# VICTORIA PLACE

**LAND BLOCK 2, PROJECT 3**

HCDA PLANNED DEVELOPMENT

PERMIT APPLICATION

JULY 2019

# APPENDICES

Howard Hughes

WARD VILLAGE

# APPENDICES

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# APPENDIX A

LEED CHECKLIST

# LEED-NCv4 Checklist
# Victoria Place
# 7/1/2019
# Target = CERTIFIED

| | Yes | ? | No |
|---|---|---|---|
| **Summary** | **50** | **17** | 59 |

| Category | Credit | Credit Name | Yes | ? | No |
|---|---|---|---|---|---|
| **Integrative Process** | C | Integrative Process | **1** | | |
| **Location and Transportation** | C | LEED-ND Location | **16** | | |
| | C | Sensitive Land Protection | | | 1 |
| | C | High Priority Site | | | 2 |
| | C | Surrounding Density & Diverse Uses | | | 5 |
| | C | Access to Quality Transit | | | 5 |
| | C | Bicycle Facilities | | | 1 |
| | C | Reduced Parking Footprint | | | 1 |
| | C | Green Vehicles | | | 1 |
| **Sustainable Sites** | P | Construction Activity Pollution Prevention | **Y** | | |
| | C | Site Assessment | **1** | | |
| | C | Site Development - Protect or Restore Habitat | | 2 | |
| | C | Open Space | **1** | | |
| | C | Rainwater Management | | | 3 |
| | C | Heat Island Reduction | **2** | | |
| | C | Light Pollution Reduction | | 1 | |
| **Water Efficiency** | P | Outdoor Water Use Reduction | **Y** | | |
| | P | Indoor Water Use Reduction | **Y** | | |
| | P | Building-Level Water Metering | **Y** | | |
| | C | Outdoor Water Use Reduction | **1** | | 1 |
| | C | Indoor Water Use Reduction | **2** | 1 | 3 |
| | C | Cooling Tower Water Use | | | 2 |
| | C | Water Metering | **1** | | |
| **Energy and Atmosphere** | P | Fundamental Commissioning and Verification | **Y** | | |
| | P | Minimum Energy Performance | **Y** | | |
| | P | Building-Level Energy Metering | **Y** | | |
| | P | Fundamental Refrigerant Management | **Y** | | |
| | C | Enhanced Commissioning | **3** | | 3 |
| | C | Optimize Energy Performance | **4** | 6 | 8 |
| | C | Advanced Energy Metering | | 1 | |
| | C | Demand Response | | | 2 |
| | C | Renewable Energy Production | | | 3 |
| | C | Enhanced Refrigerant Management | | 1 | |
| | C | Green Power and Carbon Offsets | | 2 | |
| **Materials and Resources** | P | Storage and Collection of Recyclables | **Y** | | |
| | P | CDWM Planning | **Y** | | |
| | C | Building Life-Cycle Impact Reduction | | | 5 |
| | C | BPDO - Environmental Product Declarations | **1** | | 1 |
| | C | BPDO - Sourcing of Raw Materials | **1** | | 1 |
| | C | BPDO - Material Ingredients | **1** | | 1 |
| | C | C&D Waste Management | **2** | | |

| Category | Credit | Credit Name | Yes | ? | No |
|---|---|---|---|---|---|
| **Indoor Environmental Quality** | P | Minimum IAQ Performance | **Y** | | |
| | P | Environmental Tobacco Smoke Control | **Y** | | |
| | C | Enhanced IAQ Strategies | | | 2 |
| | C | Low-Emitting Materials | **2** | | 1 |
| | C | Construction IAQ Management Plan | **1** | | |
| | C | Indoor Air Quality Assessment | | | 2 |
| | C | Thermal Comfort | **1** | | |
| | C | Interior Lighting | **2** | | |
| | C | Daylight | | | 3 |
| | C | Quality Views | **1** | | |
| | C | Acoustic Performance | | 1 | |
| **Innovation** | C | Innovation in Design: TBD | **1** | | |
| | C | Innovation in Design: TBD | **1** | | |
| | C | Innovation in Design: TBD | **1** | | |
| | C | Innovation in Design: TBD | **1** | | |
| | C | Innovation in Design: TBD | | 1 | |
| | C | LEED Accredited Professional | **1** | | |
| **Regional Priority** | C | C&D Waste Management | **1** | | |
| | C | Indoor Water Use Reduction | | 1 | |
| | C | Outdoor Water Use Reduction | | | 1 |
| | C | Optimize Energy Performance | | | 1 |

# APPENDIX B

SHPD LETTER

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

**STATE OF HAWAII**
**DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

July 9, 2019

IN REPLY REFER TO:
Log No. 2019.01133
Doc. No. 1907AM05
Archaeology

Aedard Los Banos, Executive Director
Hawaii Community Development Authority
547 Queen Street
Honolulu, Hawaii 96813
Aedard.o.losbanos@hawaii.gov

Dear Mr. Los Banos:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
**Ward Village Gateway Project (Block B East and Block C West)**
**Block C West project, Kakaʻako**
**Honolulu Ahupuaʻa, Honolulu (Kona) District, Island of Oʻahu**
**TMK: (1) 2-3-001:130 por. and 131**

This letter provides the State Historic Preservation Division's (SHPD's) review of the letter dated May 17, 2019, from the Hawaii Community Development Authority (HCDA) which (1) states that the SHPD has had an opportunity to review and comment on the effect of the proposed Victoria Ward, Ltd. (VWL) Block C West project on historic properties, pursuant to Hawaiʻi Revised Statutes (HRS) §6E-42 and Hawaiʻi Administrative Rules (HAR) §13-284; and thus HCDA (2) requests SHPD's determination that VWL has met the respective requirements as set forth in HRS §6E-42 and HRS §6E-43 and HAR §13-284-3(b) Steps 1-5 and that VWL has set forth a process to comply with HAR §13-284-3(b) Step 6 and HAR §13-284-9(d). The SHPD received this letter on May 17, 2019.

The Block C West project has undergone multiple design modifications between 2014 and 2019. The original Block C West project comprised a 2.2-acre project area. It was subsequently subsumed, along with the adjacent Block B East, into a new 4.4-acre project, designated the Ward Village Gateway project. Based on multiple factors, the Block C West Project and Block B East Project have been redesigned with the new 2.2-acre Block C West project area boundaries matching the original project area.

Pursuant to HRS §6E-42 and HAR §13-284-3(b)(1-5), VWL has completed the following five of the six historic preservation review procedural steps:

(1) Identification and inventory to determine if historic properties are present and, if so, to identify and document them;
(2) Evaluation of significance;
(3) Effect determination;
(4) Mitigation commitments; and
(5) Detailed mitigation plan(s).

The SHPD accepted the Block C West archaeological inventory survey (AIS) report on October 20, 2014 (Log No. 2014.04570, Doc. No. 1410SL22). As a result, Steps 1-4 of the historic preservation review procedural steps were completed pursuant to HRS §6E-42.



(1) Identification and inventory. Pursuant to HAR §13-284-3(b)(1), the AIS conducted within the boundaries of the Block C West project identified and documented two historic properties:
   a. Site # 50-80-14-7655 consists of subsurface historic salt pan remnants, documented as laminated organic material and associated man-made berms. The historic property reflects land-use activities related to historic salt production.
   b. Site # 50-80-14-7658 consists of buried historic surfaces, including asphalt, concrete, coral and tar pavement, oil-rolled surfaces, and fence-lines associated with the historic development of the project area.

(2) Evaluation of significance. In the Block C West AIS report, historic properties were assessed as significant per HAR §13-284-6 Criteria a-e.

Pursuant to HAR §13-284-3(b)(2), VWL provided the following site significance evaluations for the historic properties within the Block C West project area:
   a. Site # -7655 was assessed as significant under criteria c and d; and
   b. Site # -7658 was assessed as significant under criterion d.

The SHPD concurred with these site significance evaluations in its acceptance letter of the Block C West AIS report, dated October 20, 2014 (Log No. 2014.04570, Doc. No. 1410SL22).

(3) Effect determination. Pursuant to HAR §13-284-3(b)(3), VWL provided an effect recommendation of "effect, with agreed upon mitigation commitments." The SHPD concurred with this recommendation on October 20, 2014 (Log No. 2014.04570, Doc. No. 1410SL22).

(4) Mitigation commitments. Pursuant to HAR §13-284-3(b)(4), VWL proposed the following mitigation commitments:
   a. In consultation with the SHPD, it was determined that an archaeological data recovery program would be an appropriate mitigation for the historic salt pan remnants Site # -7655, located within the central and mauka portions of the project area.
   b. In order to mitigate the potential adverse impact to impact to Site # -7655 and Site # -7658, or any as yet unidentified cultural resources within the project area, a program of on-site archaeological monitoring was recommended for all subsurface project construction activities within the Block C West project area.

The SHPD concurred with VWL's mitigation commitments on SHPD on October 20, 2014 (Log No. 2014.04570, Doc. No. 1410SL22).

(5) Detailed mitigation plan(s). Pursuant to HAR §13-284-3(b)(5), VWL has completed, and SHPD has reviewed and accepted, the following agreed-upon mitigation plans:

   a. Archaeological Data Recovery Plan (DRP) for SIHP # 50-80-14-7655, Ward Village Gateway Project (Block B East and Block C West), Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (por.); SHPD accepted DRP in letter dated November 19, 2014 (Log No. 2014.05179, Doc No. 1411SL21).
   b. Archaeological Monitoring Plan (AMP) for the Ward Village Gateway Project, Blocks B East and C West, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (por.); SHPD accepted AMP in letter dated November 18, 2014 (Log No. 2014.04818, Doc No. 1411SL19).
   c. Burial Treatment Plan (BTP) for human skeletal remains found in SIHP # 50-80-14-7656, Block B East, Ward Village Gateway Project, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (por.); SHPD accepted BTP in letter dated November 18, 2014 (Log No. 2014.04396, Doc No. 1411RH01).

With the acceptance of the DRP and the AMP, VWL has completed HAR §13-284-3(b), Step 5, consisting of detailed mitigation plans to carry out the mitigation commitments. Additionally, on August 8, 2017, the SHPD accepted the End of Fieldwork Letter Report for Archaeological Data

Recovery for the Ward Village Gateway Project (Block B East and Block C West), in a letter dated 8 August 2017 (Log No. 2017.01583, Doc No. 2017.01583).

VWL provided in their letter dated April 24, 2019 (Log No. 2019.01133) a plan that specified the process to be implemented to comply with HAR §13-284-3(b)(6), verification of the detailed mitigation plans and requested, through its agency the Hawaii Community Developmental Authority (HCDA), the accelerated, 2-step verification process outlined in HAR §13-284-9(d).

(6) Verification of Completion. Pursuant to HAR §13-284-3(b)(6), VWL shall implement the following procedures and schedules to verify completion of the historic preservation review process:

a. Upon initiation of the accelerated 2-step verification process and receipt of a letter from the SHPD, agreeing that Steps 1-5 of the historic review process have been completed, and that construction may proceed, with the understanding that HAR §13-284-9(d) Step 2 must be completed to conclude the historic preservation review process, VWL will initiate implementation of all pre-construction provisions of the SHPD-accepted AMP. Additionally, a qualified archaeologist will monitor the installation of the interim protection measures and provide photographic documentation to SHPD verifying the projection measures have been properly implemented. Once construction has commenced, VWL will conduct archaeological monitoring fieldwork following the SHPD-accepted AMP.
b. Upon completion of Block C West construction, the AMR and ADRR will be completed and submitted to the SHPD for review and acceptance within 6 months after completion of monitoring. The ADRR is currently being written in tandem with the associated ADRR for VWL's Block I project, which also addresses SIHP # 50-80-14-7655.
c. When determined adequate, the SHPD will, in accordance with HAR §13-284-9(d)(2) Step 2, write a letter stating that the AMR and ADRR are accepted and that the historic preservation process is concluded.

Based on the above, SHPD indicates that it has reviewed and commented on the effect of the proposed project pursuant to HRS §6E-42 and HAR §13-284-3; that it is SHPD's determination that VWL has completed Steps 1 through 5 pursuant to HAR §13-284-3(b)(1-5); and that SHPD concurs with the procedures and schedule VWL has proposed to complete Step 6 (verification of completion) per HAR §13-284-3(b).

Please contact Andrew McCallister, Historic Preservation Archaeologist III, at Andrew.McCallister@hawaii.gov or at (808) 692-8015 for matters regarding archaeological resources or this letter.

Aloha,
*Alan Downer*

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Sergut Berhanu, HCDA, sergut.berhanu@hawaii.gov
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# APPENDIX C

TRAFFIC IMPACT REPORT

Traffic Impact Report

# Block C West



Prepared for:
The Howard Hughes Corporation

Prepared by:
Wilson Okamoto Corporation

April 2019

*TRAFFIC IMPACT REPORT*

*FOR*

*BLOCK C WEST*

*Prepared for*:

The Howard Hughes Corporation
1240 Ala Moana Blvd., Suite 200
Honolulu, HI 96813

*Prepared by*:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #8206-52

April 2019

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# I. INTRODUCTION

## A. Purpose of Study

The purpose of this study is to identify and assess the potential traffic impacts resulting from the Block C West development of the Ward Village Master Plan in Kakaako on the island of Oahu. A previous assessment including the Block C West development was included in the "Transportation Master Plan and Assessment for the Ward Villages Master Plan" (hereafter referred to as the "Ward Villages Master Plan") dated October 2018. This report is a supplemental study to specifically address the Block C West development and incorporate the most recent development plans which include residential uses.

## B. Scope of Study

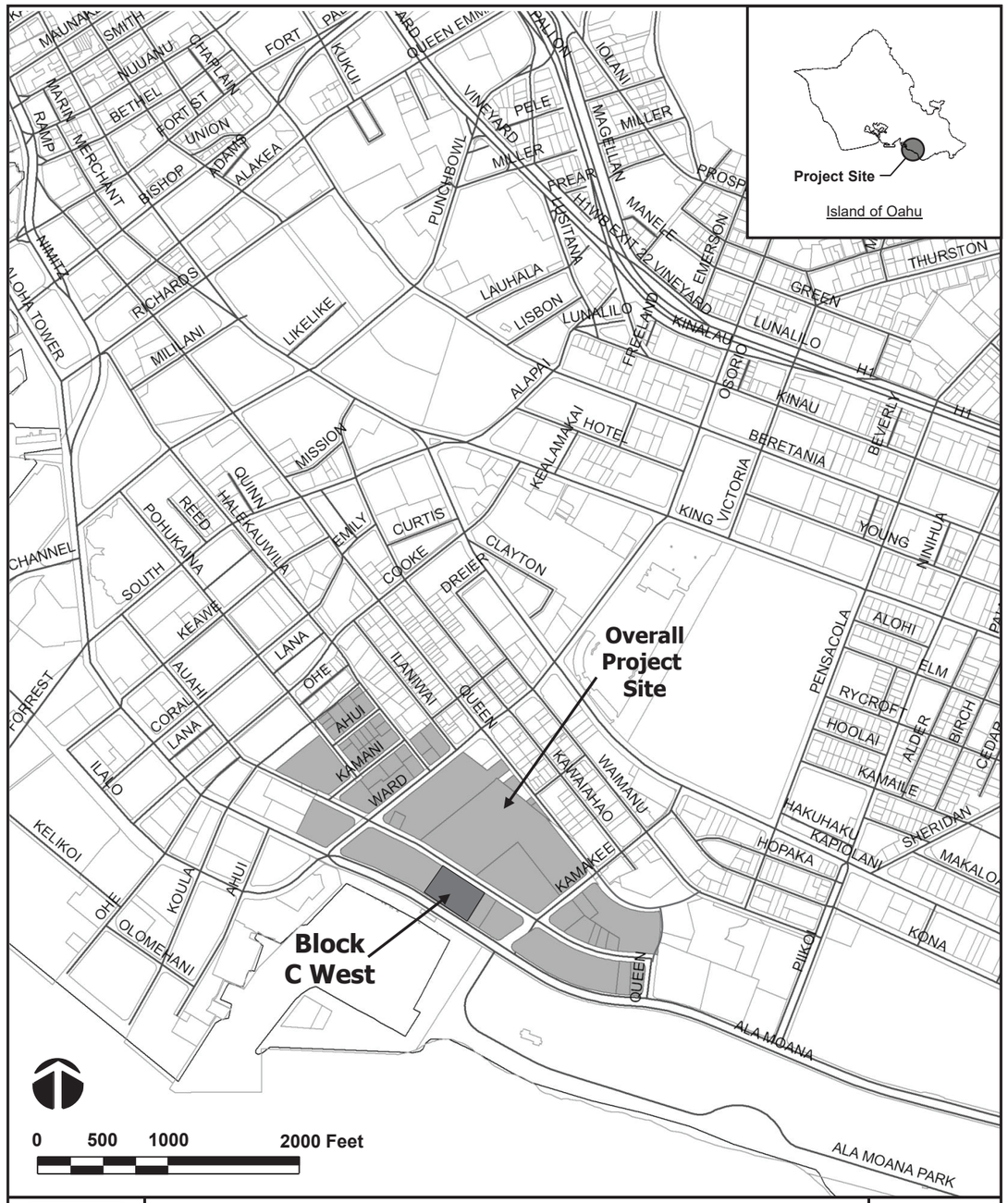
This report presents the findings and conclusions of the traffic study, the scope of which includes:

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 project site for the proposed Block C West development is located adjacent to Auahi Street in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Auahi Street to the north, Ala Moana Boulevard to the south, and commercial and residential uses to the east and west. Primary access to the project site is expected to be provided via a new two-way driveway off Auahi Street with a




| WILSON OKAMOTO CORPORATION | BLOCK C WEST | FIGURE 1 |
|---|---|---|
| | LOCATION AND VICINITY MAP | |



secondary access for the loading areas provided via an existing driveway for the adjacent Block C East development (also referred to as the Waiea Development).

**B. Project Characteristics**

The Block C West development is included in Phase 2 of the overall Ward Village Master Plan. The overall Ward Village Master Plan entails the future redevelopment of Ward Center, Ward Village Shops, and other surrounding commercial and office buildings implemented in five (5) phases over the next 10 – 15 years. At the time of this report, a portion of Phase 1 has been completed including Blocks C East (Waiea) and K (Anaha). The remainder of Phase 1 is expected to be completed later this year with the completion of Blocks M (Ae'o) and O (Ke Kilohana). Under Phase 2, preliminary construction activities associated with Blocks N East (A'Ali'i) and I (Ko'ula) have commenced and are expected to be completed by Year 2021 and Year 2022, respectively. Block C West is expected to be completed by Year 2023 and will include 360 residential units. Primary access to the project site is expected to be provided via a new two-way driveway off Auahi Street with residential and (residential) guest parking provided on site. A secondary access for loading is expected to be provided via the existing driveway for the adjacent Block C East. In addition, a pull-out area for passenger loading is also expected to be provided near the northwest corner of the project site adjacent to Auahi Street. Figure 2 shows the proposed project site plan.

## III. EXISTING TRAFFIC CONDITIONS

**A. Area Roadway System**

East-west traffic flow through the Kakaako area is served by a number of existing major roadways which include Ala Moana Boulevard, Queen Street, and Kapiolani Boulevard that provide continuous east-west mobility through the project vicinity. These major roadways are supported by a network of connector roadways including Auahi Street, Pohukaina Street, and Halekauwila Street that provide alternate east-west routes through the surrounding areas. North-south traffic through

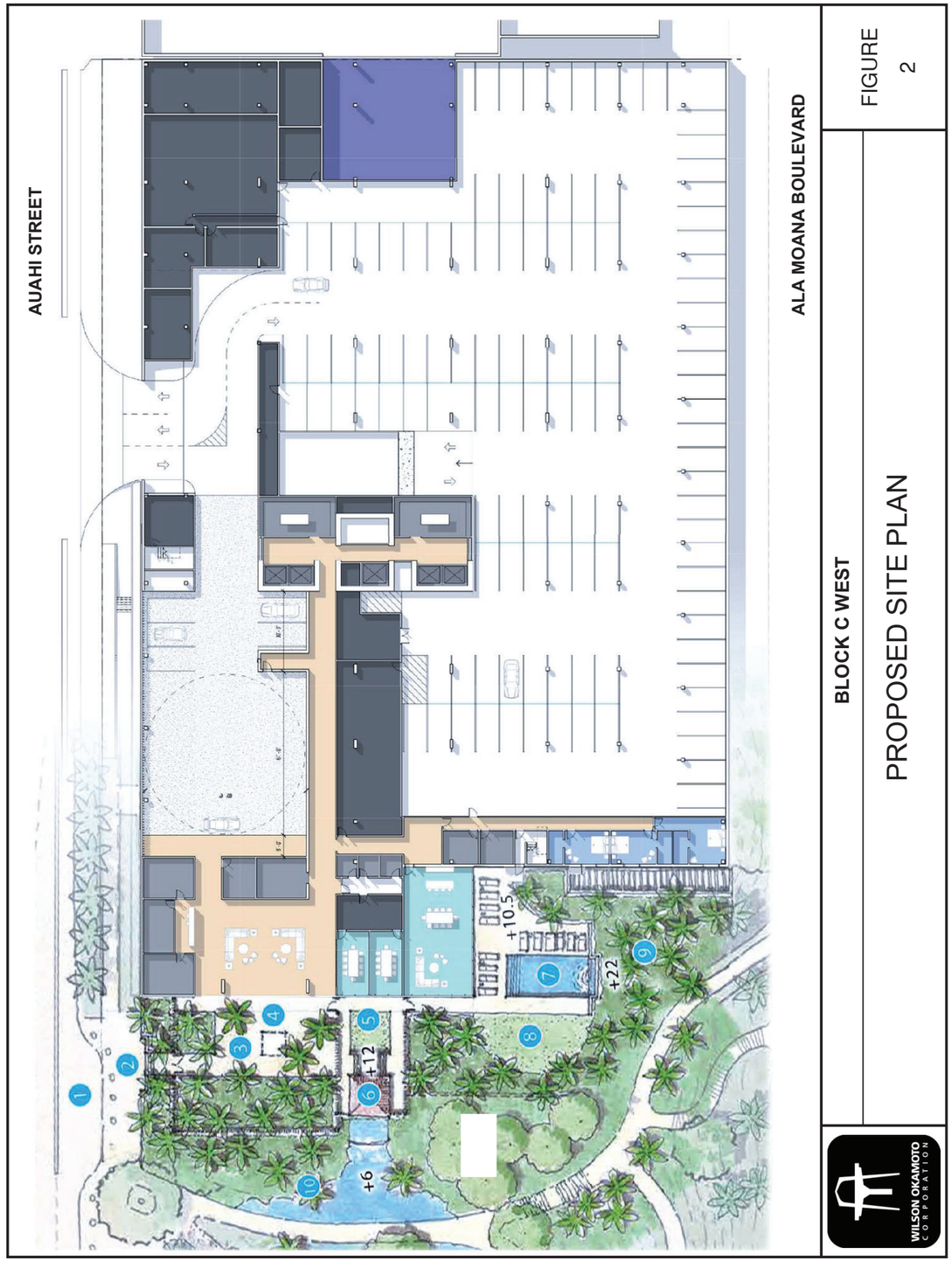



FIGURE 2

BLOCK C WEST

PROPOSED SITE PLAN

WILSON OKAMOTO CORPORATION



the Kakaako area is served by a number of existing major roadways including Ward Avenue and Piikoi Street that support either one-way or two-way travel through the project vicinity. These major roadways are supported by a network of connector roadways including Cooke Street and Kamakee Street that provide alternate north-south routes through the surrounding areas. Figure 3 shows the existing lane use at key locations within the study area.

**B. Traffic Volumes and Conditions**

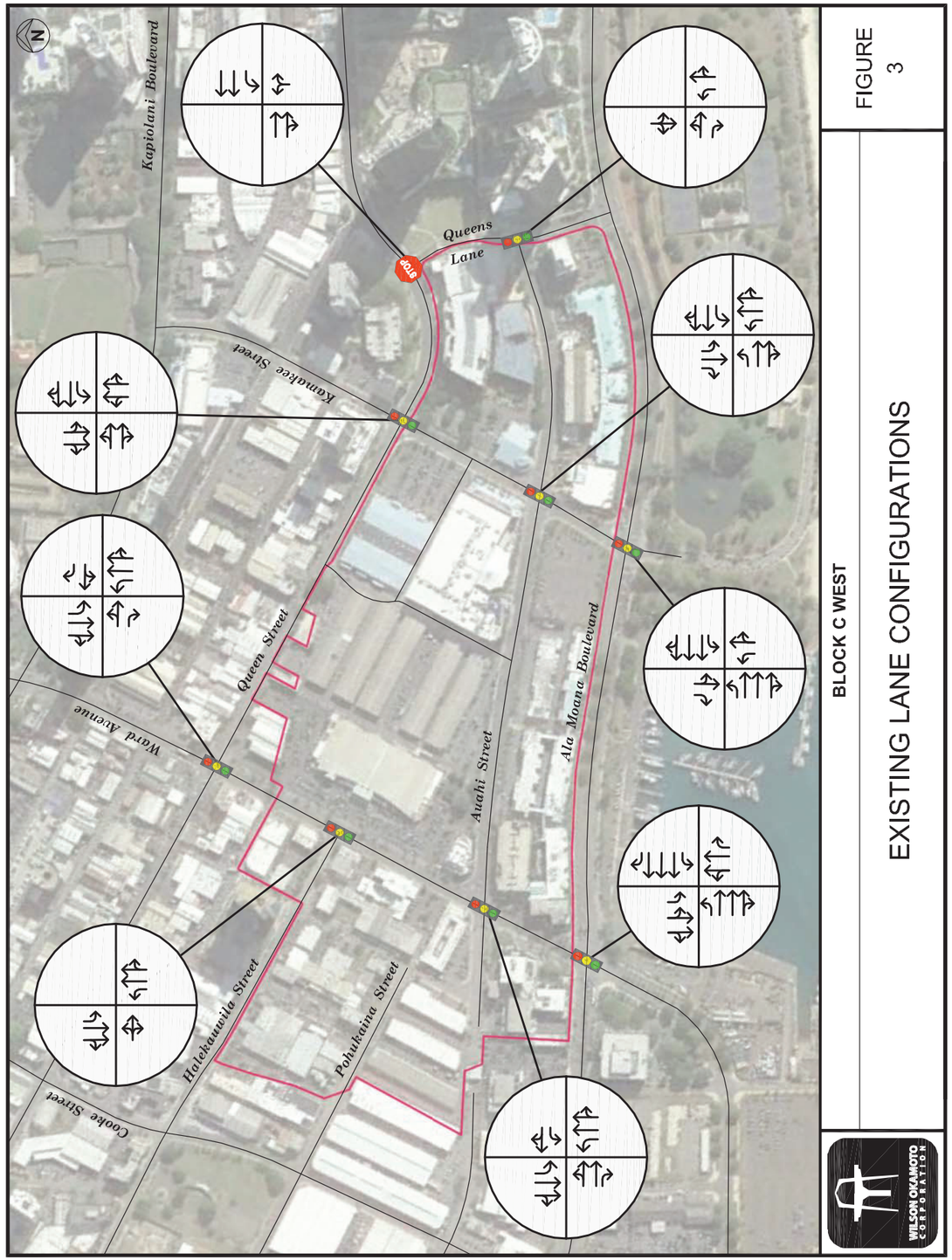
**1. General**

**a. Field Investigation**

The existing traffic count data utilized for this study consisted of turning movement count surveys at 22 locations during the weekday morning peak hours of 6:00 AM and 9:00 AM and afternoon peak hours of 3:00 PM and 6:00 PM. The surveys were conducted during March and April 2018 at the intersections along the following roadways:

- Along Kapiolani Boulevard at the intersections with Cooke Street, Ward Avenue, Kamakee Street, Queen Street, and Piikoi Street
- Along Auahi Street at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Queen Street and Queens Lane
- Along Halekauwila Street at the intersections with Cooke Street, Ward Avenue, and Kamakee Street
- Along Queen Street at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Queens Lane
- Along Ala Moana Boulevard at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Piikoi Street
- Pohukaina Street and Cooke Street
- Waimanu Street and Piikoi Street

As previously discussed, Blocks C East and K have been completed and occupied and as such, the trips associated with these blocks are assumed to be captured within the surveyed existing volumes. In addition, the project sites for Blocks N East, I, C West, N West, B East, B West and A had been cleared of their existing uses at the time of the field investigation. 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. It should be noted that the HCM 2010 methodology is available with the Synchro software; however, as previously discussed in the Ward Villages Master Plan, analysis conducted using that methodology is unable to accommodate all of the exclusive and shared-use lane configurations in the study area. As such, for the purpose of this report, the HCM 2000 methodology output was used for consistency with the overall traffic study. 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. Baseline Peak Hour Traffic**

**a. General**

Figures 4 and 5 show the baseline Year 2022 AM and PM peak hour traffic volumes at key locations within the study area which includes the development of other projects in the vicinity, as well as




BLOCK C WEST

BASELINE YEAR 2022 AM PEAK HOUR OF TRAFFIC

FIGURE 4




BLOCK C WEST

BASELINE YEAR 2022 PM PEAK HOUR OF TRAFFIC

FIGURE 5

Phase 1 and a portion of Phase 2 of the Ward Village Master Plan. Those phases are expected to include residential and commercial/retail uses for Blocks C East, K, M, O, N East, and I. The baseline traffic conditions are based on the projected Year 2022 conditions included in the "Transportation Master Plan and Assessment for the Ward Villages Master Plan" dated October 2018. It should be noted that in conjunction with the development of Block N East, that project is expected to improve the intersection of Ward Avenue with Queen Street to provide an exclusive left-turn lane and a shared through and right-turn lane along both approaches of Queen Street.

The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between 4:30 PM and 5:30 PM. Although the peak hours of traffic generally occur around the same time periods at each of the study intersections, the absolute commuter peak hour time periods for each intersection may differ slightly. The analysis is based on these absolute commuter peak hour time periods to identify the traffic impacts resulting from the proposed project. LOS calculations for the study intersections are included in Appendix C.

**b. Ward Avenue and Queen Street**

At the intersection with Queen Street, Ward Avenue carries 567 vehicles northbound and 1,013 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 893 vehicles traveling northbound and 955 vehicles traveling southbound. The northbound and southbound approaches of the intersection operate at LOS "C" during the AM and PM peak periods.

The Queen Street approaches of the intersection carry 284 vehicles eastbound and 529 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 539 vehicles traveling eastbound and 512 vehicles traveling





westbound. The eastbound approach of Queen Street operates at LOS "B" and LOS "D" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "C" and LOS "D", respectively.

**c. Queen Street and Kamakee Street**

At the intersection with Kamakee Street, Queen Street carries 301 vehicles eastbound and 464 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 578 vehicles traveling eastbound and 628 vehicles traveling westbound. The eastbound and westbound approaches operate at LOS "B" during both peak periods.

The Kamakee Street approaches carry 167 vehicles northbound and 255 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is similar with 198 vehicles traveling northbound and 220 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS "B" during the AM peak period and LOS "C" during the PM peak period.

**d. Queen Street and Queens Lane**

At the intersection with Queens Lane, Queen Street carries 302 vehicles eastbound and 479 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 688 vehicles traveling eastbound and 728 vehicles traveling westbound. The westbound left-turn traffic movement operates at LOS "A" during both peak periods.

Queens Lane carries 132 vehicles northbound during the AM peak period and 279 vehicles during the PM peak period. The Queens Lane approach operates at LOS "B" during both peak periods.

**e. Ward Avenue and Halekauwila Street**

At the intersection with Halekauwila Street, Ward Avenue carries 451 vehicles northbound and 808 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic

volumes are higher with 578 vehicles traveling northbound and 798 vehicles traveling southbound. Both approaches of Ward Avenue operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period.

The Halekauwila Street approach of the intersection carries 146 vehicles eastbound during the AM peak period and 393 vehicles during the PM peak period. The eastbound approach of Halekauwila Street operates at LOS "B" during both peak periods.

**f. Ward Avenue and Auahi Street**

At the intersection with Auahi Street, Ward Avenue carries 413 vehicles northbound and 519 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 461 vehicles traveling northbound and 566 vehicles traveling southbound. During the AM peak period both approaches of Ward Avenue operates at LOS "A" while both approaches operate at LOS "B" during the PM peak period.

The Auahi Street approaches of the intersection carry 94 vehicles eastbound and 241 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 182 vehicles traveling eastbound and 492 vehicles traveling westbound. The eastbound approach of Auahi Street operates at LOS "B" and LOS "A" during the AM and PM peak periods, respectively, while the westbound approach at LOS "B" and LOS "A" during both peak periods.

**g. Kamakee Street and Auahi Street**

At the intersection with Auahi Street, Kamakee Street carries 189 vehicles northbound and 334 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 245 vehicles traveling northbound and 334 vehicles traveling southbound. Both approaches of Kamakee Street operate at





LOS "A" during the AM peak period and LOS "B" during the PM peak period.

Auahi Street carries 149 vehicles eastbound and 117 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 329 vehicles traveling eastbound and 213 vehicles traveling westbound. The eastbound and westbound approaches of Auahi Street operate at LOS "B" during both peak periods.

