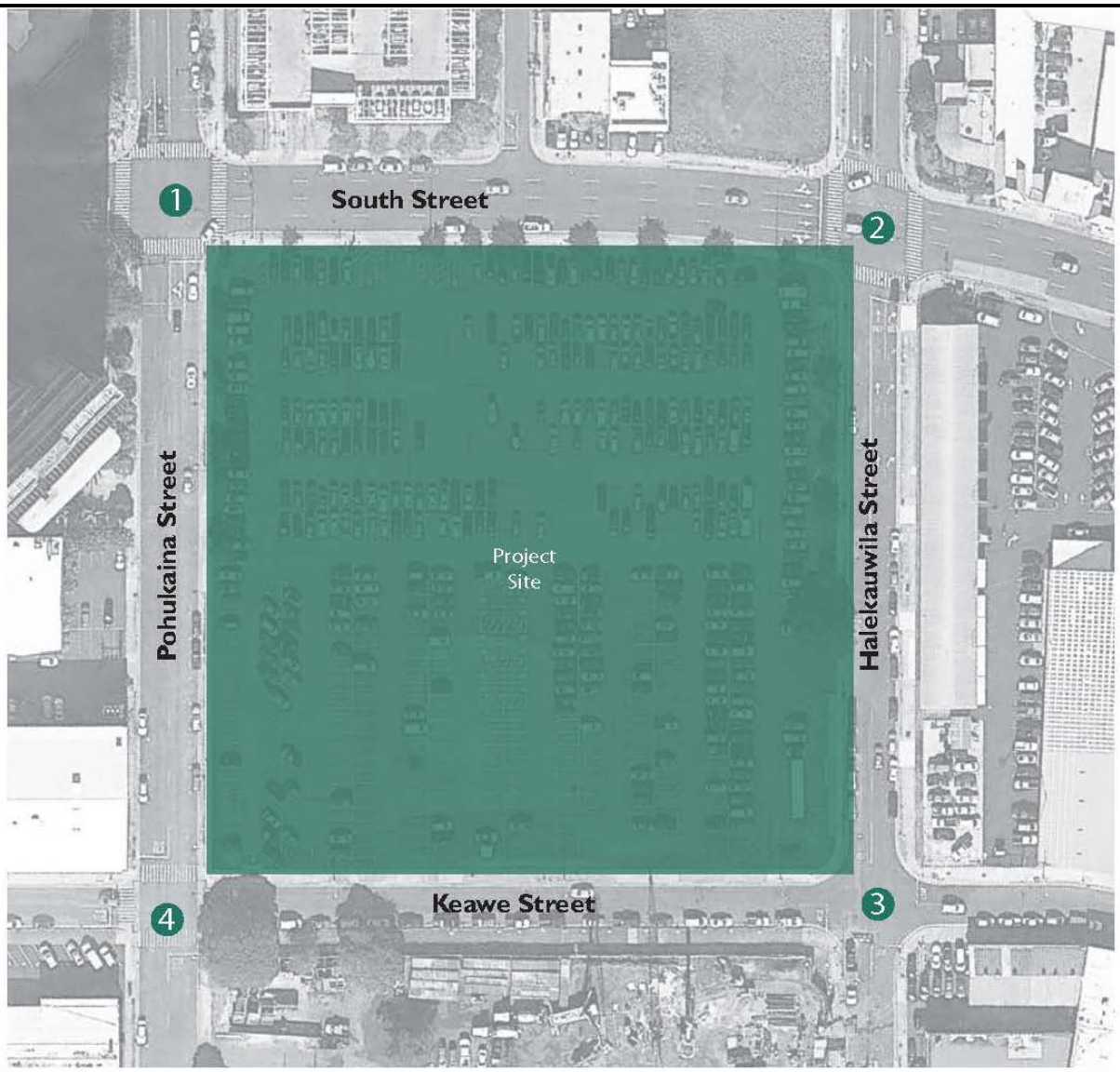
LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

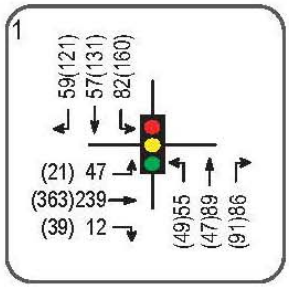
"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying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

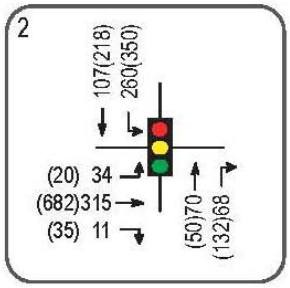
**2. Existing Peak Hour Traffic**

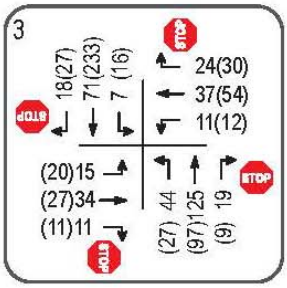
**a. General**

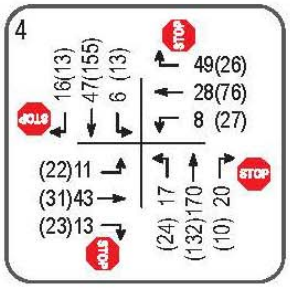
Figure 4 shows the existing AM and PM peak period traffic volumes and operating conditions. The AM peak hour of traffic generally occurs between 7:00 AM and 8:00 AM. The PM peak hour of traffic generally occurs between the hours of 4:15 PM and 5:15 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.




LEGEND
- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

North
Not to Scale

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**KEAUHOU LANE**

# EXISTING PEAK HOURS OF TRAFFIC

FIGURE 4

**b. Halekauwila Street and South Street**

At the intersection with South Street, Halekauwila Street carries 367 vehicles eastbound and 138 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 568 vehicles traveling eastbound and 182 vehicles traveling westbound. Both approaches of Halekauwila Street operate at LOS "A" during both peak periods.

The South Street approach of the intersection carries 360 vehicles northbound during the AM peak period and 737 vehicles northbound during the PM peak period. The northbound approach of South Street operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively.

**c. Halekauwila Street and Keawe Street**

At the intersection with Keawe Street, Halekauwila Street carries 96 vehicles eastbound and 188 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is slightly higher with 276 vehicles traveling eastbound and 133 vehicles traveling westbound. The eastbound approach of Halekauwila Street operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "A" during both peak periods.

The Keawe Street approaches of the intersection carry 60 vehicles northbound and 72 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 58 vehicles traveling northbound and 96 vehicles traveling southbound. Both approaches of Keawe Street operate at LOS "A" during both peak periods.

**d. Pohukaina Street and Keawe Street**

At the intersection with Keawe Street, Pohukaina Street carries 69 vehicles eastbound and 207 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is

higher with 188 vehicles traveling eastbound and 166 vehicles traveling westbound. Both approaches of Pohukaina Street operate at LOS "A" during both peak periods.

The Keawe Street approaches of the intersection carry 67 vehicles northbound and 85 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 76 vehicles traveling northbound and 129 vehicles traveling southbound. Both approaches of Keawe Street operate at LOS "A" during both peak periods.

**e. Pohukaina Street and South Street**

At the intersection with South Street, Pohukaina Street carries 198 vehicles eastbound and 230 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 412 vehicles traveling eastbound and 187 vehicles traveling westbound. Both approaches of Pohukaina Street operate at LOS "A" during both peak periods.

The South Street approach of the intersection carries 298 vehicles and 423 vehicles northbound during the AM and PM peak periods, respectively. This approach operates at LOS "A" during both peak periods.

## IV. PROJECTED TRAFFIC CONDITIONS

### A. Site-Generated Traffic

#### 1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 9th Edition," 2012. The ITE trip generation rates are developed empirically by correlating vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit or 1,000 square feet of development. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak periods of traffic.

**Table 1: Peak Hour Trip Generation**

| | | |
|---|---|---|
| **RENTAL APARTMENTS (MID-RISE APARTMENT)** INDEPENDENT VARIABLE: # of dwelling units = 167 | | |
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 17 |
| | EXIT | 38 |
| | TOTAL | 55 |
| PM PEAK | ENTER | 40 |
| | EXIT | 29 |
| | TOTAL | 69 |
| **RESIDENTIAL CONDO/TOWNHOUSE** INDEPENDENT VARIABLE: # of dwelling units = 35 | | |
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 4 |
| | EXIT | 18 |
| | TOTAL | 22 |
| PM PEAK | ENTER | 17 |
| | EXIT | 8 |
| | TOTAL | 25 |
| **HIGH-RISE RESIDENTIAL CONDO/TOWNHOUSE** INDEPENDENT VARIABLE: # of dwelling units = 388 | | |
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 27 |
| | EXIT | 114 |
| | TOTAL | 141 |
| PM PEAK | ENTER | 91 |
| | EXIT | 56 |
| | TOTAL | 147 |
| **COMMERCIAL (SPECIALTY RETAIL CENTER)** INDEPENDENT VARIABLE: 1,000 sf of development = 13.099 | | |
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 0 |
| | EXIT | 0 |
| | TOTAL | 0 |
| PM PEAK | ENTER | 16 |
| | EXIT | 19 |
| | TOTAL | 35 |

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

| **NEIGHBORHOOD GROCERY STORE (SUPERMARKET)** INDEPENDENT VARIABLE: 1,000 sf of development = 11.642 | | |
|---|---|---|
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 25 |
| | EXIT | 15 |
| | TOTAL | 40 |
| PM PEAK | ENTER | 56 |
| | EXIT | 54 |
| | TOTAL | 110 |
| **RESTAURANT (HIGH-TURNOVER SIT-DOWN RESTAURANT)** INDEPENDENT VARIABLE: 1,000 sf of development = 10.081 | | |
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 60 |
| | EXIT | 49 |
| | TOTAL | 109 |
| PM PEAK | ENTER | 60 |
| | EXIT | 39 |
| | TOTAL | 99 |

The trip generation methodology developed by ITE also includes provisions for pass-by trips and internal capture of trips. Pass-by trips are generated when vehicles that would be traveling through the area whether or not the project was developed make an intermediate stop at the project site between their origin and primary destination. Internal capture of trips accounts for vehicles that visit more than one destination within the same area without adding external vehicular trips to the surrounding roadways. As such, the peak hour trip generation for the proposed project was adjusted for pass-by trips and internal capture of trip (see Table 2). In addition, the site currently houses an existing at-grade parking lot. As such, the trips generated by the new development were adjusted to account for the existing trips currently accessing the site.

**Table 2: Adjusted Peak Hour Trip Generation**

| **ADJUSTED TOTALS*** | | |
|---|---|---|
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 86 |
| | EXIT | 196 |
| | TOTAL | 282 |
| PM PEAK | ENTER | 207 |
| | EXIT | 140 |
| | TOTAL | 347 |

*Prior to adjustment for existing trips currently accessing the site

**2. Trip Distribution**

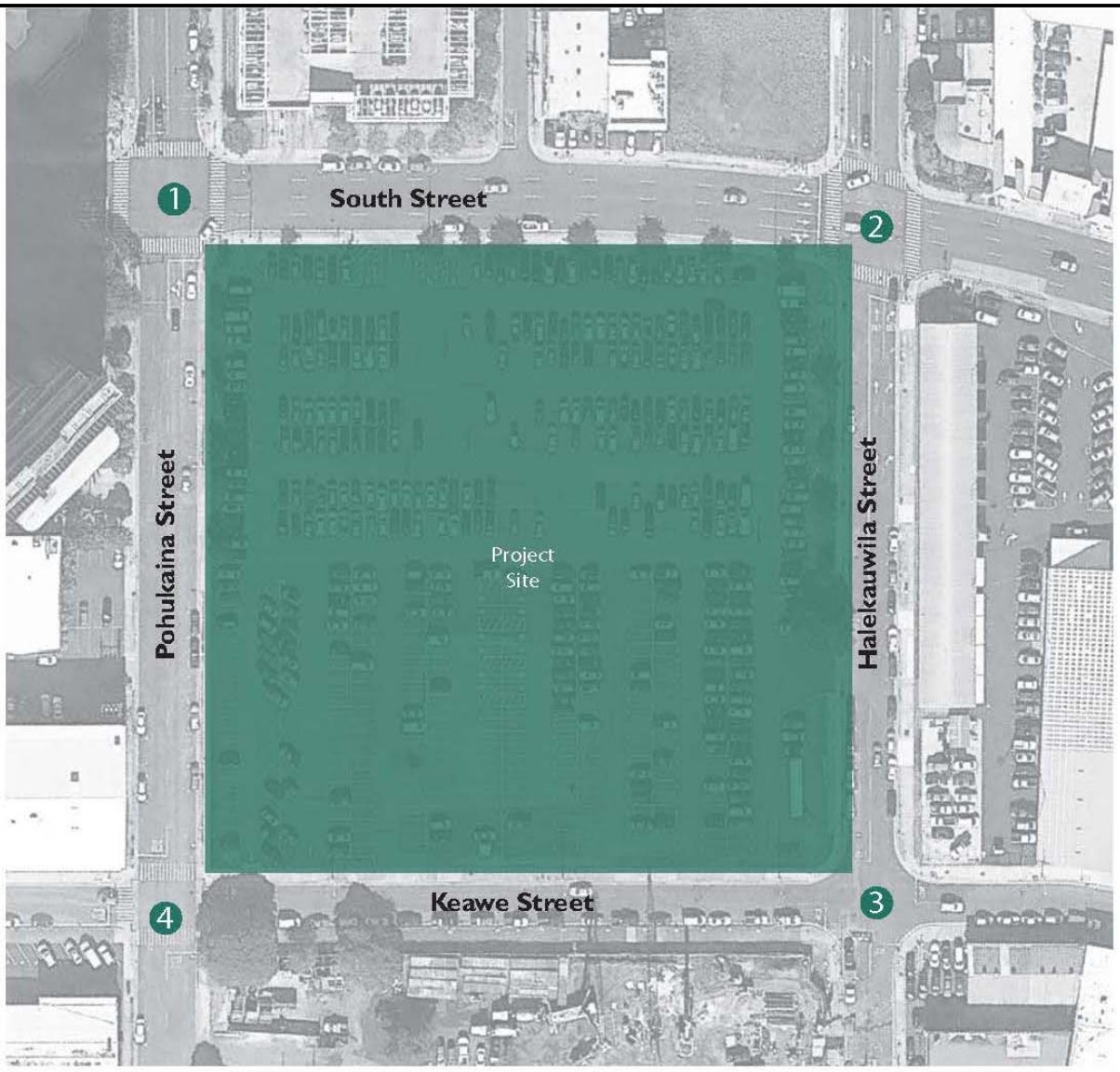
Figure 5 shows the distribution of site-generated traffic during the AM and PM peak periods. Primary access to Keauhou Lane development will be provided via new driveways off South Street and Pohukaina Street. Site-generated trips were distributed between the two primary access driveways based upon their assumed origin/destination and the relative convenience of the available routes. The directional distribution vehicles at the study intersections were assumed to remain similar to existing conditions.