**h. Auahi Street, Queens Lane, and Queen Street**

At the intersection with Queens Lane and Queen Street, Auahi Street carries 78 vehicles eastbound during the AM peak period and 273 vehicles during the PM peak period. The eastbound approach of Auahi Street operates at LOS "B" during both peak periods.

The Queens Lane approach carries 102 vehicles southbound during the AM peak period and 180 vehicles during the PM peak period. The Queens Lane approach operates at operates at LOS "A" during AM peak period and LOS "B" during the PM peak period. The northbound approach is comprised of Queen Street which carries 158 vehicles during the AM peak period and 225 vehicles during the PM peak period. The Queen Street approach also operates at LOS "B" during both peak periods.

**i. Ala Moana Boulevard and Ward Avenue**

At the intersection with Ward Avenue, Ala Moana Boulevard carries 1,841 vehicles eastbound and 1,961 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is lower with 2,124 vehicles traveling eastbound and 1,609 vehicles traveling westbound. The eastbound approach operates at LOS "D" during both peak periods, while the westbound approach at LOS "D" and LOS "E" during the AM and PM peak periods, respectively.

The Ward Avenue approaches of the intersection carry 83 vehicles northbound and 472 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 267 vehicles traveling northbound and 596 vehicles traveling southbound. The northbound approach operates at LOS "D" during both peak periods while the southbound approach operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively.

**j. Ala Moana Boulevard, Kamakee Street, and Ala Moana Park Drive**

At the intersection with Kamakee Street, Ala Moana Boulevard carries 1,696 vehicles eastbound and 1,927 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,443 vehicles traveling eastbound and 1,696 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "B" during both peak periods.

The Kamakee Street approach of the intersection carry 238 vehicles southbound during the AM peak period and 298 vehicles during the PM peak period. The Kamakee Street approach operates at LOS "D" during both peak periods. The northbound approach is comprised of Ala Moana Park Drive which carries 122 vehicles during the AM peak period and 124 vehicles during the PM peak period. The Ala Moana Park Drive operates at LOS "D" 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, 10th Edition," 2017. The ITE trip generation rates are developed empirically by correlating the vehicle





trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit. The trip generation methodology developed by ITE also includes provisions for multi-modal trips. Multi-modal trips are trips made utilizing non-motorized modes of travel such as walking and biking, as well as trips made using transit. The project site is currently served by established, convenient transit routes that may reduce the number of vehicular trips added to the surrounding major roadways. In addition, the City and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to potentially the central Honolulu area, thereby providing an alternate mode of travel through the Kakaako area. However, the planned system is not expected to be completed prior to the completion of the Block C West development and as such, trip reductions associated with the fixed guideway transit system were not incorporated into projected conditions. Table 1 summarizes the adjusted trip generation characteristics of the new development that incorporates the influence of multi-modal trips. Appendix D includes a detailed trip generation worksheet for the Block C West development.

**Table 1: Adjusted Peak Hour Trip Generation**

| **HIGH-RISE APARTMENT** INDEPENDENT VARIABLE: Dwelling Units = 360 | | |
|---|---|---|
| | | PROJECTED TRIP ENDS |
| AM PEAK | ENTER | 21 |
| | EXIT | 66 |
| | TOTAL | 87 |
| PM PEAK | ENTER | 66 |
| | EXIT | 44 |
| | TOTAL | 110 |

#### 2. Trip Distribution and Through Traffic Forecasting Methodology

The travel forecast utilized for this study is based on the OMPO regional forecasting model which contains estimated land usage for the island of Oahu by the Year 2035 including the development of other projects such as the adjacent Kamehameha Schools/Bishop Estate (KSBE) lands to the west. The travel forecast utilized for the OMPO model is based on Socio-Economic

Data (SED) which represents the population distribution within a multitude of traffic analysis zones. The model utilizes this data to forecast individual vehicle trips between destinations within the model. The use of the OMPO model more accurately reflects the anticipated impacts of development on the island more than the use of historical travel patterns or traffic count data. Figures 6 to 8 show the trip distribution percentages and the distribution of site-generated traffic during the AM and PM peak periods based on the OMPO model. As previously mentioned, parking for the residential uses is expected to be accommodated on-site via the access provided off Auahi Street. The trips associated with the proposed project were distributed at the study intersections based on their assumed origin/destination, allowed turning movement and the relative convenience of the available routes. In addition, population estimates for the island of Oahu indicate that growth is expected to be relatively linear to the Year 2035. As such, a corresponding growth factor was interpolated for the Year 2023.

**B. Other Considerations**

In conjunction with the development of the overall Ward Village Master Plan, a number of roadway improvements are also planned in the project vicinity. These improvements include the realignment of Auahi Street east of Ward Avenue to intersect Pohukaina Street and the extension of Halekauwila Street further east to Kamakee Street. These roadway modifications are expected to provide alternate east-west routes through the Kakaako area and provide further mobility throughout the area. These improvements are expected to be completed in conjunction with later phases of the Ward Villages Master Plan and as such, were not incorporated into the Year 2023 project scenarios.



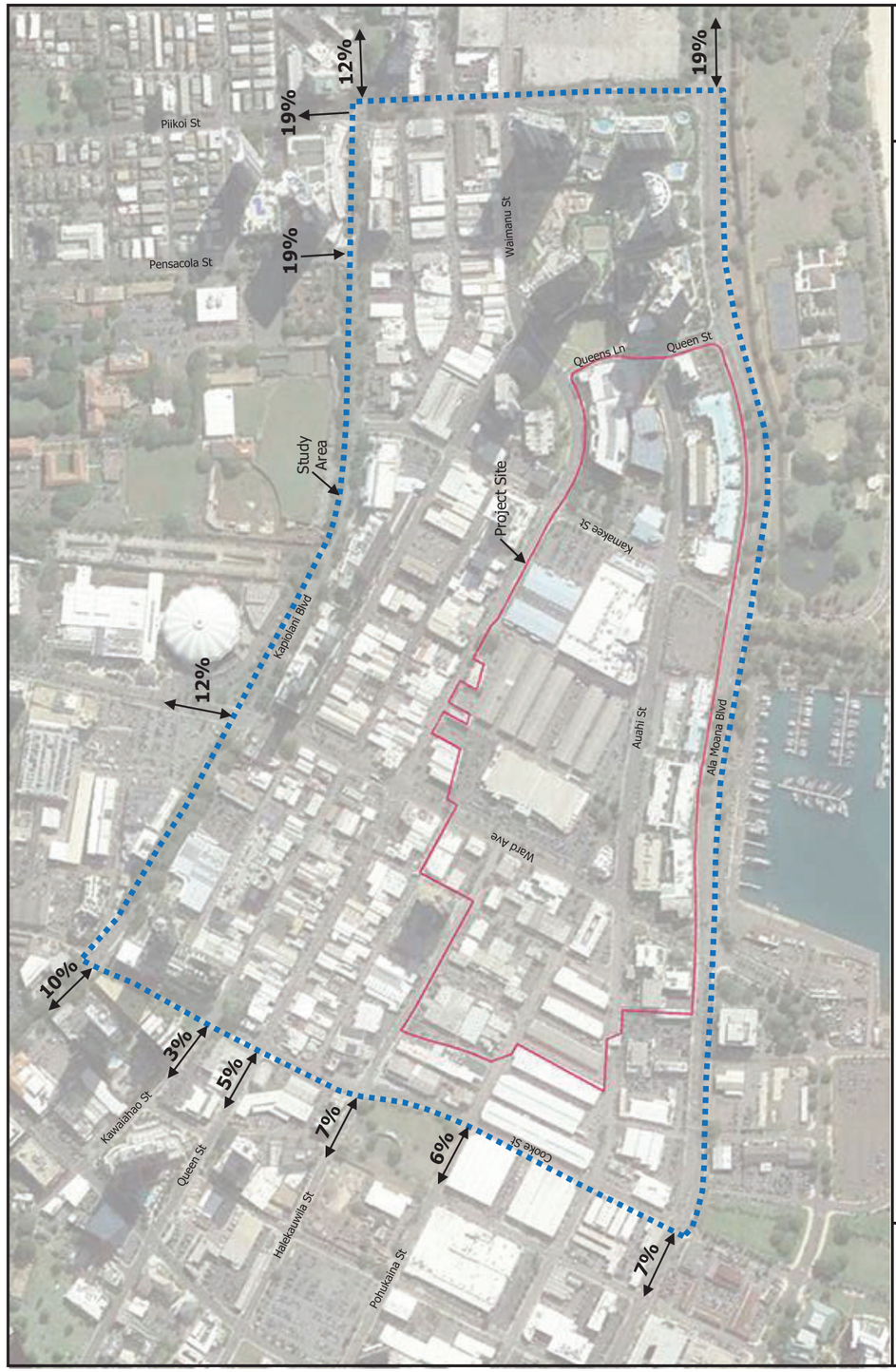



FIGURE 6

DISTRIBUTION OF EXTERNAL SITE-GENERATED TRIPS

BLOCK C WEST

WILSON OKAMOTO CORPORATION




BLOCK C WEST

DISTRIBUTION OF SITE-GENERATED VEHICLES
AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 7




BLOCK C WEST

DISTRIBUTION OF SITE-GENERATED VEHICLES
PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 8

### C. Total Traffic Volumes Without Project

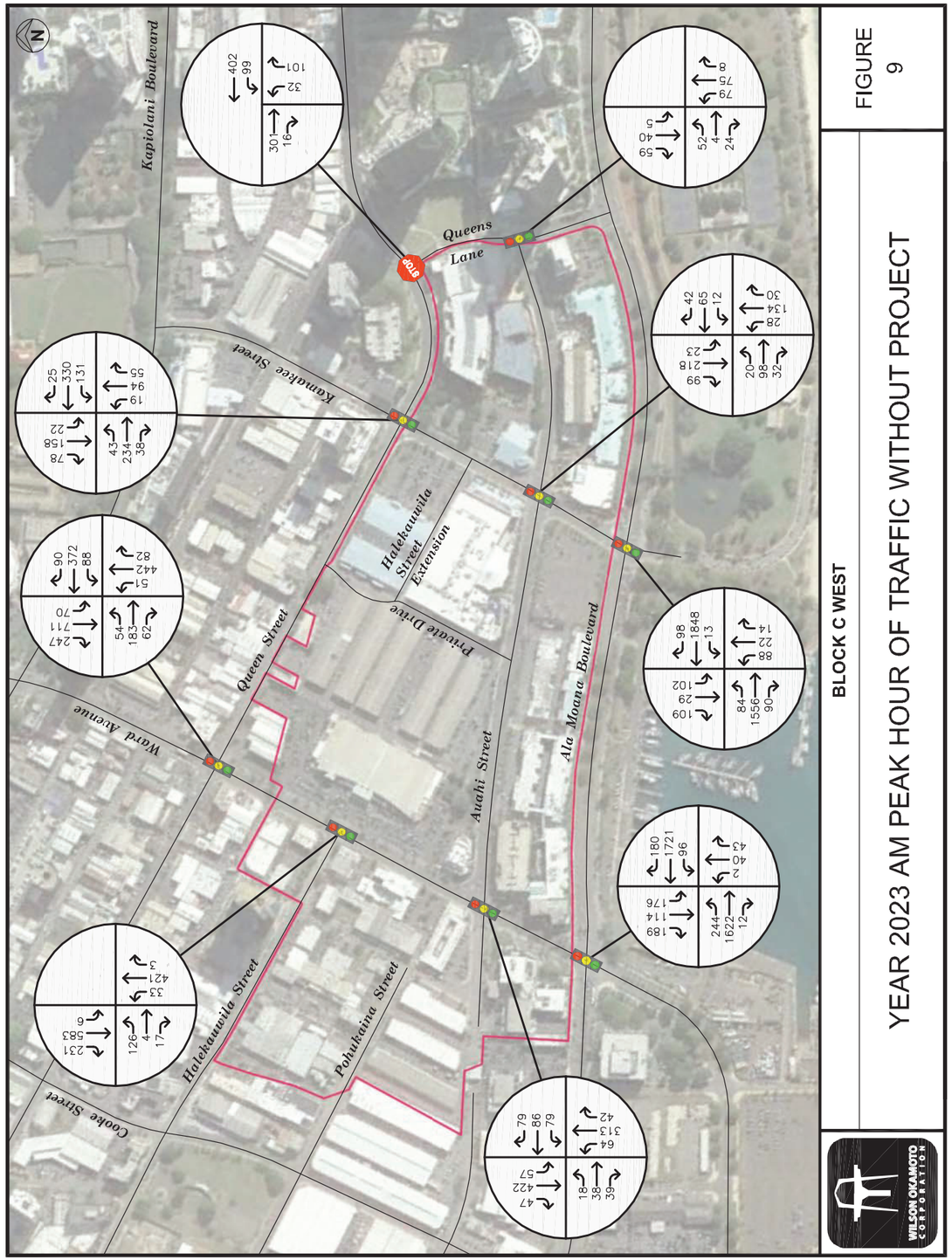
The projected Year 2023 AM and PM peak period traffic volumes and operating conditions without the Block C West development are shown in Figures 9 and 10 and summarized in Table 2. The analysis incorporates the trips associated with the development of other projects in the area including Blocks C East, K, O, N East, and I of the Ward Villages Master Plan and the anticipated ambient growth in traffic in the vicinity. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix E.

**Table 2: Baseline and Projected Year 2023 (Without Project) LOS Traffic Operating Conditions**

| Intersection | Approach/ Critical Movement | AM | | PM | |
|---|---|---|---|---|---|
| | | Base-line* | Year 2023 w/out Proj | Base-line* | Year 2023 w/out Proj |
| Ward Ave/ Queen St** | Eastbound | B | B | D | D |
| | Westbound | C | C | D | D |
| | Northbound | C | C | C | C |
| | Southbound | C | C | C | C |
| Queen St/ Kamakee St | Eastbound | B | B | B | B |
| | Westbound | B | B | B | B |
| | Northbound | B | B | C | C |
| | Southbound | B | B | C | C |
| Queen St/ Queen Lane | Westbound | A | A | A | A |
| | Northbound | B | B | B | B |
| Ward Ave/ Halekauwila St | Eastbound | B | B | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |
| Ward Ave/ Auahi St | Eastbound | B | B | A | A |
| | Westbound | B | B | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |

*Year 2022 conditions which incorporate the completion of Blocks C East, K, M, O, N East, and I.
**Intersection improvement implemented.





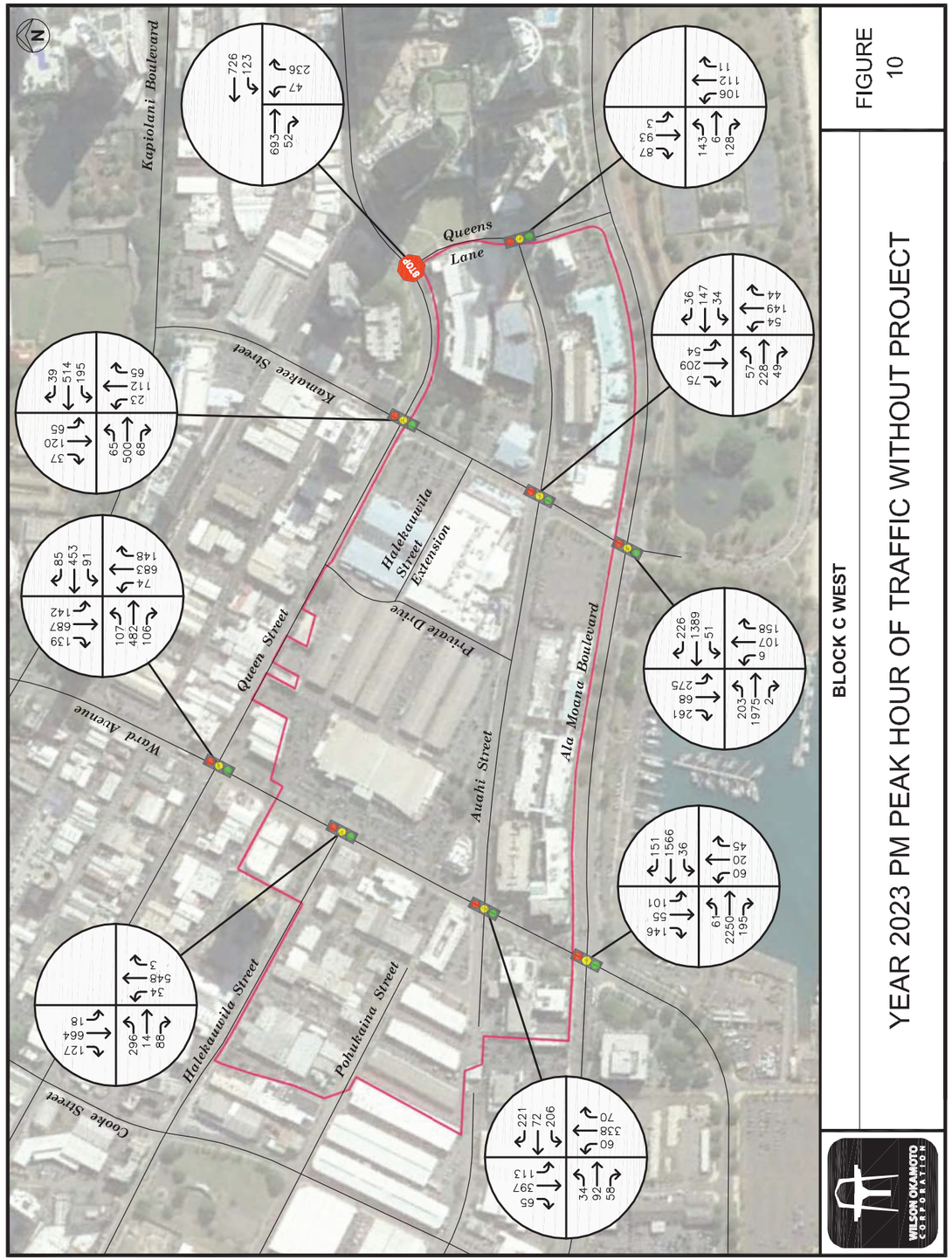



FIGURE 10

BLOCK C WEST

YEAR 2023 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

WILSON OKAMOTO CORPORATION



**Table 2: Baseline and Projected Year 2023 (Without Project) LOS Traffic Operating Conditions (Cont'd)**

| Intersection | Approach/ Critical Movement | AM | | PM | |
|---|---|---|---|---|---|
| | | Base-line* | Year 2023 w/out Proj | Base-line* | Year 2023 w/out Proj |
| Kamakee St/ Auahi St | Eastbound | B | B | B | B |
| | Westbound | B | B | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |
| Auahi St/ Queens Ln/ Queen St | Eastbound | B | B | B | B |
| | Northbound | B | B | B | B |
| | Southbound | A | A | B | B |
| Ala Moana Blvd/ Ward Ave | Eastbound | D | D | D | D |
| | Westbound | E | E | D | D |
| | Northbound | D | D | D | D |
| | Southbound | D | D | E | E |
| Ala Moana Blvd/ Kamakee St | Eastbound | B | B | C | C |
| | Westbound | B | C | B | B |
| | Northbound | D | D | D | D |
| | Southbound | D | D | D | D |

*Year 2022 conditions which incorporate the completion of Blocks C East, K, M, O, N East, and I.
**Intersection improvement implemented.

Traffic operations under Year 2023 without project conditions are generally expected to remain similar to baseline conditions. Along Ward Avenue, the approaches at the intersections with Halekauwila Street and Auahi Street are expected to continue operating at LOS "B" or better during both peak periods while those at the intersection with Queen Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period. At the intersection with Ala Moana Boulevard, traffic operations are expected to continue operating at LOS "E" or better during both peak periods. The low levels of service at this intersection is primarily due to the high volume of east-west through traffic at this intersection. Along Kamakee Street, traffic operations at the intersections with Queen Street and Auahi Street are expected to continue operating at

LOS "B" or better during the AM peak period and LOS "C" or better during the PM peak period, while those at the intersection with Ala Moana Boulevard are expected to continue operating at LOS "D" or better during both peak periods. Traffic operations at the remaining study intersections along Queen Street are also expected to continue operating similar to baseline conditions.

**D. Traffic Signal Warrant**

Due to the anticipated increase in traffic within the project vicinity as a result of the proposed project as well as other developments within Ward Village, a cursory traffic signal warrant analysis was conducted for the intersection of Auahi Street with the driveway that serves the adjacent Ward Entertainment Center and the proposed project driveway for Block C West to determine if a more extensive assessment was required. The installation of a traffic signal at an intersection may be justified by one or more of the nine warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways", 2009 Edition (MUTCD). These warrants take into account factors such as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), other characteristics of the roadway network (Warrant 8), and the presence of railroad crossings (Warrant 9). Data was collected during the peak periods of traffic and as such, for the purpose of this cursory assessment, Warrant 3 was applied to the intersection to determine whether or not a traffic signal system might be justified.

Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersection traffic during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor streets. If the traffic volumes along the minor street exceed the threshold shown in Figure 4C-3 of the MUTCD, a traffic signal system may be warranted. Under with project conditions, the traffic volumes at the intersection of Auahi Street with the Ward Entertainment Center driveway and the proposed project driveway for Block C West do not satisfy Warrant 3 for minor street





approaches with two lanes for high through traffic volumes on the major street during the AM and PM peak periods (see Figure 11). It should be noted that as previously discussed, there are future plans to modify Auahi Street which include converting the existing four lane roadway to a three-lane roadway with one lane in each direction and a striped median to facilitate turning movements. Even with the anticipated reduction of lanes along Auahi Street, the projected traffic volumes at the subject intersection do not satisfy Warrant 3 for minor street approaches with one lane for high through traffic volumes on the major street during the Year 2023 AM and PM peak periods (see Figure 12). In addition, there are currently no plans to include crosswalks across Auahi Street at this intersection. As such, a more extensive traffic signal warrant study for this location is not necessary at this time, but this location will be reassessed periodically as development progresses.

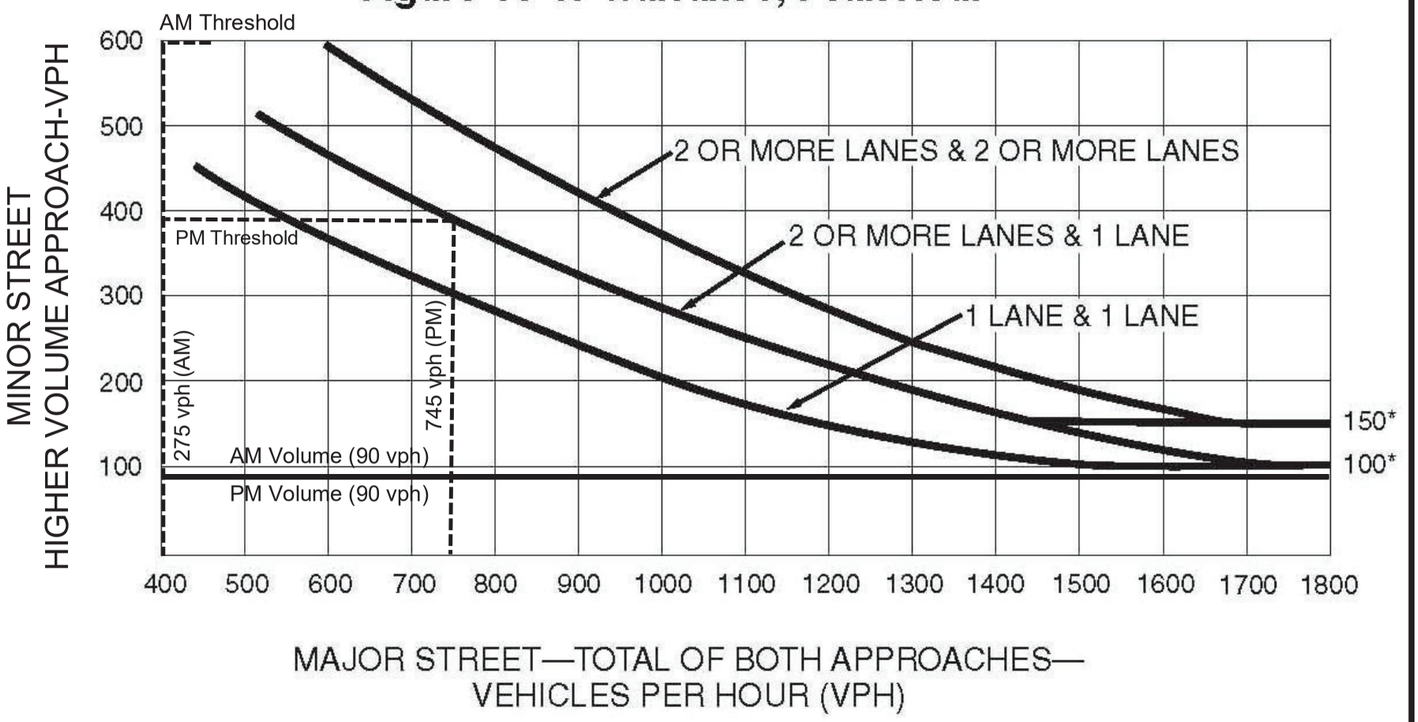
**E. Total Traffic Volumes With Project**

Figures 13 and 14 show the Year 2023 cumulative AM and PM peak hour traffic conditions resulting from the completion of the Block C West development. The cumulative volumes consist of site-generated traffic superimposed over Year 2023 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

## V. TRAFFIC IMPACT ANALYSIS

The Year 2023 cumulative AM and PM peak hour traffic conditions with the completion of the Block C West development are shown on Figures 13 and 14 and summarized in Table 3. The projected Year 2023 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

## Figure 4C-3. Warrant 3, Peak Hour

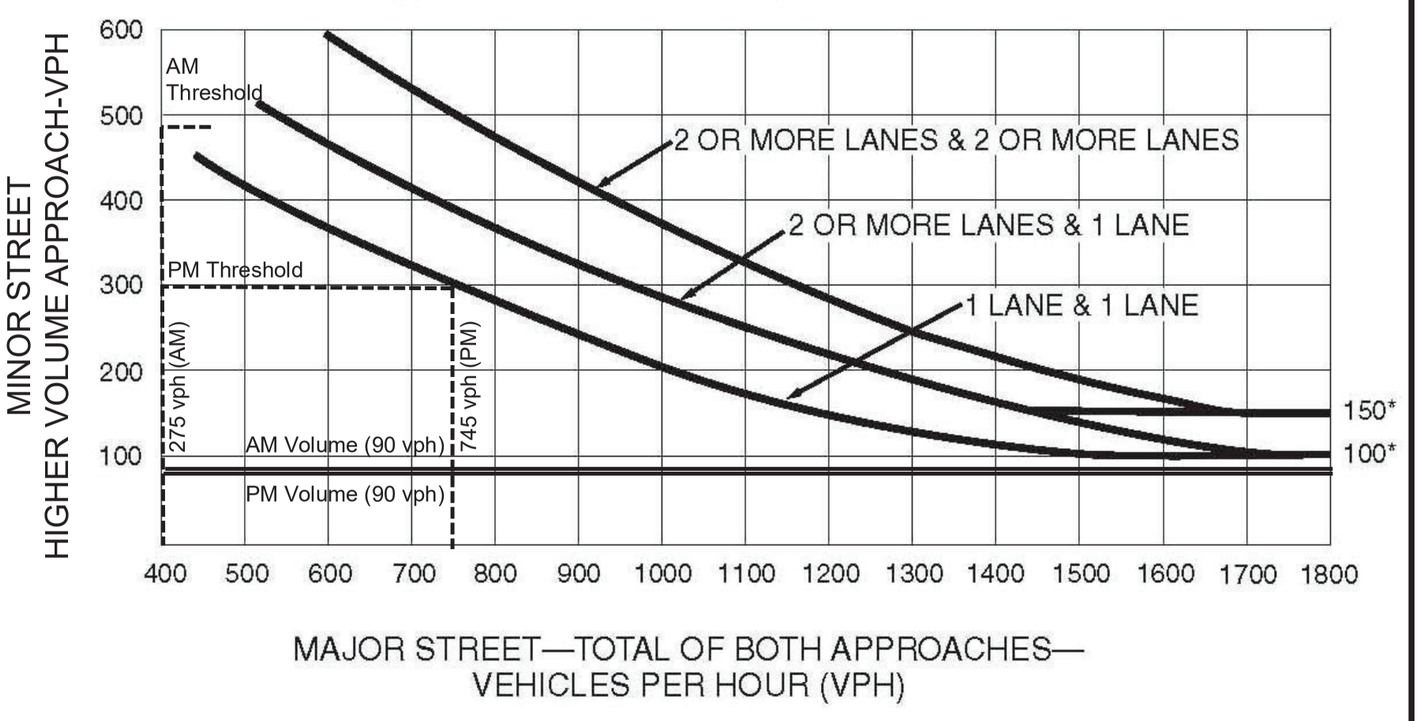



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: MUTCD

| | BLOCK C WEST | FIGURE |
|---|---|---|
| WILSON OKAMOTO CORPORATION | TRAFFIC SIGNAL WARRANT NO.3 (TWO LANE) | 11 |

## Figure 4C-3. Warrant 3, Peak Hour




*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: MUTCD

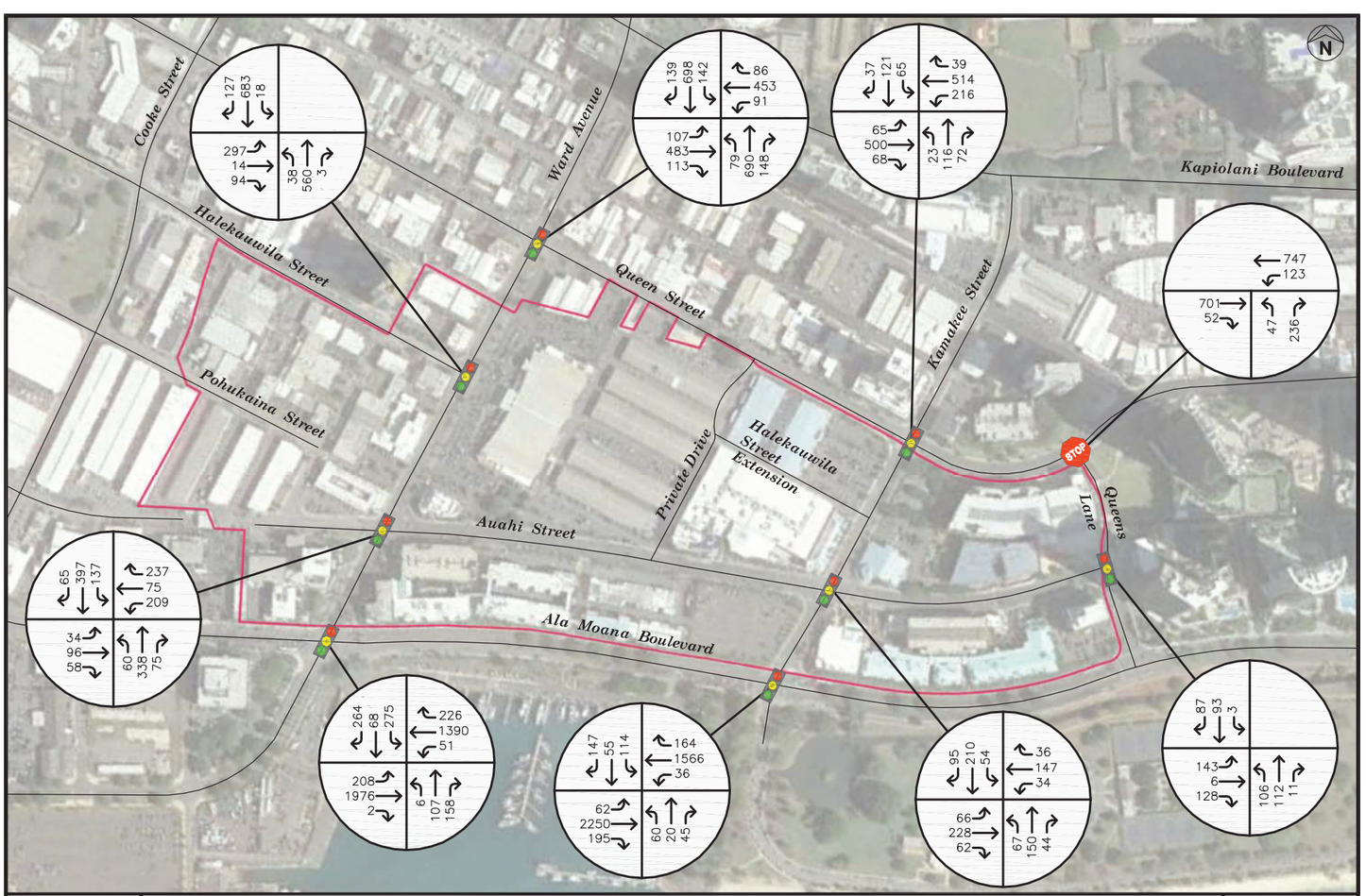
| | BLOCK C WEST | FIGURE |
|---|---|---|
| WILSON OKAMOTO CORPORATION | TRAFFIC SIGNAL WARRANT NO.3 (ONE LANE) | 12 |




**BLOCK C WEST**

YEAR 2023 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 13




**BLOCK C WEST**

YEAR 2023 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 14

**Table 3: Projected Year 2023 (Without and With Project)**
**LOS Traffic Operating Conditions**

| Intersection | Approach/ Critical Movement | AM | | PM | |
|---|---|---|---|---|---|
| | | Year 2023 | | Year 2023 | |
| | | w/out Proj | w/ Proj | w/out Proj | w/ Proj |
| Ward Ave/ Queen St | Eastbound | B | B | D | D |
| | Westbound | C | C | D | D |
| | Northbound | C | C | C | C |
| | Southbound | C | C | C | C |
| Queen St/ Kamakee St | Eastbound | B | B | B | C |
| | Westbound | B | B | B | B |
| | Northbound | B | B | C | C |
| | Southbound | B | B | C | C |
| Queen St/ Queens Ln | Westbound | A | A | A | A |
| | Northbound | B | B | B | B |
| Ward Ave/ Halekauwila St | Eastbound | B | B | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |
| Ward Ave/ Auahi St | Eastbound | B | B | A | A |
| | Westbound | B | B | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |
| Kamakee St/ Auahi St | Eastbound | B | B | B | B |
| | Westbound | B | C | B | B |
| | Northbound | A | A | B | B |
| | Southbound | A | A | B | B |
| Queens Ln/ Queen St/ Auahi St | Eastbound | B | B | B | B |
| | Northbound | B | B | B | B |
| | Southbound | A | A | B | B |
| Ala Moana Blvd/ Ward Ave | Eastbound | D | D | D | D |
| | Westbound | E | E | D | D |
| | Northbound | D | D | D | D |
| | Southbound | D | D | E | E |





**Table 3: Projected Year 2023 (Without and With Project)**
**LOS Traffic Operating Conditions (Cont'd)**

| Intersection | Approach/ Critical Movement | AM | | PM | |
|---|---|---|---|---|---|
| | | Year 2023 | | Year 2023 | |
| | | w/out Proj | w/ Proj | w/out Proj | w/ Proj |
| Ala Moana Blvd/ Kamakee St | Eastbound | B | B | C | C |
| | Westbound | C | C | B | B |
| | Northbound | D | D | D | D |
| | Southbound | D | D | D | D |

Traffic operations under Year 2023 with project conditions are generally expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Queen Street, traffic operations at the intersections with Kamakee Street and Queen Lane are expected to continue operating at LOS "B" or better during the AM peak period and LOS "C" or better during the PM peak period, while those at the intersection with Ward Avenue are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period. Along Auahi Street, the approaches at the intersections with Ward Avenue and Queen Street and Queen Lane are expected to continue operating at LOS "B" or better during both peak periods. At the intersection with Kamakee Street, the approaches at that intersection are expected to continue operating similar to without project conditions with the exception of the westbound approach which is expected to operate at a slightly lower LOS "C" during the AM peak period. Traffic operations at the remaining study intersections along Ala Moana Boulevard and Halekauwila Street are also expected to continue operating at levels of service similar to without project conditions.

## 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 the project driveways including consideration of visibility of pedestrians and bicyclists traveling along Auahi Street.

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. Provide directional signage for entering vehicles at the project driveway to facilitate traffic flow and vehicle circulation and to minimize confusion for motorists regarding the locations of the porte cochere and the parking garage. Appropriate lighting for the directional signage should be considered to ensure visibility during all hours of the day.

6. Provide adequate signage at the proposed drop-off area along Auahi Street adjacent to the project such as signs indicating a passenger loading area as well as citing maximum allowable vehicle dwell time and parking restriction.

7. Consider using on-site personnel to monitor the proposed drop-off area along Auahi Street to minimize vehicle dwell times and parking violations. In addition, queuing from this drop-off area could be monitored to ensure that queues do not extend beyond the provided pull-out storage bay length.

8. Update studies should development phasing, land use intensity, or land use mix change.

9. Continue to develop and/or enhance bicycle and pedestrian facilities, as well as public transportation services in the project vicinity as described in the "Transportation Master Plan and Assessment for the Ward Villages Master Plan," dated October 2018.

## VII. CONCLUSION

The project site for the Ward Village Master Plan currently encompasses Ward Entertainment Center, Ward Village Shops, and other surrounding commercial and office buildings. The overall master plan is expected to be implemented in five (5) phases over the next 10-15 years and entail the redevelopment of most of the existing commercial, office, and industrial spaces. Block C West is a part of Phase 2 of the master plan which is expected to include residential and restaurant uses. With the implementation of the aforementioned recommendations, traffic operations with the Block C West development are generally expected to remain similar to baseline and without project conditions. In addition, as previously discussed, there are roadway improvements planned in conjunction with the





development of the Ward Villages Master Plan including the extension of Halekauwila Street east of Ward Avenue and the realignment of Auahi Street to intersect with Pohukaina Street. These improvements are expected to provide alternate east-west routes and increase mobility through the area. The Howard Hughes Corporation will continue to work with the City and County of Honolulu to incorporate bicycle and enhanced pedestrian facilities into the development plans for the Ward Villages project to encourage alternative modes of travel and further minimize the impact of the proposed project to the surrounding roadways. However, since the Ward Village Master Plan is expected to be developed in phases over a period of 10+ years, it is recommended that Traffic Impact Analysis Reports (TIARs) continue to be prepared for each phase of the project to verify future conditions and ensure necessary mitigation measures are implemented.

# APPENDIX A
## TRAFFIC COUNT DATA

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

Counted By: AH, GH
Counters: D4-3889, D4-5674
Weather: CLEAR

File Name : WAR QUE AM
Site Code : 00000001
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Queen Street Westbound | | | | | Ward Avenue Northbound | | | | | Queen 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 | 4 | 131 | 18 | 0 | 153 | 1 | 14 | 1 | 6 | 22 | 5 | 21 | 3 | 1 | 30 | 5 | 9 | 10 | 6 | 30 | 235 |
| 06:15 AM | 7 | 141 | 21 | 3 | 172 | 1 | 9 | 5 | 6 | 21 | 4 | 37 | 2 | 1 | 44 | 6 | 10 | 9 | 4 | 29 | 266 |
| 06:30 AM | 3 | 132 | 28 | 0 | 163 | 7 | 25 | 2 | 6 | 40 | 10 | 39 | 6 | 1 | 56 | 8 | 19 | 15 | 6 | 48 | 307 |
| 06:45 AM | 8 | 157 | 31 | 3 | 199 | 8 | 25 | 4 | 1 | 38 | 10 | 65 | 2 | 2 | 79 | 8 | 22 | 9 | 5 | 44 | 360 |
| Total | 22 | 561 | 98 | 6 | 687 | 17 | 73 | 12 | 19 | 121 | 29 | 162 | 13 | 5 | 209 | 27 | 60 | 43 | 21 | 151 | 1168 |
| 07:00 AM | 7 | 138 | 47 | 5 | 197 | 7 | 37 | 9 | 11 | 64 | 7 | 81 | 11 | 0 | 99 | 19 | 17 | 7 | 12 | 55 | 415 |
| 07:15 AM | 9 | 142 | 66 | 2 | 219 | 10 | 52 | 3 | 11 | 76 | 17 | 94 | 5 | 1 | 117 | 10 | 24 | 13 | 7 | 54 | 466 |
| 07:30 AM | 4 | 171 | 56 | 4 | 235 | 17 | 63 | 0 | 13 | 93 | 11 | 97 | 4 | 8 | 120 | 9 | 24 | 15 | 11 | 59 | 507 |
| 07:45 AM | 11 | 166 | 50 | 1 | 228 | 13 | 80 | 8 | 11 | 112 | 16 | 97 | 11 | 2 | 126 | 17 | 29 | 18 | 6 | 70 | 536 |
| Total | 31 | 617 | 219 | 12 | 879 | 47 | 232 | 20 | 46 | 345 | 51 | 369 | 31 | 11 | 462 | 55 | 94 | 53 | 36 | 238 | 1924 |
| 08:00 AM | 7 | 166 | 73 | 5 | 251 | 12 | 70 | 8 | 8 | 98 | 11 | 86 | 7 | 2 | 106 | 14 | 30 | 11 | 8 | 63 | 518 |
| 08:15 AM | 11 | 150 | 50 | 5 | 216 | 7 | 63 | 12 | 8 | 90 | 9 | 108 | 14 | 3 | 134 | 10 | 42 | 14 | 5 | 71 | 511 |
| 08:30 AM | 7 | 138 | 34 | 1 | 180 | 9 | 36 | 9 | 2 | 56 | 21 | 97 | 7 | 4 | 129 | 18 | 33 | 22 | 4 | 77 | 442 |
| 08:45 AM | 11 | 170 | 58 | 2 | 241 | 7 | 34 | 5 | 10 | 56 | 9 | 103 | 8 | 5 | 125 | 26 | 32 | 19 | 9 | 86 | 508 |
| Total | 36 | 624 | 215 | 13 | 888 | 35 | 203 | 34 | 28 | 300 | 50 | 394 | 36 | 14 | 494 | 68 | 137 | 66 | 26 | 297 | 1979 |
| Grand Total | 89 | 1802 | 532 | 31 | 2454 | 99 | 508 | 66 | 93 | 766 | 130 | 925 | 80 | 30 | 1165 | 150 | 291 | 162 | 83 | 686 | 5071 |
| Apprch % | 3.6 | 73.4 | 21.7 | 1.3 | | 12.9 | 66.3 | 8.6 | 12.1 | | 11.2 | 79.4 | 6.9 | 2.6 | | 21.9 | 42.4 | 23.6 | 12.1 | | |
| Total % | 1.8 | 35.5 | 10.5 | 0.6 | 48.4 | 2 | 10 | 1.3 | 1.8 | 15.1 | 2.6 | 18.2 | 1.6 | 0.6 | 23 | 3 | 5.7 | 3.2 | 1.6 | 13.5 | |

| | Ward Avenue Southbound | | | | Queen Street Westbound | | | | Ward Avenue Northbound | | | | Queen 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 4 | 171 | 56 | 231 | 17 | 63 | 0 | 80 | 11 | 97 | 4 | 112 | 9 | 24 | 15 | 48 | 471 |
| 07:45 AM | 11 | 166 | 50 | 227 | 13 | 80 | 8 | 101 | 16 | 97 | 11 | 124 | 17 | 29 | 18 | 64 | 516 |
| 08:00 AM | 7 | 166 | 73 | 246 | 12 | 70 | 8 | 90 | 11 | 86 | 7 | 104 | 14 | 30 | 11 | 55 | 495 |
| 08:15 AM | 11 | 150 | 50 | 211 | 7 | 63 | 12 | 82 | 9 | 108 | 14 | 131 | 10 | 42 | 14 | 66 | 490 |
| Total Volume | 33 | 653 | 229 | 915 | 49 | 276 | 28 | 353 | 47 | 388 | 36 | 471 | 50 | 125 | 58 | 233 | 1972 |
| % App. Total | 3.6 | 71.4 | 25 | | 13.9 | 78.2 | 7.9 | | 10 | 82.4 | 7.6 | | 21.5 | 53.6 | 24.9 | | |
| PHF | .750 | .955 | .784 | .930 | .721 | .863 | .583 | .874 | .734 | .898 | .643 | .899 | .735 | .744 | .806 | .883 | .955 |

# Wilson Okamoto Corporation

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

Counted By: AH, GH
Counters: D4-3889, D4-5674
Weather: CLEAR

File Name : WAR QUE PM
Site Code : 00000001
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Queen Street Westbound | | | | | Ward Avenue Northbound | | | | | Queen 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 |
| 03:00 PM | 11 | 143 | 31 | 3 | 188 | 9 | 66 | 21 | 14 | 110 | 25 | 154 | 12 | 3 | 194 | 26 | 33 | 22 | 7 | 88 | 580 |
| 03:15 PM | 15 | 149 | 37 | 3 | 204 | 14 | 57 | 18 | 14 | 103 | 24 | 154 | 10 | 3 | 191 | 27 | 45 | 11 | 5 | 88 | 586 |
| 03:30 PM | 9 | 141 | 37 | 8 | 195 | 8 | 55 | 19 | 10 | 92 | 28 | 174 | 14 | 4 | 220 | 20 | 62 | 14 | 9 | 105 | 612 |
| 03:45 PM | 12 | 140 | 17 | 3 | 172 | 14 | 65 | 11 | 8 | 98 | 22 | 138 | 17 | 9 | 186 | 21 | 36 | 14 | 11 | 82 | 538 |
| Total | 47 | 573 | 122 | 17 | 759 | 45 | 243 | 69 | 46 | 403 | 99 | 620 | 53 | 19 | 791 | 94 | 176 | 61 | 32 | 363 | 2316 |
| 04:00 PM | 12 | 135 | 40 | 5 | 192 | 20 | 59 | 13 | 14 | 106 | 14 | 144 | 14 | 10 | 182 | 25 | 57 | 12 | 17 | 111 | 591 |
| 04:15 PM | 10 | 128 | 23 | 6 | 167 | 8 | 75 | 13 | 5 | 101 | 11 | 153 | 16 | 0 | 180 | 14 | 70 | 21 | 16 | 121 | 569 |
| 04:30 PM | 10 | 152 | 31 | 3 | 196 | 11 | 60 | 17 | 12 | 100 | 17 | 153 | 18 | 3 | 191 | 32 | 67 | 17 | 11 | 127 | 614 |
| 04:45 PM | 20 | 128 | 24 | 9 | 181 | 14 | 37 | 10 | 11 | 72 | 19 | 150 | 24 | 4 | 197 | 33 | 95 | 30 | 5 | 163 | 613 |
| Total | 52 | 543 | 118 | 23 | 736 | 53 | 231 | 53 | 42 | 379 | 61 | 600 | 72 | 17 | 750 | 104 | 289 | 80 | 49 | 522 | 2387 |
| 05:00 PM | 19 | 141 | 29 | 3 | 192 | 15 | 74 | 13 | 9 | 111 | 17 | 159 | 18 | 5 | 199 | 29 | 72 | 15 | 17 | 133 | 635 |
| 05:15 PM | 16 | 151 | 26 | 5 | 198 | 12 | 69 | 12 | 20 | 113 | 15 | 167 | 28 | 7 | 217 | 26 | 103 | 21 | 12 | 162 | 690 |
| 05:30 PM | 18 | 179 | 39 | 4 | 240 | 7 | 76 | 7 | 11 | 101 | 16 | 154 | 22 | 5 | 197 | 17 | 86 | 32 | 7 | 142 | 680 |
| 05:45 PM | 10 | 149 | 35 | 6 | 200 | 14 | 58 | 10 | 15 | 97 | 21 | 138 | 14 | 4 | 177 | 27 | 79 | 30 | 16 | 152 | 626 |
| Total | 63 | 620 | 129 | 18 | 830 | 48 | 277 | 42 | 55 | 422 | 69 | 618 | 82 | 21 | 790 | 99 | 340 | 98 | 52 | 589 | 2631 |
| Grand Total | 162 | 1736 | 369 | 58 | 2325 | 146 | 751 | 164 | 143 | 1204 | 229 | 1838 | 207 | 57 | 2331 | 297 | 805 | 239 | 133 | 1474 | 7334 |
| Apprch % | 7 | 74.7 | 15.9 | 2.5 | | 12.1 | 62.4 | 13.6 | 11.9 | | 9.8 | 78.9 | 8.9 | 2.4 | | 20.1 | 54.6 | 16.2 | 9 | | |
| Total % | 2.2 | 23.7 | 5 | 0.8 | 31.7 | 2 | 10.2 | 2.2 | 1.9 | 16.4 | 3.1 | 25.1 | 2.8 | 0.8 | 31.8 | 4 | 11 | 3.3 | 1.8 | 20.1 | |

| | Ward Avenue Southbound | | | | Queen Street Westbound | | | | Ward Avenue Northbound | | | | Queen 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 19 | 141 | 29 | 189 | 15 | 74 | 13 | 102 | 17 | 159 | 18 | 194 | 29 | 72 | 15 | 116 | 601 |
| 05:15 PM | 16 | 151 | 26 | 193 | 12 | 69 | 12 | 93 | 15 | 167 | 28 | 210 | 26 | 103 | 21 | 150 | 646 |
| 05:30 PM | 18 | 179 | 39 | 236 | 7 | 76 | 7 | 90 | 16 | 154 | 22 | 192 | 17 | 86 | 32 | 135 | 653 |
| 05:45 PM | 10 | 149 | 35 | 194 | 14 | 58 | 10 | 82 | 21 | 138 | 14 | 173 | 27 | 79 | 30 | 136 | 585 |
| Total Volume | 63 | 620 | 129 | 812 | 48 | 277 | 42 | 367 | 69 | 618 | 82 | 769 | 99 | 340 | 98 | 537 | 2485 |
| % App. Total | 7.8 | 76.4 | 15.9 | | 13.1 | 75.5 | 11.4 | | 9 | 80.4 | 10.7 | | 18.4 | 63.3 | 18.2 | | |
| PHF | .829 | .866 | .827 | .860 | .800 | .911 | .808 | .900 | .821 | .925 | .732 | .915 | .853 | .825 | .766 | .895 | .951 |

# Wilson Okamoto Corporation

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

Counted By: LF, FS
Counters: D4-5673, D4-5677
Weather: CLEAR

File Name : WAR HAL AM
Site Code : 00000002
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | Ward Avenue Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 1 | 103 | 47 | 151 | 15 | 20 | 3 | 5 | 43 | 10 | 1 | 7 | 6 | 24 | 218 |
| 06:15 AM | 0 | 102 | 44 | 146 | 5 | 35 | 0 | 8 | 48 | 6 | 1 | 10 | 10 | 27 | 221 |
| 06:30 AM | 0 | 95 | 47 | 142 | 2 | 48 | 0 | 12 | 62 | 9 | 1 | 6 | 32 | 48 | 252 |
| 06:45 AM | 1 | 113 | 49 | 163 | 2 | 57 | 1 | 20 | 80 | 21 | 0 | 6 | 40 | 67 | 310 |
| Total | 2 | 413 | 187 | 602 | 24 | 160 | 4 | 45 | 233 | 46 | 3 | 29 | 88 | 166 | 1001 |
| 07:00 AM | 3 | 94 | 46 | 143 | 6 | 78 | 0 | 17 | 101 | 22 | 0 | 10 | 17 | 49 | 293 |
| 07:15 AM | 1 | 115 | 40 | 156 | 4 | 93 | 0 | 12 | 109 | 24 | 2 | 2 | 14 | 42 | 307 |
| 07:30 AM | 3 | 135 | 56 | 194 | 3 | 89 | 2 | 13 | 107 | 22 | 1 | 2 | 15 | 40 | 341 |
| 07:45 AM | 1 | 128 | 56 | 185 | 1 | 94 | 0 | 10 | 105 | 28 | 1 | 5 | 13 | 47 | 337 |
| Total | 8 | 472 | 198 | 678 | 14 | 354 | 2 | 52 | 422 | 96 | 4 | 19 | 59 | 178 | 1278 |
| 08:00 AM | 2 | 129 | 42 | 173 | 4 | 86 | 1 | 12 | 103 | 20 | 1 | 5 | 14 | 40 | 316 |
| 08:15 AM | 0 | 119 | 38 | 157 | 9 | 105 | 0 | 16 | 130 | 30 | 1 | 5 | 15 | 51 | 338 |
| 08:30 AM | 4 | 105 | 37 | 146 | 7 | 107 | 2 | 10 | 126 | 15 | 2 | 11 | 8 | 36 | 308 |
| 08:45 AM | 4 | 124 | 36 | 164 | 1 | 86 | 0 | 8 | 95 | 33 | 2 | 7 | 9 | 51 | 310 |
| Total | 10 | 477 | 153 | 640 | 21 | 384 | 3 | 46 | 454 | 98 | 6 | 28 | 46 | 178 | 1272 |
| Grand Total | 20 | 1362 | 538 | 1920 | 59 | 898 | 9 | 143 | 1109 | 240 | 13 | 76 | 193 | 522 | 3551 |
| Apprch % | 1 | 70.9 | 28 | | 5.3 | 81 | 0.8 | 12.9 | | 46 | 2.5 | 14.6 | 37 | | |
| Total % | 0.6 | 38.4 | 15.2 | 54.1 | 1.7 | 25.3 | 0.3 | 4 | 31.2 | 6.8 | 0.4 | 2.1 | 5.4 | 14.7 | |

| | Ward Avenue Southbound | | | | Ward Avenue Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | |
| 07:30 AM | 3 | 135 | 56 | 194 | 3 | 89 | 2 | 94 | 22 | 1 | 2 | 25 | 313 |
| 07:45 AM | 1 | 128 | 56 | 185 | 1 | 94 | 0 | 95 | 28 | 1 | 5 | 34 | 314 |
| 08:00 AM | 2 | 129 | 42 | 173 | 4 | 86 | 1 | 91 | 20 | 1 | 5 | 26 | 290 |
| 08:15 AM | 0 | 119 | 38 | 157 | 9 | 105 | 0 | 114 | 30 | 1 | 5 | 36 | 307 |
| Total Volume | 6 | 511 | 192 | 709 | 17 | 374 | 3 | 394 | 100 | 4 | 17 | 121 | 1224 |
| % App. Total | 0.8 | 72.1 | 27.1 | | 4.3 | 94.9 | 0.8 | | 82.6 | 3.3 | 14 | | |
| PHF | .500 | .946 | .857 | .914 | .472 | .890 | .375 | .864 | .833 | 1.00 | .850 | .840 | .975 |

# Wilson Okamoto Corporation

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

Counted By: LF, FS
Counters: D4-5673, D4-5677
Weather: CLEAR

File Name : WAR HAL PM
Site Code : 00000002
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | Ward Avenue Northbound | | | | | Halekauwila Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 2 | 128 | 23 | 153 | 6 | 147 | 2 | 18 | 173 | 44 | 2 | 13 | 16 | 75 | 401 |
| 03:15 PM | 2 | 130 | 29 | 161 | 6 | 130 | 2 | 43 | 181 | 39 | 1 | 11 | 45 | 96 | 438 |
| 03:30 PM | 5 | 110 | 38 | 153 | 8 | 147 | 2 | 19 | 176 | 43 | 2 | 17 | 47 | 109 | 438 |
| 03:45 PM | 2 | 126 | 27 | 155 | 6 | 109 | 1 | 18 | 134 | 43 | 2 | 10 | 14 | 69 | 358 |
| Total | 11 | 494 | 117 | 622 | 26 | 533 | 7 | 98 | 664 | 169 | 7 | 51 | 122 | 349 | 1635 |
| 04:00 PM | 3 | 119 | 35 | 157 | 8 | 109 | 0 | 25 | 142 | 46 | 4 | 9 | 10 | 69 | 368 |
| 04:15 PM | 1 | 121 | 28 | 150 | 6 | 102 | 2 | 33 | 143 | 41 | 4 | 16 | 17 | 78 | 371 |
| 04:30 PM | 5 | 146 | 20 | 171 | 5 | 110 | 2 | 22 | 139 | 59 | 1 | 21 | 18 | 99 | 409 |
| 04:45 PM | 3 | 137 | 29 | 169 | 8 | 116 | 0 | 23 | 147 | 63 | 1 | 20 | 12 | 96 | 412 |
| Total | 12 | 523 | 112 | 647 | 27 | 437 | 4 | 103 | 571 | 209 | 10 | 66 | 57 | 342 | 1560 |
| 05:00 PM | 3 | 139 | 28 | 170 | 7 | 123 | 2 | 31 | 163 | 46 | 5 | 18 | 23 | 92 | 425 |
| 05:15 PM | 5 | 159 | 16 | 180 | 6 | 115 | 1 | 13 | 135 | 81 | 2 | 20 | 18 | 121 | 436 |
| 05:30 PM | 6 | 161 | 31 | 198 | 7 | 118 | 0 | 17 | 142 | 55 | 5 | 22 | 6 | 88 | 428 |
| 05:45 PM | 2 | 152 | 42 | 196 | 5 | 86 | 1 | 17 | 109 | 43 | 4 | 12 | 16 | 75 | 380 |
| Total | 16 | 611 | 117 | 744 | 25 | 442 | 4 | 78 | 549 | 225 | 16 | 72 | 63 | 376 | 1669 |
| Grand Total | 39 | 1628 | 346 | 2013 | 78 | 1412 | 15 | 279 | 1784 | 603 | 33 | 189 | 242 | 1067 | 4864 |
| Apprch % | 1.9 | 80.9 | 17.2 | | 4.4 | 79.1 | 0.8 | 15.6 | | 56.5 | 3.1 | 17.7 | 22.7 | | |
| Total % | 0.8 | 33.5 | 7.1 | 41.4 | 1.6 | 29 | 0.3 | 5.7 | 36.7 | 12.4 | 0.7 | 3.9 | 5 | 21.9 | |

| | Ward Avenue Southbound | | | | Ward Avenue Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | |
| 04:45 PM | 3 | 137 | 29 | 169 | 8 | 116 | 0 | 124 | 63 | 1 | 20 | 84 | 377 |
| 05:00 PM | 3 | 139 | 28 | 170 | 7 | 123 | 2 | 132 | 46 | 5 | 18 | 69 | 371 |
| 05:15 PM | 5 | 159 | 16 | 180 | 6 | 115 | 1 | 122 | 81 | 2 | 20 | 103 | 405 |
| 05:30 PM | 6 | 161 | 31 | 198 | 7 | 118 | 0 | 125 | 55 | 5 | 22 | 82 | 405 |
| Total Volume | 17 | 596 | 104 | 717 | 28 | 472 | 3 | 503 | 245 | 13 | 80 | 338 | 1558 |
| % App. Total | 2.4 | 83.1 | 14.5 | | 5.6 | 93.8 | 0.6 | | 72.5 | 3.8 | 23.7 | | |
| PHF | .708 | .925 | .839 | .905 | .875 | .959 | .375 | .953 | .756 | .650 | .909 | .820 | .962 |

# Wilson Okamoto Corporation

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

Counted By: MM, EV
Counters: D4-3888, D4-5675
Weather: CLEAR

File Name : WAR AUA AM
Site Code : 00000003
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Auahi Street Westbound | | | | | Ward Avenue Northbound | | | | | Auahi 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 | 29 | 65 | 5 | 5 | 104 | 5 | 9 | 8 | 14 | 36 | 4 | 30 | 15 | 2 | 51 | 2 | 2 | 5 | 10 | 19 | 210 |
| 06:15 AM | 28 | 48 | 8 | 4 | 88 | 3 | 4 | 10 | 10 | 27 | 6 | 26 | 24 | 10 | 66 | 2 | 4 | 4 | 11 | 21 | 202 |
| 06:30 AM | 17 | 58 | 5 | 12 | 92 | 11 | 3 | 9 | 14 | 37 | 9 | 35 | 20 | 3 | 67 | 2 | 5 | 8 | 8 | 23 | 219 |
| 06:45 AM | 19 | 78 | 8 | 3 | 108 | 5 | 8 | 9 | 7 | 29 | 14 | 48 | 12 | 6 | 80 | 1 | 9 | 4 | 8 | 22 | 239 |
| Total | 93 | 249 | 26 | 24 | 392 | 24 | 24 | 36 | 45 | 129 | 33 | 139 | 71 | 21 | 264 | 7 | 20 | 21 | 37 | 85 | 870 |
| 07:00 AM | 16 | 63 | 3 | 3 | 85 | 18 | 11 | 11 | 8 | 48 | 19 | 54 | 5 | 3 | 81 | 3 | 9 | 4 | 5 | 21 | 235 |
| 07:15 AM | 12 | 85 | 14 | 1 | 112 | 11 | 22 | 15 | 6 | 54 | 18 | 69 | 12 | 2 | 101 | 4 | 9 | 7 | 1 | 21 | 288 |
| 07:30 AM | 9 | 105 | 11 | 3 | 128 | 15 | 14 | 10 | 6 | 45 | 18 | 73 | 6 | 1 | 98 | 6 | 5 | 17 | 2 | 30 | 301 |
| 07:45 AM | 15 | 90 | 12 | 5 | 122 | 26 | 18 | 14 | 6 | 64 | 12 | 75 | 6 | 3 | 96 | 3 | 12 | 7 | 2 | 24 | 306 |
| Total | 52 | 343 | 40 | 12 | 447 | 70 | 65 | 50 | 26 | 211 | 67 | 271 | 29 | 9 | 376 | 16 | 35 | 35 | 10 | 96 | 1130 |
| 08:00 AM | 15 | 85 | 7 | 5 | 112 | 12 | 17 | 17 | 5 | 51 | 11 | 61 | 13 | 1 | 86 | 4 | 6 | 5 | 5 | 20 | 269 |
| 08:15 AM | 18 | 78 | 8 | 3 | 107 | 13 | 11 | 11 | 11 | 46 | 17 | 69 | 14 | 0 | 100 | 4 | 8 | 3 | 2 | 17 | 270 |
| 08:30 AM | 11 | 67 | 13 | 6 | 97 | 13 | 8 | 16 | 3 | 40 | 19 | 92 | 12 | 0 | 123 | 6 | 18 | 10 | 3 | 37 | 297 |
| 08:45 AM | 18 | 84 | 11 | 7 | 120 | 11 | 15 | 9 | 7 | 42 | 11 | 67 | 21 | 3 | 102 | 5 | 19 | 6 | 5 | 35 | 299 |
| Total | 62 | 314 | 39 | 21 | 436 | 49 | 51 | 53 | 26 | 179 | 58 | 289 | 60 | 4 | 411 | 19 | 51 | 24 | 15 | 109 | 1135 |
| Grand Total | 207 | 906 | 105 | 57 | 1275 | 143 | 140 | 139 | 97 | 519 | 158 | 699 | 160 | 34 | 1051 | 42 | 106 | 80 | 62 | 290 | 3135 |
| Apprch % | 16.2 | 71.1 | 8.2 | 4.5 | | 27.6 | 27 | 26.8 | 18.7 | | 15 | 66.5 | 15.2 | 3.2 | | 14.5 | 36.6 | 27.6 | 21.4 | | |
| Total % | 6.6 | 28.9 | 3.3 | 1.8 | 40.7 | 4.6 | 4.5 | 4.4 | 3.1 | 16.6 | 5 | 22.3 | 5.1 | 1.1 | 33.5 | 1.3 | 3.4 | 2.6 | 2 | 9.3 | |

| | Ward Avenue Southbound | | | | Auahi Street Westbound | | | | Ward Avenue Northbound | | | | Auahi 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 12 | 85 | 14 | 111 | 11 | 22 | 15 | 48 | 18 | 69 | 12 | 99 | 4 | 9 | 7 | 20 | 278 |
| 07:30 AM | 9 | 105 | 11 | 125 | 15 | 14 | 10 | 39 | 18 | 73 | 6 | 97 | 6 | 5 | 17 | 28 | 289 |
| 07:45 AM | 15 | 90 | 12 | 117 | 26 | 18 | 14 | 58 | 12 | 75 | 6 | 93 | 3 | 12 | 7 | 22 | 290 |
| 08:00 AM | 15 | 85 | 7 | 107 | 12 | 17 | 17 | 46 | 11 | 61 | 13 | 85 | 4 | 6 | 5 | 15 | 253 |
| Total Volume | 51 | 365 | 44 | 460 | 64 | 71 | 56 | 191 | 59 | 278 | 37 | 374 | 17 | 32 | 36 | 85 | 1110 |
| % App. Total | 11.1 | 79.3 | 9.6 | | 33.5 | 37.2 | 29.3 | | 15.8 | 74.3 | 9.9 | | 20 | 37.6 | 42.4 | | |
| PHF | .850 | .869 | .786 | .920 | .615 | .807 | .824 | .823 | .819 | .927 | .712 | .944 | .708 | .667 | .529 | .759 | .957 |