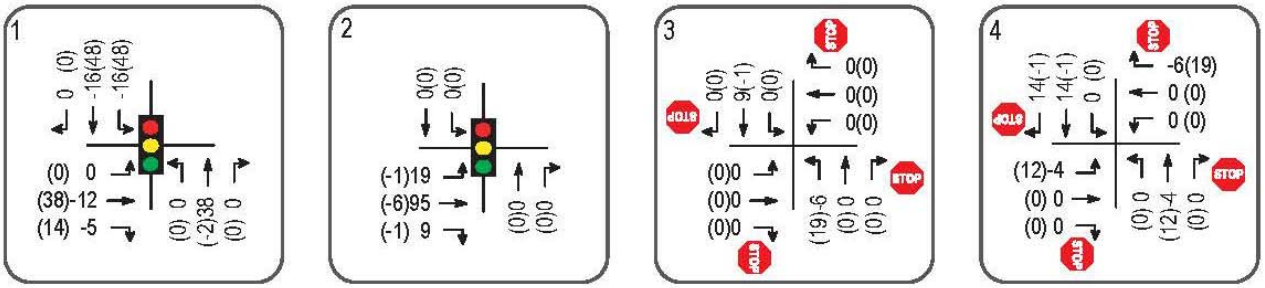
**B. Through Traffic Forecasting Methodology**

The travel forecast is based upon historical traffic count data obtained from the State DOT, Highways Division at survey stations located in the vicinity of the project site. The historical data indicates a stable or declining growth in traffic and, as such, an annual traffic growth rate of approximately 0.5% was conservatively assumed in the project vicinity. As such, using 2013 as the Base Year, a growth rate factor of 1.015 was applied to the existing traffic demands in the project vicinity to achieve the projected Year 2016 traffic demands.

**C. Other Considerations**

The proposed Keauhou Lane development will be located across Keawe Street from another planned development. Halekauwila Place is currently under construction and is expected to include affordable rental units and retail space. As described in the "Traffic Impact Report for Halekauwila Place" dated October 2009, the trips associated with this future residential development were incorporated into




LEGEND
- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

North
Not to Scale

**WILSON OKAMOTO CORPORATION**
**ENGINEERS - PLANNERS**

**KEAUHOU LANE**

# DISTRIBUTION OF SITE-GENERATED VEHICLES

FIGURE 5

Year 2016 without project conditions to account for the traffic expected to be generated by this development.

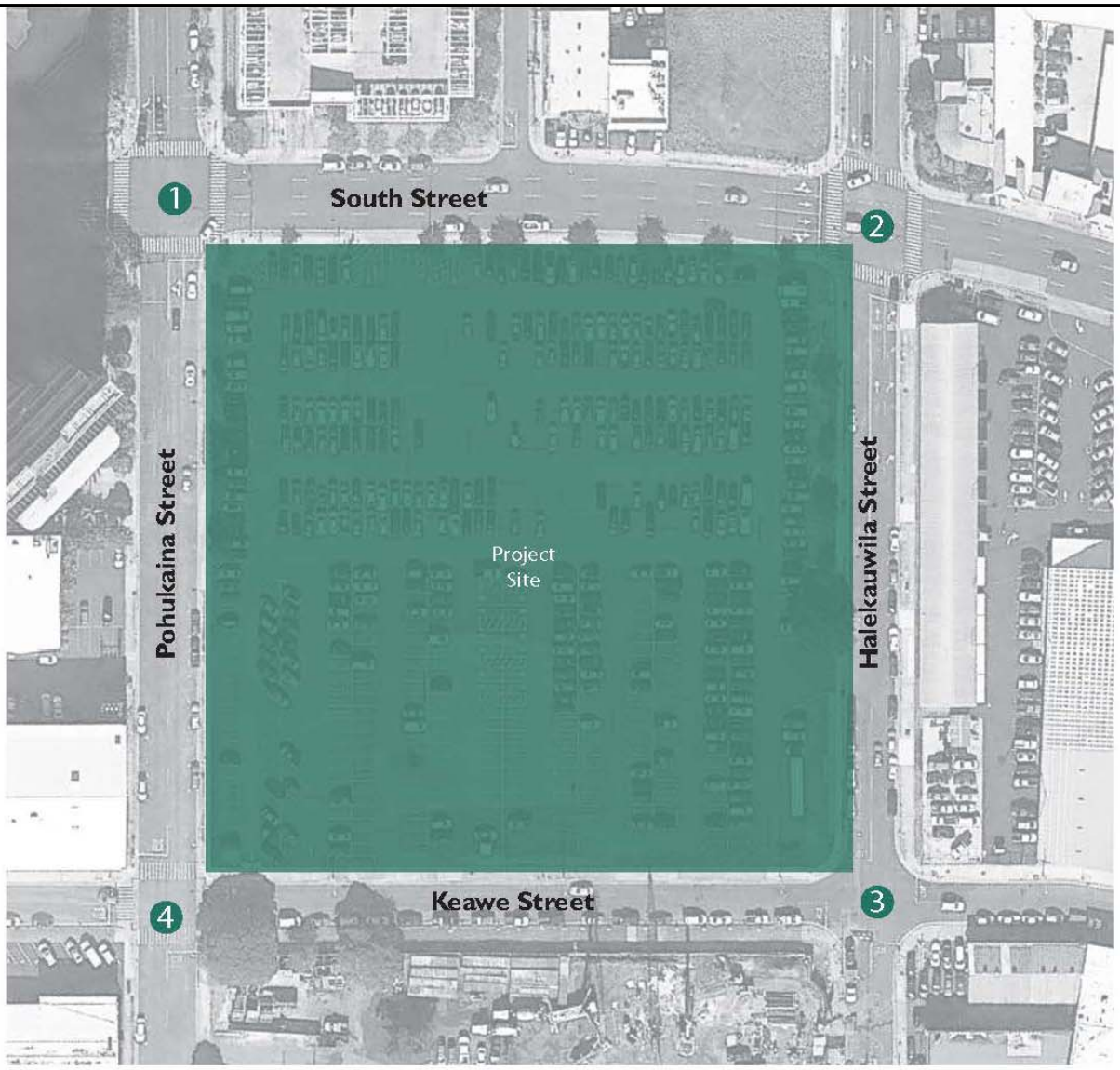
**D. Total Traffic Volumes Without Project**

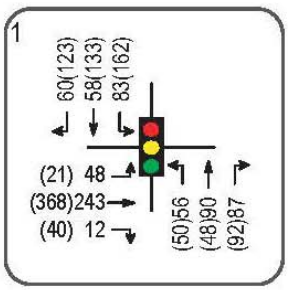
The projected Year 2016 AM and PM peak period traffic volumes and operating conditions without the proposed Keauhou Lane development are shown in Figure 6, and summarized in Table 3. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

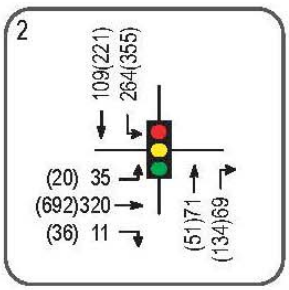
**Table 3: Existing and Projected Year 2016 (Without Project) LOS Traffic Operating Conditions**

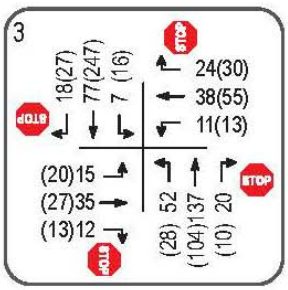
| Intersection | Approach | AM | | PM | |
|---|---|---|---|---|---|
| | | Exist | Year 2016 w/out Proj | Exist | Year 2016 w/out Proj |
| Halekauwila St/ South St | Eastbound | A | A | A | A |
| | Westbound | A | A | A | A |
| | Northbound | A | A | B | B |
| Halekauwila St/ Keawe St | Eastbound | A | A | B | B |
| | Westbound | A | A | A | A |
| | Northbound | A | A | A | A |
| | Southbound | A | A | A | A |
| Pohukaina St/ Keawe St | Eastbound | A | A | A | A |
| | Westbound | A | A | A | A |
| | Northbound | A | A | A | A |
| | Southbound | A | A | A | A |
| Pohukaina St/ South St | Eastbound | A | A | A | A |
| | Westbound | A | A | A | A |
| | Northbound | A | A | A | A |

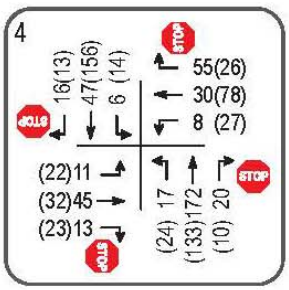
Traffic operations under Year 2016 without project conditions are expected to remain similar to existing conditions. The approaches of the study intersections along Halekauwila Street are expected to continue operating at LOS "A" during the AM peak period and LOS "B" or better during the PM peak period. Along Pohukaina Street, the approaches of the study intersections are expected to continue operating at LOS "A" during both peak periods.




LEGEND
- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

North
Not to Scale

**WILSON OKAMOTO CORPORATION**
**ENGINEERS - PLANNERS**

**KEAUHOU LANE**

# YEAR 2016 PEAK HOURS OF TRAFFIC WITHOUT PROJECT

FIGURE 6

### E. Total Traffic Volumes With Project

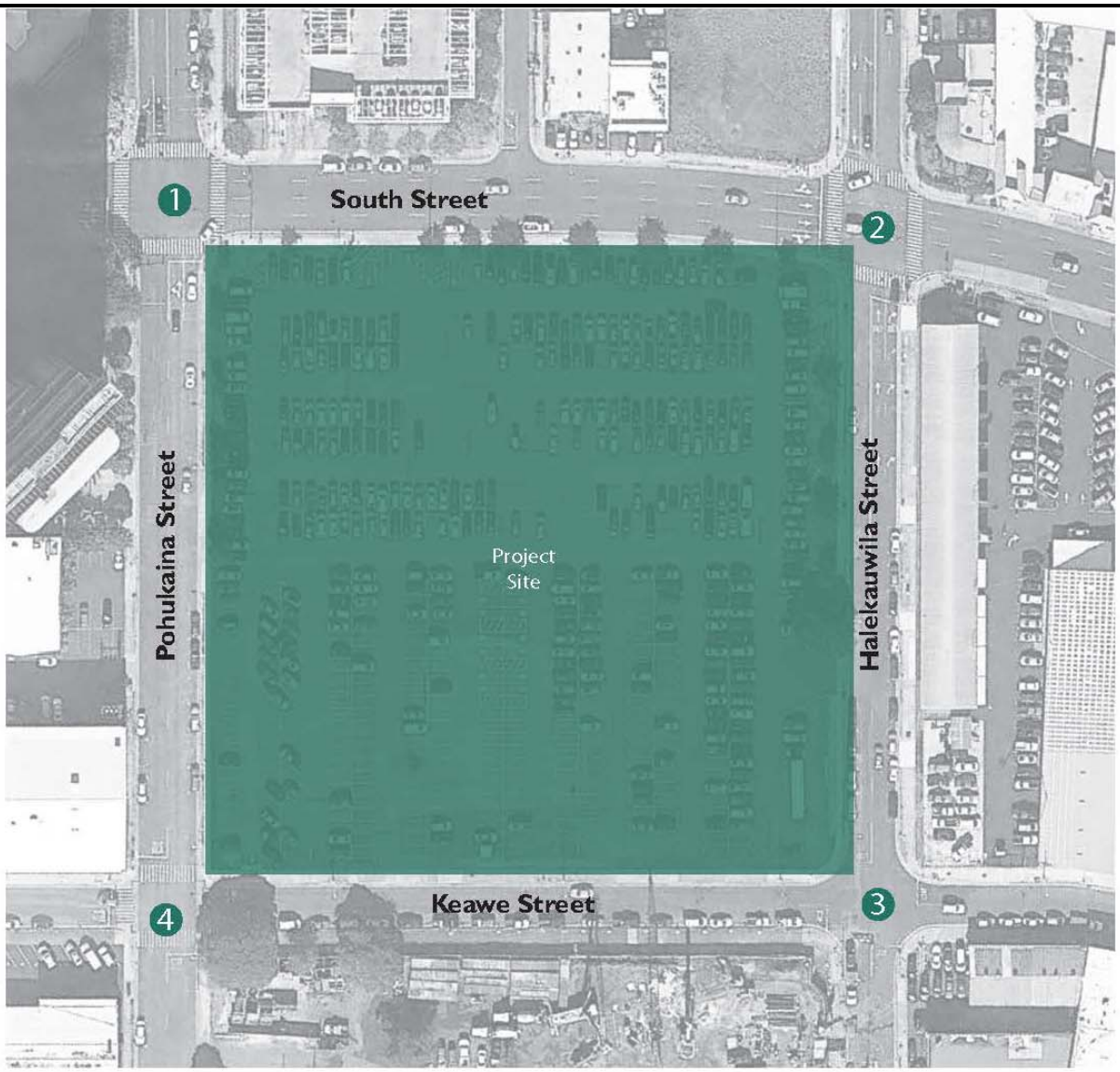
Figure 7 shows the Year 2016 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the proposed Keauhou Lane development. The cumulative volumes consist of site- generated traffic superimposed over Year 2016 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