# Wilson Okamoto Corporation

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

Counted By: BE, EV
Counters: D4-3889, D4-5675
Weather: CLEAR

File Name : WAR AUA PM
Site Code : 00000003
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Auahi Street Westbound | | | | | Ward Avenue Northbound | | | | | Auahi 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 |
| 03:00 PM | 27 | 90 | 16 | 35 | 168 | 41 | 22 | 45 | 8 | 116 | 14 | 77 | 14 | 1 | 106 | 6 | 19 | 11 | 2 | 38 | 428 |
| 03:15 PM | 26 | 91 | 16 | 23 | 156 | 59 | 14 | 55 | 13 | 141 | 11 | 57 | 15 | 3 | 86 | 9 | 19 | 15 | 4 | 47 | 430 |
| 03:30 PM | 26 | 86 | 15 | 29 | 156 | 57 | 14 | 54 | 26 | 151 | 15 | 86 | 22 | 13 | 136 | 8 | 21 | 15 | 14 | 58 | 501 |
| 03:45 PM | 22 | 83 | 13 | 5 | 123 | 29 | 11 | 41 | 9 | 90 | 16 | 63 | 12 | 4 | 95 | 9 | 22 | 13 | 8 | 52 | 360 |
| Total | 101 | 350 | 60 | 92 | 603 | 186 | 61 | 195 | 56 | 498 | 56 | 283 | 63 | 21 | 423 | 32 | 81 | 54 | 28 | 195 | 1719 |
| 04:00 PM | 34 | 82 | 11 | 15 | 142 | 19 | 25 | 35 | 7 | 86 | 9 | 74 | 14 | 3 | 100 | 9 | 20 | 19 | 9 | 57 | 385 |
| 04:15 PM | 34 | 87 | 19 | 11 | 151 | 27 | 13 | 33 | 6 | 79 | 10 | 77 | 11 | 3 | 101 | 7 | 17 | 9 | 6 | 39 | 370 |
| 04:30 PM | 30 | 115 | 13 | 28 | 186 | 16 | 16 | 15 | 18 | 65 | 3 | 81 | 16 | 3 | 103 | 10 | 33 | 11 | 13 | 67 | 421 |
| 04:45 PM | 40 | 94 | 12 | 21 | 167 | 23 | 12 | 20 | 16 | 71 | 6 | 73 | 17 | 3 | 99 | 9 | 22 | 10 | 7 | 48 | 385 |
| Total | 138 | 378 | 55 | 75 | 646 | 85 | 66 | 103 | 47 | 301 | 28 | 305 | 58 | 12 | 403 | 35 | 92 | 49 | 35 | 211 | 1561 |
| 05:00 PM | 44 | 92 | 12 | 14 | 162 | 30 | 19 | 9 | 10 | 68 | 5 | 90 | 14 | 2 | 111 | 10 | 37 | 19 | 7 | 73 | 414 |
| 05:15 PM | 33 | 110 | 11 | 17 | 171 | 15 | 17 | 13 | 7 | 52 | 15 | 61 | 17 | 6 | 99 | 6 | 33 | 20 | 4 | 63 | 385 |
| 05:30 PM | 53 | 112 | 8 | 6 | 179 | 19 | 12 | 16 | 1 | 48 | 10 | 85 | 17 | 2 | 114 | 6 | 26 | 13 | 5 | 50 | 391 |
| 05:45 PM | 46 | 99 | 12 | 16 | 173 | 16 | 18 | 32 | 9 | 75 | 6 | 49 | 17 | 0 | 72 | 4 | 17 | 13 | 3 | 37 | 357 |
| Total | 176 | 413 | 43 | 53 | 685 | 80 | 66 | 70 | 27 | 243 | 36 | 285 | 65 | 10 | 396 | 26 | 113 | 65 | 19 | 223 | 1547 |
| Grand Total | 415 | 1141 | 158 | 220 | 1934 | 351 | 193 | 368 | 130 | 1042 | 120 | 873 | 186 | 43 | 1222 | 93 | 286 | 168 | 82 | 629 | 4827 |
| Apprch % | 21.5 | 59 | 8.2 | 11.4 | | 33.7 | 18.5 | 35.3 | 12.5 | | 9.8 | 71.4 | 15.2 | 3.5 | | 14.8 | 45.5 | 26.7 | 13 | | |
| Total % | 8.6 | 23.6 | 3.3 | 4.6 | 40.1 | 7.3 | 4 | 7.6 | 2.7 | 21.6 | 2.5 | 18.1 | 3.9 | 0.9 | 25.3 | 1.9 | 5.9 | 3.5 | 1.7 | 13 | |

| | Ward Avenue Southbound | | | | Auahi Street Westbound | | | | Ward Avenue Northbound | | | | Auahi 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 03:00 PM | | | | | | | | | | | | | | | | | |
| 03:00 PM | 27 | 90 | 16 | 133 | 41 | 22 | 45 | 108 | 14 | 77 | 14 | 105 | 6 | 19 | 11 | 36 | 382 |
| 03:15 PM | 26 | 91 | 16 | 133 | 59 | 14 | 55 | 128 | 11 | 57 | 15 | 83 | 9 | 19 | 15 | 43 | 387 |
| 03:30 PM | 26 | 86 | 15 | 127 | 57 | 14 | 54 | 125 | 15 | 86 | 22 | 123 | 8 | 21 | 15 | 44 | 419 |
| 03:45 PM | 22 | 83 | 13 | 118 | 29 | 11 | 41 | 81 | 16 | 63 | 12 | 91 | 9 | 22 | 13 | 44 | 334 |
| Total Volume | 101 | 350 | 60 | 511 | 186 | 61 | 195 | 442 | 56 | 283 | 63 | 402 | 32 | 81 | 54 | 167 | 1522 |
| % App. Total | 19.8 | 68.5 | 11.7 | | 42.1 | 13.8 | 44.1 | | 13.9 | 70.4 | 15.7 | | 19.2 | 48.5 | 32.3 | | |
| PHF | .935 | .962 | .938 | .961 | .788 | .693 | .886 | .863 | .875 | .823 | .716 | .817 | .889 | .920 | .900 | .949 | .908 |

# Wilson Okamoto Corporation

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

Counted By: DY, YS
Counters: D4-3890, D4-5671
Weather: CLEAR

File Name : ALA WAR AM1
Site Code : 00000004
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Ward Avenue Northbound | | | | | Ala Moana Boulevard 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 | 36 | 17 | 15 | 0 | 68 | 13 | 157 | 11 | 5 | 186 | 0 | 3 | 3 | 0 | 6 | 32 | 206 | 0 | 4 | 242 | 502 |
| 06:15 AM | 21 | 22 | 9 | 3 | 55 | 6 | 188 | 11 | 5 | 210 | 0 | 2 | 4 | 5 | 11 | 43 | 231 | 0 | 3 | 277 | 553 |
| 06:30 AM | 28 | 23 | 12 | 2 | 65 | 15 | 256 | 22 | 6 | 299 | 0 | 3 | 4 | 5 | 12 | 50 | 273 | 2 | 5 | 330 | 706 |
| 06:45 AM | 36 | 30 | 28 | 1 | 95 | 15 | 301 | 29 | 2 | 347 | 0 | 4 | 3 | 1 | 8 | 61 | 365 | 1 | 3 | 430 | 880 |
| Total | 121 | 92 | 64 | 6 | 283 | 49 | 902 | 73 | 18 | 1042 | 0 | 12 | 14 | 11 | 37 | 186 | 1075 | 3 | 15 | 1279 | 2641 |
| 07:00 AM | 44 | 30 | 28 | 6 | 108 | 15 | 343 | 26 | 4 | 388 | 0 | 6 | 12 | 7 | 25 | 53 | 352 | 1 | 5 | 411 | 932 |
| 07:15 AM | 29 | 25 | 35 | 3 | 92 | 29 | 427 | 37 | 2 | 495 | 0 | 14 | 10 | 4 | 28 | 59 | 376 | 6 | 1 | 442 | 1057 |
| 07:30 AM | 50 | 33 | 42 | 5 | 130 | 33 | 386 | 46 | 7 | 472 | 0 | 8 | 7 | 6 | 21 | 54 | 365 | 1 | 4 | 424 | 1047 |
| 07:45 AM | 39 | 34 | 40 | 2 | 115 | 35 | 415 | 42 | 1 | 493 | 2 | 7 | 14 | 1 | 24 | 54 | 367 | 1 | 1 | 423 | 1055 |
| Total | 162 | 122 | 145 | 16 | 445 | 112 | 1571 | 151 | 14 | 1848 | 2 | 35 | 43 | 18 | 98 | 220 | 1460 | 9 | 11 | 1700 | 4091 |
| 08:00 AM | 34 | 14 | 34 | 4 | 86 | 27 | 358 | 37 | 3 | 425 | 0 | 8 | 9 | 2 | 19 | 50 | 379 | 3 | 5 | 437 | 967 |
| 08:15 AM | 39 | 42 | 10 | 3 | 94 | 24 | 365 | 47 | 8 | 444 | 1 | 15 | 9 | 2 | 27 | 53 | 368 | 1 | 6 | 428 | 993 |
| 08:30 AM | 30 | 43 | 34 | 2 | 109 | 35 | 293 | 47 | 3 | 378 | 0 | 11 | 6 | 4 | 21 | 59 | 351 | 1 | 2 | 413 | 921 |
| 08:45 AM | 30 | 27 | 32 | 2 | 91 | 27 | 291 | 33 | 4 | 355 | 0 | 14 | 15 | 0 | 29 | 56 | 336 | 0 | 2 | 394 | 869 |
| Total | 133 | 126 | 110 | 11 | 380 | 113 | 1307 | 164 | 18 | 1602 | 1 | 48 | 39 | 8 | 96 | 218 | 1434 | 5 | 15 | 1672 | 3750 |
| Grand Total | 416 | 340 | 319 | 33 | 1108 | 274 | 3780 | 388 | 50 | 4492 | 3 | 95 | 96 | 37 | 231 | 624 | 3969 | 17 | 41 | 4651 | 10482 |
| Apprch % | 37.5 | 30.7 | 28.8 | 3 | | 6.1 | 84.1 | 8.6 | 1.1 | | 1.3 | 41.1 | 41.6 | 16 | | 13.4 | 85.3 | 0.4 | 0.9 | | |
| Total % | 4 | 3.2 | 3 | 0.3 | 10.6 | 2.6 | 36.1 | 3.7 | 0.5 | 42.9 | 0 | 0.9 | 0.9 | 0.4 | 2.2 | 6 | 37.9 | 0.2 | 0.4 | 44.4 | |

| | Ward Avenue Southbound | | | | Ala Moana Boulevard Westbound | | | | Ward Avenue Northbound | | | | Ala Moana Boulevard 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 29 | 25 | 35 | 89 | 29 | 427 | 37 | 493 | 0 | 14 | 10 | 24 | 59 | 376 | 6 | 441 | 1047 |
| 07:30 AM | 50 | 33 | 42 | 125 | 33 | 386 | 46 | 465 | 0 | 8 | 7 | 15 | 54 | 365 | 1 | 420 | 1025 |
| 07:45 AM | 39 | 34 | 40 | 113 | 35 | 415 | 42 | 492 | 2 | 7 | 14 | 23 | 54 | 367 | 1 | 422 | 1050 |
| 08:00 AM | 34 | 14 | 34 | 82 | 27 | 358 | 37 | 422 | 0 | 8 | 9 | 17 | 50 | 379 | 3 | 432 | 953 |
| Total Volume | 152 | 106 | 151 | 409 | 124 | 1586 | 162 | 1872 | 2 | 37 | 40 | 79 | 217 | 1487 | 11 | 1715 | 4075 |
| % App. Total | 37.2 | 25.9 | 36.9 | | 6.6 | 84.7 | 8.7 | | 2.5 | 46.8 | 50.6 | | 12.7 | 86.7 | 0.6 | | |
| PHF | .760 | .779 | .899 | .818 | .886 | .929 | .880 | .949 | .250 | .661 | .714 | .823 | .919 | .981 | .458 | .972 | .970 |

# Wilson Okamoto Corporation

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

Counted By: DY, HM
Counters: D4-3890, D4-5671
Weather: CLEAR

File Name : ALA WAR PM
Site Code : 00000004
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Ward Avenue Northbound | | | | | Ala Moana Boulevard 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 |
| 03:00 PM | 29 | 16 | 73 | 6 | 124 | 17 | 304 | 43 | 3 | 367 | 0 | 17 | 11 | 5 | 33 | 61 | 350 | 1 | 2 | 414 | 938 |
| 03:15 PM | 46 | 10 | 88 | 13 | 157 | 12 | 384 | 35 | 6 | 437 | 0 | 21 | 10 | 8 | 39 | 47 | 415 | 0 | 3 | 465 | 1098 |
| 03:30 PM | 49 | 13 | 94 | 6 | 162 | 15 | 330 | 48 | 3 | 396 | 2 | 22 | 23 | 1 | 48 | 70 | 439 | 0 | 2 | 511 | 1117 |
| 03:45 PM | 45 | 20 | 56 | 4 | 125 | 8 | 250 | 102 | 6 | 366 | 1 | 18 | 19 | 5 | 43 | 40 | 435 | 1 | 4 | 480 | 1014 |
| Total | 169 | 59 | 311 | 29 | 568 | 52 | 1268 | 228 | 18 | 1566 | 3 | 78 | 63 | 19 | 163 | 218 | 1639 | 2 | 11 | 1870 | 4167 |
| 04:00 PM | 49 | 10 | 39 | 5 | 103 | 5 | 290 | 49 | 8 | 352 | 1 | 18 | 23 | 10 | 52 | 45 | 467 | 0 | 8 | 520 | 1027 |
| 04:15 PM | 47 | 15 | 44 | 4 | 110 | 12 | 346 | 32 | 7 | 397 | 1 | 19 | 28 | 5 | 53 | 56 | 469 | 0 | 5 | 530 | 1090 |
| 04:30 PM | 71 | 19 | 55 | 6 | 151 | 13 | 287 | 81 | 11 | 392 | 3 | 32 | 38 | 3 | 76 | 45 | 427 | 2 | 8 | 482 | 1101 |
| 04:45 PM | 48 | 14 | 54 | 16 | 132 | 12 | 311 | 50 | 6 | 379 | 1 | 19 | 34 | 12 | 66 | 36 | 498 | 0 | 10 | 544 | 1121 |
| Total | 215 | 58 | 192 | 31 | 496 | 42 | 1234 | 212 | 32 | 1520 | 6 | 88 | 123 | 30 | 247 | 182 | 1861 | 2 | 31 | 2076 | 4339 |
| 05:00 PM | 68 | 11 | 63 | 8 | 150 | 16 | 279 | 44 | 15 | 354 | 4 | 27 | 51 | 7 | 89 | 53 | 366 | 0 | 2 | 421 | 1014 |
| 05:15 PM | 68 | 20 | 53 | 8 | 149 | 13 | 355 | 51 | 7 | 426 | 1 | 34 | 36 | 10 | 81 | 35 | 451 | 0 | 4 | 490 | 1146 |
| 05:30 PM | 63 | 18 | 56 | 3 | 140 | 6 | 309 | 54 | 6 | 375 | 0 | 19 | 26 | 12 | 57 | 43 | 486 | 2 | 3 | 534 | 1106 |
| 05:45 PM | 69 | 11 | 59 | 5 | 144 | 10 | 301 | 37 | 12 | 360 | 0 | 16 | 24 | 10 | 50 | 43 | 420 | 0 | 1 | 464 | 1018 |
| Total | 268 | 60 | 231 | 24 | 583 | 45 | 1244 | 186 | 40 | 1515 | 5 | 96 | 137 | 39 | 277 | 174 | 1723 | 2 | 10 | 1909 | 4284 |
| Grand Total | 652 | 177 | 734 | 84 | 1647 | 139 | 3746 | 626 | 90 | 4601 | 14 | 262 | 323 | 88 | 687 | 574 | 5223 | 6 | 52 | 5855 | 12790 |
| Apprch % | 39.6 | 10.7 | 44.6 | 5.1 | | 3 | 81.4 | 13.6 | 2 | | 2 | 38.1 | 47 | 12.8 | | 9.8 | 89.2 | 0.1 | 0.9 | | |
| Total % | 5.1 | 1.4 | 5.7 | 0.7 | 12.9 | 1.1 | 29.3 | 4.9 | 0.7 | 36 | 0.1 | 2 | 2.5 | 0.7 | 5.4 | 4.5 | 40.8 | 0 | 0.4 | 45.8 | |

| | Ward Avenue Southbound | | | | Ala Moana Boulevard Westbound | | | | Ward Avenue Northbound | | | | Ala Moana Boulevard 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 48 | 14 | 54 | 116 | 12 | 311 | 50 | 373 | 1 | 19 | 34 | 54 | 36 | 498 | 0 | 534 | 1077 |
| 05:00 PM | 68 | 11 | 63 | 142 | 16 | 279 | 44 | 339 | 4 | 27 | 51 | 82 | 53 | 366 | 0 | 419 | 982 |
| 05:15 PM | 68 | 20 | 53 | 141 | 13 | 355 | 51 | 419 | 1 | 34 | 36 | 71 | 35 | 451 | 0 | 486 | 1117 |
| 05:30 PM | 63 | 18 | 56 | 137 | 6 | 309 | 54 | 369 | 0 | 19 | 26 | 45 | 43 | 486 | 2 | 531 | 1082 |
| Total Volume | 247 | 63 | 226 | 536 | 47 | 1254 | 199 | 1500 | 6 | 99 | 147 | 252 | 167 | 1801 | 2 | 1970 | 4258 |
| % App. Total | 46.1 | 11.8 | 42.2 | | 3.1 | 83.6 | 13.3 | | 2.4 | 39.3 | 58.3 | | 8.5 | 91.4 | 0.1 | | |
| PHF | .908 | .788 | .897 | .944 | .734 | .883 | .921 | .895 | .375 | .728 | .721 | .768 | .788 | .904 | .250 | .922 | .953 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5672, D4-5674
Weather: CLEAR

File Name : KAM AUA AM
Site Code : 00000001
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Auahi Street Westbound | | | | | Kamakee Street Northbound | | | | | Auahi 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 | 14 | 9 | 3 | 28 | 0 | 4 | 3 | 6 | 13 | 2 | 9 | 3 | 2 | 16 | 0 | 6 | 1 | 0 | 7 | 64 |
| 06:15 AM | 2 | 13 | 13 | 5 | 33 | 1 | 9 | 2 | 2 | 14 | 7 | 7 | 1 | 1 | 16 | 2 | 5 | 3 | 2 | 12 | 75 |
| 06:30 AM | 3 | 17 | 10 | 11 | 41 | 0 | 8 | 9 | 8 | 25 | 2 | 12 | 0 | 4 | 18 | 1 | 5 | 2 | 3 | 11 | 95 |
| 06:45 AM | 0 | 18 | 12 | 7 | 37 | 0 | 7 | 7 | 5 | 19 | 7 | 17 | 4 | 6 | 34 | 8 | 8 | 2 | 3 | 21 | 111 |
| Total | 7 | 62 | 44 | 26 | 139 | 1 | 28 | 21 | 21 | 71 | 18 | 45 | 8 | 13 | 84 | 11 | 24 | 8 | 8 | 51 | 345 |
| 07:00 AM | 2 | 27 | 21 | 7 | 57 | 3 | 15 | 9 | 5 | 32 | 7 | 8 | 2 | 3 | 20 | 4 | 12 | 3 | 4 | 23 | 132 |
| 07:15 AM | 3 | 28 | 20 | 4 | 55 | 4 | 13 | 8 | 2 | 27 | 5 | 13 | 6 | 5 | 29 | 4 | 12 | 2 | 7 | 25 | 136 |
| 07:30 AM | 2 | 25 | 20 | 5 | 52 | 4 | 21 | 9 | 5 | 39 | 7 | 13 | 3 | 5 | 28 | 1 | 8 | 4 | 3 | 16 | 135 |
| 07:45 AM | 2 | 23 | 19 | 6 | 50 | 6 | 14 | 6 | 2 | 28 | 3 | 32 | 9 | 1 | 45 | 0 | 12 | 9 | 2 | 23 | 146 |
| Total | 9 | 103 | 80 | 22 | 214 | 17 | 63 | 32 | 14 | 126 | 22 | 66 | 20 | 14 | 122 | 9 | 44 | 18 | 16 | 87 | 549 |
| 08:00 AM | 5 | 39 | 20 | 7 | 71 | 4 | 15 | 9 | 2 | 30 | 6 | 23 | 5 | 3 | 37 | 3 | 21 | 5 | 1 | 30 | 168 |
| 08:15 AM | 4 | 37 | 23 | 8 | 72 | 0 | 14 | 9 | 3 | 26 | 10 | 18 | 11 | 7 | 46 | 3 | 19 | 1 | 5 | 28 | 172 |
| 08:30 AM | 5 | 30 | 22 | 8 | 65 | 4 | 19 | 9 | 8 | 40 | 2 | 10 | 9 | 4 | 25 | 7 | 22 | 7 | 9 | 45 | 175 |
| 08:45 AM | 7 | 31 | 21 | 13 | 72 | 3 | 12 | 12 | 12 | 39 | 3 | 21 | 3 | 3 | 30 | 3 | 29 | 3 | 4 | 39 | 180 |
| Total | 21 | 137 | 86 | 36 | 280 | 11 | 60 | 39 | 25 | 135 | 21 | 72 | 28 | 17 | 138 | 16 | 91 | 16 | 19 | 142 | 695 |
| Grand Total | 37 | 302 | 210 | 84 | 633 | 29 | 151 | 92 | 60 | 332 | 61 | 183 | 56 | 44 | 344 | 36 | 159 | 42 | 43 | 280 | 1589 |
| Apprch % | 5.8 | 47.7 | 33.2 | 13.3 | | 8.7 | 45.5 | 27.7 | 18.1 | | 17.7 | 53.2 | 16.3 | 12.8 | | 12.9 | 56.8 | 15 | 15.4 | | |
| Total % | 2.3 | 19 | 13.2 | 5.3 | 39.8 | 1.8 | 9.5 | 5.8 | 3.8 | 20.9 | 3.8 | 11.5 | 3.5 | 2.8 | 21.6 | 2.3 | 10 | 2.6 | 2.7 | 17.6 | |

| | Kamakee Street Southbound | | | | Auahi Street Westbound | | | | Kamakee Street Northbound | | | | Auahi 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | | | | | | | | |
| 08:00 AM | 5 | 39 | 20 | 64 | 4 | 15 | 9 | 28 | 6 | 23 | 5 | 34 | 3 | 21 | 5 | 29 | 155 |
| 08:15 AM | 4 | 37 | 23 | 64 | 0 | 14 | 9 | 23 | 10 | 18 | 11 | 39 | 3 | 19 | 1 | 23 | 149 |
| 08:30 AM | 5 | 30 | 22 | 57 | 4 | 19 | 9 | 32 | 2 | 10 | 9 | 21 | 7 | 22 | 7 | 36 | 146 |
| 08:45 AM | 7 | 31 | 21 | 59 | 3 | 12 | 12 | 27 | 3 | 21 | 3 | 27 | 3 | 29 | 3 | 35 | 148 |
| Total Volume | 21 | 137 | 86 | 244 | 11 | 60 | 39 | 110 | 21 | 72 | 28 | 121 | 16 | 91 | 16 | 123 | 598 |
| % App. Total | 8.6 | 56.1 | 35.2 | | 10 | 54.5 | 35.5 | | 17.4 | 59.5 | 23.1 | | 13 | 74 | 13 | | |
| PHF | .750 | .878 | .935 | .953 | .688 | .789 | .813 | .859 | .525 | .783 | .636 | .776 | .571 | .784 | .571 | .854 | .965 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5672, D4-5674
Weather: CLEAR

File Name : KAM AUA PM
Site Code : 00000001
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Auahi Street Westbound | | | | | Kamakee Street Northbound | | | | | Auahi 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 |
| 03:00 PM | 7 | 49 | 24 | 31 | 111 | 13 | 27 | 17 | 24 | 81 | 7 | 17 | 11 | 25 | 60 | 6 | 56 | 5 | 20 | 87 | 339 |
| 03:15 PM | 11 | 38 | 20 | 39 | 108 | 8 | 30 | 18 | 29 | 85 | 9 | 18 | 11 | 23 | 61 | 12 | 37 | 13 | 25 | 87 | 341 |
| 03:30 PM | 10 | 30 | 23 | 24 | 87 | 10 | 27 | 15 | 23 | 75 | 5 | 17 | 6 | 23 | 51 | 13 | 53 | 6 | 6 | 78 | 291 |
| 03:45 PM | 7 | 19 | 16 | 29 | 71 | 6 | 26 | 12 | 17 | 61 | 5 | 14 | 8 | 13 | 40 | 14 | 56 | 7 | 9 | 86 | 258 |
| Total | 35 | 136 | 83 | 123 | 377 | 37 | 110 | 62 | 93 | 302 | 26 | 66 | 36 | 84 | 212 | 45 | 202 | 31 | 60 | 338 | 1229 |
| 04:00 PM | 10 | 29 | 19 | 38 | 96 | 5 | 23 | 5 | 20 | 53 | 4 | 21 | 8 | 11 | 44 | 15 | 44 | 4 | 14 | 77 | 270 |
| 04:15 PM | 8 | 36 | 20 | 31 | 95 | 8 | 39 | 10 | 24 | 81 | 7 | 17 | 7 | 24 | 55 | 7 | 56 | 6 | 17 | 86 | 317 |
| 04:30 PM | 19 | 42 | 14 | 60 | 135 | 9 | 31 | 5 | 48 | 93 | 9 | 15 | 12 | 15 | 51 | 15 | 48 | 11 | 14 | 88 | 367 |
| 04:45 PM | 11 | 38 | 16 | 22 | 87 | 6 | 35 | 8 | 5 | 54 | 13 | 21 | 8 | 23 | 65 | 14 | 54 | 7 | 15 | 90 | 296 |
| Total | 48 | 145 | 69 | 151 | 413 | 28 | 128 | 28 | 97 | 281 | 33 | 74 | 35 | 73 | 215 | 51 | 202 | 28 | 60 | 341 | 1250 |
| 05:00 PM | 12 | 29 | 16 | 27 | 84 | 9 | 31 | 10 | 37 | 87 | 10 | 15 | 14 | 36 | 75 | 15 | 54 | 9 | 19 | 97 | 343 |
| 05:15 PM | 18 | 30 | 16 | 46 | 110 | 7 | 24 | 8 | 26 | 65 | 7 | 15 | 12 | 18 | 52 | 14 | 58 | 8 | 18 | 98 | 325 |
| 05:30 PM | 16 | 29 | 14 | 32 | 91 | 6 | 21 | 10 | 18 | 55 | 8 | 15 | 14 | 23 | 60 | 8 | 70 | 9 | 24 | 111 | 317 |
| 05:45 PM | 16 | 39 | 18 | 43 | 116 | 9 | 24 | 10 | 24 | 67 | 5 | 16 | 11 | 28 | 60 | 12 | 69 | 3 | 18 | 102 | 345 |
| Total | 62 | 127 | 64 | 148 | 401 | 31 | 100 | 38 | 105 | 274 | 30 | 61 | 51 | 105 | 247 | 49 | 251 | 29 | 79 | 408 | 1330 |
| Grand Total | 145 | 408 | 216 | 422 | 1191 | 96 | 338 | 128 | 295 | 857 | 89 | 201 | 122 | 262 | 674 | 145 | 655 | 88 | 199 | 1087 | 3809 |
| Apprch % | 12.2 | 34.3 | 18.1 | 35.4 | | 11.2 | 39.4 | 14.9 | 34.4 | | 13.2 | 29.8 | 18.1 | 38.9 | | 13.3 | 60.3 | 8.1 | 18.3 | | |
| Total % | 3.8 | 10.7 | 5.7 | 11.1 | 31.3 | 2.5 | 8.9 | 3.4 | 7.7 | 22.5 | 2.3 | 5.3 | 3.2 | 6.9 | 17.7 | 3.8 | 17.2 | 2.3 | 5.2 | 28.5 | |

| | Kamakee Street Southbound | | | | Auahi Street Westbound | | | | Kamakee Street Northbound | | | | Auahi 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 8 | 36 | 20 | 64 | 8 | 39 | 10 | 57 | 7 | 17 | 7 | 31 | 7 | 56 | 6 | 69 | 221 |
| 04:30 PM | 19 | 42 | 14 | 75 | 9 | 31 | 5 | 45 | 9 | 15 | 12 | 36 | 15 | 48 | 11 | 74 | 230 |
| 04:45 PM | 11 | 38 | 16 | 65 | 6 | 35 | 8 | 49 | 13 | 21 | 8 | 42 | 14 | 54 | 7 | 75 | 231 |
| 05:00 PM | 12 | 29 | 16 | 57 | 9 | 31 | 10 | 50 | 10 | 15 | 14 | 39 | 15 | 54 | 9 | 78 | 224 |
| Total Volume | 50 | 145 | 66 | 261 | 32 | 136 | 33 | 201 | 39 | 68 | 41 | 148 | 51 | 212 | 33 | 296 | 906 |
| % App. Total | 19.2 | 55.6 | 25.3 | | 15.9 | 67.7 | 16.4 | | 26.4 | 45.9 | 27.7 | | 17.2 | 71.6 | 11.1 | | |
| PHF | .658 | .863 | .825 | .870 | .889 | .872 | .825 | .882 | .750 | .810 | .732 | .881 | .850 | .946 | .750 | .949 | .981 |

# Wilson Okamoto Corporation

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

Counted By: LF
Counters: D4-5673
Weather: CLEAR

File Name : KAM MID AM
Site Code : 00000002
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | Kamakee Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 27 | 2 | 0 | 29 | 0 | 10 | 0 | 10 | 1 | 0 | 1 | 2 | 41 |
| 06:15 AM | 19 | 6 | 1 | 26 | 3 | 8 | 3 | 14 | 0 | 2 | 2 | 4 | 44 |
| 06:30 AM | 24 | 3 | 3 | 30 | 3 | 24 | 2 | 29 | 0 | 2 | 3 | 5 | 64 |
| 06:45 AM | 27 | 7 | 2 | 36 | 4 | 28 | 1 | 33 | 0 | 3 | 6 | 9 | 78 |
| Total | 97 | 18 | 6 | 121 | 10 | 70 | 6 | 86 | 1 | 7 | 12 | 20 | 227 |
| 07:00 AM | 46 | 7 | 4 | 57 | 5 | 19 | 1 | 25 | 1 | 4 | 2 | 7 | 89 |
| 07:15 AM | 49 | 3 | 3 | 55 | 5 | 22 | 1 | 28 | 2 | 2 | 0 | 4 | 87 |
| 07:30 AM | 44 | 6 | 3 | 53 | 0 | 24 | 4 | 28 | 3 | 2 | 4 | 9 | 90 |
| 07:45 AM | 43 | 7 | 0 | 50 | 1 | 35 | 0 | 36 | 2 | 3 | 3 | 8 | 94 |
| Total | 182 | 23 | 10 | 215 | 11 | 100 | 6 | 117 | 8 | 11 | 9 | 28 | 360 |
| 08:00 AM | 62 | 2 | 2 | 66 | 4 | 30 | 0 | 34 | 4 | 2 | 0 | 6 | 106 |
| 08:15 AM | 56 | 7 | 2 | 65 | 0 | 30 | 0 | 30 | 2 | 2 | 0 | 4 | 99 |
| 08:30 AM | 54 | 6 | 0 | 60 | 2 | 24 | 2 | 28 | 3 | 3 | 2 | 8 | 96 |
| 08:45 AM | 54 | 5 | 1 | 60 | 0 | 35 | 1 | 36 | 2 | 6 | 3 | 11 | 107 |
| Total | 226 | 20 | 5 | 251 | 6 | 119 | 3 | 128 | 11 | 13 | 5 | 29 | 408 |
| Grand Total | 505 | 61 | 21 | 587 | 27 | 289 | 15 | 331 | 20 | 31 | 26 | 77 | 995 |
| Apprch % | 86 | 10.4 | 3.6 | | 8.2 | 87.3 | 4.5 | | 26 | 40.3 | 33.8 | | |
| Total % | 50.8 | 6.1 | 2.1 | 59 | 2.7 | 29 | 1.5 | 33.3 | 2 | 3.1 | 2.6 | 7.7 | |

| | Kamakee Street Southbound | | | Kamakee Street Northbound | | | Halekauwila Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | App. Total | Left | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | |
| 08:00 AM | 62 | 2 | 64 | 4 | 30 | 34 | 4 | 2 | 6 | 104 |
| 08:15 AM | 56 | 7 | 63 | 0 | 30 | 30 | 2 | 2 | 4 | 97 |
| 08:30 AM | 54 | 6 | 60 | 2 | 24 | 26 | 3 | 3 | 6 | 92 |
| 08:45 AM | 54 | 5 | 59 | 0 | 35 | 35 | 2 | 6 | 8 | 102 |
| Total Volume | 226 | 20 | 246 | 6 | 119 | 125 | 11 | 13 | 24 | 395 |
| % App. Total | 91.9 | 8.1 | | 4.8 | 95.2 | | 45.8 | 54.2 | | |
| PHF | .911 | .714 | .961 | .375 | .850 | .893 | .688 | .542 | .750 | .950 |

# Wilson Okamoto Corporation

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

Counted By: LF
Counters: D4-5673
Weather: CLEAR

File Name : KAM MID PM
Site Code : 00000002
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | Kamakee Street Northbound | | | | Halekauwila Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 81 | 14 | 2 | 97 | 3 | 34 | 6 | 43 | 12 | 2 | 7 | 21 | 161 |
| 03:15 PM | 72 | 8 | 7 | 87 | 2 | 47 | 1 | 50 | 8 | 6 | 12 | 26 | 163 |
| 03:30 PM | 56 | 18 | 4 | 78 | 2 | 42 | 0 | 44 | 3 | 7 | 6 | 16 | 138 |
| 03:45 PM | 43 | 13 | 3 | 59 | 4 | 34 | 0 | 38 | 7 | 2 | 2 | 11 | 108 |
| Total | 252 | 53 | 16 | 321 | 11 | 157 | 7 | 175 | 30 | 17 | 27 | 74 | 570 |
| 04:00 PM | 58 | 14 | 9 | 81 | 4 | 40 | 0 | 44 | 9 | 5 | 8 | 22 | 147 |
| 04:15 PM | 60 | 9 | 6 | 75 | 1 | 31 | 1 | 33 | 11 | 3 | 4 | 18 | 126 |
| 04:30 PM | 72 | 11 | 5 | 88 | 4 | 29 | 1 | 34 | 9 | 7 | 4 | 20 | 142 |
| 04:45 PM | 60 | 22 | 7 | 89 | 7 | 38 | 2 | 47 | 8 | 10 | 8 | 26 | 162 |
| Total | 250 | 56 | 27 | 333 | 16 | 138 | 4 | 158 | 37 | 25 | 24 | 86 | 577 |
| 05:00 PM | 60 | 12 | 7 | 79 | 2 | 35 | 7 | 44 | 8 | 1 | 4 | 13 | 136 |
| 05:15 PM | 67 | 15 | 2 | 84 | 5 | 36 | 2 | 43 | 6 | 4 | 6 | 16 | 143 |
| 05:30 PM | 60 | 21 | 2 | 83 | 5 | 29 | 3 | 37 | 8 | 3 | 6 | 17 | 137 |
| 05:45 PM | 74 | 18 | 10 | 102 | 10 | 29 | 0 | 39 | 6 | 10 | 7 | 23 | 164 |
| Total | 261 | 66 | 21 | 348 | 22 | 129 | 12 | 163 | 28 | 18 | 23 | 69 | 580 |
| Grand Total | 763 | 175 | 64 | 1002 | 49 | 424 | 23 | 496 | 95 | 60 | 74 | 229 | 1727 |
| Apprch % | 76.1 | 17.5 | 6.4 | | 9.9 | 85.5 | 4.6 | | 41.5 | 26.2 | 32.3 | | |
| Total % | 44.2 | 10.1 | 3.7 | 58 | 2.8 | 24.6 | 1.3 | 28.7 | 5.5 | 3.5 | 4.3 | 13.3 | |

| | Kamakee Street Southbound | | | Kamakee Street Northbound | | | Halekauwila Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | App. Total | Left | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | |
| 04:30 PM | 72 | 11 | 83 | 4 | 29 | 33 | 9 | 7 | 16 | 132 |
| 04:45 PM | 60 | 22 | 82 | 7 | 38 | 45 | 8 | 10 | 18 | 145 |
| 05:00 PM | 60 | 12 | 72 | 2 | 35 | 37 | 8 | 1 | 9 | 118 |
| 05:15 PM | 67 | 15 | 82 | 5 | 36 | 41 | 6 | 4 | 10 | 133 |
| Total Volume | 259 | 60 | 319 | 18 | 138 | 156 | 31 | 22 | 53 | 528 |
| % App. Total | 81.2 | 18.8 | | 11.5 | 88.5 | | 58.5 | 41.5 | | |
| PHF | .899 | .682 | .961 | .643 | .908 | .867 | .861 | .550 | .736 | .910 |

# Wilson Okamoto Corporation

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

Counted By: EV, YS
Counters: D4-5675, D4-3889
Weather: CLEAR

File Name : QUE KAM AM
Site Code : 00000003
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Queen Street Westbound | | | | | Kamakee Street Northbound | | | | | Queen 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 | 5 | 17 | 2 | 0 | 24 | 6 | 2 | 0 | 0 | 8 | 3 | 6 | 0 | 2 | 11 | 2 | 13 | 2 | 1 | 18 | 61 |
| 06:15 AM | 7 | 15 | 7 | 0 | 29 | 11 | 8 | 1 | 1 | 21 | 1 | 5 | 0 | 0 | 6 | 5 | 11 | 2 | 4 | 22 | 78 |
| 06:30 AM | 5 | 20 | 6 | 1 | 32 | 4 | 18 | 0 | 2 | 24 | 3 | 7 | 8 | 1 | 19 | 1 | 12 | 4 | 4 | 21 | 96 |
| 06:45 AM | 2 | 22 | 15 | 0 | 39 | 8 | 16 | 4 | 2 | 30 | 5 | 15 | 5 | 2 | 27 | 2 | 19 | 3 | 5 | 29 | 125 |
| Total | 19 | 74 | 30 | 1 | 124 | 29 | 44 | 5 | 5 | 83 | 12 | 33 | 13 | 5 | 63 | 10 | 55 | 11 | 14 | 90 | 360 |
| 07:00 AM | 4 | 32 | 9 | 1 | 46 | 21 | 46 | 1 | 1 | 69 | 1 | 13 | 6 | 1 | 21 | 3 | 14 | 4 | 3 | 24 | 160 |
| 07:15 AM | 4 | 31 | 14 | 0 | 49 | 17 | 58 | 6 | 0 | 81 | 1 | 20 | 4 | 1 | 26 | 3 | 20 | 6 | 3 | 32 | 188 |
| 07:30 AM | 4 | 24 | 23 | 2 | 53 | 12 | 84 | 5 | 1 | 102 | 4 | 14 | 1 | 2 | 21 | 3 | 36 | 6 | 9 | 54 | 230 |
| 07:45 AM | 6 | 23 | 17 | 1 | 47 | 27 | 79 | 3 | 2 | 111 | 4 | 25 | 6 | 1 | 36 | 3 | 19 | 4 | 4 | 30 | 224 |
| Total | 18 | 110 | 63 | 4 | 195 | 77 | 267 | 15 | 4 | 363 | 10 | 72 | 17 | 5 | 104 | 12 | 89 | 20 | 19 | 140 | 802 |
| 08:00 AM | 4 | 33 | 10 | 5 | 52 | 31 | 66 | 11 | 1 | 109 | 0 | 9 | 11 | 2 | 22 | 1 | 46 | 5 | 3 | 55 | 238 |
| 08:15 AM | 6 | 28 | 12 | 4 | 50 | 26 | 44 | 4 | 1 | 75 | 10 | 17 | 8 | 5 | 40 | 3 | 42 | 10 | 3 | 58 | 223 |
| 08:30 AM | 7 | 25 | 14 | 6 | 52 | 23 | 33 | 5 | 0 | 61 | 6 | 7 | 10 | 12 | 35 | 1 | 37 | 10 | 0 | 48 | 196 |
| 08:45 AM | 14 | 28 | 8 | 9 | 59 | 21 | 30 | 4 | 1 | 56 | 3 | 5 | 7 | 5 | 20 | 7 | 37 | 7 | 2 | 53 | 188 |
| Total | 31 | 114 | 44 | 24 | 213 | 101 | 173 | 24 | 3 | 301 | 19 | 38 | 36 | 24 | 117 | 12 | 162 | 32 | 8 | 214 | 845 |
| Grand Total | 68 | 298 | 137 | 29 | 532 | 207 | 484 | 44 | 12 | 747 | 41 | 143 | 66 | 34 | 284 | 34 | 306 | 63 | 41 | 444 | 2007 |
| Apprch % | 12.8 | 56 | 25.8 | 5.5 | | 27.7 | 64.8 | 5.9 | 1.6 | | 14.4 | 50.4 | 23.2 | 12 | | 7.7 | 68.9 | 14.2 | 9.2 | | |
| Total % | 3.4 | 14.8 | 6.8 | 1.4 | 26.5 | 10.3 | 24.1 | 2.2 | 0.6 | 37.2 | 2 | 7.1 | 3.3 | 1.7 | 14.2 | 1.7 | 15.2 | 3.1 | 2 | 22.1 | |

| | Kamakee Street Southbound | | | | Queen Street Westbound | | | | Kamakee Street Northbound | | | | Queen 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 4 | 24 | 23 | 51 | 12 | 84 | 5 | 101 | 4 | 14 | 1 | 19 | 3 | 36 | 6 | 45 | 216 |
| 07:45 AM | 6 | 23 | 17 | 46 | 27 | 79 | 3 | 109 | 4 | 25 | 6 | 35 | 3 | 19 | 4 | 26 | 216 |
| 08:00 AM | 4 | 33 | 10 | 47 | 31 | 66 | 11 | 108 | 0 | 9 | 11 | 20 | 1 | 46 | 5 | 52 | 227 |
| 08:15 AM | 6 | 28 | 12 | 46 | 26 | 44 | 4 | 74 | 10 | 17 | 8 | 35 | 3 | 42 | 10 | 55 | 210 |
| Total Volume | 20 | 108 | 62 | 190 | 96 | 273 | 23 | 392 | 18 | 65 | 26 | 109 | 10 | 143 | 25 | 178 | 869 |
| % App. Total | 10.5 | 56.8 | 32.6 | | 24.5 | 69.6 | 5.9 | | 16.5 | 59.6 | 23.9 | | 5.6 | 80.3 | 14 | | |
| PHF | .833 | .818 | .674 | .931 | .774 | .813 | .523 | .899 | .450 | .650 | .591 | .779 | .833 | .777 | .625 | .809 | .957 |

# Wilson Okamoto Corporation

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

Counted By: EV, YS
Counters: D4-5675, D4-3889
Weather: CLEAR

File Name : QUE KAM PM
Site Code : 00000003
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Queen Street Westbound | | | | | Kamakee Street Northbound | | | | | Queen 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 |
| 03:00 PM | 15 | 34 | 14 | 9 | 72 | 42 | 41 | 3 | 0 | 86 | 7 | 16 | 26 | 18 | 67 | 4 | 52 | 12 | 7 | 75 | 300 |
| 03:15 PM | 13 | 31 | 15 | 10 | 69 | 36 | 36 | 6 | 1 | 79 | 6 | 28 | 9 | 16 | 59 | 12 | 62 | 13 | 9 | 96 | 303 |
| 03:30 PM | 11 | 29 | 8 | 11 | 59 | 36 | 53 | 8 | 2 | 99 | 5 | 16 | 12 | 10 | 43 | 8 | 51 | 12 | 11 | 82 | 283 |
| 03:45 PM | 9 | 18 | 7 | 2 | 36 | 28 | 59 | 5 | 1 | 93 | 1 | 36 | 17 | 4 | 58 | 11 | 60 | 6 | 10 | 87 | 274 |
| Total | 48 | 112 | 44 | 32 | 236 | 142 | 189 | 22 | 4 | 357 | 19 | 96 | 64 | 48 | 227 | 35 | 225 | 43 | 37 | 340 | 1160 |
| 04:00 PM | 8 | 27 | 7 | 6 | 48 | 30 | 59 | 10 | 0 | 99 | 2 | 17 | 16 | 5 | 40 | 10 | 84 | 15 | 13 | 122 | 309 |
| 04:15 PM | 12 | 21 | 6 | 5 | 44 | 38 | 74 | 11 | 2 | 125 | 4 | 20 | 16 | 7 | 47 | 6 | 59 | 7 | 13 | 85 | 301 |
| 04:30 PM | 14 | 30 | 3 | 4 | 51 | 36 | 41 | 10 | 1 | 88 | 3 | 25 | 10 | 15 | 53 | 15 | 89 | 15 | 21 | 140 | 332 |
| 04:45 PM | 12 | 23 | 5 | 4 | 44 | 40 | 82 | 10 | 1 | 133 | 4 | 23 | 12 | 9 | 48 | 6 | 98 | 12 | 7 | 123 | 348 |
| Total | 46 | 101 | 21 | 19 | 187 | 144 | 256 | 41 | 4 | 445 | 13 | 85 | 54 | 36 | 188 | 37 | 330 | 49 | 54 | 470 | 1290 |
| 05:00 PM | 17 | 29 | 8 | 6 | 60 | 37 | 75 | 9 | 2 | 123 | 5 | 20 | 15 | 20 | 60 | 10 | 88 | 8 | 22 | 128 | 371 |
| 05:15 PM | 14 | 19 | 6 | 2 | 41 | 41 | 71 | 14 | 3 | 129 | 8 | 27 | 11 | 13 | 59 | 12 | 93 | 21 | 12 | 138 | 367 |
| 05:30 PM | 17 | 36 | 9 | 3 | 65 | 26 | 68 | 3 | 2 | 99 | 4 | 21 | 7 | 4 | 36 | 9 | 94 | 15 | 15 | 133 | 333 |
| 05:45 PM | 12 | 41 | 5 | 6 | 64 | 30 | 62 | 3 | 1 | 96 | 2 | 33 | 5 | 5 | 45 | 11 | 87 | 18 | 12 | 128 | 333 |
| Total | 60 | 125 | 28 | 17 | 230 | 134 | 276 | 29 | 8 | 447 | 19 | 101 | 38 | 42 | 200 | 42 | 362 | 62 | 61 | 527 | 1404 |
| Grand Total | 154 | 338 | 93 | 68 | 653 | 420 | 721 | 92 | 16 | 1249 | 51 | 282 | 156 | 126 | 615 | 114 | 917 | 154 | 152 | 1337 | 3854 |
| Apprch % | 23.6 | 51.8 | 14.2 | 10.4 | | 33.6 | 57.7 | 7.4 | 1.3 | | 8.3 | 45.9 | 25.4 | 20.5 | | 8.5 | 68.6 | 11.5 | 11.4 | | |
| Total % | 4 | 8.8 | 2.4 | 1.8 | 16.9 | 10.9 | 18.7 | 2.4 | 0.4 | 32.4 | 1.3 | 7.3 | 4 | 3.3 | 16 | 3 | 23.8 | 4 | 3.9 | 34.7 | |

| | Kamakee Street Southbound | | | | Queen Street Westbound | | | | Kamakee Street Northbound | | | | Queen 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 12 | 23 | 5 | 40 | 40 | 82 | 10 | 132 | 4 | 23 | 12 | 39 | 6 | 98 | 12 | 116 | 327 |
| 05:00 PM | 17 | 29 | 8 | 54 | 37 | 75 | 9 | 121 | 5 | 20 | 15 | 40 | 10 | 88 | 8 | 106 | 321 |
| 05:15 PM | 14 | 19 | 6 | 39 | 41 | 71 | 14 | 126 | 8 | 27 | 11 | 46 | 12 | 93 | 21 | 126 | 337 |
| 05:30 PM | 17 | 36 | 9 | 62 | 26 | 68 | 3 | 97 | 4 | 21 | 7 | 32 | 9 | 94 | 15 | 118 | 309 |
| Total Volume | 60 | 107 | 28 | 195 | 144 | 296 | 36 | 476 | 21 | 91 | 45 | 157 | 37 | 373 | 56 | 466 | 1294 |
| % App. Total | 30.8 | 54.9 | 14.4 | | 30.3 | 62.2 | 7.6 | | 13.4 | 58 | 28.7 | | 7.9 | 80 | 12 | | |
| PHF | .882 | .743 | .778 | .786 | .878 | .902 | .643 | .902 | .656 | .843 | .750 | .853 | .771 | .952 | .667 | .925 | .960 |

# Wilson Okamoto Corporation

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

Counted By: DY
Counters: D4-5671
Weather: CLEAR

File Name : QUE QUE AM
Site Code : 00000004
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Queen Street Westbound | | | Queens Lane Northbound | | | | Queen Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | Peds | App. Total | Thru | Right | App. Total | Int. Total |
| 06:00 AM | 1 | 22 | 23 | 0 | 5 | 5 | 10 | 19 | 2 | 21 | 54 |
| 06:15 AM | 10 | 26 | 36 | 2 | 4 | 2 | 8 | 12 | 4 | 16 | 60 |
| 06:30 AM | 9 | 28 | 37 | 4 | 7 | 1 | 12 | 16 | 3 | 19 | 68 |
| 06:45 AM | 11 | 38 | 49 | 7 | 11 | 7 | 25 | 19 | 3 | 22 | 96 |
| Total | 31 | 114 | 145 | 13 | 27 | 15 | 55 | 66 | 12 | 78 | 278 |
| 07:00 AM | 9 | 63 | 72 | 4 | 12 | 2 | 18 | 29 | 1 | 30 | 120 |
| 07:15 AM | 16 | 79 | 95 | 10 | 16 | 3 | 29 | 35 | 4 | 39 | 163 |
| 07:30 AM | 20 | 83 | 103 | 3 | 16 | 6 | 25 | 40 | 3 | 43 | 171 |
| 07:45 AM | 30 | 80 | 110 | 12 | 25 | 2 | 39 | 27 | 5 | 32 | 181 |
| Total | 75 | 305 | 380 | 29 | 69 | 13 | 111 | 131 | 13 | 144 | 635 |
| 08:00 AM | 24 | 91 | 115 | 7 | 22 | 1 | 30 | 56 | 2 | 58 | 203 |
| 08:15 AM | 18 | 73 | 91 | 6 | 22 | 3 | 31 | 50 | 3 | 53 | 175 |
| 08:30 AM | 20 | 70 | 90 | 5 | 25 | 2 | 32 | 47 | 5 | 52 | 174 |
| 08:45 AM | 20 | 62 | 82 | 11 | 25 | 6 | 42 | 46 | 3 | 49 | 173 |
| Total | 82 | 296 | 378 | 29 | 94 | 12 | 135 | 199 | 13 | 212 | 725 |
| Grand Total | 188 | 715 | 903 | 71 | 190 | 40 | 301 | 396 | 38 | 434 | 1638 |
| Apprch % | 20.8 | 79.2 | | 23.6 | 63.1 | 13.3 | | 91.2 | 8.8 | | |
| Total % | 11.5 | 43.7 | 55.1 | 4.3 | 11.6 | 2.4 | 18.4 | 24.2 | 2.3 | 26.5 | |

| | Queen Street Westbound | | | Queens Lane Northbound | | | Queen Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | |
| 07:45 AM | 30 | 80 | 110 | 12 | 25 | 37 | 27 | 5 | 32 | 179 |
| 08:00 AM | 24 | 91 | 115 | 7 | 22 | 29 | 56 | 2 | 58 | 202 |
| 08:15 AM | 18 | 73 | 91 | 6 | 22 | 28 | 50 | 3 | 53 | 172 |
| 08:30 AM | 20 | 70 | 90 | 5 | 25 | 30 | 47 | 5 | 52 | 172 |
| Total Volume | 92 | 314 | 406 | 30 | 94 | 124 | 180 | 15 | 195 | 725 |
| % App. Total | 22.7 | 77.3 | | 24.2 | 75.8 | | 92.3 | 7.7 | | |
| PHF | .767 | .863 | .883 | .625 | .940 | .838 | .804 | .750 | .841 | .897 |

# Wilson Okamoto Corporation

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

Counted By: DY
Counters: D4-5671
Weather: CLEAR

File Name : QUE QUE PM
Site Code : 00000004
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Queen Street Westbound | | | Queens Lane Northbound | | | | Queen Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | Peds | App. Total | Thru | Right | App. Total | Int. Total |
| 03:00 PM | 28 | 108 | 136 | 8 | 41 | 6 | 55 | 94 | 11 | 105 | 296 |
| 03:15 PM | 24 | 106 | 130 | 6 | 42 | 11 | 59 | 103 | 14 | 117 | 306 |
| 03:30 PM | 28 | 126 | 154 | 9 | 50 | 8 | 67 | 88 | 8 | 96 | 317 |
| 03:45 PM | 21 | 106 | 127 | 3 | 39 | 3 | 45 | 90 | 7 | 97 | 269 |
| Total | 101 | 446 | 547 | 26 | 172 | 28 | 226 | 375 | 40 | 415 | 1188 |
| 04:00 PM | 24 | 99 | 123 | 12 | 37 | 3 | 52 | 120 | 12 | 132 | 307 |
| 04:15 PM | 33 | 113 | 146 | 22 | 70 | 6 | 98 | 98 | 7 | 105 | 349 |
| 04:30 PM | 40 | 111 | 151 | 5 | 44 | 6 | 55 | 123 | 11 | 134 | 340 |
| 04:45 PM | 23 | 130 | 153 | 11 | 62 | 7 | 80 | 132 | 15 | 147 | 380 |
| Total | 120 | 453 | 573 | 50 | 213 | 22 | 285 | 473 | 45 | 518 | 1376 |
| 05:00 PM | 25 | 115 | 140 | 15 | 54 | 8 | 77 | 143 | 12 | 155 | 372 |
| 05:15 PM | 26 | 100 | 126 | 13 | 59 | 6 | 78 | 139 | 10 | 149 | 353 |
| 05:30 PM | 27 | 93 | 120 | 12 | 48 | 7 | 67 | 115 | 16 | 131 | 318 |
| 05:45 PM | 33 | 100 | 133 | 16 | 53 | 11 | 80 | 108 | 18 | 126 | 339 |
| Total | 111 | 408 | 519 | 56 | 214 | 32 | 302 | 505 | 56 | 561 | 1382 |
| Grand Total | 332 | 1307 | 1639 | 132 | 599 | 82 | 813 | 1353 | 141 | 1494 | 3946 |
| Apprch % | 20.3 | 79.7 | | 16.2 | 73.7 | 10.1 | | 90.6 | 9.4 | | |
| Total % | 8.4 | 33.1 | 41.5 | 3.3 | 15.2 | 2.1 | 20.6 | 34.3 | 3.6 | 37.9 | |

| | Queen Street Westbound | | | Queens Lane Northbound | | | Queen Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | |
| 04:30 PM | 40 | 111 | 151 | 5 | 44 | 49 | 123 | 11 | 134 | 334 |
| 04:45 PM | 23 | 130 | 153 | 11 | 62 | 73 | 132 | 15 | 147 | 373 |
| 05:00 PM | 25 | 115 | 140 | 15 | 54 | 69 | 143 | 12 | 155 | 364 |
| 05:15 PM | 26 | 100 | 126 | 13 | 59 | 72 | 139 | 10 | 149 | 347 |
| Total Volume | 114 | 456 | 570 | 44 | 219 | 263 | 537 | 48 | 585 | 1418 |
| % App. Total | 20 | 80 | | 16.7 | 83.3 | | 91.8 | 8.2 | | |
| PHF | .713 | .877 | .931 | .733 | .883 | .901 | .939 | .800 | .944 | .950 |

# Wilson Okamoto Corporation

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

Counted By: WL
Counters: D4-3890
Weather: CLEAR

File Name : AUA QUE QUE AM
Site Code : 00000005
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Queens Lane Southbound | | | | | Auahi Street Westbound | | Queen Street Northbound | | | | | Auahi Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 1 | 3 | 2 | 3 | 9 | 2 | 2 | 3 | 4 | 0 | 3 | 10 | 2 | 0 | 5 | 5 | 12 | 33 |
| 06:15 AM | 0 | 5 | 7 | 2 | 14 | 5 | 5 | 5 | 1 | 0 | 4 | 10 | 1 | 0 | 3 | 9 | 13 | 42 |
| 06:30 AM | 1 | 7 | 6 | 4 | 18 | 9 | 9 | 6 | 8 | 2 | 6 | 22 | 3 | 0 | 1 | 13 | 17 | 66 |
| 06:45 AM | 3 | 1 | 5 | 1 | 10 | 7 | 7 | 10 | 10 | 0 | 5 | 25 | 6 | 0 | 2 | 11 | 19 | 61 |
| Total | 5 | 16 | 20 | 10 | 51 | 23 | 23 | 24 | 23 | 2 | 18 | 67 | 12 | 0 | 11 | 38 | 61 | 202 |
| 07:00 AM | 0 | 5 | 6 | 3 | 14 | 8 | 8 | 9 | 12 | 2 | 2 | 25 | 4 | 1 | 5 | 14 | 24 | 71 |
| 07:15 AM | 1 | 10 | 9 | 1 | 21 | 2 | 2 | 8 | 11 | 1 | 2 | 22 | 6 | 1 | 3 | 13 | 23 | 68 |
| 07:30 AM | 1 | 11 | 9 | 7 | 28 | 9 | 9 | 21 | 14 | 0 | 5 | 40 | 6 | 0 | 6 | 19 | 31 | 108 |
| 07:45 AM | 2 | 12 | 16 | 1 | 31 | 3 | 3 | 17 | 24 | 0 | 3 | 44 | 9 | 1 | 2 | 12 | 24 | 102 |
| Total | 4 | 38 | 40 | 12 | 94 | 22 | 22 | 55 | 61 | 3 | 12 | 131 | 25 | 3 | 16 | 58 | 102 | 349 |
| 08:00 AM | 2 | 7 | 14 | 5 | 28 | 6 | 6 | 18 | 13 | 0 | 1 | 32 | 12 | 1 | 8 | 17 | 38 | 104 |
| 08:15 AM | 1 | 9 | 10 | 5 | 25 | 2 | 2 | 19 | 18 | 2 | 2 | 41 | 14 | 0 | 6 | 24 | 44 | 112 |
| 08:30 AM | 0 | 9 | 15 | 12 | 36 | 10 | 10 | 19 | 15 | 5 | 8 | 47 | 13 | 2 | 6 | 18 | 39 | 132 |
| 08:45 AM | 3 | 9 | 5 | 6 | 23 | 6 | 6 | 14 | 14 | 1 | 8 | 37 | 12 | 0 | 12 | 26 | 50 | 116 |
| Total | 6 | 34 | 44 | 28 | 112 | 24 | 24 | 70 | 60 | 8 | 19 | 157 | 51 | 3 | 32 | 85 | 171 | 464 |
| Grand Total | 15 | 88 | 104 | 50 | 257 | 69 | 69 | 149 | 144 | 13 | 49 | 355 | 88 | 6 | 59 | 181 | 334 | 1015 |
| Apprch % | 5.8 | 34.2 | 40.5 | 19.5 | | 100 | | 42 | 40.6 | 3.7 | 13.8 | | 26.3 | 1.8 | 17.7 | 54.2 | | |
| Total % | 1.5 | 8.7 | 10.2 | 4.9 | 25.3 | 6.8 | 6.8 | 14.7 | 14.2 | 1.3 | 4.8 | 35 | 8.7 | 0.6 | 5.8 | 17.8 | 32.9 | |

| | Queens Lane Southbound | | | | Westbound | Queen Street Northbound | | | | Auahi Street 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 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | |
| 07:45 AM | 2 | 12 | 16 | 30 | 0 | 17 | 24 | 0 | 41 | 9 | 1 | 2 | 12 | 83 |
| 08:00 AM | 2 | 7 | 14 | 23 | 0 | 18 | 13 | 0 | 31 | 12 | 1 | 8 | 21 | 75 |
| 08:15 AM | 1 | 9 | 10 | 20 | 0 | 19 | 18 | 2 | 39 | 14 | 0 | 6 | 20 | 79 |
| 08:30 AM | 0 | 9 | 15 | 24 | 0 | 19 | 15 | 5 | 39 | 13 | 2 | 6 | 21 | 84 |
| Total Volume | 5 | 37 | 55 | 97 | 0 | 73 | 70 | 7 | 150 | 48 | 4 | 22 | 74 | 321 |
| % App. Total | 5.2 | 38.1 | 56.7 | | | 48.7 | 46.7 | 4.7 | | 64.9 | 5.4 | 29.7 | | |
| PHF | .625 | .771 | .859 | .808 | .000 | .961 | .729 | .350 | .915 | .857 | .500 | .688 | .881 | .955 |

# Wilson Okamoto Corporation

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

Counted By: WL
Counters: D4-3890
Weather: CLEAR

File Name : AUA QUE QUE PM
Site Code : 00000005
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Queens Lane Southbound | | | | | Auahi Street Westbound | | Queen Street Northbound | | | | | Auahi Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 3 | 21 | 17 | 22 | 63 | 7 | 7 | 32 | 21 | 2 | 22 | 77 | 24 | 9 | 12 | 21 | 66 | 213 |
| 03:15 PM | 4 | 16 | 17 | 11 | 48 | 1 | 1 | 30 | 20 | 4 | 16 | 70 | 22 | 4 | 12 | 21 | 59 | 178 |
| 03:30 PM | 1 | 16 | 21 | 11 | 49 | 6 | 6 | 20 | 16 | 2 | 8 | 46 | 38 | 4 | 20 | 16 | 78 | 179 |
| 03:45 PM | 1 | 8 | 18 | 19 | 46 | 23 | 23 | 26 | 18 | 1 | 7 | 52 | 14 | 2 | 26 | 15 | 57 | 178 |
| Total | 9 | 61 | 73 | 63 | 206 | 37 | 37 | 108 | 75 | 9 | 53 | 245 | 98 | 19 | 70 | 73 | 260 | 748 |
| 04:00 PM | 1 | 22 | 10 | 20 | 53 | 7 | 7 | 17 | 17 | 1 | 4 | 39 | 31 | 3 | 16 | 16 | 66 | 165 |
| 04:15 PM | 0 | 22 | 16 | 25 | 63 | 21 | 21 | 28 | 37 | 4 | 17 | 86 | 36 | 3 | 23 | 44 | 106 | 276 |
| 04:30 PM | 1 | 21 | 25 | 20 | 67 | 23 | 23 | 36 | 14 | 2 | 9 | 61 | 27 | 5 | 20 | 38 | 90 | 241 |
| 04:45 PM | 2 | 14 | 18 | 14 | 48 | 21 | 21 | 37 | 30 | 5 | 18 | 90 | 27 | 4 | 22 | 32 | 85 | 244 |
| Total | 4 | 79 | 69 | 79 | 231 | 72 | 72 | 118 | 98 | 12 | 48 | 276 | 121 | 15 | 81 | 130 | 347 | 926 |
| 05:00 PM | 2 | 17 | 21 | 22 | 62 | 16 | 16 | 26 | 27 | 2 | 13 | 68 | 35 | 1 | 25 | 33 | 94 | 240 |
| 05:15 PM | 1 | 23 | 14 | 16 | 54 | 23 | 23 | 20 | 36 | 3 | 6 | 65 | 27 | 1 | 37 | 28 | 93 | 235 |
| 05:30 PM | 0 | 26 | 19 | 12 | 57 | 16 | 16 | 26 | 18 | 5 | 18 | 67 | 34 | 4 | 28 | 29 | 95 | 235 |
| 05:45 PM | 0 | 20 | 27 | 30 | 77 | 22 | 22 | 26 | 23 | 0 | 11 | 60 | 37 | 0 | 29 | 30 | 96 | 255 |
| Total | 3 | 86 | 81 | 80 | 250 | 77 | 77 | 98 | 104 | 10 | 48 | 260 | 133 | 6 | 119 | 120 | 378 | 965 |
| Grand Total | 16 | 226 | 223 | 222 | 687 | 186 | 186 | 324 | 277 | 31 | 149 | 781 | 352 | 40 | 270 | 323 | 985 | 2639 |
| Apprch % | 2.3 | 32.9 | 32.5 | 32.3 | | 100 | | 41.5 | 35.5 | 4 | 19.1 | | 35.7 | 4.1 | 27.4 | 32.8 | | |
| Total % | 0.6 | 8.6 | 8.5 | 8.4 | 26 | 7 | 7 | 12.3 | 10.5 | 1.2 | 5.6 | 29.6 | 13.3 | 1.5 | 10.2 | 12.2 | 37.3 | |

| | Queens Lane Southbound | | | | Westbound | Queen Street Northbound | | | | Auahi Street 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | |
| 05:00 PM | 2 | 17 | 21 | 40 | 0 | 26 | 27 | 2 | 55 | 35 | 1 | 25 | 61 | 156 |
| 05:15 PM | 1 | 23 | 14 | 38 | 0 | 20 | 36 | 3 | 59 | 27 | 1 | 37 | 65 | 162 |
| 05:30 PM | 0 | 26 | 19 | 45 | 0 | 26 | 18 | 5 | 49 | 34 | 4 | 28 | 66 | 160 |
| 05:45 PM | 0 | 20 | 27 | 47 | 0 | 26 | 23 | 0 | 49 | 37 | 0 | 29 | 66 | 162 |
| Total Volume | 3 | 86 | 81 | 170 | 0 | 98 | 104 | 10 | 212 | 133 | 6 | 119 | 258 | 640 |
| % App. Total | 1.8 | 50.6 | 47.6 | | | 46.2 | 49.1 | 4.7 | | 51.6 | 2.3 | 46.1 | | |
| PHF | .375 | .827 | .750 | .904 | .000 | .942 | .722 | .500 | .898 | .899 | .375 | .804 | .977 | .988 |