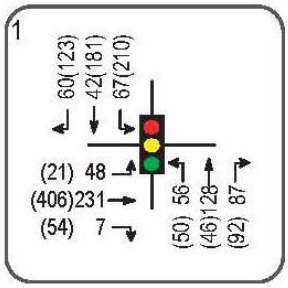
## V. TRAFFIC IMPACT ANALYSIS

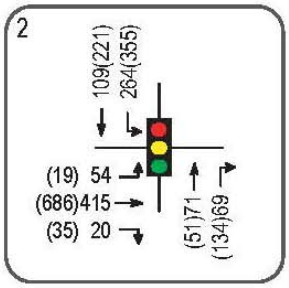
The Year 2016 cumulative AM and PM peak hour traffic conditions with the Keauhou Lane development are summarized in Table 4. The existing and projected Year 2016 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

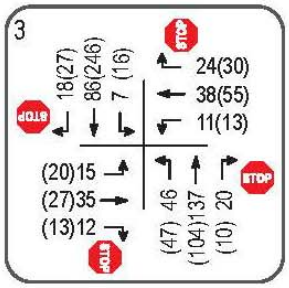
**Table 4: Existing and Projected Year 2016 (Without and With Project) LOS Traffic Operating Conditions**

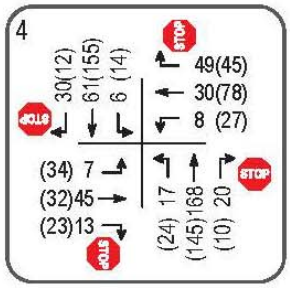
| Intersection | Approach | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | Exist | Year 2016 | | Exist | Year 2016 | |
| | | | w/out Proj | w/ Proj | | w/out Proj | w/ Proj |
| Halekauwila St/ South St | Eastbound | A | A | A | A | A | A |
| | Westbound | A | A | A | A | A | A |
| | Northbound | A | A | A | B | B | B |
| Halekauwila St/ Keawe St | Eastbound | A | A | A | B | B | B |
| | Westbound | A | A | A | A | A | A |
| | Northbound | A | A | A | A | A | A |
| | Southbound | A | A | A | A | A | A |
| Pohukaina St/ Keawe St | Eastbound | A | A | A | A | A | A |
| | Westbound | A | A | A | A | A | A |
| | Northbound | A | A | A | A | A | A |
| | Southbound | A | A | A | A | A | A |
| Pohukaina St/ South St | Eastbound | A | A | A | A | A | A |
| | Westbound | A | A | A | A | A | A |
| | Northbound | A | A | A | A | A | A |




LEGEND
- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

North
Not to Scale

**WILSON OKAMOTO CORPORATION**
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**KEAUHOU LANE**

YEAR 2016 PEAK HOURS OF TRAFFIC
WITH PROJECT

FIGURE
7

Traffic operations in the vicinity of the Keauhou Lane development are expected to remain similar to existing and Year 2016 without project conditions primarily due to the removal of the at-grade parking lot currently house within the project site. Along Halekauwila Street, the approaches of the study intersections are expected to continue operating at LOS "A" during the AM peak period and LOS "B" or better during the PM peak period. Similarly, the approaches of the study intersections along Pohukaina Street are expected to continue operating at LOS "A" during both peak periods.

## VI. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be incorporated in the project design.

1. Maintain sufficient sight distance for motorists to safely enter and exit all project driveways. Parking along South Street and Pohukaina Street fronting the project site may need to be restricted during the design phase of the project to ensure that sufficient sight distances are maintained.

2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

4. Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. If access at the entrances to the parking garaged are controlled, provide sufficient storage for entering vehicles at the parking garage access control (i.e., automatic gate, etc.) to ensure that queues do not extend onto the adjacent public roadway.

## VII. CONCLUSION

The proposed Keauhou Lane development is expected to be a multi-use development with residential townhouses and condominiums, rental apartments, and commercial uses. Traffic operations in the vicinity of the proposed development are expected to remain similar to existing and without project conditions, primarily due to the removal of the existing at-grade parking lot currently housed within the project site. As such, with the implementation of the aforementioned recommendations, the proposed Keauhou Lane development is not expected to have a significant impact on traffic operations in the vicinity.

# APPENDIX A

# EXISTING TRAFFIC COUNT DATA

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:DY, CY
Counter:D4-5676, D4-5673
Weather:Clear

File Name : HalSou AM
Site Code : 00000004
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | South Street Southbound | | | | | Halekauwila Street Westbound | | | | | South Street Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 4 | 2 | 11 | 1 | 31 | 1 | 2 | 35 | 30 | 25 | 0 | 1 | 56 | 102 |
| 06:15 AM | 0 | 0 | 0 | 1 | 1 | 0 | 6 | 3 | 6 | 15 | 1 | 30 | 1 | 8 | 40 | 44 | 20 | 0 | 9 | 73 | 129 |
| 06:30 AM | 0 | 0 | 0 | 4 | 4 | 0 | 8 | 7 | 7 | 22 | 3 | 51 | 4 | 8 | 66 | 54 | 31 | 0 | 4 | 89 | 181 |
| 06:45 AM | 0 | 0 | 0 | 6 | 6 | 0 | 11 | 21 | 10 | 42 | 8 | 61 | 2 | 10 | 81 | 55 | 35 | 0 | 12 | 102 | 231 |
| Total | 0 | 0 | 0 | 11 | 11 | 0 | 30 | 35 | 25 | 90 | 13 | 173 | 8 | 28 | 222 | 183 | 111 | 0 | 26 | 320 | 643 |
| 07:00 AM | 0 | 0 | 0 | 18 | 18 | 0 | 12 | 15 | 10 | 37 | 5 | 80 | 4 | 9 | 98 | 64 | 19 | 0 | 6 | 89 | 242 |
| 07:15 AM | 0 | 0 | 0 | 4 | 4 | 0 | 24 | 19 | 10 | 53 | 9 | 83 | 1 | 6 | 99 | 69 | 32 | 0 | 9 | 110 | 266 |
| 07:30 AM | 0 | 0 | 0 | 11 | 11 | 0 | 19 | 22 | 9 | 50 | 12 | 73 | 1 | 8 | 94 | 68 | 35 | 0 | 10 | 113 | 268 |
| 07:45 AM | 0 | 0 | 0 | 5 | 5 | 0 | 15 | 12 | 18 | 45 | 8 | 79 | 5 | 9 | 101 | 59 | 21 | 0 | 7 | 87 | 238 |
| Total | 0 | 0 | 0 | 38 | 38 | 0 | 70 | 68 | 47 | 185 | 34 | 315 | 11 | 32 | 392 | 260 | 107 | 0 | 32 | 399 | 1014 |
| Grand Total | 0 | 0 | 0 | 49 | 49 | 0 | 100 | 103 | 72 | 275 | 47 | 488 | 19 | 60 | 614 | 443 | 218 | 0 | 58 | 719 | 1657 |
| Apprch % | 0 | 0 | 0 | 100 | | 0 | 36.4 | 37.5 | 26.2 | | 7.7 | 79.5 | 3.1 | 9.8 | | 61.6 | 30.3 | 0 | 8.1 | | |
| Total % | 0 | 0 | 0 | 3 | 3 | 0 | 6 | 6.2 | 4.3 | 16.6 | 2.8 | 29.5 | 1.1 | 3.6 | 37.1 | 26.7 | 13.2 | 0 | 3.5 | 43.4 | |

| | South Street Southbound | | | | Halekauwila Street Westbound | | | | South Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 12 | 15 | 27 | 5 | 80 | 4 | 89 | 64 | 19 | 0 | 83 | 199 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | **24** | 19 | **43** | 9 | **83** | 1 | **93** | **69** | 32 | 0 | 101 | **237** |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 19 | **22** | 41 | **12** | 73 | 1 | 86 | 68 | **35** | 0 | **103** | 230 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 15 | 12 | 27 | 8 | 79 | **5** | 92 | 59 | 21 | 0 | 80 | 199 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 70 | 68 | 138 | 34 | 315 | 11 | 360 | 260 | 107 | 0 | 367 | 865 |
| % App. Total | 0 | 0 | 0 | | 0 | 50.7 | 49.3 | | 9.4 | 87.5 | 3.1 | | 70.8 | 29.2 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .729 | .773 | .802 | .708 | .949 | .550 | .968 | .942 | .764 | .000 | .891 | .912 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:CY, DY
Counter:D4-5673, D4-5676
Weather:Clear

File Name : HalSou PM
Site Code : 00000004
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | South Street Southbound | | | | | Halekauwila Street Westbound | | | | | South Street Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 0 | 0 | 0 | 4 | 4 | 0 | 8 | 17 | 6 | 31 | 24 | 140 | 4 | 4 | 172 | 64 | 31 | 0 | 4 | 99 | 306 |
| 03:45 PM | 0 | 0 | 0 | 2 | 2 | 0 | 7 | 22 | 1 | 30 | 5 | 128 | 5 | 5 | 143 | 86 | 40 | 0 | 5 | 131 | 306 |
| Total | 0 | 0 | 0 | 6 | 6 | 0 | 15 | 39 | 7 | 61 | 29 | 268 | 9 | 9 | 315 | 150 | 71 | 0 | 9 | 230 | 612 |
| 04:00 PM | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 20 | 15 | 45 | 9 | 172 | 6 | 9 | 196 | 86 | 37 | 0 | 13 | 136 | 387 |
| 04:15 PM | 0 | 0 | 0 | 8 | 8 | 0 | 7 | 27 | 19 | 53 | 4 | 143 | 7 | 11 | 165 | 89 | 39 | 0 | 11 | 139 | 365 |
| 04:30 PM | 0 | 0 | 0 | 8 | 8 | 0 | 23 | 41 | 9 | 73 | 9 | 184 | 8 | 12 | 213 | 77 | 63 | 0 | 13 | 153 | 447 |
| 04:45 PM | 0 | 0 | 0 | 14 | 14 | 0 | 9 | 30 | 17 | 56 | 6 | 159 | 15 | 10 | 190 | 102 | 55 | 0 | 11 | 168 | 428 |
| Total | 0 | 0 | 0 | 40 | 40 | 0 | 49 | 118 | 60 | 227 | 28 | 658 | 36 | 42 | 764 | 354 | 194 | 0 | 48 | 596 | 1627 |
| 05:00 PM | 0 | 0 | 0 | 10 | 10 | 0 | 11 | 34 | 19 | 64 | 1 | 196 | 5 | 9 | 211 | 82 | 61 | 0 | 8 | 151 | 436 |
| 05:15 PM | 0 | 0 | 0 | 11 | 11 | 0 | 12 | 24 | 11 | 47 | 5 | 142 | 7 | 16 | 170 | 75 | 39 | 0 | 11 | 125 | 353 |
| Grand Total | 0 | 0 | 0 | 67 | 67 | 0 | 87 | 215 | 97 | 399 | 63 | 1264 | 57 | 76 | 1460 | 661 | 365 | 0 | 76 | 1102 | 3028 |
| Apprch % | 0 | 0 | 0 | 100 | | 0 | 21.8 | 53.9 | 24.3 | | 4.3 | 86.6 | 3.9 | 5.2 | | 60 | 33.1 | 0 | 6.9 | | |
| Total % | 0 | 0 | 0 | 2.2 | 2.2 | 0 | 2.9 | 7.1 | 3.2 | 13.2 | 2.1 | 41.7 | 1.9 | 2.5 | 48.2 | 21.8 | 12.1 | 0 | 2.5 | 36.4 | |

| | South Street Southbound | | | | Halekauwila Street Westbound | | | | South Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 7 | 27 | 34 | 4 | 143 | 7 | 154 | 89 | 39 | 0 | 128 | 316 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | **23** | **41** | **64** | **9** | 184 | 8 | 201 | 77 | **63** | 0 | 140 | **405** |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 9 | 30 | 39 | 6 | 159 | **15** | 180 | **102** | 55 | 0 | **157** | 376 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 11 | 34 | 45 | 1 | **196** | 5 | **202** | 82 | 61 | 0 | 143 | 390 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 50 | 132 | 182 | 20 | 682 | 35 | 737 | 350 | 218 | 0 | 568 | 1487 |
| % App. Total | 0 | 0 | 0 | | 0 | 27.5 | 72.5 | | 2.7 | 92.5 | 4.7 | | 61.6 | 38.4 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .543 | .805 | .711 | .556 | .870 | .583 | .912 | .858 | .865 | .000 | .904 | .918 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC
Counter:D4-3890
Weather:Clear

File Name : HalKea AM
Site Code : 00000001
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Halekauwila Street Westbound | | | | | Keawe Street Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 1 | 8 | 3 | 2 | 14 | 2 | 9 | 3 | 1 | 15 | 1 | 0 | 0 | 3 | 4 | 1 | 14 | 4 | 4 | 23 | 56 |
| 06:15 AM | 3 | 6 | 2 | 2 | 13 | 4 | 8 | 1 | 1 | 14 | 0 | 1 | 0 | 1 | 2 | 2 | 11 | 6 | 1 | 20 | 49 |
| 06:30 AM | 1 | 10 | 4 | 3 | 18 | 6 | 15 | 5 | 0 | 26 | 1 | 3 | 3 | 3 | 10 | 2 | 17 | 6 | 1 | 26 | 80 |
| 06:45 AM | 1 | 12 | 12 | 4 | 29 | 8 | 22 | 4 | 0 | 34 | 3 | 2 | 3 | 1 | 9 | 0 | 25 | 7 | 2 | 34 | 106 |
| Total | 6 | 36 | 21 | 11 | 74 | 20 | 54 | 13 | 2 | 89 | 5 | 6 | 6 | 8 | 25 | 5 | 67 | 23 | 8 | 103 | 291 |
| 07:00 AM | 4 | 10 | 4 | 10 | 28 | 11 | 25 | 3 | 1 | 40 | 3 | 6 | 1 | 2 | 12 | 1 | 20 | 3 | 2 | 26 | 106 |
| 07:15 AM | 4 | 6 | 8 | 4 | 22 | 9 | 34 | 4 | 1 | 48 | 4 | 8 | 3 | 0 | 15 | 2 | 13 | 4 | 2 | 21 | 106 |
| 07:30 AM | 1 | 5 | 9 | 10 | 25 | 12 | 40 | 7 | 0 | 59 | 4 | 12 | 5 | 0 | 21 | 2 | 22 | 5 | 3 | 32 | 137 |
| 07:45 AM | 2 | 16 | 3 | 2 | 23 | 12 | 26 | 5 | 1 | 44 | 4 | 8 | 2 | 0 | 14 | 2 | 16 | 6 | 3 | 27 | 108 |
| Total | 11 | 37 | 24 | 26 | 98 | 44 | 125 | 19 | 3 | 191 | 15 | 34 | 11 | 2 | 62 | 7 | 71 | 18 | 10 | 106 | 457 |
| Grand Total | 17 | 73 | 45 | 37 | 172 | 64 | 179 | 32 | 5 | 280 | 20 | 40 | 17 | 10 | 87 | 12 | 138 | 41 | 18 | 209 | 748 |
| Apprch % | 9.9 | 42.4 | 26.2 | 21.5 | | 22.9 | 63.9 | 11.4 | 1.8 | | 23 | 46 | 19.5 | 11.5 | | 5.7 | 66 | 19.6 | 8.6 | | |
| Total % | 2.3 | 9.8 | 6 | 4.9 | 23 | 8.6 | 23.9 | 4.3 | 0.7 | 37.4 | 2.7 | 5.3 | 2.3 | 1.3 | 11.6 | 1.6 | 18.4 | 5.5 | 2.4 | 27.9 | |