# Wilson Okamoto Corporation

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

Counted By: MM
Counters: D4-5677
Weather: CLEAR

File Name : AUA MID AM
Site Code : 00000006
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Parking Garage Southbound | | | | Auahi Street Westbound | | | Parking Garage Exit Northbound | | | | | Auahi Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Int. Total |
| 06:00 AM | 0 | 0 | 8 | 8 | 4 | 0 | 4 | 0 | 0 | 0 | 2 | 2 | 3 | 6 | 0 | 9 | 23 |
| 06:15 AM | 0 | 2 | 0 | 2 | 7 | 0 | 7 | 0 | 1 | 0 | 5 | 6 | 1 | 4 | 2 | 7 | 22 |
| 06:30 AM | 0 | 1 | 9 | 10 | 9 | 0 | 9 | 0 | 0 | 0 | 2 | 2 | 0 | 6 | 2 | 8 | 29 |
| 06:45 AM | 0 | 0 | 5 | 5 | 12 | 4 | 16 | 0 | 0 | 0 | 1 | 1 | 1 | 7 | 1 | 9 | 31 |
| Total | 0 | 3 | 22 | 25 | 32 | 4 | 36 | 0 | 1 | 0 | 10 | 11 | 5 | 23 | 5 | 33 | 105 |
| 07:00 AM | 0 | 2 | 5 | 7 | 14 | 1 | 15 | 0 | 0 | 0 | 4 | 4 | 3 | 11 | 0 | 14 | 40 |
| 07:15 AM | 0 | 5 | 9 | 14 | 16 | 0 | 16 | 1 | 0 | 0 | 2 | 3 | 3 | 11 | 4 | 18 | 51 |
| 07:30 AM | 1 | 3 | 7 | 11 | 24 | 4 | 28 | 3 | 0 | 0 | 3 | 6 | 0 | 10 | 3 | 13 | 58 |
| 07:45 AM | 1 | 2 | 5 | 8 | 27 | 4 | 31 | 3 | 0 | 0 | 2 | 5 | 4 | 11 | 4 | 19 | 63 |
| Total | 2 | 12 | 26 | 40 | 81 | 9 | 90 | 7 | 0 | 0 | 11 | 18 | 10 | 43 | 11 | 64 | 212 |
| 08:00 AM | 0 | 2 | 11 | 13 | 22 | 6 | 28 | 0 | 0 | 3 | 6 | 9 | 7 | 18 | 4 | 29 | 79 |
| 08:15 AM | 0 | 4 | 9 | 13 | 21 | 10 | 31 | 1 | 1 | 4 | 7 | 13 | 10 | 18 | 6 | 34 | 91 |
| 08:30 AM | 0 | 4 | 7 | 11 | 26 | 5 | 31 | 2 | 0 | 4 | 10 | 16 | 7 | 20 | 5 | 32 | 90 |
| 08:45 AM | 2 | 3 | 13 | 18 | 15 | 5 | 20 | 4 | 1 | 3 | 3 | 11 | 2 | 21 | 2 | 25 | 74 |
| Total | 2 | 13 | 40 | 55 | 84 | 26 | 110 | 7 | 2 | 14 | 26 | 49 | 26 | 77 | 17 | 120 | 334 |
| Grand Total | 4 | 28 | 88 | 120 | 197 | 39 | 236 | 14 | 3 | 14 | 47 | 78 | 41 | 143 | 33 | 217 | 651 |
| Apprch % | 3.3 | 23.3 | 73.3 | | 83.5 | 16.5 | | 17.9 | 3.8 | 17.9 | 60.3 | | 18.9 | 65.9 | 15.2 | | |
| Total % | 0.6 | 4.3 | 13.5 | 18.4 | 30.3 | 6 | 36.3 | 2.2 | 0.5 | 2.2 | 7.2 | 12 | 6.3 | 22 | 5.1 | 33.3 | |

| | Parking Garage Southbound | | | Auahi Street Westbound | | | Parking Garage Exit Northbound | | | | Auahi Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | | | | | |
| 08:00 AM | 0 | 2 | 2 | 22 | 6 | 28 | 0 | 0 | 3 | 3 | 7 | 18 | 25 | 58 |
| 08:15 AM | 0 | 4 | 4 | 21 | 10 | 31 | 1 | 1 | 4 | 6 | 10 | 18 | 28 | 69 |
| 08:30 AM | 0 | 4 | 4 | 26 | 5 | 31 | 2 | 0 | 4 | 6 | 7 | 20 | 27 | 68 |
| 08:45 AM | 2 | 3 | 5 | 15 | 5 | 20 | 4 | 1 | 3 | 8 | 2 | 21 | 23 | 56 |
| Total Volume | 2 | 13 | 15 | 84 | 26 | 110 | 7 | 2 | 14 | 23 | 26 | 77 | 103 | 251 |
| % App. Total | 13.3 | 86.7 | | 76.4 | 23.6 | | 30.4 | 8.7 | 60.9 | | 25.2 | 74.8 | | |
| PHF | .250 | .813 | .750 | .808 | .650 | .887 | .438 | .500 | .875 | .719 | .650 | .917 | .920 | .909 |

# Wilson Okamoto Corporation

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

Counted By: BB
Counters: D4-5677
Weather: CLEAR

File Name : AUA MID PM
Site Code : 00000006
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted

| | Parking Garage Southbound | | | | Auahi Street Westbound | | | Parking Garage Exit Northbound | | | | | Auahi Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Int. Total |
| 03:00 PM | 0 | 6 | 28 | 34 | 29 | 13 | 42 | 15 | 0 | 10 | 11 | 36 | 18 | 33 | 35 | 86 | 198 |
| 03:15 PM | 2 | 11 | 31 | 44 | 41 | 9 | 50 | 16 | 0 | 13 | 30 | 59 | 13 | 23 | 28 | 64 | 217 |
| 03:30 PM | 1 | 7 | 29 | 37 | 41 | 4 | 45 | 9 | 3 | 17 | 16 | 45 | 18 | 35 | 25 | 78 | 205 |
| 03:45 PM | 0 | 8 | 24 | 32 | 29 | 8 | 37 | 16 | 1 | 12 | 12 | 41 | 16 | 32 | 33 | 81 | 191 |
| Total | 3 | 32 | 112 | 147 | 140 | 34 | 174 | 56 | 4 | 52 | 69 | 181 | 65 | 123 | 121 | 309 | 811 |
| 04:00 PM | 1 | 7 | 32 | 40 | 21 | 7 | 28 | 14 | 4 | 20 | 12 | 50 | 9 | 24 | 38 | 71 | 189 |
| 04:15 PM | 1 | 8 | 34 | 43 | 38 | 12 | 50 | 11 | 1 | 20 | 14 | 46 | 15 | 43 | 42 | 100 | 239 |
| 04:30 PM | 1 | 5 | 39 | 45 | 48 | 16 | 64 | 15 | 1 | 10 | 14 | 40 | 22 | 39 | 50 | 111 | 260 |
| 04:45 PM | 2 | 9 | 40 | 51 | 46 | 10 | 56 | 12 | 1 | 10 | 11 | 34 | 7 | 36 | 28 | 71 | 212 |
| Total | 5 | 29 | 145 | 179 | 153 | 45 | 198 | 52 | 7 | 60 | 51 | 170 | 53 | 142 | 158 | 353 | 900 |
| 05:00 PM | 1 | 11 | 13 | 25 | 34 | 10 | 44 | 13 | 0 | 13 | 10 | 36 | 10 | 40 | 36 | 86 | 191 |
| 05:15 PM | 5 | 7 | 31 | 43 | 28 | 6 | 34 | 12 | 1 | 11 | 2 | 26 | 4 | 46 | 27 | 77 | 180 |
| 05:30 PM | 2 | 4 | 40 | 46 | 30 | 10 | 40 | 13 | 3 | 10 | 19 | 45 | 16 | 47 | 37 | 100 | 231 |
| 05:45 PM | 4 | 10 | 45 | 59 | 44 | 14 | 58 | 8 | 2 | 17 | 16 | 43 | 14 | 42 | 31 | 87 | 247 |
| Total | 12 | 32 | 129 | 173 | 136 | 40 | 176 | 46 | 6 | 51 | 47 | 150 | 44 | 175 | 131 | 350 | 849 |
| Grand Total | 20 | 93 | 386 | 499 | 429 | 119 | 548 | 154 | 17 | 163 | 167 | 501 | 162 | 440 | 410 | 1012 | 2560 |
| Apprch % | 4 | 18.6 | 77.4 | | 78.3 | 21.7 | | 30.7 | 3.4 | 32.5 | 33.3 | | 16 | 43.5 | 40.5 | | |
| Total % | 0.8 | 3.6 | 15.1 | 19.5 | 16.8 | 4.6 | 21.4 | 6 | 0.7 | 6.4 | 6.5 | 19.6 | 6.3 | 17.2 | 16 | 39.5 | |

| | Parking Garage Southbound | | | Auahi Street Westbound | | | Parking Garage Exit Northbound | | | | Auahi Street Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | |
| 04:15 PM | 1 | 8 | 9 | 38 | 12 | 50 | 11 | 1 | 20 | 32 | 15 | 43 | 58 | 149 |
| 04:30 PM | 1 | 5 | 6 | 48 | 16 | 64 | 15 | 1 | 10 | 26 | 22 | 39 | 61 | 157 |
| 04:45 PM | 2 | 9 | 11 | 46 | 10 | 56 | 12 | 1 | 10 | 23 | 7 | 36 | 43 | 133 |
| 05:00 PM | 1 | 11 | 12 | 34 | 10 | 44 | 13 | 0 | 13 | 26 | 10 | 40 | 50 | 132 |
| Total Volume | 5 | 33 | 38 | 166 | 48 | 214 | 51 | 3 | 53 | 107 | 54 | 158 | 212 | 571 |
| % App. Total | 13.2 | 86.8 | | 77.6 | 22.4 | | 47.7 | 2.8 | 49.5 | | 25.5 | 74.5 | | |
| PHF | .625 | .750 | .792 | .865 | .750 | .836 | .850 | .750 | .663 | .836 | .614 | .919 | .869 | .909 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5677, D4-5673
Weather: CLEAR

File Name : ALA KAM AM
Site Code : 00000001
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Ala Moana Park Drive Northbound | | | | | Ala Moana Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 AM | 1 | 3 | 6 | 4 | 14 | 1 | 176 | 3 | 11 | 191 | 4 | 1 | 0 | 1 | 6 | 7 | 194 | 19 | 220 | 431 |
| 06:15 AM | 5 | 9 | 7 | 4 | 25 | 0 | 148 | 6 | 4 | 158 | 5 | 20 | 1 | 3 | 29 | 9 | 191 | 14 | 214 | 426 |
| 06:30 AM | 2 | 3 | 13 | 3 | 21 | 1 | 276 | 9 | 8 | 294 | 4 | 1 | 4 | 5 | 14 | 12 | 258 | 21 | 291 | 620 |
| 06:45 AM | 8 | 6 | 13 | 4 | 31 | 2 | 301 | 7 | 10 | 320 | 8 | 0 | 2 | 5 | 15 | 22 | 351 | 24 | 397 | 763 |
| Total | 16 | 21 | 39 | 15 | 91 | 4 | 901 | 25 | 33 | 963 | 21 | 22 | 7 | 14 | 64 | 50 | 994 | 78 | 1122 | 2240 |
| 07:00 AM | 5 | 1 | 22 | 9 | 37 | 3 | 371 | 8 | 14 | 396 | 9 | 6 | 2 | 4 | 21 | 13 | 359 | 19 | 391 | 845 |
| 07:15 AM | 8 | 7 | 23 | 5 | 43 | 2 | 432 | 14 | 15 | 463 | 22 | 2 | 3 | 4 | 31 | 20 | 381 | 15 | 416 | 953 |
| 07:30 AM | 5 | 4 | 19 | 7 | 35 | 5 | 417 | 4 | 20 | 446 | 26 | 6 | 2 | 7 | 41 | 16 | 355 | 26 | 397 | 919 |
| 07:45 AM | 2 | 8 | 21 | 12 | 43 | 2 | 431 | 16 | 13 | 462 | 19 | 4 | 5 | 5 | 33 | 18 | 322 | 20 | 360 | 898 |
| Total | 20 | 20 | 85 | 33 | 158 | 12 | 1651 | 42 | 62 | 1767 | 76 | 18 | 12 | 20 | 126 | 67 | 1417 | 80 | 1564 | 3615 |
| 08:00 AM | 7 | 8 | 32 | 3 | 50 | 3 | 426 | 11 | 7 | 447 | 15 | 8 | 3 | 2 | 28 | 14 | 367 | 23 | 404 | 929 |
| 08:15 AM | 3 | 7 | 26 | 4 | 40 | 3 | 318 | 3 | 7 | 331 | 13 | 5 | 6 | 6 | 30 | 14 | 318 | 24 | 356 | 757 |
| 08:30 AM | 6 | 12 | 18 | 6 | 42 | 6 | 335 | 6 | 9 | 356 | 19 | 6 | 2 | 5 | 32 | 20 | 323 | 25 | 368 | 798 |
| 08:45 AM | 3 | 8 | 31 | 7 | 49 | 2 | 274 | 4 | 9 | 289 | 19 | 2 | 6 | 2 | 29 | 9 | 284 | 22 | 315 | 682 |
| Total | 19 | 35 | 107 | 20 | 181 | 14 | 1353 | 24 | 32 | 1423 | 66 | 21 | 17 | 15 | 119 | 57 | 1292 | 94 | 1443 | 3166 |
| Grand Total | 55 | 76 | 231 | 68 | 430 | 30 | 3905 | 91 | 127 | 4153 | 163 | 61 | 36 | 49 | 309 | 174 | 3703 | 252 | 4129 | 9021 |
| Apprch % | 12.8 | 17.7 | 53.7 | 15.8 | | 0.7 | 94 | 2.2 | 3.1 | | 52.8 | 19.7 | 11.7 | 15.9 | | 4.2 | 89.7 | 6.1 | | |
| Total % | 0.6 | 0.8 | 2.6 | 0.8 | 4.8 | 0.3 | 43.3 | 1 | 1.4 | 46 | 1.8 | 0.7 | 0.4 | 0.5 | 3.4 | 1.9 | 41 | 2.8 | 45.8 | |

| | Kamakee Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Ala Moana Park Drive Northbound | | | | Ala Moana Boulevard 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 8 | 7 | 23 | 38 | 2 | 432 | 14 | 448 | 22 | 2 | 3 | 27 | 20 | 381 | 15 | 416 | 929 |
| 07:30 AM | 5 | 4 | 19 | 28 | 5 | 417 | 4 | 426 | 26 | 6 | 2 | 34 | 16 | 355 | 26 | 397 | 885 |
| 07:45 AM | 2 | 8 | 21 | 31 | 2 | 431 | 16 | 449 | 19 | 4 | 5 | 28 | 18 | 322 | 20 | 360 | 868 |
| 08:00 AM | 7 | 8 | 32 | 47 | 3 | 426 | 11 | 440 | 15 | 8 | 3 | 26 | 14 | 367 | 23 | 404 | 917 |
| Total Volume | 22 | 27 | 95 | 144 | 12 | 1706 | 45 | 1763 | 82 | 20 | 13 | 115 | 68 | 1425 | 84 | 1577 | 3599 |
| % App. Total | 15.3 | 18.8 | 66 | | 0.7 | 96.8 | 2.6 | | 71.3 | 17.4 | 11.3 | | 4.3 | 90.4 | 5.3 | | |
| PHF | .688 | .844 | .742 | .766 | .600 | .987 | .703 | .982 | .788 | .625 | .650 | .846 | .850 | .935 | .808 | .948 | .969 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5677, D4-5673
Weather: CLEAR

File Name : ALA KAM PM
Site Code : 00000001
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee Street Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Ala Moana Park Drive Northbound | | | | | Ala Moana Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 03:00 PM | 17 | 12 | 26 | 12 | 67 | 7 | 318 | 14 | 30 | 369 | 12 | 5 | 5 | 9 | 31 | 22 | 405 | 29 | 456 | 923 |
| 03:15 PM | 11 | 5 | 45 | 3 | 64 | 15 | 330 | 10 | 8 | 363 | 20 | 1 | 11 | 13 | 45 | 13 | 496 | 33 | 542 | 1014 |
| 03:30 PM | 10 | 13 | 35 | 14 | 72 | 6 | 317 | 13 | 22 | 358 | 21 | 9 | 4 | 12 | 46 | 21 | 456 | 43 | 520 | 996 |
| 03:45 PM | 12 | 10 | 30 | 14 | 66 | 7 | 317 | 17 | 13 | 354 | 21 | 7 | 9 | 11 | 48 | 12 | 486 | 45 | 543 | 1011 |
| Total | 50 | 40 | 136 | 43 | 269 | 35 | 1282 | 54 | 73 | 1444 | 74 | 22 | 29 | 45 | 170 | 68 | 1843 | 150 | 2061 | 3944 |
| 04:00 PM | 5 | 9 | 32 | 9 | 55 | 9 | 344 | 11 | 14 | 378 | 12 | 0 | 11 | 11 | 34 | 16 | 508 | 43 | 567 | 1034 |
| 04:15 PM | 9 | 16 | 30 | 13 | 68 | 7 | 388 | 14 | 14 | 423 | 10 | 5 | 9 | 4 | 28 | 5 | 477 | 40 | 522 | 1041 |
| 04:30 PM | 6 | 13 | 41 | 10 | 70 | 8 | 347 | 24 | 26 | 405 | 18 | 9 | 7 | 11 | 45 | 13 | 528 | 49 | 590 | 1110 |
| 04:45 PM | 17 | 13 | 28 | 3 | 61 | 9 | 333 | 19 | 11 | 372 | 16 | 5 | 15 | 7 | 43 | 13 | 544 | 49 | 606 | 1082 |
| Total | 37 | 51 | 131 | 35 | 254 | 33 | 1412 | 68 | 65 | 1578 | 56 | 19 | 42 | 33 | 150 | 47 | 2057 | 181 | 2285 | 4267 |
| 05:00 PM | 14 | 8 | 43 | 8 | 73 | 7 | 279 | 11 | 13 | 310 | 26 | 11 | 7 | 10 | 54 | 20 | 516 | 42 | 578 | 1015 |
| 05:15 PM | 9 | 11 | 35 | 11 | 66 | 5 | 330 | 18 | 18 | 371 | 11 | 8 | 7 | 9 | 35 | 14 | 532 | 39 | 585 | 1057 |
| 05:30 PM | 8 | 10 | 33 | 9 | 60 | 2 | 322 | 14 | 19 | 357 | 20 | 10 | 10 | 15 | 55 | 18 | 523 | 38 | 579 | 1051 |
| 05:45 PM | 8 | 8 | 43 | 2 | 61 | 5 | 290 | 21 | 29 | 345 | 28 | 8 | 9 | 7 | 52 | 19 | 485 | 26 | 530 | 988 |
| Total | 39 | 37 | 154 | 30 | 260 | 19 | 1221 | 64 | 79 | 1383 | 85 | 37 | 33 | 41 | 196 | 71 | 2056 | 145 | 2272 | 4111 |
| Grand Total | 126 | 128 | 421 | 108 | 783 | 87 | 3915 | 186 | 217 | 4405 | 215 | 78 | 104 | 119 | 516 | 186 | 5956 | 476 | 6618 | 12322 |
| Apprch % | 16.1 | 16.3 | 53.8 | 13.8 | | 2 | 88.9 | 4.2 | 4.9 | | 41.7 | 15.1 | 20.2 | 23.1 | | 2.8 | 90 | 7.2 | | |
| Total % | 1 | 1 | 3.4 | 0.9 | 6.4 | 0.7 | 31.8 | 1.5 | 1.8 | 35.7 | 1.7 | 0.6 | 0.8 | 1 | 4.2 | 1.5 | 48.3 | 3.9 | 53.7 | |

| | Kamakee Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Ala Moana Park Drive Northbound | | | | Ala Moana Boulevard 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 5 | 9 | 32 | 46 | 9 | 344 | 11 | 364 | 12 | 0 | 11 | 23 | 16 | 508 | 43 | 567 | 1000 |
| 04:15 PM | 9 | 16 | 30 | 55 | 7 | 388 | 14 | 409 | 10 | 5 | 9 | 24 | 5 | 477 | 40 | 522 | 1010 |
| 04:30 PM | 6 | 13 | 41 | 60 | 8 | 347 | 24 | 379 | 18 | 9 | 7 | 34 | 13 | 528 | 49 | 590 | 1063 |
| 04:45 PM | 17 | 13 | 28 | 58 | 9 | 333 | 19 | 361 | 16 | 5 | 15 | 36 | 13 | 544 | 49 | 606 | 1061 |
| Total Volume | 37 | 51 | 131 | 219 | 33 | 1412 | 68 | 1513 | 56 | 19 | 42 | 117 | 47 | 2057 | 181 | 2285 | 4134 |
| % App. Total | 16.9 | 23.3 | 59.8 | | 2.2 | 93.3 | 4.5 | | 47.9 | 16.2 | 35.9 | | 2.1 | 90 | 7.9 | | |
| PHF | .544 | .797 | .799 | .913 | .917 | .910 | .708 | .925 | .778 | .528 | .700 | .813 | .734 | .945 | .923 | .943 | .972 |

# Wilson Okamoto Corporation

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

Counted By: LF, WL
Counters: D4-5674, D4-5672
Weather: CLEAR

File Name : ALA QUE AM
Site Code : 00000002
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Queen Street Southbound | | | | Ala Moana Boulevard Westbound | | | Ala Moana Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | App. Total | Left | Thru | Peds | App. Total | Int. Total |
| 06:00 AM | 3 | 4 | 3 | 10 | 182 | 9 | 191 | 2 | 211 | 4 | 217 | 418 |
| 06:15 AM | 4 | 2 | 8 | 14 | 169 | 12 | 181 | 1 | 195 | 9 | 205 | 400 |
| 06:30 AM | 9 | 3 | 4 | 16 | 249 | 12 | 261 | 2 | 260 | 10 | 272 | 549 |
| 06:45 AM | 4 | 1 | 5 | 10 | 294 | 16 | 310 | 0 | 355 | 11 | 366 | 686 |
| Total | 20 | 10 | 20 | 50 | 894 | 49 | 943 | 5 | 1021 | 34 | 1060 | 2053 |
| 07:00 AM | 4 | 7 | 5 | 16 | 356 | 21 | 377 | 4 | 368 | 13 | 385 | 778 |
| 07:15 AM | 7 | 4 | 5 | 16 | 435 | 14 | 449 | 2 | 400 | 5 | 407 | 872 |
| 07:30 AM | 8 | 4 | 5 | 17 | 409 | 23 | 432 | 4 | 361 | 12 | 377 | 826 |
| 07:45 AM | 4 | 5 | 6 | 15 | 440 | 31 | 471 | 6 | 320 | 10 | 336 | 822 |
| Total | 23 | 20 | 21 | 64 | 1640 | 89 | 1729 | 16 | 1449 | 40 | 1505 | 3298 |
| 08:00 AM | 8 | 12 | 7 | 27 | 402 | 29 | 431 | 6 | 373 | 12 | 391 | 849 |
| 08:15 AM | 8 | 8 | 9 | 25 | 307 | 30 | 337 | 3 | 325 | 2 | 330 | 692 |
| 08:30 AM | 8 | 6 | 13 | 27 | 330 | 29 | 359 | 4 | 326 | 9 | 339 | 725 |
| 08:45 AM | 12 | 6 | 8 | 26 | 264 | 24 | 288 | 8 | 270 | 11 | 289 | 603 |
| Total | 36 | 32 | 37 | 105 | 1303 | 112 | 1415 | 21 | 1294 | 34 | 1349 | 2869 |
| Grand Total | 79 | 62 | 78 | 219 | 3837 | 250 | 4087 | 42 | 3764 | 108 | 3914 | 8220 |
| Apprch % | 36.1 | 28.3 | 35.6 | | 93.9 | 6.1 | | 1.1 | 96.2 | 2.8 | | |
| Total % | 1 | 0.8 | 0.9 | 2.7 | 46.7 | 3 | 49.7 | 0.5 | 45.8 | 1.3 | 47.6 | |

| | Queen Street Southbound | | | Ala Moana Boulevard Westbound | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 7 | 4 | 11 | 435 | 14 | 449 | 2 | 400 | 402 | 862 |
| 07:30 AM | 8 | 4 | 12 | 409 | 23 | 432 | 4 | 361 | 365 | 809 |
| 07:45 AM | 4 | 5 | 9 | 440 | 31 | 471 | 6 | 320 | 326 | 806 |
| 08:00 AM | 8 | 12 | 20 | 402 | 29 | 431 | 6 | 373 | 379 | 830 |
| Total Volume | 27 | 25 | 52 | 1686 | 97 | 1783 | 18 | 1454 | 1472 | 3307 |
| % App. Total | 51.9 | 48.1 | | 94.6 | 5.4 | | 1.2 | 98.8 | | |
| PHF | .844 | .521 | .650 | .958 | .782 | .946 | .750 | .909 | .915 | .959 |

# Wilson Okamoto Corporation

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

Counted By: LF, WL
Counters: D4-5674, D4-5672
Weather: CLEAR

File Name : ALA QUE PM
Site Code : 00000002
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Queen Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Ala Moana Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Int. Total |
| 03:00 PM | 31 | 9 | 6 | 46 | 357 | 53 | 2 | 412 | 11 | 435 | 8 | 454 | 912 |
| 03:15 PM | 17 | 6 | 8 | 31 | 298 | 26 | 13 | 337 | 11 | 499 | 11 | 521 | 889 |
| 03:30 PM | 25 | 12 | 40 | 77 | 322 | 37 | 4 | 363 | 10 | 492 | 16 | 518 | 958 |
| 03:45 PM | 26 | 10 | 12 | 48 | 346 | 38 | 0 | 384 | 9 | 498 | 4 | 511 | 943 |
| Total | 99 | 37 | 66 | 202 | 1323 | 154 | 19 | 1496 | 41 | 1924 | 39 | 2004 | 3702 |
| 04:00 PM | 28 | 12 | 25 | 65 | 302 | 39 | 0 | 341 | 10 | 505 | 5 | 520 | 926 |
| 04:15 PM | 25 | 14 | 16 | 55 | 422 | 44 | 11 | 477 | 2 | 512 | 30 | 544 | 1076 |
| 04:30 PM | 19 | 14 | 5 | 38 | 324 | 47 | 0 | 371 | 14 | 529 | 7 | 550 | 959 |
| 04:45 PM | 26 | 15 | 15 | 56 | 323 | 40 | 13 | 376 | 13 | 542 | 13 | 568 | 1000 |
| Total | 98 | 55 | 61 | 214 | 1371 | 170 | 24 | 1565 | 39 | 2088 | 55 | 2182 | 3961 |
| 05:00 PM | 40 | 15 | 16 | 71 | 291 | 49 | 5 | 345 | 7 | 537 | 15 | 559 | 975 |
| 05:15 PM | 34 | 14 | 11 | 59 | 286 | 35 | 6 | 327 | 11 | 500 | 23 | 534 | 920 |
| 05:30 PM | 29 | 23 | 4 | 56 | 303 | 46 | 5 | 354 | 9 | 532 | 25 | 566 | 976 |
| 05:45 PM | 33 | 17 | 25 | 75 | 306 | 46 | 16 | 368 | 11 | 519 | 15 | 545 | 988 |
| Total | 136 | 69 | 56 | 261 | 1186 | 176 | 32 | 1394 | 38 | 2088 | 78 | 2204 | 3859 |
| Grand Total | 333 | 161 | 183 | 677 | 3880 | 500 | 75 | 4455 | 118 | 6100 | 172 | 6390 | 11522 |
| Apprch % | 49.2 | 23.8 | 27 | | 87.1 | 11.2 | 1.7 | | 1.8 | 95.5 | 2.7 | | |
| Total % | 2.9 | 1.4 | 1.6 | 5.9 | 33.7 | 4.3 | 0.7 | 38.7 | 1 | 52.9 | 1.5 | 55.5 | |

| | Queen Street Southbound | | | Ala Moana Boulevard Westbound | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | 25 | 14 | 39 | 422 | 44 | 466 | 2 | 512 | 514 | 1019 |
| 04:30 PM | 19 | 14 | 33 | 324 | 47 | 371 | 14 | 529 | 543 | 947 |
| 04:45 PM | 26 | 15 | 41 | 323 | 40 | 363 | 13 | 542 | 555 | 959 |
| 05:00 PM | 40 | 15 | 55 | 291 | 49 | 340 | 7 | 537 | 544 | 939 |
| Total Volume | 110 | 58 | 168 | 1360 | 180 | 1540 | 36 | 2120 | 2156 | 3864 |
| % App. Total | 65.5 | 34.5 | | 88.3 | 11.7 | | 1.7 | 98.3 | | |
| PHF | .688 | .967 | .764 | .806 | .918 | .826 | .643 | .978 | .971 | .948 |

# Wilson Okamoto Corporation

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

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : ALA PII AM
Site Code : 00000003
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Piikoi Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Thru | App. Total | Int. Total |
| 06:00 AM | 11 | 12 | 2 | 25 | 84 | 33 | 0 | 117 | 38 | 179 | 217 | 359 |
| 06:15 AM | 8 | 19 | 4 | 31 | 166 | 61 | 10 | 237 | 31 | 161 | 192 | 460 |
| 06:30 AM | 22 | 29 | 4 | 55 | 266 | 74 | 13 | 353 | 55 | 201 | 256 | 664 |
| 06:45 AM | 31 | 28 | 11 | 70 | 293 | 70 | 13 | 376 | 84 | 264 | 348 | 794 |
| Total | 72 | 88 | 21 | 181 | 809 | 238 | 36 | 1083 | 208 | 805 | 1013 | 2277 |
| 07:00 AM | 36 | 22 | 4 | 62 | 357 | 103 | 17 | 477 | 90 | 299 | 389 | 928 |
| 07:15 AM | 32 | 34 | 6 | 72 | 413 | 99 | 4 | 516 | 85 | 308 | 393 | 981 |
| 07:30 AM | 42 | 37 | 9 | 88 | 421 | 90 | 13 | 524 | 96 | 271 | 367 | 979 |
| 07:45 AM | 29 | 51 | 5 | 85 | 423 | 71 | 9 | 503 | 69 | 269 | 338 | 926 |
| Total | 139 | 144 | 24 | 307 | 1614 | 363 | 43 | 2020 | 340 | 1147 | 1487 | 3814 |
| 08:00 AM | 29 | 39 | 7 | 75 | 382 | 83 | 9 | 474 | 104 | 281 | 385 | 934 |
| 08:15 AM | 39 | 22 | 9 | 70 | 349 | 86 | 9 | 444 | 78 | 244 | 322 | 836 |
| 08:30 AM | 37 | 36 | 6 | 79 | 292 | 79 | 14 | 385 | 91 | 242 | 333 | 797 |
| 08:45 AM | 23 | 45 | 12 | 80 | 260 | 104 | 7 | 371 | 73 | 193 | 266 | 717 |
| Total | 128 | 142 | 34 | 304 | 1283 | 352 | 39 | 1674 | 346 | 960 | 1306 | 3284 |
| Grand Total | 339 | 374 | 79 | 792 | 3706 | 953 | 118 | 4777 | 894 | 2912 | 3806 | 9375 |
| Apprch % | 42.8 | 47.2 | 10 | | 77.6 | 19.9 | 2.5 | | 23.5 | 76.5 | | |
| Total % | 3.6 | 4 | 0.8 | 8.4 | 39.5 | 10.2 | 1.3 | 51 | 9.5 | 31.1 | 40.6 | |

| | Piikoi Street Southbound | | | Ala Moana Boulevard Westbound | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 32 | 34 | 66 | 413 | 99 | 512 | 85 | 308 | 393 | 971 |
| 07:30 AM | 42 | 37 | 79 | 421 | 90 | 511 | 96 | 271 | 367 | 957 |
| 07:45 AM | 29 | 51 | 80 | 423 | 71 | 494 | 69 | 269 | 338 | 912 |
| 08:00 AM | 29 | 39 | 68 | 382 | 83 | 465 | 104 | 281 | 385 | 918 |
| Total Volume | 132 | 161 | 293 | 1639 | 343 | 1982 | 354 | 1129 | 1483 | 3758 |
| % App. Total | 45.1 | 54.9 | | 82.7 | 17.3 | | 23.9 | 76.1 | | |
| PHF | .786 | .789 | .916 | .969 | .866 | .968 | .851 | .916 | .943 | .968 |