| | Keawe Street Southbound | | | | Halekauwila Street Westbound | | | | Keawe Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 4 | 10 | 4 | 18 | 11 | 25 | 3 | 39 | 3 | 6 | 1 | 10 | 1 | 20 | 3 | 24 | 91 |
| 07:15 AM | 4 | 6 | 8 | 18 | 9 | 34 | 4 | 47 | 4 | 8 | 3 | 15 | 2 | 13 | 4 | 19 | 99 |
| 07:30 AM | 1 | 5 | 9 | 15 | 12 | 40 | 7 | 59 | 4 | 12 | 5 | 21 | 2 | 22 | 5 | 29 | 124 |
| 07:45 AM | 2 | 16 | 3 | 21 | 12 | 26 | 5 | 43 | 4 | 8 | 2 | 14 | 2 | 16 | 6 | 24 | 102 |
| Total Volume | 11 | 37 | 24 | 72 | 44 | 125 | 19 | 188 | 15 | 34 | 11 | 60 | 7 | 71 | 18 | 96 | 416 |
| % App. Total | 15.3 | 51.4 | 33.3 | | 23.4 | 66.5 | 10.1 | | 25 | 56.7 | 18.3 | | 7.3 | 74 | 18.8 | | |
| PHF | .688 | .578 | .667 | .857 | .917 | .781 | .679 | .797 | .938 | .708 | .550 | .714 | .875 | .807 | .750 | .828 | .839 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:GC
Counter:D4-3890
Weather:Clear

File Name : HalKea PM
Site Code : 00000001
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Halekauwila Street Westbound | | | | | Keawe Street Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 2 | 9 | 5 | 5 | 21 | 4 | 11 | 1 | 0 | 16 | 6 | 6 | 3 | 1 | 16 | 5 | 33 | 6 | 4 | 48 | 101 |
| 03:45 PM | 4 | 11 | 1 | 1 | 17 | 3 | 24 | 5 | 2 | 34 | 6 | 8 | 2 | 1 | 17 | 0 | 38 | 9 | 2 | 49 | 117 |
| Total | 6 | 20 | 6 | 6 | 38 | 7 | 35 | 6 | 2 | 50 | 12 | 14 | 5 | 2 | 33 | 5 | 71 | 15 | 6 | 97 | 218 |
| 04:00 PM | 3 | 7 | 7 | 3 | 20 | 8 | 22 | 2 | 1 | 33 | 3 | 3 | 2 | 4 | 12 | 1 | 39 | 10 | 0 | 50 | 115 |
| 04:15 PM | 1 | 10 | 2 | 2 | 15 | 3 | 21 | 2 | 1 | 27 | 4 | 8 | 3 | 1 | 16 | 6 | 37 | 6 | 1 | 50 | 108 |
| 04:30 PM | 2 | 13 | 14 | 5 | 34 | 6 | 25 | 1 | 2 | 34 | 7 | 6 | 3 | 4 | 20 | 6 | 55 | 10 | 2 | 73 | 161 |
| 04:45 PM | 5 | 16 | 6 | 9 | 36 | 7 | 23 | 2 | 1 | 33 | 2 | 8 | 5 | 1 | 16 | 4 | 70 | 7 | 7 | 88 | 173 |
| Total | 11 | 46 | 29 | 19 | 105 | 24 | 91 | 7 | 5 | 127 | 16 | 25 | 13 | 10 | 64 | 17 | 201 | 33 | 10 | 261 | 557 |
| 05:00 PM | 2 | 11 | 8 | 0 | 21 | 8 | 28 | 3 | 1 | 40 | 7 | 5 | 0 | 3 | 15 | 4 | 59 | 6 | 1 | 70 | 146 |
| 05:15 PM | 3 | 14 | 2 | 1 | 20 | 6 | 21 | 3 | 1 | 31 | 4 | 8 | 3 | 3 | 18 | 2 | 49 | 4 | 0 | 55 | 124 |
| Grand Total | 22 | 91 | 45 | 26 | 184 | 45 | 175 | 19 | 9 | 248 | 39 | 52 | 21 | 18 | 130 | 28 | 380 | 58 | 17 | 483 | 1045 |
| Apprch % | 12 | 49.5 | 24.5 | 14.1 | | 18.1 | 70.6 | 7.7 | 3.6 | | 30 | 40 | 16.2 | 13.8 | | 5.8 | 78.7 | 12 | 3.5 | | |
| Total % | 2.1 | 8.7 | 4.3 | 2.5 | 17.6 | 4.3 | 16.7 | 1.8 | 0.9 | 23.7 | 3.7 | 5 | 2 | 1.7 | 12.4 | 2.7 | 36.4 | 5.6 | 1.6 | 46.2 | |

| | Keawe Street Southbound | | | | Halekauwila Street Westbound | | | | Keawe Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 2 | 13 | **14** | **29** | 6 | 25 | 1 | 32 | **7** | 6 | 3 | **16** | **6** | 55 | **10** | 71 | 148 |
| 04:45 PM | **5** | **16** | 6 | 27 | 7 | 23 | 2 | 32 | 2 | **8** | **5** | 15 | 4 | **70** | 7 | **81** | **155** |
| 05:00 PM | 2 | 11 | 8 | 21 | **8** | **28** | **3** | **39** | 7 | 5 | 0 | 12 | 4 | 59 | 6 | 69 | 141 |
| 05:15 PM | 3 | 14 | 2 | 19 | 6 | 21 | 3 | 30 | 4 | 8 | 3 | 15 | 2 | 49 | 4 | 55 | 119 |
| Total Volume | 12 | 54 | 30 | 96 | 27 | 97 | 9 | 133 | 20 | 27 | 11 | 58 | 16 | 233 | 27 | 276 | 563 |
| % App. Total | 12.5 | 56.2 | 31.2 | | 20.3 | 72.9 | 6.8 | | 34.5 | 46.6 | 19 | | 5.8 | 84.4 | 9.8 | | |
| PHF | .600 | .844 | .536 | .828 | .844 | .866 | .750 | .853 | .714 | .844 | .550 | .906 | .667 | .832 | .675 | .852 | .908 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:MM
Counter:D4-3889
Weather:Clear

File Name : KeaPoh AM
Site Code : 00000002
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Pohukaina Street Westbound | | | | | Keawe Street Northbound | | | | | Pohukaina Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 2 | 6 | 3 | 1 | 12 | 1 | 9 | 1 | 0 | 11 | 2 | 1 | 6 | 2 | 11 | 1 | 9 | 3 | 1 | 14 | 48 |
| 06:15 AM | 1 | 8 | 6 | 0 | 15 | 1 | 11 | 0 | 1 | 13 | 1 | 4 | 0 | 7 | 12 | 0 | 7 | 2 | 3 | 12 | 52 |
| 06:30 AM | 4 | 8 | 9 | 2 | 23 | 1 | 20 | 4 | 1 | 26 | 0 | 5 | 5 | 3 | 13 | 1 | 10 | 5 | 4 | 20 | 82 |
| 06:45 AM | 4 | 10 | 9 | 0 | 23 | 2 | 28 | 5 | 1 | 36 | 1 | 7 | 5 | 5 | 18 | 1 | 9 | 2 | 7 | 19 | 96 |
| Total | 11 | 32 | 27 | 3 | 73 | 5 | 68 | 10 | 3 | 86 | 4 | 17 | 16 | 17 | 54 | 3 | 35 | 12 | 15 | 65 | 278 |
| 07:00 AM | 3 | 7 | 12 | 5 | 27 | 4 | 26 | 5 | 0 | 35 | 0 | 7 | 2 | 2 | 11 | 1 | 11 | 3 | 6 | 21 | 94 |
| 07:15 AM | 0 | 3 | 13 | 2 | 18 | 3 | 45 | 4 | 2 | 54 | 3 | 10 | 5 | 6 | 24 | 2 | 14 | 5 | 6 | 27 | 123 |
| 07:30 AM | 2 | 7 | 10 | 4 | 23 | 5 | 49 | 6 | 0 | 60 | 3 | 12 | 1 | 2 | 18 | 2 | 8 | 0 | 5 | 15 | 116 |
| 07:45 AM | 3 | 11 | 14 | 3 | 31 | 5 | 50 | 5 | 2 | 62 | 5 | 14 | 5 | 2 | 26 | 1 | 14 | 8 | 6 | 29 | 148 |
| Total | 8 | 28 | 49 | 14 | 99 | 17 | 170 | 20 | 4 | 211 | 11 | 43 | 13 | 12 | 79 | 6 | 47 | 16 | 23 | 92 | 481 |
| Grand Total | 19 | 60 | 76 | 17 | 172 | 22 | 238 | 30 | 7 | 297 | 15 | 60 | 29 | 29 | 133 | 9 | 82 | 28 | 38 | 157 | 759 |
| Apprch % | 11 | 34.9 | 44.2 | 9.9 | | 7.4 | 80.1 | 10.1 | 2.4 | | 11.3 | 45.1 | 21.8 | 21.8 | | 5.7 | 52.2 | 17.8 | 24.2 | | |
| Total % | 2.5 | 7.9 | 10 | 2.2 | 22.7 | 2.9 | 31.4 | 4 | 0.9 | 39.1 | 2 | 7.9 | 3.8 | 3.8 | 17.5 | 1.2 | 10.8 | 3.7 | 5 | 20.7 | |

| | Keawe Street Southbound | | | | Pohukaina Street Westbound | | | | Keawe Street Northbound | | | | Pohukaina Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **3** | 7 | 12 | 22 | 4 | 26 | 5 | 35 | 0 | 7 | 2 | 9 | 1 | 11 | 3 | 15 | 81 |
| 07:15 AM | 0 | 3 | 13 | 16 | 3 | 45 | 4 | 52 | 3 | 10 | **5** | 18 | **2** | **14** | 5 | 21 | 107 |
| 07:30 AM | 2 | 7 | 10 | 19 | **5** | 49 | **6** | **60** | 3 | 12 | 1 | 16 | 2 | 8 | 0 | 10 | 105 |
| 07:45 AM | 3 | **11** | **14** | **28** | 5 | **50** | 5 | 60 | **5** | **14** | 5 | **24** | 1 | 14 | **8** | **23** | **135** |
| Total Volume | 8 | 28 | 49 | 85 | 17 | 170 | 20 | 207 | 11 | 43 | 13 | 67 | 6 | 47 | 16 | 69 | 428 |
| % App. Total | 9.4 | 32.9 | 57.6 | | 8.2 | 82.1 | 9.7 | | 16.4 | 64.2 | 19.4 | | 8.7 | 68.1 | 23.2 | | |
| PHF | .667 | .636 | .875 | .759 | .850 | .850 | .833 | .863 | .550 | .768 | .650 | .698 | .750 | .839 | .500 | .750 | .793 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:MM
Counter:D4-3889
Weather:Clear

File Name : KeaPoh PM
Site Code : 00000002
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Pohukaina Street Westbound | | | | | Keawe Street Northbound | | | | | Pohukaina Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 7 | 9 | 11 | 1 | 28 | 0 | 35 | 6 | 0 | 41 | 2 | 5 | 4 | 0 | 11 | 1 | 31 | 2 | 3 | 37 | 117 |
| 03:45 PM | 6 | 20 | 5 | 5 | 36 | 4 | 51 | 7 | 1 | 63 | 3 | 8 | 9 | 0 | 20 | 2 | 26 | 7 | 2 | 37 | 156 |
| Total | 13 | 29 | 16 | 6 | 64 | 4 | 86 | 13 | 1 | 104 | 5 | 13 | 13 | 0 | 31 | 3 | 57 | 9 | 5 | 74 | 273 |
| 04:00 PM | 6 | 18 | 8 | 2 | 34 | 3 | 36 | 5 | 2 | 46 | 3 | 7 | 8 | 9 | 27 | 0 | 30 | 3 | 5 | 38 | 145 |
| 04:15 PM | 8 | 15 | 6 | 1 | 30 | 3 | 34 | 4 | 1 | 42 | 5 | 7 | 9 | 5 | 26 | 3 | 26 | 1 | 4 | 34 | 132 |
| 04:30 PM | 3 | 25 | 3 | 5 | 36 | 7 | 39 | 2 | 2 | 50 | 8 | 5 | 6 | 6 | 25 | 8 | 39 | 2 | 5 | 54 | 165 |
| 04:45 PM | 10 | 13 | 10 | 2 | 35 | 6 | 34 | 4 | 1 | 45 | 5 | 12 | 5 | 8 | 30 | 0 | 36 | 4 | 7 | 47 | 157 |
| Total | 27 | 71 | 27 | 10 | 135 | 19 | 143 | 15 | 6 | 183 | 21 | 31 | 28 | 28 | 108 | 11 | 131 | 10 | 21 | 173 | 599 |
| 05:00 PM | 7 | 21 | 7 | 1 | 36 | 6 | 29 | 2 | 0 | 37 | 4 | 6 | 5 | 5 | 20 | 3 | 39 | 3 | 9 | 54 | 147 |
| 05:15 PM | 7 | 17 | 6 | 0 | 30 | 5 | 30 | 2 | 2 | 39 | 5 | 8 | 7 | 11 | 31 | 2 | 41 | 4 | 2 | 49 | 149 |
| Grand Total | 54 | 138 | 56 | 17 | 265 | 34 | 288 | 32 | 9 | 363 | 35 | 58 | 53 | 44 | 190 | 19 | 268 | 26 | 37 | 350 | 1168 |
| Apprch % | 20.4 | 52.1 | 21.1 | 6.4 | | 9.4 | 79.3 | 8.8 | 2.5 | | 18.4 | 30.5 | 27.9 | 23.2 | | 5.4 | 76.6 | 7.4 | 10.6 | | |
| Total % | 4.6 | 11.8 | 4.8 | 1.5 | 22.7 | 2.9 | 24.7 | 2.7 | 0.8 | 31.1 | 3 | 5 | 4.5 | 3.8 | 16.3 | 1.6 | 22.9 | 2.2 | 3.2 | 30 | |

| | Keawe Street Southbound | | | | Pohukaina Street Westbound | | | | Keawe Street Northbound | | | | Pohukaina Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 3 | **25** | 3 | 31 | **7** | **39** | 2 | **48** | **8** | 5 | 6 | 19 | **8** | 39 | 2 | **49** | **147** |
| 04:45 PM | **10** | 13 | **10** | 33 | 6 | 34 | **4** | 44 | 5 | **12** | 5 | **22** | 0 | 36 | **4** | 40 | 139 |
| 05:00 PM | 7 | 21 | 7 | **35** | 6 | 29 | 2 | 37 | 4 | 6 | 5 | 15 | 3 | 39 | 3 | 45 | 132 |
| 05:15 PM | 7 | 17 | 6 | 30 | 5 | 30 | 2 | 37 | 5 | 8 | **7** | 20 | 2 | **41** | 4 | 47 | 134 |
| Total Volume | 27 | 76 | 26 | 129 | 24 | 132 | 10 | 166 | 22 | 31 | 23 | 76 | 13 | 155 | 13 | 181 | 552 |
| % App. Total | 20.9 | 58.9 | 20.2 | | 14.5 | 79.5 | 6 | | 28.9 | 40.8 | 30.3 | | 7.2 | 85.6 | 7.2 | | |
| PHF | .675 | .760 | .650 | .921 | .857 | .846 | .625 | .865 | .688 | .646 | .821 | .864 | .406 | .945 | .813 | .923 | .939 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:RT, TO
Counter:D4-5674, D4-3888
Weather:Clear

File Name : PohSou AM
Site Code : 00000000
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | South Street Southbound | | | | | Pohukaina Street Westbound | | | | | South Street Northbound | | | | | Pohukaina Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 6 | 0 | 11 | 1 | 33 | 4 | 0 | 38 | 11 | 6 | 5 | 1 | 23 | 72 |
| 06:15 AM | 0 | 0 | 0 | 7 | 7 | 5 | 6 | 7 | 2 | 20 | 1 | 24 | 0 | 1 | 26 | 17 | 9 | 12 | 5 | 43 | 96 |
| 06:30 AM | 0 | 0 | 0 | 4 | 4 | 8 | 9 | 7 | 2 | 26 | 2 | 56 | 1 | 3 | 62 | 23 | 11 | 15 | 0 | 49 | 141 |
| 06:45 AM | 0 | 0 | 0 | 3 | 3 | 8 | 18 | 15 | 3 | 44 | 3 | 52 | 2 | 0 | 57 | 30 | 18 | 9 | 2 | 59 | 163 |
| Total | 0 | 0 | 0 | 14 | 14 | 24 | 35 | 35 | 7 | 101 | 7 | 165 | 7 | 4 | 183 | 81 | 44 | 41 | 8 | 174 | 472 |
| 07:00 AM | 0 | 0 | 0 | 6 | 6 | 8 | 14 | 16 | 3 | 41 | 7 | 50 | 2 | 4 | 63 | 24 | 13 | 13 | 5 | 55 | 165 |
| 07:15 AM | 0 | 0 | 0 | 5 | 5 | 13 | 23 | 23 | 2 | 61 | 9 | 69 | 3 | 7 | 88 | 19 | 15 | 14 | 7 | 55 | 209 |
| 07:30 AM | 0 | 0 | 0 | 16 | 16 | 14 | 26 | 26 | 4 | 70 | 14 | 61 | 4 | 4 | 83 | 16 | 12 | 18 | 8 | 54 | 223 |
| 07:45 AM | 0 | 0 | 0 | 6 | 6 | 20 | 26 | 21 | 1 | 68 | 17 | 59 | 3 | 1 | 80 | 23 | 17 | 14 | 3 | 57 | 211 |
| Total | 0 | 0 | 0 | 33 | 33 | 55 | 89 | 86 | 10 | 240 | 47 | 239 | 12 | 16 | 314 | 82 | 57 | 59 | 23 | 221 | 808 |
| Grand Total | 0 | 0 | 0 | 47 | 47 | 79 | 124 | 121 | 17 | 341 | 54 | 404 | 19 | 20 | 497 | 163 | 101 | 100 | 31 | 395 | 1280 |
| Apprch % | 0 | 0 | 0 | 100 | | 23.2 | 36.4 | 35.5 | 5 | | 10.9 | 81.3 | 3.8 | 4 | | 41.3 | 25.6 | 25.3 | 7.8 | | |
| Total % | 0 | 0 | 0 | 3.7 | 3.7 | 6.2 | 9.7 | 9.5 | 1.3 | 26.6 | 4.2 | 31.6 | 1.5 | 1.6 | 38.8 | 12.7 | 7.9 | 7.8 | 2.4 | 30.9 | |

| | South Street Southbound | | | | Pohukaina Street Westbound | | | | South Street Northbound | | | | Pohukaina Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 0 | 0 | 0 | 0 | 8 | 14 | 16 | 38 | 7 | 50 | 2 | 59 | 24 | 13 | 13 | 50 | 147 |
| 07:15 AM | 0 | 0 | 0 | 0 | 13 | 23 | 23 | 59 | 9 | 69 | 3 | 81 | 19 | 15 | 14 | 48 | 188 |
| 07:30 AM | 0 | 0 | 0 | 0 | 14 | 26 | 26 | 66 | 14 | 61 | 4 | 79 | 16 | 12 | 18 | 46 | 191 |
| 07:45 AM | 0 | 0 | 0 | 0 | 20 | 26 | 21 | 67 | 17 | 59 | 3 | 79 | 23 | 17 | 14 | 54 | 200 |
| Total Volume | 0 | 0 | 0 | 0 | 55 | 89 | 86 | 230 | 47 | 239 | 12 | 298 | 82 | 57 | 59 | 198 | 726 |
| % App. Total | 0 | 0 | 0 | | 23.9 | 38.7 | 37.4 | | 15.8 | 80.2 | 4 | | 41.4 | 28.8 | 29.8 | | |
| PHF | .000 | .000 | .000 | .000 | .688 | .856 | .827 | .858 | .691 | .866 | .750 | .920 | .854 | .838 | .819 | .917 | .908 |

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:RT, LH
Counter:D4-3888, D4-5674
Weather:Clear

File Name : PohSou PM
Site Code : 00000000
Start Date : 9/19/2013
Page No : 1

Groups Printed- Unshifted

| | South Street Southbound | | | | | Pohukaina Street Westbound | | | | | South Street Northbound | | | | | Pohukaina Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 0 | 0 | 0 | 6 | 6 | 11 | 18 | 19 | 1 | 49 | 9 | 77 | 7 | 5 | 98 | 37 | 23 | 23 | 9 | 92 | 245 |
| 03:45 PM | 0 | 0 | 0 | 3 | 3 | 8 | 13 | 35 | 3 | 59 | 5 | 63 | 11 | 0 | 79 | 31 | 21 | 17 | 6 | 75 | 216 |
| Total | 0 | 0 | 0 | 9 | 9 | 19 | 31 | 54 | 4 | 108 | 14 | 140 | 18 | 5 | 177 | 68 | 44 | 40 | 15 | 167 | 461 |
| 04:00 PM | 0 | 0 | 0 | 2 | 2 | 14 | 9 | 28 | 7 | 58 | 2 | 80 | 9 | 9 | 100 | 35 | 26 | 25 | 11 | 97 | 257 |
| 04:15 PM | 0 | 0 | 0 | 1 | 1 | 13 | 10 | 26 | 3 | 52 | 4 | 78 | 3 | 7 | 92 | 42 | 30 | 29 | 10 | 111 | 256 |
| 04:30 PM | 0 | 0 | 0 | 9 | 9 | 11 | 10 | 26 | 5 | 52 | 5 | 81 | 13 | 9 | 108 | 46 | 35 | 35 | 15 | 131 | 300 |
| 04:45 PM | 0 | 0 | 0 | 1 | 1 | 16 | 15 | 18 | 3 | 52 | 4 | 88 | 14 | 5 | 111 | 40 | 27 | 38 | 10 | 115 | 279 |
| Total | 0 | 0 | 0 | 13 | 13 | 54 | 44 | 98 | 18 | 214 | 15 | 327 | 39 | 30 | 411 | 163 | 118 | 127 | 46 | 454 | 1092 |
| 05:00 PM | 0 | 0 | 0 | 3 | 3 | 9 | 12 | 21 | 0 | 42 | 8 | 116 | 9 | 4 | 137 | 32 | 39 | 19 | 8 | 98 | 280 |
| 05:15 PM | 0 | 0 | 0 | 6 | 6 | 6 | 11 | 21 | 4 | 42 | 7 | 81 | 10 | 13 | 111 | 23 | 33 | 13 | 2 | 71 | 230 |
| Grand Total | 0 | 0 | 0 | 31 | 31 | 88 | 98 | 194 | 26 | 406 | 44 | 664 | 76 | 52 | 836 | 286 | 234 | 199 | 71 | 790 | 2063 |
| Apprch % | 0 | 0 | 0 | 100 | | 21.7 | 24.1 | 47.8 | 6.4 | | 5.3 | 79.4 | 9.1 | 6.2 | | 36.2 | 29.6 | 25.2 | 9 | | |
| Total % | 0 | 0 | 0 | 1.5 | 1.5 | 4.3 | 4.8 | 9.4 | 1.3 | 19.7 | 2.1 | 32.2 | 3.7 | 2.5 | 40.5 | 13.9 | 11.3 | 9.6 | 3.4 | 38.3 | |

| | South Street Southbound | | | | Pohukaina Street Westbound | | | | South Street Northbound | | | | Pohukaina Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | 0 | 13 | 10 | **26** | **49** | 4 | 78 | 3 | 85 | 42 | 30 | 29 | 101 | 235 |
| 04:30 PM | 0 | 0 | 0 | 0 | 11 | 10 | 26 | 47 | 5 | 81 | 13 | 99 | **46** | 35 | 35 | **116** | 262 |
| 04:45 PM | 0 | 0 | 0 | 0 | **16** | **15** | 18 | 49 | 4 | 88 | **14** | 106 | 40 | 27 | **38** | 105 | 260 |
| 05:00 PM | 0 | 0 | 0 | 0 | 9 | 12 | 21 | 42 | **8** | **116** | 9 | **133** | 32 | **39** | 19 | 90 | **265** |
| Total Volume | 0 | 0 | 0 | 0 | 49 | 47 | 91 | 187 | 21 | 363 | 39 | 423 | 160 | 131 | 121 | 412 | 1022 |
| % App. Total | 0 | 0 | 0 | | 26.2 | 25.1 | 48.7 | | 5 | 85.8 | 9.2 | | 38.8 | 31.8 | 29.4 | | |
| PHF | .000 | .000 | .000 | .000 | .766 | .783 | .875 | .954 | .656 | .782 | .696 | .795 | .870 | .840 | .796 | .888 | .964 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:HI
Counter:D4-3890
Weather:Clear

File Name : West Entrance AM
Site Code : 00000001
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Southbound | Public Parking Lot Westbound | | | | | South Street Northbound | | | | | Eastbound | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | App. Total | Int. Total |
| 06:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 11 |
| 06:45 AM | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 6 | 0 | 6 | 0 | 8 |
| Total | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 17 | 0 | 17 | 0 | 19 |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 9 | 0 | 9 |
| 07:15 AM | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 10 | 0 | 10 | 0 | 12 |
| 07:30 AM | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 9 | 0 | 9 | 0 | 10 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 11 |
| Total | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 39 | 0 | 39 | 0 | 42 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 8 |
| 08:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 10 |
| Grand Total | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 74 | 0 | 74 | 0 | 79 |
| Apprch % | | 0 | 0 | 100 | 0 | | 0 | 0 | 100 | 0 | | | |
| Total % | 0 | 0 | 0 | 6.3 | 0 | 6.3 | 0 | 0 | 93.7 | 0 | 93.7 | 0 | |

| | Southbound | Public Parking Lot Westbound | | | | South Street Northbound | | | | Eastbound | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | App. Total | Int. Total |
| Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 | 9 |
| 07:15 AM | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 10 | 10 | 0 | 12 |
| 07:30 AM | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 9 | 9 | 0 | 10 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 | 0 | 11 |
| Total Volume | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 39 | 39 | 0 | 42 |
| % App. Total | | 0 | 0 | 100 | | 0 | 0 | 100 | | | |
| PHF | .000 | .000 | .000 | .375 | .375 | .000 | .000 | .886 | .886 | .000 | .875 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:HI
Counter:D4-3890
Weather:Clear

File Name : West Entrance PM
Site Code : 00000001
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Southbound | Public Parking Lot Westbound | | | | | South Street Northbound | | | | | Eastbound | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | App. Total | Int. Total |
| 03:30 PM | 0 | 0 | 0 | 14 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 03:45 PM | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 9 |
| Total | 0 | 0 | 0 | 22 | 0 | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 23 |
| 04:00 PM | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 9 |
| 04:15 PM | 0 | 0 | 0 | 19 | 0 | 19 | 0 | 0 | 2 | 0 | 2 | 0 | 21 |
| 04:30 PM | 0 | 0 | 0 | 13 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 04:45 PM | 0 | 0 | 0 | 14 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| Total | 0 | 0 | 0 | 54 | 0 | 54 | 0 | 0 | 3 | 0 | 3 | 0 | 57 |
| 05:00 PM | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 05:15 PM | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Grand Total | 0 | 0 | 0 | 92 | 0 | 92 | 0 | 0 | 4 | 0 | 4 | 0 | 96 |
| Apprch % | | 0 | 0 | 100 | 0 | | 0 | 0 | 100 | 0 | | | |
| Total % | 0 | 0 | 0 | 95.8 | 0 | 95.8 | 0 | 0 | 4.2 | 0 | 4.2 | 0 | |

| | Southbound | Public Parking Lot Westbound | | | | South Street Northbound | | | | Eastbound | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | **19** | **19** | 0 | 0 | **2** | **2** | 0 | **21** |
| 04:30 PM | 0 | 0 | 0 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 13 |
| 04:45 PM | 0 | 0 | 0 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 14 |
| 05:00 PM | 0 | 0 | 0 | 15 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| Total Volume | 0 | 0 | 0 | 61 | 61 | 0 | 0 | 2 | 2 | 0 | 63 |
| % App. Total | | 0 | 0 | 100 | | 0 | 0 | 100 | | | |
| PHF | .000 | .000 | .000 | .803 | .803 | .000 | .000 | .250 | .250 | .000 | .750 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:GC
Counter:D4-3889
Weather:Clear