# Wilson Okamoto Corporation

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

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : ALA PII PM
Site Code : 00000003
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Piikoi Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Thru | App. Total | Int. Total |
| 03:00 PM | 47 | 66 | 23 | 136 | 307 | 83 | 12 | 402 | 64 | 376 | 440 | 978 |
| 03:15 PM | 40 | 36 | 21 | 97 | 308 | 87 | 29 | 424 | 93 | 431 | 524 | 1045 |
| 03:30 PM | 48 | 40 | 23 | 111 | 267 | 78 | 13 | 358 | 104 | 425 | 529 | 998 |
| 03:45 PM | 39 | 38 | 36 | 113 | 336 | 91 | 29 | 456 | 65 | 455 | 520 | 1089 |
| Total | 174 | 180 | 103 | 457 | 1218 | 339 | 83 | 1640 | 326 | 1687 | 2013 | 4110 |
| 04:00 PM | 46 | 45 | 14 | 105 | 295 | 85 | 13 | 393 | 94 | 449 | 543 | 1041 |
| 04:15 PM | 49 | 62 | 30 | 141 | 383 | 109 | 22 | 514 | 84 | 469 | 553 | 1208 |
| 04:30 PM | 50 | 51 | 33 | 134 | 327 | 103 | 14 | 444 | 68 | 475 | 543 | 1121 |
| 04:45 PM | 62 | 63 | 13 | 138 | 281 | 92 | 21 | 394 | 106 | 474 | 580 | 1112 |
| Total | 207 | 221 | 90 | 518 | 1286 | 389 | 70 | 1745 | 352 | 1867 | 2219 | 4482 |
| 05:00 PM | 55 | 51 | 17 | 123 | 287 | 86 | 15 | 388 | 83 | 491 | 574 | 1085 |
| 05:15 PM | 37 | 53 | 33 | 123 | 298 | 97 | 11 | 406 | 95 | 466 | 561 | 1090 |
| 05:30 PM | 67 | 55 | 29 | 151 | 242 | 93 | 22 | 357 | 120 | 432 | 552 | 1060 |
| 05:45 PM | 50 | 67 | 22 | 139 | 337 | 90 | 19 | 446 | 102 | 444 | 546 | 1131 |
| Total | 209 | 226 | 101 | 536 | 1164 | 366 | 67 | 1597 | 400 | 1833 | 2233 | 4366 |
| Grand Total | 590 | 627 | 294 | 1511 | 3668 | 1094 | 220 | 4982 | 1078 | 5387 | 6465 | 12958 |
| Apprch % | 39 | 41.5 | 19.5 | | 73.6 | 22 | 4.4 | | 16.7 | 83.3 | | |
| Total % | 4.6 | 4.8 | 2.3 | 11.7 | 28.3 | 8.4 | 1.7 | 38.4 | 8.3 | 41.6 | 49.9 | |

| | Piikoi Street Southbound | | | Ala Moana Boulevard Westbound | | | Ala Moana Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | 49 | 62 | 111 | 383 | 109 | 492 | 84 | 469 | 553 | 1156 |
| 04:30 PM | 50 | 51 | 101 | 327 | 103 | 430 | 68 | 475 | 543 | 1074 |
| 04:45 PM | 62 | 63 | 125 | 281 | 92 | 373 | 106 | 474 | 580 | 1078 |
| 05:00 PM | 55 | 51 | 106 | 287 | 86 | 373 | 83 | 491 | 574 | 1053 |
| Total Volume | 216 | 227 | 443 | 1278 | 390 | 1668 | 341 | 1909 | 2250 | 4361 |
| % App. Total | 48.8 | 51.2 | | 76.6 | 23.4 | | 15.2 | 84.8 | | |
| PHF | .871 | .901 | .886 | .834 | .894 | .848 | .804 | .972 | .970 | .943 |

# Wilson Okamoto Corporation

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

Counted By: BE, DY
Counters: D4-3889, D4-3890
Weather: CLEAR

File Name : PII WAI AM
Site Code : 00000004
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Piikoi Street Southbound | | | Ala Moana Center Ramp Westbound | | | | Piikoi Street Northbound | | | | Waimanu Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 5 | 2 | 7 | 0 | 3 | 0 | 3 | 82 | 3 | 6 | 91 | 21 | 7 | 21 | 2 | 51 | 152 |
| 06:15 AM | 14 | 2 | 16 | 3 | 1 | 5 | 9 | 85 | 5 | 6 | 96 | 34 | 9 | 20 | 3 | 66 | 187 |
| 06:30 AM | 24 | 9 | 33 | 2 | 4 | 5 | 11 | 118 | 11 | 11 | 140 | 29 | 16 | 34 | 4 | 83 | 267 |
| 06:45 AM | 20 | 6 | 26 | 1 | 5 | 9 | 15 | 124 | 13 | 7 | 144 | 58 | 17 | 49 | 5 | 129 | 314 |
| Total | 63 | 19 | 82 | 6 | 13 | 19 | 38 | 409 | 32 | 30 | 471 | 142 | 49 | 124 | 14 | 329 | 920 |
| 07:00 AM | 17 | 13 | 30 | 2 | 6 | 10 | 18 | 190 | 21 | 5 | 216 | 74 | 28 | 47 | 6 | 155 | 419 |
| 07:15 AM | 27 | 8 | 35 | 7 | 5 | 5 | 17 | 163 | 9 | 8 | 180 | 94 | 35 | 46 | 5 | 180 | 412 |
| 07:30 AM | 32 | 24 | 56 | 7 | 4 | 9 | 20 | 175 | 24 | 9 | 208 | 70 | 43 | 55 | 6 | 174 | 458 |
| 07:45 AM | 43 | 14 | 57 | 13 | 9 | 6 | 28 | 143 | 19 | 11 | 173 | 87 | 37 | 38 | 7 | 169 | 427 |
| Total | 119 | 59 | 178 | 29 | 24 | 30 | 83 | 671 | 73 | 33 | 777 | 325 | 143 | 186 | 24 | 678 | 1716 |
| 08:00 AM | 43 | 18 | 61 | 8 | 8 | 7 | 23 | 146 | 16 | 8 | 170 | 85 | 47 | 46 | 7 | 185 | 439 |
| 08:15 AM | 20 | 10 | 30 | 10 | 15 | 15 | 40 | 151 | 19 | 12 | 182 | 89 | 47 | 54 | 5 | 195 | 447 |
| 08:30 AM | 36 | 11 | 47 | 10 | 15 | 13 | 38 | 144 | 20 | 15 | 179 | 73 | 56 | 67 | 13 | 209 | 473 |
| 08:45 AM | 32 | 11 | 43 | 9 | 17 | 15 | 41 | 170 | 9 | 9 | 188 | 83 | 56 | 56 | 3 | 198 | 470 |
| Total | 131 | 50 | 181 | 37 | 55 | 50 | 142 | 611 | 64 | 44 | 719 | 330 | 206 | 223 | 28 | 787 | 1829 |
| Grand Total | 313 | 128 | 441 | 72 | 92 | 99 | 263 | 1691 | 169 | 107 | 1967 | 797 | 398 | 533 | 66 | 1794 | 4465 |
| Apprch % | 71 | 29 | | 27.4 | 35 | 37.6 | | 86 | 8.6 | 5.4 | | 44.4 | 22.2 | 29.7 | 3.7 | | |
| Total % | 7 | 2.9 | 9.9 | 1.6 | 2.1 | 2.2 | 5.9 | 37.9 | 3.8 | 2.4 | 44.1 | 17.8 | 8.9 | 11.9 | 1.5 | 40.2 | |

| | Piikoi Street Southbound | | | Ala Moana Center Ramp Westbound | | | Piikoi Street Northbound | | | Waimanu Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Thru | Right | App. Total | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | | | | | |
| 08:00 AM | 43 | 18 | 61 | 8 | 8 | 16 | 146 | 16 | 162 | 85 | 47 | 46 | 178 | 417 |
| 08:15 AM | 20 | 10 | 30 | 10 | 15 | 25 | 151 | 19 | 170 | 89 | 47 | 54 | 190 | 415 |
| 08:30 AM | 36 | 11 | 47 | 10 | 15 | 25 | 144 | 20 | 164 | 73 | 56 | 67 | 196 | 432 |
| 08:45 AM | 32 | 11 | 43 | 9 | 17 | 26 | 170 | 9 | 179 | 83 | 56 | 56 | 195 | 443 |
| Total Volume | 131 | 50 | 181 | 37 | 55 | 92 | 611 | 64 | 675 | 330 | 206 | 223 | 759 | 1707 |
| % App. Total | 72.4 | 27.6 | | 40.2 | 59.8 | | 90.5 | 9.5 | | 43.5 | 27.1 | 29.4 | | |
| PHF | .762 | .694 | .742 | .925 | .809 | .885 | .899 | .800 | .943 | .927 | .920 | .832 | .968 | .963 |

# Wilson Okamoto Corporation

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

Counted By: BE, DY
Counters: D4-3889, D4-3890
Weather: CLEAR

File Name : PII WAI PM
Site Code : 00000004
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted

| | Piikoi Street Southbound | | | Ala Moana Center Ramp Westbound | | | | Piikoi Street Northbound | | | | Waimanu Street Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 61 | 8 | 69 | 53 | 71 | 37 | 161 | 174 | 21 | 31 | 226 | 120 | 65 | 58 | 9 | 252 | 708 |
| 03:15 PM | 60 | 23 | 83 | 41 | 54 | 28 | 123 | 184 | 15 | 23 | 222 | 110 | 60 | 72 | 7 | 249 | 677 |
| 03:30 PM | 67 | 18 | 85 | 30 | 44 | 17 | 91 | 142 | 19 | 23 | 184 | 81 | 62 | 66 | 16 | 225 | 585 |
| 03:45 PM | 50 | 18 | 68 | 37 | 53 | 27 | 117 | 148 | 20 | 46 | 214 | 114 | 81 | 55 | 10 | 260 | 659 |
| Total | 238 | 67 | 305 | 161 | 222 | 109 | 492 | 648 | 75 | 123 | 846 | 425 | 268 | 251 | 42 | 986 | 2629 |
| 04:00 PM | 44 | 21 | 65 | 35 | 42 | 16 | 93 | 154 | 16 | 39 | 209 | 90 | 69 | 69 | 24 | 252 | 619 |
| 04:15 PM | 61 | 38 | 99 | 40 | 65 | 23 | 128 | 169 | 20 | 31 | 220 | 110 | 67 | 63 | 19 | 259 | 706 |
| 04:30 PM | 70 | 23 | 93 | 40 | 59 | 25 | 124 | 150 | 16 | 66 | 232 | 91 | 85 | 70 | 21 | 267 | 716 |
| 04:45 PM | 85 | 29 | 114 | 50 | 76 | 26 | 152 | 157 | 19 | 50 | 226 | 122 | 77 | 97 | 22 | 318 | 810 |
| Total | 260 | 111 | 371 | 165 | 242 | 90 | 497 | 630 | 71 | 186 | 887 | 413 | 298 | 299 | 86 | 1096 | 2851 |
| 05:00 PM | 73 | 13 | 86 | 33 | 49 | 23 | 105 | 147 | 8 | 52 | 207 | 120 | 90 | 78 | 23 | 311 | 709 |
| 05:15 PM | 80 | 23 | 103 | 51 | 60 | 29 | 140 | 160 | 13 | 51 | 224 | 127 | 87 | 66 | 24 | 304 | 771 |
| 05:30 PM | 75 | 19 | 94 | 49 | 46 | 27 | 122 | 184 | 15 | 44 | 243 | 107 | 94 | 88 | 27 | 316 | 775 |
| 05:45 PM | 77 | 32 | 109 | 57 | 61 | 21 | 139 | 149 | 24 | 48 | 221 | 95 | 86 | 78 | 26 | 285 | 754 |
| Total | 305 | 87 | 392 | 190 | 216 | 100 | 506 | 640 | 60 | 195 | 895 | 449 | 357 | 310 | 100 | 1216 | 3009 |
| Grand Total | 803 | 265 | 1068 | 516 | 680 | 299 | 1495 | 1918 | 206 | 504 | 2628 | 1287 | 923 | 860 | 228 | 3298 | 8489 |
| Apprch % | 75.2 | 24.8 | | 34.5 | 45.5 | 20 | | 73 | 7.8 | 19.2 | | 39 | 28 | 26.1 | 6.9 | | |
| Total % | 9.5 | 3.1 | 12.6 | 6.1 | 8 | 3.5 | 17.6 | 22.6 | 2.4 | 5.9 | 31 | 15.2 | 10.9 | 10.1 | 2.7 | 38.9 | |

| | Piikoi Street Southbound | | | Ala Moana Center Ramp Westbound | | | Piikoi Street Northbound | | | Waimanu Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Thru | Right | App. Total | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | |
| 04:45 PM | 85 | 29 | 114 | 50 | 76 | 126 | 157 | 19 | 176 | 122 | 77 | 97 | 296 | 712 |
| 05:00 PM | 73 | 13 | 86 | 33 | 49 | 82 | 147 | 8 | 155 | 120 | 90 | 78 | 288 | 611 |
| 05:15 PM | 80 | 23 | 103 | 51 | 60 | 111 | 160 | 13 | 173 | 127 | 87 | 66 | 280 | 667 |
| 05:30 PM | 75 | 19 | 94 | 49 | 46 | 95 | 184 | 15 | 199 | 107 | 94 | 88 | 289 | 677 |
| Total Volume | 313 | 84 | 397 | 183 | 231 | 414 | 648 | 55 | 703 | 476 | 348 | 329 | 1153 | 2667 |
| % App. Total | 78.8 | 21.2 | | 44.2 | 55.8 | | 92.2 | 7.8 | | 41.3 | 30.2 | 28.5 | | |
| PHF | .921 | .724 | .871 | .897 | .760 | .821 | .880 | .724 | .883 | .937 | .926 | .848 | .974 | .936 |

# Wilson Okamoto Corporation

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

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : KAP COO AM
Site Code : 00000001
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Kapiolani Boulevard Westbound | | | | | Cooke Street Northbound | | | | | Kapiolani Boulevard 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 | 2 | 0 | 4 | 6 | 28 | 48 | 15 | 5 | 96 | 3 | 10 | 9 | 4 | 26 | 0 | 62 | 10 | 7 | 79 | 207 |
| 06:15 AM | 0 | 3 | 0 | 2 | 5 | 51 | 68 | 29 | 6 | 154 | 10 | 19 | 8 | 10 | 47 | 0 | 53 | 10 | 10 | 73 | 279 |
| 06:30 AM | 0 | 3 | 2 | 4 | 9 | 69 | 79 | 37 | 7 | 192 | 9 | 30 | 5 | 13 | 57 | 0 | 86 | 11 | 12 | 109 | 367 |
| 06:45 AM | 0 | 6 | 10 | 6 | 22 | 93 | 151 | 46 | 17 | 307 | 10 | 23 | 5 | 21 | 59 | 1 | 98 | 11 | 9 | 119 | 507 |
| Total | 0 | 14 | 12 | 16 | 42 | 241 | 346 | 127 | 35 | 749 | 32 | 82 | 27 | 48 | 189 | 1 | 299 | 42 | 38 | 380 | 1360 |
| 07:00 AM | 1 | 3 | 5 | 8 | 17 | 104 | 168 | 55 | 5 | 332 | 14 | 38 | 3 | 13 | 68 | 0 | 107 | 11 | 23 | 141 | 558 |
| 07:15 AM | 3 | 6 | 4 | 19 | 32 | 109 | 226 | 58 | 14 | 407 | 15 | 53 | 10 | 11 | 89 | 0 | 137 | 12 | 22 | 171 | 699 |
| 07:30 AM | 4 | 13 | 4 | 10 | 31 | 113 | 228 | 69 | 11 | 421 | 9 | 45 | 12 | 14 | 80 | 0 | 144 | 25 | 12 | 181 | 713 |
| 07:45 AM | 0 | 11 | 15 | 11 | 37 | 112 | 211 | 72 | 14 | 409 | 15 | 41 | 6 | 12 | 74 | 0 | 145 | 15 | 25 | 185 | 705 |
| Total | 8 | 33 | 28 | 48 | 117 | 438 | 833 | 254 | 44 | 1569 | 53 | 177 | 31 | 50 | 311 | 0 | 533 | 63 | 82 | 678 | 2675 |
| 08:00 AM | 4 | 9 | 11 | 14 | 38 | 118 | 177 | 48 | 14 | 357 | 14 | 50 | 22 | 5 | 91 | 0 | 129 | 19 | 31 | 179 | 665 |
| 08:15 AM | 1 | 8 | 6 | 15 | 30 | 96 | 169 | 46 | 12 | 323 | 22 | 37 | 19 | 11 | 89 | 0 | 154 | 17 | 19 | 190 | 632 |
| 08:30 AM | 1 | 6 | 6 | 4 | 17 | 88 | 109 | 39 | 16 | 252 | 19 | 27 | 14 | 13 | 73 | 0 | 136 | 15 | 17 | 168 | 510 |
| 08:45 AM | 1 | 8 | 6 | 3 | 18 | 58 | 110 | 26 | 5 | 199 | 16 | 49 | 16 | 10 | 91 | 2 | 149 | 25 | 11 | 187 | 495 |
| Total | 7 | 31 | 29 | 36 | 103 | 360 | 565 | 159 | 47 | 1131 | 71 | 163 | 71 | 39 | 344 | 2 | 568 | 76 | 78 | 724 | 2302 |
| Grand Total | 15 | 78 | 69 | 100 | 262 | 1039 | 1744 | 540 | 126 | 3449 | 156 | 422 | 129 | 137 | 844 | 3 | 1400 | 181 | 198 | 1782 | 6337 |
| Apprch % | 5.7 | 29.8 | 26.3 | 38.2 | | 30.1 | 50.6 | 15.7 | 3.7 | | 18.5 | 50 | 15.3 | 16.2 | | 0.2 | 78.6 | 10.2 | 11.1 | | |
| Total % | 0.2 | 1.2 | 1.1 | 1.6 | 4.1 | 16.4 | 27.5 | 8.5 | 2 | 54.4 | 2.5 | 6.7 | 2 | 2.2 | 13.3 | 0 | 22.1 | 2.9 | 3.1 | 28.1 | |

| | Cooke Street Southbound | | | | Kapiolani Boulevard Westbound | | | | Cooke Street Northbound | | | | Kapiolani Boulevard 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 3 | 6 | 4 | 13 | 109 | 226 | 58 | 393 | 15 | 53 | 10 | 78 | 0 | 137 | 12 | 149 | 633 |
| 07:30 AM | 4 | 13 | 4 | 21 | 113 | 228 | 69 | 410 | 9 | 45 | 12 | 66 | 0 | 144 | 25 | 169 | 666 |
| 07:45 AM | 0 | 11 | 15 | 26 | 112 | 211 | 72 | 395 | 15 | 41 | 6 | 62 | 0 | 145 | 15 | 160 | 643 |
| 08:00 AM | 4 | 9 | 11 | 24 | 118 | 177 | 48 | 343 | 14 | 50 | 22 | 86 | 0 | 129 | 19 | 148 | 601 |
| Total Volume | 11 | 39 | 34 | 84 | 452 | 842 | 247 | 1541 | 53 | 189 | 50 | 292 | 0 | 555 | 71 | 626 | 2543 |
| % App. Total | 13.1 | 46.4 | 40.5 | | 29.3 | 54.6 | 16 | | 18.2 | 64.7 | 17.1 | | 0 | 88.7 | 11.3 | | |
| PHF | .688 | .750 | .567 | .808 | .958 | .923 | .858 | .940 | .883 | .892 | .568 | .849 | .000 | .957 | .710 | .926 | .955 |

# Wilson Okamoto Corporation

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

Counted By: TS, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : KAP COO PM
Site Code : 00000001
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Kapiolani Boulevard Westbound | | | | | Cooke Street Northbound | | | | | Kapiolani Boulevard 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 |
| 03:00 PM | 6 | 7 | 11 | 8 | 32 | 51 | 164 | 32 | 16 | 263 | 18 | 59 | 29 | 9 | 115 | 4 | 195 | 23 | 19 | 241 | 651 |
| 03:15 PM | 1 | 5 | 4 | 4 | 14 | 63 | 137 | 25 | 7 | 232 | 24 | 67 | 36 | 9 | 136 | 2 | 225 | 22 | 10 | 259 | 641 |
| 03:30 PM | 2 | 6 | 5 | 9 | 22 | 81 | 194 | 30 | 16 | 321 | 24 | 69 | 30 | 10 | 133 | 4 | 242 | 15 | 22 | 283 | 759 |
| 03:45 PM | 5 | 5 | 6 | 14 | 30 | 80 | 164 | 34 | 18 | 296 | 24 | 59 | 38 | 4 | 125 | 1 | 269 | 22 | 19 | 311 | 762 |
| Total | 14 | 23 | 26 | 35 | 98 | 275 | 659 | 121 | 57 | 1112 | 90 | 254 | 133 | 32 | 509 | 11 | 931 | 82 | 70 | 1094 | 2813 |
| 04:00 PM | 3 | 20 | 6 | 15 | 44 | 85 | 156 | 32 | 12 | 285 | 16 | 59 | 44 | 15 | 134 | 6 | 203 | 19 | 27 | 255 | 718 |
| 04:15 PM | 6 | 10 | 7 | 18 | 41 | 68 | 164 | 32 | 26 | 290 | 21 | 75 | 52 | 27 | 175 | 5 | 289 | 25 | 12 | 331 | 837 |
| 04:30 PM | 4 | 20 | 12 | 10 | 46 | 69 | 136 | 52 | 23 | 280 | 16 | 62 | 62 | 23 | 163 | 1 | 311 | 22 | 22 | 356 | 845 |
| 04:45 PM | 4 | 14 | 11 | 12 | 41 | 66 | 154 | 46 | 15 | 281 | 32 | 82 | 77 | 20 | 211 | 2 | 339 | 16 | 22 | 379 | 912 |
| Total | 17 | 64 | 36 | 55 | 172 | 288 | 610 | 162 | 76 | 1136 | 85 | 278 | 235 | 85 | 683 | 14 | 1142 | 82 | 83 | 1321 | 3312 |
| 05:00 PM | 6 | 11 | 2 | 10 | 29 | 70 | 195 | 37 | 24 | 326 | 16 | 59 | 57 | 29 | 161 | 2 | 349 | 13 | 34 | 398 | 914 |
| 05:15 PM | 0 | 7 | 4 | 18 | 29 | 69 | 154 | 32 | 20 | 275 | 26 | 72 | 55 | 23 | 176 | 7 | 353 | 10 | 24 | 394 | 874 |
| 05:30 PM | 3 | 4 | 2 | 3 | 12 | 48 | 138 | 23 | 9 | 218 | 15 | 63 | 32 | 31 | 141 | 0 | 309 | 25 | 18 | 352 | 723 |
| 05:45 PM | 1 | 4 | 6 | 13 | 24 | 56 | 119 | 18 | 17 | 210 | 8 | 62 | 21 | 18 | 109 | 3 | 248 | 18 | 10 | 279 | 622 |
| Total | 10 | 26 | 14 | 44 | 94 | 243 | 606 | 110 | 70 | 1029 | 65 | 256 | 165 | 101 | 587 | 12 | 1259 | 66 | 86 | 1423 | 3133 |
| Grand Total | 41 | 113 | 76 | 134 | 364 | 806 | 1875 | 393 | 203 | 3277 | 240 | 788 | 533 | 218 | 1779 | 37 | 3332 | 230 | 239 | 3838 | 9258 |
| Apprch % | 11.3 | 31 | 20.9 | 36.8 | | 24.6 | 57.2 | 12 | 6.2 | | 13.5 | 44.3 | 30 | 12.3 | | 1 | 86.8 | 6 | 6.2 | | |
| Total % | 0.4 | 1.2 | 0.8 | 1.4 | 3.9 | 8.7 | 20.3 | 4.2 | 2.2 | 35.4 | 2.6 | 8.5 | 5.8 | 2.4 | 19.2 | 0.4 | 36 | 2.5 | 2.6 | 41.5 | |

| | Cooke Street Southbound | | | | Kapiolani Boulevard Westbound | | | | Cooke Street Northbound | | | | Kapiolani Boulevard 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 4 | 20 | 12 | 36 | 69 | 136 | 52 | 257 | 16 | 62 | 62 | 140 | 1 | 311 | 22 | 334 | 767 |
| 04:45 PM | 4 | 14 | 11 | 29 | 66 | 154 | 46 | 266 | 32 | 82 | 77 | 191 | 2 | 339 | 16 | 357 | 843 |
| 05:00 PM | 6 | 11 | 2 | 19 | 70 | 195 | 37 | 302 | 16 | 59 | 57 | 132 | 2 | 349 | 13 | 364 | 817 |
| 05:15 PM | 0 | 7 | 4 | 11 | 69 | 154 | 32 | 255 | 26 | 72 | 55 | 153 | 7 | 353 | 10 | 370 | 789 |
| Total Volume | 14 | 52 | 29 | 95 | 274 | 639 | 167 | 1080 | 90 | 275 | 251 | 616 | 12 | 1352 | 61 | 1425 | 3216 |
| % App. Total | 14.7 | 54.7 | 30.5 | | 25.4 | 59.2 | 15.5 | | 14.6 | 44.6 | 40.7 | | 0.8 | 94.9 | 4.3 | | |
| PHF | .583 | .650 | .604 | .660 | .979 | .819 | .803 | .894 | .703 | .838 | .815 | .806 | .429 | .958 | .693 | .963 | .954 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5674, D4-3889
Weather: CLEAR

File Name : KAP WAR AM
Site Code : 00000002
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Kapiolani Boulevard Westbound | | | | | Ward Avenue Northbound | | | | | Kapiolani Boulevard Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 25 | 102 | 31 | 6 | 164 | 14 | 57 | 3 | 7 | 81 | 13 | 28 | 11 | 10 | 62 | 51 | 17 | 3 | 71 | 378 |
| 06:15 AM | 23 | 153 | 36 | 7 | 219 | 33 | 94 | 9 | 17 | 153 | 16 | 53 | 6 | 11 | 86 | 37 | 17 | 14 | 68 | 526 |
| 06:30 AM | 30 | 140 | 31 | 25 | 226 | 46 | 152 | 21 | 11 | 230 | 20 | 52 | 6 | 12 | 90 | 81 | 21 | 26 | 128 | 674 |
| 06:45 AM | 42 | 167 | 52 | 46 | 307 | 58 | 206 | 33 | 51 | 348 | 19 | 91 | 3 | 27 | 140 | 76 | 22 | 32 | 130 | 925 |
| Total | 120 | 562 | 150 | 84 | 916 | 151 | 509 | 66 | 86 | 812 | 68 | 224 | 26 | 60 | 378 | 245 | 77 | 75 | 397 | 2503 |
| 07:00 AM | 44 | 118 | 66 | 22 | 250 | 53 | 227 | 45 | 40 | 365 | 31 | 112 | 10 | 25 | 178 | 85 | 26 | 24 | 135 | 928 |
| 07:15 AM | 58 | 174 | 59 | 36 | 327 | 47 | 283 | 41 | 55 | 426 | 32 | 142 | 8 | 13 | 195 | 112 | 27 | 31 | 170 | 1118 |
| 07:30 AM | 62 | 156 | 66 | 30 | 314 | 53 | 329 | 27 | 42 | 451 | 41 | 114 | 7 | 29 | 191 | 147 | 20 | 33 | 200 | 1156 |
| 07:45 AM | 42 | 196 | 61 | 20 | 319 | 65 | 286 | 17 | 32 | 400 | 26 | 91 | 13 | 23 | 153 | 116 | 18 | 10 | 144 | 1016 |
| Total | 206 | 644 | 252 | 108 | 1210 | 218 | 1125 | 130 | 169 | 1642 | 130 | 459 | 38 | 90 | 717 | 460 | 91 | 98 | 649 | 4218 |
| 08:00 AM | 51 | 199 | 60 | 24 | 334 | 61 | 288 | 26 | 15 | 390 | 34 | 63 | 19 | 8 | 124 | 128 | 34 | 10 | 172 | 1020 |
| 08:15 AM | 44 | 204 | 62 | 18 | 328 | 65 | 237 | 16 | 20 | 338 | 28 | 78 | 14 | 8 | 128 | 118 | 25 | 2 | 145 | 939 |
| 08:30 AM | 56 | 183 | 47 | 13 | 299 | 29 | 152 | 22 | 22 | 225 | 35 | 78 | 10 | 17 | 140 | 130 | 33 | 11 | 174 | 838 |
| 08:45 AM | 37 | 177 | 44 | 11 | 269 | 42 | 144 | 9 | 10 | 205 | 26 | 82 | 20 | 10 | 138 | 137 | 20 | 6 | 163 | 775 |
| Total | 188 | 763 | 213 | 66 | 1230 | 197 | 821 | 73 | 67 | 1158 | 123 | 301 | 63 | 43 | 530 | 513 | 112 | 29 | 654 | 3572 |
| Grand Total | 514 | 1969 | 615 | 258 | 3356 | 566 | 2455 | 269 | 322 | 3612 | 321 | 984 | 127 | 193 | 1625 | 1218 | 280 | 202 | 1700 | 10293 |
| Apprch % | 15.3 | 58.7 | 18.3 | 7.7 | | 15.7 | 68 | 7.4 | 8.9 | | 19.8 | 60.6 | 7.8 | 11.9 | | 71.6 | 16.5 | 11.9 | | |
| Total % | 5 | 19.1 | 6 | 2.5 | 32.6 | 5.5 | 23.9 | 2.6 | 3.1 | 35.1 | 3.1 | 9.6 | 1.2 | 1.9 | 15.8 | 11.8 | 2.7 | 2 | 16.5 | |

| | Ward Avenue Southbound | | | | Kapiolani Boulevard Westbound | | | | Ward Avenue Northbound | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | |
| 07:15 AM | 58 | 174 | 59 | 291 | 47 | 283 | 41 | 371 | 32 | 142 | 8 | 182 | 112 | 27 | 139 | 983 |
| 07:30 AM | 62 | 156 | 66 | 284 | 53 | 329 | 27 | 409 | 41 | 114 | 7 | 162 | 147 | 20 | 167 | 1022 |
| 07:45 AM | 42 | 196 | 61 | 299 | 65 | 286 | 17 | 368 | 26 | 91 | 13 | 130 | 116 | 18 | 134 | 931 |
| 08:00 AM | 51 | 199 | 60 | 310 | 61 | 288 | 26 | 375 | 34 | 63 | 19 | 116 | 128 | 34 | 162 | 963 |
| Total Volume | 213 | 725 | 246 | 1184 | 226 | 1186 | 111 | 1523 | 133 | 410 | 47 | 590 | 503 | 99 | 602 | 3899 |
| % App. Total | 18 | 61.2 | 20.8 | | 14.8 | 77.9 | 7.3 | | 22.5 | 69.5 | 8 | | 83.6 | 16.4 | | |
| PHF | .859 | .911 | .932 | .955 | .869 | .901 | .677 | .931 | .811 | .722 | .618 | .810 | .855 | .728 | .901 | .954 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5674, D4-3889
Weather: CLEAR

File Name : KAP WAR PM
Site Code : 00000002
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Ward Avenue Southbound | | | | | Kapiolani Boulevard Westbound | | | | | Ward Avenue Northbound | | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 59 | 134 | 35 | 7 | 235 | 39 | 180 | 20 | 13 | 252 | 38 | 124 | 28 | 7 | 197 | 211 | 31 | 8 | 250 | 934 |
| 03:15 PM | 68 | 156 | 32 | 6 | 262 | 39 | 174 | 14 | 24 | 251 | 25 | 145 | 44 | 18 | 232 | 213 | 34 | 14 | 261 | 1006 |
| 03:30 PM | 59 | 156 | 48 | 11 | 274 | 0 | 249 | 27 | 11 | 287 | 27 | 115 | 43 | 16 | 201 | 289 | 28 | 13 | 330 | 1092 |
| 03:45 PM | 72 | 168 | 41 | 17 | 298 | 0 | 244 | 28 | 16 | 288 | 24 | 143 | 50 | 8 | 225 | 264 | 31 | 8 | 303 | 1114 |
| Total | 258 | 614 | 156 | 41 | 1069 | 78 | 847 | 89 | 64 | 1078 | 114 | 527 | 165 | 49 | 855 | 977 | 124 | 43 | 1144 | 4146 |
| 04:00 PM | 65 | 126 | 46 | 16 | 253 | 1 | 216 | 38 | 22 | 277 | 40 | 108 | 44 | 18 | 210 | 258 | 36 | 9 | 303 | 1043 |
| 04:15 PM | 64 | 157 | 35 | 11 | 267 | 0 | 227 | 21 | 18 | 266 | 30 | 130 | 42 | 9 | 211 | 301 | 27 | 11 | 339 | 1083 |
| 04:30 PM | 67 | 145 | 31 | 17 | 260 | 0 | 222 | 33 | 25 | 280 | 28 | 121 | 41 | 15 | 205 | 349 | 28 | 18 | 395 | 1140 |
| 04:45 PM | 80 | 165 | 36 | 7 | 288 | 0 | 228 | 26 | 11 | 265 | 26 | 137 | 46 | 18 | 227 | 397 | 43 | 8 | 448 | 1228 |
| Total | 276 | 593 | 148 | 51 | 1068 | 1 | 893 | 118 | 76 | 1088 | 124 | 496 | 173 | 60 | 853 | 1305 | 134 | 46 | 1485 | 4494 |
| 05:00 PM | 69 | 165 | 41 | 21 | 296 | 0 | 273 | 26 | 25 | 324 | 40 | 131 | 48 | 23 | 242 | 380 | 36 | 15 | 431 | 1293 |
| 05:15 PM | 73 | 163 | 31 | 13 | 280 | 5 | 234 | 19 | 22 | 280 | 26 | 140 | 54 | 19 | 239 | 337 | 24 | 10 | 371 | 1170 |
| 05:30 PM | 54 | 140 | 31 | 14 | 239 | 39 | 147 | 31 | 16 | 233 | 39 | 112 | 31 | 20 | 202 | 311 | 38 | 15 | 364 | 1038 |
| 05:45 PM | 70 | 149 | 33 | 8 | 260 | 33 | 141 | 14 | 19 | 207 | 29 | 107 | 40 | 14 | 190 | 246 | 36 | 10 | 292 | 949 |
| Total | 266 | 617 | 136 | 56 | 1075 | 77 | 795 | 90 | 82 | 1044 | 134 | 490 | 173 | 76 | 873 | 1274 | 134 | 50 | 1458 | 4450 |
| Grand Total | 800 | 1824 | 440 | 148 | 3212 | 156 | 2535 | 297 | 222 | 3210 | 372 | 1513 | 511 | 185 | 2581 | 3556 | 392 | 139 | 4087 | 13090 |
| Apprch % | 24.9 | 56.8 | 13.7 | 4.6 | | 4.9 | 79 | 9.3 | 6.9 | | 14.4 | 58.6 | 19.8 | 7.2 | | 87 | 9.6 | 3.4 | | |
| Total % | 6.1 | 13.9 | 3.4 | 1.1 | 24.5 | 1.2 | 19.4 | 2.3 | 1.7 | 24.5 | 2.8 | 11.6 | 3.9 | 1.4 | 19.7 | 27.2 | 3 | 1.1 | 31.2 | |

| | Ward Avenue Southbound | | | | Kapiolani Boulevard Westbound | | | | Ward Avenue Northbound | | | | Kapiolani Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | |
| 04:30 PM | 67 | 145 | 31 | 243 | 0 | 222 | 33 | 255 | 28 | 121 | 41 | 190 | 349 | 28 | 377 | 1065 |
| 04:45 PM | 80 | 165 | 36 | 281 | 0 | 228 | 26 | 254 | 26 | 137 | 46 | 209 | 397 | 43 | 440 | 1184 |
| 05:00 PM | 69 | 165 | 41 | 275 | 0 | 273 | 26 | 299 | 40 | 131 | 48 | 219 | 380 | 36 | 416 | 1209 |
| 05:15 PM | 73 | 163 | 31 | 267 | 5 | 234 | 19 | 258 | 26 | 140 | 54 | 220 | 337 | 24 | 361 | 1106 |
| Total Volume | 289 | 638 | 139 | 1066 | 5 | 957 | 104 | 1066 | 120 | 529 | 189 | 838 | 1463 | 131 | 1594 | 4564 |
| % App. Total | 27.1 | 59.8 | 13 | | 0.5 | 89.8 | 9.8 | | 14.3 | 63.1 | 22.6 | | 91.8 | 8.2 | | |
| PHF | .903 | .967 | .848 | .948 | .250 | .876 | .788 | .891 | .750 | .945 | .875 | .952 | .921 | .762 | .906 | .944 |