File Name : North Entrance AM
Site Code : 00000002
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Southbound | Halekauwila Street Westbound | | | | | Public Parking Lot Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:30 AM | 0 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 11 | 0 | 11 | 21 |
| 06:45 AM | 0 | 12 | 0 | 0 | 0 | 12 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 9 | 0 | 9 | 22 |
| Total | 0 | 20 | 0 | 0 | 0 | 20 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 20 | 0 | 20 | 43 |
| 07:00 AM | 0 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 10 | 0 | 10 | 19 |
| 07:15 AM | 0 | 12 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 9 | 21 |
| 07:30 AM | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 17 | 0 | 17 | 34 |
| 07:45 AM | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 8 | 0 | 8 | 19 |
| Total | 0 | 46 | 0 | 0 | 0 | 46 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 44 | 0 | 44 | 93 |
| 08:00 AM | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 5 | 0 | 5 | 26 |
| 08:15 AM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 24 |
| Grand Total | 0 | 97 | 0 | 0 | 0 | 97 | 1 | 0 | 6 | 0 | 7 | 0 | 0 | 82 | 0 | 82 | 186 |
| Apprch % | | 100 | 0 | 0 | 0 | | 14.3 | 0 | 85.7 | 0 | | 0 | 0 | 100 | 0 | | |
| Total % | 0 | 52.2 | 0 | 0 | 0 | 52.2 | 0.5 | 0 | 3.2 | 0 | 3.8 | 0 | 0 | 44.1 | 0 | 44.1 | |

| | Southbound | Halekauwila Street Westbound | | | | Public Parking Lot Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 16 | 0 | 0 | 16 | 0 | 0 | 1 | 1 | 0 | 0 | 17 | 17 | 34 |
| 07:45 AM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 1 | 1 | 0 | 0 | 8 | 8 | 19 |
| 08:00 AM | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 1 | 1 | 0 | 0 | 5 | 5 | 26 |
| 08:15 AM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 24 |
| Total Volume | 0 | 57 | 0 | 0 | 57 | 0 | 0 | 3 | 3 | 0 | 0 | 43 | 43 | 103 |
| % App. Total | | 100 | 0 | 0 | | 0 | 0 | 100 | | 0 | 0 | 100 | | |
| PHF | .000 | .713 | .000 | .000 | .713 | .000 | .000 | .750 | .750 | .000 | .000 | .632 | .632 | .757 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:GC
Counter:D4-3889
Weather:Clear

File Name : North Entrance PM
Site Code : 00000002
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Southbound | Halekauwila Street Westbound | | | | | Public Parking Lot Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 0 | 1 | 0 | 0 | 0 | 1 | 13 | 0 | 14 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 28 |
| 03:45 PM | 0 | 1 | 0 | 0 | 0 | 1 | 4 | 0 | 6 | 0 | 10 | 0 | 0 | 2 | 0 | 2 | 13 |
| Total | 0 | 2 | 0 | 0 | 0 | 2 | 17 | 0 | 20 | 0 | 37 | 0 | 0 | 2 | 0 | 2 | 41 |
| 04:00 PM | 0 | 1 | 0 | 0 | 0 | 1 | 7 | 0 | 10 | 0 | 17 | 0 | 0 | 3 | 0 | 3 | 21 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 15 | 0 | 25 | 0 | 0 | 1 | 0 | 1 | 26 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 14 | 0 | 0 | 2 | 0 | 2 | 16 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 16 | 0 | 0 | 2 | 0 | 2 | 18 |
| Total | 0 | 1 | 0 | 0 | 0 | 1 | 32 | 0 | 40 | 0 | 72 | 0 | 0 | 8 | 0 | 8 | 81 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 9 | 0 | 16 | 0 | 0 | 1 | 0 | 1 | 17 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 12 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 22 |
| Grand Total | 0 | 3 | 0 | 0 | 0 | 3 | 66 | 0 | 81 | 0 | 147 | 0 | 0 | 11 | 0 | 11 | 161 |
| Apprch % | | 100 | 0 | 0 | 0 | | 44.9 | 0 | 55.1 | 0 | | 0 | 0 | 100 | 0 | | |
| Total % | 0 | 1.9 | 0 | 0 | 0 | 1.9 | 41 | 0 | 50.3 | 0 | 91.3 | 0 | 0 | 6.8 | 0 | 6.8 | |

| | Southbound | Halekauwila Street Westbound | | | | Public Parking Lot Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | | | | | |
| 03:30 PM | 0 | **1** | 0 | 0 | **1** | **13** | 0 | 14 | **27** | 0 | 0 | 0 | 0 | **28** |
| 03:45 PM | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 6 | 10 | 0 | 0 | 2 | 2 | 13 |
| 04:00 PM | 0 | 1 | 0 | 0 | 1 | 7 | 0 | 10 | 17 | 0 | 0 | **3** | **3** | 21 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 10 | 0 | **15** | 25 | 0 | 0 | 1 | 1 | 26 |
| Total Volume | 0 | 3 | 0 | 0 | 3 | 34 | 0 | 45 | 79 | 0 | 0 | 6 | 6 | 88 |
| % App. Total | | 100 | 0 | 0 | | 43 | 0 | 57 | | 0 | 0 | 100 | | |
| PHF | .000 | .750 | .000 | .000 | .750 | .654 | .000 | .750 | .731 | .000 | .000 | .500 | .500 | .786 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:TO
Counter:D4-5675
Weather:Clear

File Name : East Entrance AM
Site Code : 00000003
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Westboun d | Keawe Street Northbound | | | | | Public Parking Lot Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:30 AM | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 06:45 AM | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 AM | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:30 AM | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 0 | 7 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 9 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Grand Total | 0 | 0 | 11 | 0 | 11 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 14 |
| Apprch % | 0 | 0 | 100 | 0 | | | 100 | 0 | 0 | 0 | | 0 | 0 | 100 | 0 | | |
| Total % | 0 | 0 | 78.6 | 0 | 78.6 | 0 | 7.1 | 0 | 0 | 0 | 7.1 | 0 | 0 | 14.3 | 0 | 14.3 | |

| | Keawe Street Southbound | | | | Westbound | Keawe Street Northbound | | | | Public Parking Lot Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:45 AM | | | | | | | | | | | | | | |
| 06:45 AM | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 AM | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:30 AM | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 |
| Total Volume | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 10 |
| % App. Total | 0 | 0 | 100 | | | 0 | 0 | 0 | | 0 | 0 | 100 | | |
| PHF | .000 | .000 | .563 | .563 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 | .250 | .500 |

# Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, HI 96826

Counted By:TO
Counter:D4-5675
Weather:Clear

File Name : East Entrance PM
Site Code : 00000003
Start Date : 10/1/2013
Page No : 1

Groups Printed- Unshifted

| | Keawe Street Southbound | | | | | Westbound | Keawe Street Northbound | | | | | Public Parking Lot Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 8 | 8 |
| 03:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 5 | 0 | 4 | 0 | 9 | 10 |
| 04:00 PM | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 3 | 6 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 3 | 2 | 0 | 1 | 0 | 3 | 7 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grand Total | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 5 | 7 | 0 | 5 | 0 | 12 | 18 |
| Apprch % | 0 | 0 | 100 | 0 | | | 100 | 0 | 0 | 0 | | 58.3 | 0 | 41.7 | 0 | | |
| Total % | 0 | 0 | 5.6 | 0 | 5.6 | 0 | 27.8 | 0 | 0 | 0 | 27.8 | 38.9 | 0 | 27.8 | 0 | 66.7 | |

| | Keawe Street Southbound | | | | Westbound | Keawe Street Northbound | | | | Public Parking Lot Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:30 PM | | | | | | | | | | | | | | |
| 03:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 8 | 8 |
| 03:45 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 2 |
| 04:00 PM | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 1 | 3 | 6 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total Volume | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 0 | 4 | 7 | 0 | 5 | 12 | 17 |
| % App. Total | 0 | 0 | 100 | | | 100 | 0 | 0 | | 58.3 | 0 | 41.7 | | |
| PHF | .000 | .000 | .250 | .250 | .000 | .500 | .000 | .000 | .500 | .438 | .000 | .313 | .375 | .531 |

# APPENDIX B

# LEVEL OF SERVICE DEFINITIONS

## LEVEL OF SERVICE DEFINITIONS

## LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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

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

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

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

"Highway Capacity Manual," Transportation Research Board, 2000.

## LEVEL OF SERVICE DEFINITIONS

## LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

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

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

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

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

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

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

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

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

"Highway Capacity Manual," Transportation Research Board, 2000.

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

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

"Highway Capacity Manual," Transportation Research Board, 2000.

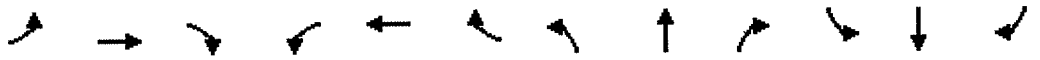
# APPENDIX C

# CAPACITY ANALYSIS CALCULATIONS
# EXISTING PEAK PERIOD TRAFFIC ANALYSIS

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 260 | 107 | 0 | 0 | 70 | 68 | 34 | 315 | 11 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 1.00 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | | 3418 | | | 1863 | 1583 | | 6349 | | | | |
| Flt Permitted | | 0.75 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | | 2670 | | | 1863 | 1583 | | 6349 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 286 | 118 | 0 | 0 | 77 | 75 | 37 | 346 | 12 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 404 | 0 | 0 | 77 | 28 | 0 | 390 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 10.1 | | | 10.1 | 10.1 | | 7.4 | | | | |
| Effective Green, g (s) | | 10.1 | | | 10.1 | 10.1 | | 7.4 | | | | |
| Actuated g/C Ratio | | 0.37 | | | 0.37 | 0.37 | | 0.27 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 980 | | | 684 | 581 | | 1708 | | | | |
| v/s Ratio Prot | | | | | 0.04 | | | | | | | |
| v/s Ratio Perm | | c0.15 | | | | 0.02 | | 0.06 | | | | |
| v/c Ratio | | 0.41 | | | 0.11 | 0.05 | | 0.23 | | | | |
| Uniform Delay, d1 | | 6.5 | | | 5.7 | 5.6 | | 7.8 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.1 | 0.0 | | 0.1 | | | | |
| Delay (s) | | 6.8 | | | 5.8 | 5.6 | | 7.9 | | | | |
| Level of Service | | A | | | A | A | | A | | | | |
| Approach Delay (s) | | 6.8 | | | 5.7 | | | 7.9 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.33 | | |
| Actuated Cycle Length (s) | 27.5 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 36.4% | 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 | | | | | | | | | | | | |
| Volume (vph) | 350 | 218 | 0 | 0 | 50 | 132 | 20 | 682 | 35 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 0.99 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | | 3433 | | | 1863 | 1583 | | 6354 | | | | |
| Flt Permitted | | 0.77 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | | 2732 | | | 1863 | 1583 | | 6354 | | | | |
| 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) | 380 | 237 | 0 | 0 | 54 | 143 | 22 | 741 | 38 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 617 | 0 | 0 | 54 | 120 | 0 | 794 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 16.1 | | | 16.1 | 16.1 | | 13.0 | | | | |
| Effective Green, g (s) | | 16.1 | | | 16.1 | 16.1 | | 13.0 | | | | |
| Actuated g/C Ratio | | 0.41 | | | 0.41 | 0.41 | | 0.33 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 1124 | | | 767 | 651 | | 2112 | | | | |
| v/s Ratio Prot | | | | | 0.03 | | | | | | | |
| v/s Ratio Perm | | c0.23 | | | | 0.08 | | 0.12 | | | | |
| v/c Ratio | | 0.55 | | | 0.07 | 0.18 | | 0.38 | | | | |
| Uniform Delay, d1 | | 8.7 | | | 7.0 | 7.3 | | 10.0 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.6 | | | 0.0 | 0.1 | | 0.1 | | | | |
| Delay (s) | | 9.3 | | | 7.0 | 7.5 | | 10.1 | | | | |
| Level of Service | | A | | | A | A | | B | | | | |
| Approach Delay (s) | | 9.3 | | | 7.3 | | | 10.1 | | | 0.0 | |
| Approach LOS | | A | | | A | | | B | | | A | |

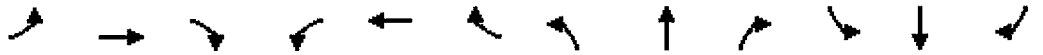
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.47 | | |
| Actuated Cycle Length (s) | 39.1 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 50.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 7 | 71 | 18 | 44 | 125 | 19 | 15 | 34 | 11 | 11 | 37 | 24 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 8 | 85 | 21 | 52 | 149 | 23 | 18 | 40 | 13 | 13 | 44 | 29 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 114 | 224 | 71 | 86 |
| Volume Left (vph) | 8 | 52 | 18 | 13 |
| Volume Right (vph) | 21 | 23 | 13 | 29 |
| Hadj (s) | -0.06 | 0.02 | -0.03 | -0.14 |
| Departure Headway (s) | 4.5 | 4.4 | 4.8 | 4.6 |
| Degree Utilization, x | 0.14 | 0.28 | 0.09 | 0.11 |
| Capacity (veh/h) | 766 | 774 | 697 | 712 |
| Control Delay (s) | 8.2 | 9.1 | 8.3 | 8.2 |
| Approach Delay (s) | 8.2 | 9.1 | 8.3 | 8.2 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.6 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 28.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 16 | 233 | 27 | 27 | 97 | 9 | 20 | 27 | 11 | 12 | 54 | 30 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 18 | 256 | 30 | 30 | 107 | 10 | 22 | 30 | 12 | 13 | 59 | 33 |

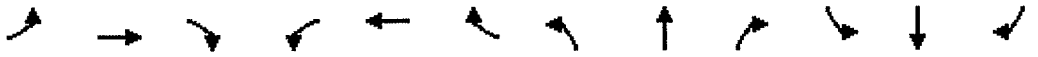
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 303 | 146 | 64 | 105 |
| Volume Left (vph) | 18 | 30 | 22 | 13 |
| Volume Right (vph) | 30 | 10 | 12 | 33 |
| Hadj (s) | -0.01 | 0.03 | -0.01 | -0.13 |
| Departure Headway (s) | 4.5 | 4.7 | 5.1 | 4.9 |
| Degree Utilization, x | 0.38 | 0.19 | 0.09 | 0.14 |
| Capacity (veh/h) | 762 | 717 | 636 | 661 |
| Control Delay (s) | 10.2 | 8.9 | 8.6 | 8.8 |
| Approach Delay (s) | 10.2 | 8.9 | 8.6 | 8.8 |
| Approach LOS | B | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.5 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.5% | 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 6 | 47 | 16 | 17 | 170 | 20 | 11 | 43 | 13 | 8 | 28 | 49 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Hourly flow rate (vph) | 8 | 59 | 20 | 22 | 215 | 25 | 14 | 54 | 16 | 10 | 35 | 62 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 87 | 262 | 85 | 108 |
| Volume Left (vph) | 8 | 22 | 14 | 10 |
| Volume Right (vph) | 20 | 25 | 16 | 62 |
| Hadj (s) | -0.09 | -0.01 | -0.05 | -0.29 |
| Departure Headway (s) | 4.6 | 4.5 | 4.8 | 4.5 |
| Degree Utilization, x | 0.11 | 0.33 | 0.11 | 0.14 |
| Capacity (veh/h) | 729 | 769 | 690 | 727 |
| Control Delay (s) | 8.2 | 9.6 | 8.4 | 8.3 |
| Approach Delay (s) | 8.2 | 9.6 | 8.4 | 8.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.9 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 26.9% | 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 13 | 155 | 13 | 24 | 132 | 10 | 22 | 31 | 23 | 27 | 76 | 26 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 14 | 165 | 14 | 26 | 140 | 11 | 23 | 33 | 24 | 29 | 81 | 28 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 193 | 177 | 81 | 137 |
| Volume Left (vph) | 14 | 26 | 23 | 29 |
| Volume Right (vph) | 14 | 11 | 24 | 28 |
| Hadj (s) | 0.01 | 0.03 | -0.09 | -0.05 |
| Departure Headway (s) | 4.7 | 4.7 | 4.9 | 4.9 |
| Degree Utilization, x | 0.25 | 0.23 | 0.11 | 0.19 |
| Capacity (veh/h) | 722 | 717 | 670 | 682 |
| Control Delay (s) | 9.2 | 9.1 | 8.5 | 9.0 |
| Approach Delay (s) | 9.2 | 9.1 | 8.5 | 9.0 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.0 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | | |
| Volume (vph) | 160 | 131 | 121 | 49 | 47 | 91 | 21 | 363 | 39 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.96 | | | 0.93 | | | 0.99 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 1.00 | | | | |
| Satd. Flow (prot) | | 3319 | | | 3238 | | | 3481 | | | | |
| Flt Permitted | | 0.78 | | | 0.78 | | | 1.00 | | | | |
| Satd. Flow (perm) | | 2635 | | | 2562 | | | 3481 | | | | |
| Peak-hour factor, PHF | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 167 | 136 | 126 | 51 | 49 | 95 | 22 | 378 | 41 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 84 | 0 | 0 | 64 | 0 | 0 | 14 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 345 | 0 | 0 | 131 | 0 | 0 | 427 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 9.6 | | | 9.6 | | | 9.4 | | | | |
| Effective Green, g (s) | | 9.6 | | | 9.6 | | | 9.4 | | | | |
| Actuated g/C Ratio | | 0.33 | | | 0.33 | | | 0.32 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 872 | | | 848 | | | 1128 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | c0.13 | | | 0.05 | | | 0.12 | | | | |
| v/c Ratio | | 0.40 | | | 0.16 | | | 0.38 | | | | |
| Uniform Delay, d1 | | 7.5 | | | 6.8 | | | 7.5 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.1 | | | 0.2 | | | | |
| Delay (s) | | 7.8 | | | 6.9 | | | 7.8 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 7.8 | | | 6.9 | | | 7.8 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.39 | | |
| Actuated Cycle Length (s) | 29.0 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 42.2% | 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 | | ↕ | | | ↕ | | | ↕ | | | | |
| Volume (vph) | 82 | 57 | 59 | 55 | 89 | 86 | 47 | 239 | 12 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.96 | | | 0.94 | | | 0.99 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 0.99 | | | | |
| Satd. Flow (prot) | | 3313 | | | 3301 | | | 3491 | | | | |
| Flt Permitted | | 0.77 | | | 0.84 | | | 0.99 | | | | |
| Satd. Flow (perm) | | 2616 | | | 2795 | | | 3491 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 90 | 63 | 65 | 60 | 98 | 95 | 52 | 263 | 13 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 73 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 168 | 0 | 0 | 180 | 0 | 0 | 323 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 5.4 | | | 5.4 | | | 8.0 | | | | |
| Effective Green, g (s) | | 5.4 | | | 5.4 | | | 8.0 | | | | |
| Actuated g/C Ratio | | 0.23 | | | 0.23 | | | 0.34 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 603 | | | 645 | | | 1193 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | 0.06 | | | c0.06 | | | 0.09 | | | | |
| v/c Ratio | | 0.28 | | | 0.28 | | | 0.27 | | | | |
| Uniform Delay, d1 | | 7.4 | | | 7.4 | | | 5.6 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.2 | | | 0.1 | | | | |
| Delay (s) | | 7.7 | | | 7.6 | | | 5.7 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 7.7 | | | 7.6 | | | 5.7 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.27 | | |
| Actuated Cycle Length (s) | 23.4 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 33.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# APPENDIX D

# CAPACITY ANALYSIS CALCULATIONS
# PROJECTED YEAR 2016 PEAK PERIOD TRAFFIC
# ANALYSIS WITHOUT PROJECT

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 264 | 109 | 0 | 0 | 71 | 69 | 35 | 320 | 11 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 1.00 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | | 3418 | | | 1863 | 1583 | | 6349 | | | | |
| Flt Permitted | | 0.75 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | | 2668 | | | 1863 | 1583 | | 6349 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 290 | 120 | 0 | 0 | 78 | 76 | 38 | 352 | 12 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 410 | 0 | 0 | 78 | 28 | 0 | 397 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 10.2 | | | 10.2 | 10.2 | | 7.6 | | | | |
| Effective Green, g (s) | | 10.2 | | | 10.2 | 10.2 | | 7.6 | | | | |
| Actuated g/C Ratio | | 0.37 | | | 0.37 | 0.37 | | 0.27 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 978 | | | 683 | 580 | | 1735 | | | | |
| v/s Ratio Prot | | | | | 0.04 | | | | | | | |
| v/s Ratio Perm | | c0.15 | | | | 0.02 | | 0.06 | | | | |
| v/c Ratio | | 0.42 | | | 0.11 | 0.05 | | 0.23 | | | | |
| Uniform Delay, d1 | | 6.6 | | | 5.8 | 5.7 | | 7.8 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.1 | 0.0 | | 0.1 | | | | |
| Delay (s) | | 6.9 | | | 5.9 | 5.7 | | 7.9 | | | | |
| Level of Service | | A | | | A | A | | A | | | | |
| Approach Delay (s) | | 6.9 | | | 5.8 | | | 7.9 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

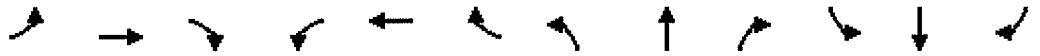
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 27.8 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 36.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 355 | 221 | 0 | 0 | 51 | 134 | 20 | 692 | 36 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 0.99 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | | 3433 | | | 1863 | 1583 | | 6353 | | | | |
| Flt Permitted | | 0.77 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | | 2729 | | | 1863 | 1583 | | 6353 | | | | |
| 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) | 386 | 240 | 0 | 0 | 55 | 146 | 22 | 752 | 39 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 626 | 0 | 0 | 55 | 124 | 0 | 806 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 16.3 | | | 16.3 | 16.3 | | 13.1 | | | | |
| Effective Green, g (s) | | 16.3 | | | 16.3 | 16.3 | | 13.1 | | | | |
| Actuated g/C Ratio | | 0.41 | | | 0.41 | 0.41 | | 0.33 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 1129 | | | 770 | 654 | | 2112 | | | | |
| v/s Ratio Prot | | | | | 0.03 | | | | | | | |
| v/s Ratio Perm | | c0.23 | | | | 0.08 | | 0.13 | | | | |
| v/c Ratio | | 0.55 | | | 0.07 | 0.19 | | 0.38 | | | | |
| Uniform Delay, d1 | | 8.8 | | | 7.0 | 7.3 | | 10.1 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.6 | | | 0.0 | 0.1 | | 0.1 | | | | |
| Delay (s) | | 9.4 | | | 7.0 | 7.5 | | 10.2 | | | | |
| Level of Service | | A | | | A | A | | B | | | | |
| Approach Delay (s) | | 9.4 | | | 7.4 | | | 10.2 | | | 0.0 | |
| Approach LOS | | A | | | A | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 39.4 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 51.4% | 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 | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 7 | 77 | 18 | 52 | 137 | 20 | 15 | 35 | 12 | 11 | 38 | 24 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 8 | 92 | 21 | 62 | 163 | 24 | 18 | 42 | 14 | 13 | 45 | 29 |

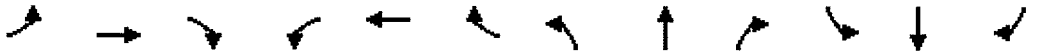
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 121 | 249 | 74 | 87 |
| Volume Left (vph) | 8 | 62 | 18 | 13 |
| Volume Right (vph) | 21 | 24 | 14 | 29 |
| Hadj (s) | -0.06 | 0.03 | -0.03 | -0.13 |
| Departure Headway (s) | 4.5 | 4.5 | 4.8 | 4.7 |
| Degree Utilization, x | 0.15 | 0.31 | 0.10 | 0.11 |
| Capacity (veh/h) | 756 | 770 | 683 | 696 |
| Control Delay (s) | 8.3 | 9.5 | 8.4 | 8.3 |
| Approach Delay (s) | 8.3 | 9.5 | 8.4 | 8.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.9 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 30.1% | 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 16 | 247 | 27 | 28 | 104 | 10 | 20 | 27 | 13 | 13 | 55 | 30 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 18 | 271 | 30 | 31 | 114 | 11 | 22 | 30 | 14 | 14 | 60 | 33 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 319 | 156 | 66 | 108 |
| Volume Left (vph) | 18 | 31 | 22 | 14 |
| Volume Right (vph) | 30 | 11 | 14 | 33 |
| Hadj (s) | -0.01 | 0.03 | -0.03 | -0.12 |
| Departure Headway (s) | 4.5 | 4.8 | 5.2 | 5.0 |
| Degree Utilization, x | 0.40 | 0.21 | 0.09 | 0.15 |
| Capacity (veh/h) | 756 | 711 | 626 | 649 |
| Control Delay (s) | 10.6 | 9.0 | 8.7 | 8.9 |
| Approach Delay (s) | 10.6 | 9.0 | 8.7 | 8.9 |
| Approach LOS | B | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.7 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 30.1% | 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 6 | 47 | 16 | 17 | 172 | 20 | 11 | 45 | 13 | 8 | 30 | 55 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Hourly flow rate (vph) | 8 | 59 | 20 | 22 | 218 | 25 | 14 | 57 | 16 | 10 | 38 | 70 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 87 | 265 | 87 | 118 |
| Volume Left (vph) | 8 | 22 | 14 | 10 |
| Volume Right (vph) | 20 | 25 | 16 | 70 |
| Hadj (s) | -0.09 | -0.01 | -0.05 | -0.30 |
| Departure Headway (s) | 4.6 | 4.5 | 4.8 | 4.5 |
| Degree Utilization, x | 0.11 | 0.33 | 0.12 | 0.15 |
| Capacity (veh/h) | 721 | 762 | 684 | 726 |
| Control Delay (s) | 8.2 | 9.7 | 8.5 | 8.3 |
| Approach Delay (s) | 8.2 | 9.7 | 8.5 | 8.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.0 | | |
| Level of Service | A | | |
| 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 14 | 156 | 13 | 24 | 133 | 10 | 22 | 32 | 23 | 27 | 78 | 26 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 15 | 166 | 14 | 26 | 141 | 11 | 23 | 34 | 24 | 29 | 83 | 28 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 195 | 178 | 82 | 139 |
| Volume Left (vph) | 15 | 26 | 23 | 29 |
| Volume Right (vph) | 14 | 11 | 24 | 28 |
| Hadj (s) | 0.01 | 0.03 | -0.09 | -0.04 |
| Departure Headway (s) | 4.7 | 4.7 | 4.9 | 4.9 |
| Degree Utilization, x | 0.25 | 0.23 | 0.11 | 0.19 |
| Capacity (veh/h) | 720 | 715 | 667 | 680 |
| Control Delay (s) | 9.3 | 9.2 | 8.5 | 9.0 |
| Approach Delay (s) | 9.3 | 9.2 | 8.5 | 9.0 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.1 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | | |
| Volume (vph) | 83 | 58 | 60 | 56 | 90 | 87 | 48 | 243 | 12 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.96 | | | 0.94 | | | 0.99 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 0.99 | | | | |
| Satd. Flow (prot) | | 3312 | | | 3301 | | | 3491 | | | | |
| Flt Permitted | | 0.77 | | | 0.83 | | | 0.99 | | | | |
| Satd. Flow (perm) | | 2615 | | | 2788 | | | 3491 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 91 | 64 | 66 | 62 | 99 | 96 | 53 | 267 | 13 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 51 | 0 | 0 | 74 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 170 | 0 | 0 | 183 | 0 | 0 | 328 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 5.4 | | | 5.4 | | | 8.1 | | | | |
| Effective Green, g (s) | | 5.4 | | | 5.4 | | | 8.1 | | | | |
| Actuated g/C Ratio | | 0.23 | | | 0.23 | | | 0.34 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 600 | | | 640 | | | 1203 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | 0.07 | | | c0.07 | | | 0.09 | | | | |
| v/c Ratio | | 0.28 | | | 0.29 | | | 0.27 | | | | |
| Uniform Delay, d1 | | 7.5 | | | 7.5 | | | 5.6 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.2 | | | 0.1 | | | | |
| Delay (s) | | 7.7 | | | 7.7 | | | 5.7 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 7.7 | | | 7.7 | | | 5.7 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.28 | | |
| Actuated Cycle Length (s) | 23.5 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 33.8% | 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 | | | | | | | | | | | | |
| Volume (vph) | 162 | 133 | 123 | 50 | 48 | 92 | 21 | 368 | 40 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.96 | | | 0.93 | | | 0.99 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 1.00 | | | | |
| Satd. Flow (prot) | | 3319 | | | 3239 | | | 3481 | | | | |
| Flt Permitted | | 0.78 | | | 0.78 | | | 1.00 | | | | |
| Satd. Flow (perm) | | 2633 | | | 2556 | | | 3481 | | | | |
| Peak-hour factor, PHF | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 169 | 139 | 128 | 52 | 50 | 96 | 22 | 383 | 42 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 85 | 0 | 0 | 64 | 0 | 0 | 14 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 351 | 0 | 0 | 134 | 0 | 0 | 433 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 9.7 | | | 9.7 | | | 9.5 | | | | |
| Effective Green, g (s) | | 9.7 | | | 9.7 | | | 9.5 | | | | |
| Actuated g/C Ratio | | 0.33 | | | 0.33 | | | 0.33 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 874 | | | 849 | | | 1132 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | c0.13 | | | 0.05 | | | 0.12 | | | | |
| v/c Ratio | | 0.40 | | | 0.16 | | | 0.38 | | | | |
| Uniform Delay, d1 | | 7.5 | | | 6.9 | | | 7.6 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.1 | | | 0.2 | | | | |
| Delay (s) | | 7.8 | | | 7.0 | | | 7.8 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 7.8 | | | 7.0 | | | 7.8 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.39 | | |
| Actuated Cycle Length (s) | 29.2 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 42.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# APPENDIX E

# CAPACITY ANALYSIS CALCULATIONS
# PROJECTED YEAR 2016 PEAK PERIOD TRAFFIC
# ANALYSIS WITH PROJECT

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 264 | 109 | 0 | 0 | 71 | 69 | 54 | 415 | 20 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 0.99 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 0.99 | | | | |
| Satd. Flow (prot) | | 3418 | | | 1863 | 1583 | | 6334 | | | | |
| Flt Permitted | | 0.75 | | | 1.00 | 1.00 | | 0.99 | | | | |
| Satd. Flow (perm) | | 2665 | | | 1863 | 1583 | | 6334 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 290 | 120 | 0 | 0 | 78 | 76 | 59 | 456 | 22 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 410 | 0 | 0 | 78 | 27 | 0 | 530 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 10.6 | | | 10.6 | 10.6 | | 8.7 | | | | |
| Effective Green, g (s) | | 10.6 | | | 10.6 | 10.6 | | 8.7 | | | | |
| Actuated g/C Ratio | | 0.36 | | | 0.36 | 0.36 | | 0.30 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 964 | | | 673 | 572 | | 1880 | | | | |
| v/s Ratio Prot | | | | | 0.04 | | | | | | | |
| v/s Ratio Perm | | c0.15 | | | | 0.02 | | 0.08 | | | | |
| v/c Ratio | | 0.43 | | | 0.12 | 0.05 | | 0.28 | | | | |
| Uniform Delay, d1 | | 7.1 | | | 6.2 | 6.1 | | 7.9 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.3 | | | 0.1 | 0.0 | | 0.1 | | | | |
| Delay (s) | | 7.4 | | | 6.3 | 6.1 | | 8.0 | | | | |
| Level of Service | | A | | | A | A | | A | | | | |
| Approach Delay (s) | | 7.4 | | | 6.2 | | | 8.0 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.36 | | |
| Actuated Cycle Length (s) | 29.3 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 38.6% | 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 | | | | | | | | | | | | |
| Volume (vph) | 355 | 221 | 0 | 0 | 51 | 134 | 19 | 686 | 35 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 1.00 | 1.00 | | 0.86 | | | | |
| Frt | | 1.00 | | | 1.00 | 0.85 | | 0.99 | | | | |
| Flt Protected | | 0.97 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | | 3433 | | | 1863 | 1583 | | 6354 | | | | |
| Flt Permitted | | 0.77 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | | 2729 | | | 1863 | 1583 | | 6354 | | | | |
| 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) | 386 | 240 | 0 | 0 | 55 | 146 | 21 | 746 | 38 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 626 | 0 | 0 | 55 | 124 | 0 | 798 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | | | 2 | 4 | | | | | |
| Actuated Green, G (s) | | 16.3 | | | 16.3 | 16.3 | | 13.0 | | | | |
| Effective Green, g (s) | | 16.3 | | | 16.3 | 16.3 | | 13.0 | | | | |
| Actuated g/C Ratio | | 0.41 | | | 0.41 | 0.41 | | 0.33 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 1131 | | | 772 | 656 | | 2101 | | | | |
| v/s Ratio Prot | | | | | 0.03 | | | | | | | |
| v/s Ratio Perm | | c0.23 | | | | 0.08 | | 0.13 | | | | |
| v/c Ratio | | 0.55 | | | 0.07 | 0.19 | | 0.38 | | | | |
| Uniform Delay, d1 | | 8.7 | | | 6.9 | 7.3 | | 10.1 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.6 | | | 0.0 | 0.1 | | 0.1 | | | | |
| Delay (s) | | 9.3 | | | 7.0 | 7.4 | | 10.2 | | | | |
| Level of Service | | A | | | A | A | | B | | | | |
| Approach Delay (s) | | 9.3 | | | 7.3 | | | 10.2 | | | 0.0 | |
| Approach LOS | | A | | | A | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 39.3 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 51.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

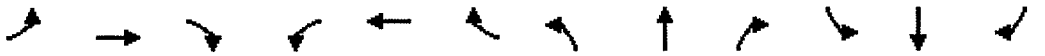
# HCM Unsignalized Intersection Capacity Analysis
## 3: Keawe St & Halekauwila St

10/17/2013

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 7 | 86 | 18 | 46 | 137 | 20 | 15 | 35 | 12 | 11 | 38 | 24 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 8 | 102 | 21 | 55 | 163 | 24 | 18 | 42 | 14 | 13 | 45 | 29 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 132 | 242 | 74 | 87 |
| Volume Left (vph) | 8 | 55 | 18 | 13 |
| Volume Right (vph) | 21 | 24 | 14 | 29 |
| Hadj (s) | -0.05 | 0.02 | -0.03 | -0.13 |
| Departure Headway (s) | 4.5 | 4.5 | 4.9 | 4.7 |
| Degree Utilization, x | 0.17 | 0.30 | 0.10 | 0.11 |
| Capacity (veh/h) | 756 | 768 | 681 | 694 |
| Control Delay (s) | 8.4 | 9.4 | 8.4 | 8.3 |
| Approach Delay (s) | 8.4 | 9.4 | 8.4 | 8.3 |
| Approach LOS | A | A | A | A |

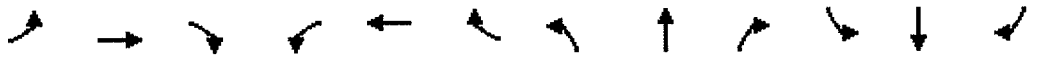
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 29.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 16 | 246 | 27 | 47 | 104 | 10 | 20 | 27 | 13 | 13 | 55 | 30 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 18 | 270 | 30 | 52 | 114 | 11 | 22 | 30 | 14 | 14 | 60 | 33 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 318 | 177 | 66 | 108 |
| Volume Left (vph) | 18 | 52 | 22 | 14 |
| Volume Right (vph) | 30 | 11 | 14 | 33 |
| Hadj (s) | -0.01 | 0.06 | -0.03 | -0.12 |
| Departure Headway (s) | 4.6 | 4.8 | 5.2 | 5.1 |
| Degree Utilization, x | 0.40 | 0.24 | 0.10 | 0.15 |
| Capacity (veh/h) | 750 | 709 | 617 | 640 |
| Control Delay (s) | 10.6 | 9.3 | 8.8 | 9.0 |
| Approach Delay (s) | 10.6 | 9.3 | 8.8 | 9.0 |
| Approach LOS | B | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 37.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 6 | 61 | 30 | 17 | 168 | 20 | 7 | 45 | 13 | 8 | 30 | 49 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Hourly flow rate (vph) | 8 | 77 | 38 | 22 | 213 | 25 | 9 | 57 | 16 | 10 | 38 | 62 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 123 | 259 | 82 | 110 |
| Volume Left (vph) | 8 | 22 | 9 | 10 |
| Volume Right (vph) | 38 | 25 | 16 | 62 |
| Hadj (s) | -0.14 | -0.01 | -0.06 | -0.29 |
| Departure Headway (s) | 4.5 | 4.5 | 4.9 | 4.6 |
| Degree Utilization, x | 0.15 | 0.33 | 0.11 | 0.14 |
| Capacity (veh/h) | 738 | 759 | 674 | 710 |
| Control Delay (s) | 8.4 | 9.7 | 8.5 | 8.4 |
| Approach Delay (s) | 8.4 | 9.7 | 8.5 | 8.4 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.0 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 28.4% | 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 | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 14 | 155 | 12 | 24 | 145 | 10 | 34 | 32 | 23 | 27 | 78 | 45 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 15 | 165 | 13 | 26 | 154 | 11 | 36 | 34 | 24 | 29 | 83 | 48 |

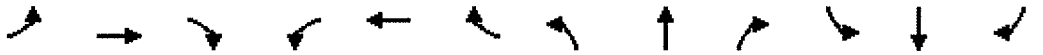
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 193 | 190 | 95 | 160 |
| Volume Left (vph) | 15 | 26 | 36 | 29 |
| Volume Right (vph) | 13 | 11 | 24 | 48 |
| Hadj (s) | 0.01 | 0.03 | -0.04 | -0.11 |
| Departure Headway (s) | 4.8 | 4.8 | 5.0 | 4.9 |
| Degree Utilization, x | 0.26 | 0.26 | 0.13 | 0.22 |
| Capacity (veh/h) | 699 | 698 | 650 | 677 |
| Control Delay (s) | 9.5 | 9.5 | 8.8 | 9.2 |
| Approach Delay (s) | 9.5 | 9.5 | 8.8 | 9.2 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.3 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 31.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | | |
| Volume (vph) | 67 | 42 | 60 | 56 | 128 | 87 | 48 | 231 | 7 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.95 | | | 0.95 | | | 1.00 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 0.99 | | | | |
| Satd. Flow (prot) | | 3285 | | | 3334 | | | 3496 | | | | |
| Flt Permitted | | 0.76 | | | 0.85 | | | 0.99 | | | | |
| Satd. Flow (perm) | | 2541 | | | 2880 | | | 3496 | | | | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 74 | 46 | 66 | 62 | 141 | 96 | 53 | 254 | 8 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 73 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 136 | 0 | 0 | 226 | 0 | 0 | 312 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 5.7 | | | 5.7 | | | 8.0 | | | | |
| Effective Green, g (s) | | 5.7 | | | 5.7 | | | 8.0 | | | | |
| Actuated g/C Ratio | | 0.24 | | | 0.24 | | | 0.34 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 611 | | | 692 | | | 1180 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | 0.05 | | | c0.08 | | | 0.09 | | | | |
| v/c Ratio | | 0.22 | | | 0.33 | | | 0.26 | | | | |
| Uniform Delay, d1 | | 7.2 | | | 7.4 | | | 5.7 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.2 | | | 0.3 | | | 0.1 | | | | |
| Delay (s) | | 7.4 | | | 7.7 | | | 5.8 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 7.4 | | | 7.7 | | | 5.8 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.29 | | |
| Actuated Cycle Length (s) | 23.7 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 33.5% | 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 | | ↕ | | | ↕ | | | ↕ | | | | |
| Volume (vph) | 210 | 181 | 123 | 50 | 46 | 92 | 21 | 406 | 54 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | | |
| Frt | | 0.96 | | | 0.93 | | | 0.98 | | | | |
| Flt Protected | | 0.98 | | | 0.99 | | | 1.00 | | | | |
| Satd. Flow (prot) | | 3344 | | | 3236 | | | 3472 | | | | |
| Flt Permitted | | 0.77 | | | 0.77 | | | 1.00 | | | | |
| Satd. Flow (perm) | | 2620 | | | 2524 | | | 3472 | | | | |
| Peak-hour factor, PHF | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Adj. Flow (vph) | 219 | 189 | 128 | 52 | 48 | 96 | 22 | 423 | 56 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 61 | 0 | 0 | 61 | 0 | 0 | 17 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 475 | 0 | 0 | 135 | 0 | 0 | 484 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Actuated Green, G (s) | | 12.0 | | | 12.0 | | | 10.6 | | | | |
| Effective Green, g (s) | | 12.0 | | | 12.0 | | | 10.6 | | | | |
| Actuated g/C Ratio | | 0.37 | | | 0.37 | | | 0.33 | | | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 964 | | | 929 | | | 1128 | | | | |
| v/s Ratio Prot | | | | | | | | | | | | |
| v/s Ratio Perm | | c0.18 | | | 0.05 | | | 0.14 | | | | |
| v/c Ratio | | 0.49 | | | 0.15 | | | 0.43 | | | | |
| Uniform Delay, d1 | | 7.9 | | | 6.9 | | | 8.6 | | | | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | | |
| Incremental Delay, d2 | | 0.4 | | | 0.1 | | | 0.3 | | | | |
| Delay (s) | | 8.3 | | | 7.0 | | | 8.9 | | | | |
| Level of Service | | A | | | A | | | A | | | | |
| Approach Delay (s) | | 8.3 | | | 7.0 | | | 8.9 | | | 0.0 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.46 | | |
| Actuated Cycle Length (s) | 32.6 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 46.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group