# Wilson Okamoto Corporation

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

Counted By: WL, LF
Counters: D4-5677, D4-5672
Weather: CLEAR

File Name : KAP KAM AM
Site Code : 00000003
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Kapiolani Boulevard Westbound | | | | Kamakee Street Northbound | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 22 | 99 | 3 | 124 | 4 | 5 | 2 | 11 | 63 | 12 | 7 | 82 | 217 |
| 06:15 AM | 27 | 152 | 2 | 181 | 18 | 6 | 9 | 33 | 45 | 13 | 10 | 68 | 282 |
| 06:30 AM | 20 | 268 | 1 | 289 | 13 | 10 | 14 | 37 | 101 | 12 | 13 | 126 | 452 |
| 06:45 AM | 32 | 291 | 5 | 328 | 30 | 17 | 6 | 53 | 92 | 25 | 12 | 129 | 510 |
| Total | 101 | 810 | 11 | 922 | 65 | 38 | 31 | 134 | 301 | 62 | 42 | 405 | 1461 |
| 07:00 AM | 35 | 387 | 1 | 423 | 27 | 7 | 13 | 47 | 131 | 15 | 13 | 159 | 629 |
| 07:15 AM | 45 | 403 | 4 | 452 | 27 | 10 | 7 | 44 | 144 | 27 | 43 | 214 | 710 |
| 07:30 AM | 51 | 414 | 2 | 467 | 31 | 15 | 14 | 60 | 193 | 17 | 49 | 259 | 786 |
| 07:45 AM | 50 | 361 | 8 | 419 | 41 | 16 | 9 | 66 | 151 | 6 | 68 | 225 | 710 |
| Total | 181 | 1565 | 15 | 1761 | 126 | 48 | 43 | 217 | 619 | 65 | 173 | 857 | 2835 |
| 08:00 AM | 39 | 362 | 4 | 405 | 24 | 24 | 13 | 61 | 180 | 15 | 55 | 250 | 716 |
| 08:15 AM | 39 | 278 | 6 | 323 | 19 | 12 | 21 | 52 | 160 | 11 | 23 | 194 | 569 |
| 08:30 AM | 26 | 222 | 3 | 251 | 23 | 22 | 10 | 55 | 172 | 16 | 27 | 215 | 521 |
| 08:45 AM | 18 | 174 | 8 | 200 | 10 | 27 | 9 | 46 | 167 | 24 | 15 | 206 | 452 |
| Total | 122 | 1036 | 21 | 1179 | 76 | 85 | 53 | 214 | 679 | 66 | 120 | 865 | 2258 |
| Grand Total | 404 | 3411 | 47 | 3862 | 267 | 171 | 127 | 565 | 1599 | 193 | 335 | 2127 | 6554 |
| Apprch % | 10.5 | 88.3 | 1.2 | | 47.3 | 30.3 | 22.5 | | 75.2 | 9.1 | 15.7 | | |
| Total % | 6.2 | 52 | 0.7 | 58.9 | 4.1 | 2.6 | 1.9 | 8.6 | 24.4 | 2.9 | 5.1 | 32.5 | |

| | Kapiolani Boulevard Westbound | | | Kamakee Street Northbound | | | Kapiolani Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 45 | 403 | 448 | 27 | 10 | 37 | 144 | 27 | 171 | 656 |
| 07:30 AM | 51 | 414 | 465 | 31 | 15 | 46 | 193 | 17 | 210 | 721 |
| 07:45 AM | 50 | 361 | 411 | 41 | 16 | 57 | 151 | 6 | 157 | 625 |
| 08:00 AM | 39 | 362 | 401 | 24 | 24 | 48 | 180 | 15 | 195 | 644 |
| Total Volume | 185 | 1540 | 1725 | 123 | 65 | 188 | 668 | 65 | 733 | 2646 |
| % App. Total | 10.7 | 89.3 | | 65.4 | 34.6 | | 91.1 | 8.9 | | |
| PHF | .907 | .930 | .927 | .750 | .677 | .825 | .865 | .602 | .873 | .917 |

# Wilson Okamoto Corporation

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

Counted By: WL, LF
Counters: D4-5677, D4-5672
Weather: CLEAR

File Name : KAP KAM PM
Site Code : 00000003
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Kapiolani Boulevard Westbound | | | | Kamakee Street Northbound | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 28 | 201 | 3 | 232 | 29 | 37 | 17 | 83 | 249 | 28 | 14 | 291 | 606 |
| 03:15 PM | 18 | 195 | 9 | 222 | 27 | 43 | 12 | 82 | 322 | 13 | 22 | 357 | 661 |
| 03:30 PM | 0 | 211 | 4 | 215 | 40 | 43 | 15 | 98 | 338 | 23 | 23 | 384 | 697 |
| 03:45 PM | 1 | 255 | 8 | 264 | 18 | 48 | 22 | 88 | 377 | 19 | 40 | 436 | 788 |
| Total | 47 | 862 | 24 | 933 | 114 | 171 | 66 | 351 | 1286 | 83 | 99 | 1468 | 2752 |
| 04:00 PM | 3 | 222 | 4 | 229 | 43 | 32 | 20 | 95 | 338 | 14 | 13 | 365 | 689 |
| 04:15 PM | 1 | 226 | 6 | 233 | 21 | 40 | 20 | 81 | 394 | 19 | 22 | 435 | 749 |
| 04:30 PM | 0 | 215 | 8 | 223 | 39 | 54 | 15 | 108 | 412 | 33 | 27 | 472 | 803 |
| 04:45 PM | 6 | 206 | 4 | 216 | 31 | 53 | 33 | 117 | 502 | 26 | 19 | 547 | 880 |
| Total | 10 | 869 | 22 | 901 | 134 | 179 | 88 | 401 | 1646 | 92 | 81 | 1819 | 3121 |
| 05:00 PM | 1 | 220 | 9 | 230 | 49 | 55 | 16 | 120 | 442 | 29 | 25 | 496 | 846 |
| 05:15 PM | 0 | 225 | 5 | 230 | 26 | 53 | 25 | 104 | 444 | 36 | 18 | 498 | 832 |
| 05:30 PM | 32 | 177 | 9 | 218 | 30 | 45 | 22 | 97 | 347 | 26 | 20 | 393 | 708 |
| 05:45 PM | 31 | 175 | 2 | 208 | 23 | 33 | 25 | 81 | 359 | 15 | 16 | 390 | 679 |
| Total | 64 | 797 | 25 | 886 | 128 | 186 | 88 | 402 | 1592 | 106 | 79 | 1777 | 3065 |
| Grand Total | 121 | 2528 | 71 | 2720 | 376 | 536 | 242 | 1154 | 4524 | 281 | 259 | 5064 | 8938 |
| Apprch % | 4.4 | 92.9 | 2.6 | | 32.6 | 46.4 | 21 | | 89.3 | 5.5 | 5.1 | | |
| Total % | 1.4 | 28.3 | 0.8 | 30.4 | 4.2 | 6 | 2.7 | 12.9 | 50.6 | 3.1 | 2.9 | 56.7 | |

| | Kapiolani Boulevard Westbound | | | Kamakee Street Northbound | | | Kapiolani Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | |
| 04:30 PM | 0 | 215 | 215 | 39 | 54 | 93 | 412 | 33 | 445 | 753 |
| 04:45 PM | 6 | 206 | 212 | 31 | 53 | 84 | 502 | 26 | 528 | 824 |
| 05:00 PM | 1 | 220 | 221 | 49 | 55 | 104 | 442 | 29 | 471 | 796 |
| 05:15 PM | 0 | 225 | 225 | 26 | 53 | 79 | 444 | 36 | 480 | 784 |
| Total Volume | 7 | 866 | 873 | 145 | 215 | 360 | 1800 | 124 | 1924 | 3157 |
| % App. Total | 0.8 | 99.2 | | 40.3 | 59.7 | | 93.6 | 6.4 | | |
| PHF | .292 | .962 | .970 | .740 | .977 | .865 | .896 | .861 | .911 | .958 |

# Wilson Okamoto Corporation

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

Counted By: DY, BE
Counters: D4-5673, D4-3890
Weather: CLEAR

File Name : KAP PII AM
Site Code : 00000004
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Kapiolani Boulevard Westbound | | | | Piikoi Street Northbound | | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 06:00 AM | 99 | 22 | 7 | 128 | 7 | 96 | 4 | 1 | 108 | 82 | 4 | 1 | 87 | 323 |
| 06:15 AM | 158 | 22 | 4 | 184 | 6 | 94 | 10 | 2 | 112 | 57 | 5 | 4 | 66 | 362 |
| 06:30 AM | 252 | 30 | 12 | 294 | 11 | 127 | 8 | 10 | 156 | 100 | 7 | 6 | 113 | 563 |
| 06:45 AM | 299 | 50 | 19 | 368 | 8 | 149 | 11 | 10 | 178 | 123 | 11 | 6 | 140 | 686 |
| Total | 808 | 124 | 42 | 974 | 32 | 466 | 33 | 23 | 554 | 362 | 27 | 17 | 406 | 1934 |
| 07:00 AM | 350 | 32 | 8 | 390 | 16 | 215 | 18 | 4 | 253 | 126 | 16 | 10 | 152 | 795 |
| 07:15 AM | 413 | 56 | 11 | 480 | 22 | 220 | 13 | 3 | 258 | 142 | 13 | 14 | 169 | 907 |
| 07:30 AM | 401 | 67 | 15 | 483 | 15 | 231 | 9 | 20 | 275 | 196 | 13 | 18 | 227 | 985 |
| 07:45 AM | 360 | 78 | 18 | 456 | 12 | 164 | 8 | 11 | 195 | 169 | 16 | 12 | 197 | 848 |
| Total | 1524 | 233 | 52 | 1809 | 65 | 830 | 48 | 38 | 981 | 633 | 58 | 54 | 745 | 3535 |
| 08:00 AM | 350 | 73 | 17 | 440 | 5 | 200 | 14 | 11 | 230 | 190 | 17 | 17 | 224 | 894 |
| 08:15 AM | 293 | 50 | 9 | 352 | 7 | 197 | 22 | 25 | 251 | 155 | 10 | 18 | 183 | 786 |
| 08:30 AM | 199 | 40 | 18 | 257 | 15 | 214 | 20 | 18 | 267 | 199 | 16 | 16 | 231 | 755 |
| 08:45 AM | 162 | 79 | 24 | 265 | 12 | 203 | 14 | 15 | 244 | 216 | 25 | 19 | 260 | 769 |
| Total | 1004 | 242 | 68 | 1314 | 39 | 814 | 70 | 69 | 992 | 760 | 68 | 70 | 898 | 3204 |
| Grand Total | 3336 | 599 | 162 | 4097 | 136 | 2110 | 151 | 130 | 2527 | 1755 | 153 | 141 | 2049 | 8673 |
| Apprch % | 81.4 | 14.6 | 4 | | 5.4 | 83.5 | 6 | 5.1 | | 85.7 | 7.5 | 6.9 | | |
| Total % | 38.5 | 6.9 | 1.9 | 47.2 | 1.6 | 24.3 | 1.7 | 1.5 | 29.1 | 20.2 | 1.8 | 1.6 | 23.6 | |

| | Kapiolani Boulevard Westbound | | | Piikoi Street Northbound | | | | Kapiolani Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | |
| 07:15 AM | 413 | 56 | 469 | 22 | 220 | 13 | 255 | 142 | 13 | 155 | 879 |
| 07:30 AM | 401 | 67 | 468 | 15 | 231 | 9 | 255 | 196 | 13 | 209 | 932 |
| 07:45 AM | 360 | 78 | 438 | 12 | 164 | 8 | 184 | 169 | 16 | 185 | 807 |
| 08:00 AM | 350 | 73 | 423 | 5 | 200 | 14 | 219 | 190 | 17 | 207 | 849 |
| Total Volume | 1524 | 274 | 1798 | 54 | 815 | 44 | 913 | 697 | 59 | 756 | 3467 |
| % App. Total | 84.8 | 15.2 | | 5.9 | 89.3 | 4.8 | | 92.2 | 7.8 | | |
| PHF | .923 | .878 | .958 | .614 | .882 | .786 | .895 | .889 | .868 | .904 | .930 |

# Wilson Okamoto Corporation

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

Counted By: DY, BE
Counters: D4-5673, D4-3890
Weather: CLEAR

File Name : KAP PII PM
Site Code : 00000004
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted

| | Kapiolani Boulevard Westbound | | | | Piikoi Street Northbound | | | | | Kapiolani Boulevard Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Thru | Right | Peds | App. Total | Int. Total |
| 03:00 PM | 156 | 48 | 29 | 233 | 31 | 312 | 49 | 34 | 426 | 302 | 27 | 20 | 349 | 1008 |
| 03:15 PM | 155 | 78 | 14 | 247 | 21 | 273 | 44 | 13 | 351 | 375 | 27 | 16 | 418 | 1016 |
| 03:30 PM | 152 | 77 | 13 | 242 | 21 | 337 | 57 | 9 | 424 | 373 | 29 | 33 | 435 | 1101 |
| 03:45 PM | 191 | 87 | 21 | 299 | 19 | 265 | 39 | 26 | 349 | 404 | 25 | 29 | 458 | 1106 |
| Total | 654 | 290 | 77 | 1021 | 92 | 1187 | 189 | 82 | 1550 | 1454 | 108 | 98 | 1660 | 4231 |
| 04:00 PM | 173 | 47 | 38 | 258 | 29 | 272 | 51 | 17 | 369 | 330 | 19 | 31 | 380 | 1007 |
| 04:15 PM | 174 | 68 | 36 | 278 | 25 | 257 | 35 | 34 | 351 | 403 | 29 | 23 | 455 | 1084 |
| 04:30 PM | 153 | 55 | 9 | 217 | 22 | 271 | 62 | 21 | 376 | 388 | 29 | 25 | 442 | 1035 |
| 04:45 PM | 154 | 89 | 28 | 271 | 16 | 252 | 51 | 31 | 350 | 525 | 34 | 28 | 587 | 1208 |
| Total | 654 | 259 | 111 | 1024 | 92 | 1052 | 199 | 103 | 1446 | 1646 | 111 | 107 | 1864 | 4334 |
| 05:00 PM | 143 | 61 | 37 | 241 | 28 | 319 | 51 | 29 | 427 | 426 | 36 | 34 | 496 | 1164 |
| 05:15 PM | 151 | 79 | 37 | 267 | 24 | 274 | 59 | 27 | 384 | 475 | 45 | 26 | 546 | 1197 |
| 05:30 PM | 141 | 47 | 15 | 203 | 29 | 302 | 50 | 23 | 404 | 370 | 33 | 20 | 423 | 1030 |
| 05:45 PM | 161 | 54 | 17 | 232 | 21 | 246 | 55 | 35 | 357 | 393 | 33 | 12 | 438 | 1027 |
| Total | 596 | 241 | 106 | 943 | 102 | 1141 | 215 | 114 | 1572 | 1664 | 147 | 92 | 1903 | 4418 |
| Grand Total | 1904 | 790 | 294 | 2988 | 286 | 3380 | 603 | 299 | 4568 | 4764 | 366 | 297 | 5427 | 12983 |
| Apprch % | 63.7 | 26.4 | 9.8 | | 6.3 | 74 | 13.2 | 6.5 | | 87.8 | 6.7 | 5.5 | | |
| Total % | 14.7 | 6.1 | 2.3 | 23 | 2.2 | 26 | 4.6 | 2.3 | 35.2 | 36.7 | 2.8 | 2.3 | 41.8 | |

| | Kapiolani Boulevard Westbound | | | Piikoi Street Northbound | | | | Kapiolani Boulevard Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | |
| 04:30 PM | 153 | 55 | 208 | 22 | 271 | 62 | 355 | 388 | 29 | 417 | 980 |
| 04:45 PM | 154 | 89 | 243 | 16 | 252 | 51 | 319 | 525 | 34 | 559 | 1121 |
| 05:00 PM | 143 | 61 | 204 | 28 | 319 | 51 | 398 | 426 | 36 | 462 | 1064 |
| 05:15 PM | 151 | 79 | 230 | 24 | 274 | 59 | 357 | 475 | 45 | 520 | 1107 |
| Total Volume | 601 | 284 | 885 | 90 | 1116 | 223 | 1429 | 1814 | 144 | 1958 | 4272 |
| % App. Total | 67.9 | 32.1 | | 6.3 | 78.1 | 15.6 | | 92.6 | 7.4 | | |
| PHF | .976 | .798 | .910 | .804 | .875 | .899 | .898 | .864 | .800 | .876 | .953 |

# Wilson Okamoto Corporation

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

Counted By: FS, GH
Counters: D4-5673, D4-5671
Weather: CLEAR

File Name : QUE COO AM
Site Code : 00000001
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Queen Street Westbound | | | | | Cooke Street Northbound | | | | | Queen 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 | 19 | 6 | 3 | 28 | 2 | 21 | 4 | 15 | 42 | 1 | 20 | 7 | 1 | 29 | 3 | 26 | 16 | 5 | 50 | 149 |
| 06:15 AM | 4 | 21 | 13 | 5 | 43 | 7 | 42 | 5 | 9 | 63 | 2 | 23 | 4 | 1 | 30 | 6 | 19 | 12 | 8 | 45 | 181 |
| 06:30 AM | 3 | 33 | 17 | 3 | 56 | 5 | 43 | 5 | 8 | 61 | 2 | 32 | 6 | 2 | 42 | 5 | 19 | 13 | 6 | 43 | 202 |
| 06:45 AM | 1 | 45 | 33 | 3 | 82 | 8 | 62 | 4 | 13 | 87 | 8 | 30 | 10 | 5 | 53 | 2 | 30 | 12 | 11 | 55 | 277 |
| Total | 8 | 118 | 69 | 14 | 209 | 22 | 168 | 18 | 45 | 253 | 13 | 105 | 27 | 9 | 154 | 16 | 94 | 53 | 30 | 193 | 809 |
| 07:00 AM | 4 | 36 | 27 | 5 | 72 | 15 | 80 | 9 | 10 | 114 | 9 | 40 | 6 | 6 | 61 | 6 | 30 | 15 | 9 | 60 | 307 |
| 07:15 AM | 5 | 51 | 41 | 7 | 104 | 13 | 100 | 20 | 12 | 145 | 10 | 44 | 11 | 2 | 67 | 10 | 30 | 14 | 8 | 62 | 378 |
| 07:30 AM | 1 | 40 | 47 | 12 | 100 | 19 | 116 | 9 | 13 | 157 | 6 | 57 | 10 | 4 | 77 | 10 | 44 | 17 | 5 | 76 | 410 |
| 07:45 AM | 3 | 47 | 40 | 7 | 97 | 16 | 119 | 10 | 15 | 160 | 6 | 49 | 10 | 3 | 68 | 6 | 54 | 13 | 4 | 77 | 402 |
| Total | 13 | 174 | 155 | 31 | 373 | 63 | 415 | 48 | 50 | 576 | 31 | 190 | 37 | 15 | 273 | 32 | 158 | 59 | 26 | 275 | 1497 |
| 08:00 AM | 5 | 41 | 44 | 4 | 94 | 16 | 99 | 10 | 14 | 139 | 12 | 58 | 12 | 3 | 85 | 6 | 45 | 16 | 5 | 72 | 390 |
| 08:15 AM | 4 | 54 | 29 | 1 | 88 | 16 | 80 | 10 | 7 | 113 | 10 | 48 | 11 | 6 | 75 | 9 | 49 | 9 | 4 | 71 | 347 |
| 08:30 AM | 4 | 45 | 29 | 4 | 82 | 12 | 85 | 8 | 12 | 117 | 9 | 65 | 21 | 2 | 97 | 15 | 56 | 13 | 0 | 84 | 380 |
| 08:45 AM | 8 | 45 | 26 | 5 | 84 | 9 | 63 | 12 | 21 | 105 | 9 | 58 | 9 | 3 | 79 | 11 | 57 | 18 | 6 | 92 | 360 |
| Total | 21 | 185 | 128 | 14 | 348 | 53 | 327 | 40 | 54 | 474 | 40 | 229 | 53 | 14 | 336 | 41 | 207 | 56 | 15 | 319 | 1477 |
| Grand Total | 42 | 477 | 352 | 59 | 930 | 138 | 910 | 106 | 149 | 1303 | 84 | 524 | 117 | 38 | 763 | 89 | 459 | 168 | 71 | 787 | 3783 |
| Apprch % | 4.5 | 51.3 | 37.8 | 6.3 | | 10.6 | 69.8 | 8.1 | 11.4 | | 11 | 68.7 | 15.3 | 5 | | 11.3 | 58.3 | 21.3 | 9 | | |
| Total % | 1.1 | 12.6 | 9.3 | 1.6 | 24.6 | 3.6 | 24.1 | 2.8 | 3.9 | 34.4 | 2.2 | 13.9 | 3.1 | 1 | 20.2 | 2.4 | 12.1 | 4.4 | 1.9 | 20.8 | |

| | Cooke Street Southbound | | | | Queen Street Westbound | | | | Cooke Street Northbound | | | | Queen 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 5 | 51 | 41 | 97 | 13 | 100 | 20 | 133 | 10 | 44 | 11 | 65 | 10 | 30 | 14 | 54 | 349 |
| 07:30 AM | 1 | 40 | 47 | 88 | 19 | 116 | 9 | 144 | 6 | 57 | 10 | 73 | 10 | 44 | 17 | 71 | 376 |
| 07:45 AM | 3 | 47 | 40 | 90 | 16 | 119 | 10 | 145 | 6 | 49 | 10 | 65 | 6 | 54 | 13 | 73 | 373 |
| 08:00 AM | 5 | 41 | 44 | 90 | 16 | 99 | 10 | 125 | 12 | 58 | 12 | 82 | 6 | 45 | 16 | 67 | 364 |
| Total Volume | 14 | 179 | 172 | 365 | 64 | 434 | 49 | 547 | 34 | 208 | 43 | 285 | 32 | 173 | 60 | 265 | 1462 |
| % App. Total | 3.8 | 49 | 47.1 | | 11.7 | 79.3 | 9 | | 11.9 | 73 | 15.1 | | 12.1 | 65.3 | 22.6 | | |
| PHF | .700 | .877 | .915 | .941 | .842 | .912 | .613 | .943 | .708 | .897 | .896 | .869 | .800 | .801 | .882 | .908 | .972 |

# Wilson Okamoto Corporation

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

Counted By: FS
Counters: D4-5673
Weather: CLEAR

File Name : QUE COO PM
Site Code : 00000001
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Queen Street Westbound | | | | | Cooke Street Northbound | | | | | Queen 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 |
| 03:00 PM | 9 | 55 | 17 | 0 | 81 | 24 | 85 | 12 | 5 | 126 | 10 | 63 | 13 | 3 | 89 | 11 | 46 | 8 | 3 | 68 | 364 |
| 03:15 PM | 7 | 60 | 16 | 4 | 87 | 13 | 78 | 16 | 8 | 115 | 14 | 75 | 14 | 0 | 103 | 14 | 68 | 13 | 10 | 105 | 410 |
| 03:30 PM | 4 | 54 | 28 | 4 | 90 | 14 | 81 | 11 | 17 | 123 | 8 | 56 | 14 | 1 | 79 | 13 | 71 | 14 | 5 | 103 | 395 |
| 03:45 PM | 6 | 54 | 27 | 4 | 91 | 15 | 80 | 9 | 3 | 107 | 10 | 67 | 19 | 3 | 99 | 21 | 74 | 16 | 4 | 115 | 412 |
| Total | 26 | 223 | 88 | 12 | 349 | 66 | 324 | 48 | 33 | 471 | 42 | 261 | 60 | 7 | 370 | 59 | 259 | 51 | 22 | 391 | 1581 |
| 04:00 PM | 7 | 48 | 28 | 3 | 86 | 18 | 71 | 17 | 6 | 112 | 5 | 65 | 14 | 2 | 86 | 22 | 82 | 11 | 3 | 118 | 402 |
| 04:15 PM | 2 | 67 | 23 | 3 | 95 | 14 | 67 | 6 | 3 | 90 | 1 | 63 | 17 | 4 | 85 | 26 | 87 | 17 | 9 | 139 | 409 |
| 04:30 PM | 3 | 51 | 32 | 7 | 93 | 20 | 81 | 17 | 9 | 127 | 7 | 76 | 11 | 2 | 96 | 24 | 110 | 16 | 5 | 155 | 471 |
| 04:45 PM | 4 | 73 | 24 | 6 | 107 | 14 | 88 | 20 | 10 | 132 | 9 | 86 | 11 | 9 | 115 | 35 | 100 | 13 | 9 | 157 | 511 |
| Total | 16 | 239 | 107 | 19 | 381 | 66 | 307 | 60 | 28 | 461 | 22 | 290 | 53 | 17 | 382 | 107 | 379 | 57 | 26 | 569 | 1793 |
| 05:00 PM | 5 | 73 | 17 | 9 | 104 | 8 | 78 | 20 | 7 | 113 | 11 | 81 | 14 | 3 | 109 | 16 | 113 | 11 | 15 | 155 | 481 |
| 05:15 PM | 5 | 63 | 31 | 4 | 103 | 7 | 64 | 13 | 6 | 90 | 6 | 79 | 10 | 7 | 102 | 32 | 132 | 13 | 15 | 192 | 487 |
| 05:30 PM | 8 | 35 | 16 | 18 | 77 | 20 | 65 | 12 | 16 | 113 | 8 | 67 | 19 | 3 | 97 | 14 | 122 | 18 | 8 | 162 | 449 |
| 05:45 PM | 3 | 46 | 12 | 6 | 67 | 16 | 83 | 13 | 13 | 125 | 5 | 63 | 12 | 4 | 84 | 25 | 103 | 14 | 10 | 152 | 428 |
| Total | 21 | 217 | 76 | 37 | 351 | 51 | 290 | 58 | 42 | 441 | 30 | 290 | 55 | 17 | 392 | 87 | 470 | 56 | 48 | 661 | 1845 |
| Grand Total | 63 | 679 | 271 | 68 | 1081 | 183 | 921 | 166 | 103 | 1373 | 94 | 841 | 168 | 41 | 1144 | 253 | 1108 | 164 | 96 | 1621 | 5219 |
| Apprch % | 5.8 | 62.8 | 25.1 | 6.3 | | 13.3 | 67.1 | 12.1 | 7.5 | | 8.2 | 73.5 | 14.7 | 3.6 | | 15.6 | 68.4 | 10.1 | 5.9 | | |
| Total % | 1.2 | 13 | 5.2 | 1.3 | 20.7 | 3.5 | 17.6 | 3.2 | 2 | 26.3 | 1.8 | 16.1 | 3.2 | 0.8 | 21.9 | 4.8 | 21.2 | 3.1 | 1.8 | 31.1 | |

| | Cooke Street Southbound | | | | Queen Street Westbound | | | | Cooke Street Northbound | | | | Queen 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 3 | 51 | 32 | 86 | 20 | 81 | 17 | 118 | 7 | 76 | 11 | 94 | 24 | 110 | 16 | 150 | 448 |
| 04:45 PM | 4 | 73 | 24 | 101 | 14 | 88 | 20 | 122 | 9 | 86 | 11 | 106 | 35 | 100 | 13 | 148 | 477 |
| 05:00 PM | 5 | 73 | 17 | 95 | 8 | 78 | 20 | 106 | 11 | 81 | 14 | 106 | 16 | 113 | 11 | 140 | 447 |
| 05:15 PM | 5 | 63 | 31 | 99 | 7 | 64 | 13 | 84 | 6 | 79 | 10 | 95 | 32 | 132 | 13 | 177 | 455 |
| Total Volume | 17 | 260 | 104 | 381 | 49 | 311 | 70 | 430 | 33 | 322 | 46 | 401 | 107 | 455 | 53 | 615 | 1827 |
| % App. Total | 4.5 | 68.2 | 27.3 | | 11.4 | 72.3 | 16.3 | | 8.2 | 80.3 | 11.5 | | 17.4 | 74 | 8.6 | | |
| PHF | .850 | .890 | .813 | .943 | .613 | .884 | .875 | .881 | .750 | .936 | .821 | .946 | .764 | .862 | .828 | .869 | .958 |

# Wilson Okamoto Corporation

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

Counted By: EV
Counters: D4-3889
Weather: CLEAR

File Name : COO HAL AM
Site Code : 00000002
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Halekauwila Street Westbound | | | | | Cooke 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 | 8 | 19 | 4 | 2 | 33 | 2 | 2 | 2 | 4 | 10 | 1 | 20 | 5 | 2 | 28 | 4 | 6 | 1 | 5 | 16 | 87 |
| 06:15 AM | 7 | 29 | 4 | 3 | 43 | 1 | 8 | 3 | 6 | 18 | 2 | 19 | 9 | 1 | 31 | 5 | 8 | 5 | 2 | 20 | 112 |
| 06:30 AM | 7 | 30 | 6 | 2 | 45 | 7 | 7 | 9 | 4 | 27 | 3 | 21 | 16 | 1 | 41 | 5 | 16 | 1 | 1 | 23 | 136 |
| 06:45 AM | 11 | 38 | 12 | 3 | 64 | 3 | 14 | 6 | 6 | 29 | 2 | 37 | 11 | 3 | 53 | 10 | 14 | 4 | 2 | 30 | 176 |
| Total | 33 | 116 | 26 | 10 | 185 | 13 | 31 | 20 | 20 | 84 | 8 | 97 | 41 | 7 | 153 | 24 | 44 | 11 | 10 | 89 | 511 |
| 07:00 AM | 7 | 45 | 15 | 2 | 69 | 9 | 16 | 3 | 5 | 33 | 5 | 51 | 7 | 5 | 68 | 8 | 14 | 6 | 8 | 36 | 206 |
| 07:15 AM | 14 | 48 | 13 | 5 | 80 | 4 | 17 | 6 | 4 | 31 | 4 | 39 | 8 | 2 | 53 | 17 | 16 | 2 | 2 | 37 | 201 |
| 07:30 AM | 4 | 50 | 21 | 3 | 78 | 5 | 14 | 13 | 6 | 38 | 7 | 50 | 7 | 5 | 69 | 11 | 15 | 6 | 8 | 40 | 225 |
| 07:45 AM | 10 | 56 | 14 | 4 | 84 | 9 | 21 | 8 | 3 | 41 | 6 | 47 | 10 | 3 | 66 | 13 | 22 | 6 | 4 | 45 | 236 |
| Total | 35 | 199 | 63 | 14 | 311 | 27 | 68 | 30 | 18 | 143 | 22 | 187 | 32 | 15 | 256 | 49 | 67 | 20 | 22 | 158 | 868 |
| 08:00 AM | 4 | 54 | 13 | 3 | 74 | 9 | 12 | 7 | 2 | 30 | 5 | 49 | 9 | 4 | 67 | 14 | 14 | 3 | 2 | 33 | 204 |
| 08:15 AM | 5 | 64 | 15 | 2 | 86 | 6 | 16 | 9 | 2 | 33 | 4 | 40 | 3 | 1 | 48 | 18 | 16 | 15 | 2 | 51 | 218 |
| 08:30 AM | 7 | 55 | 12 | 5 | 79 | 2 | 17 | 8 | 7 | 34 | 4 | 68 | 9 | 4 | 85 | 16 | 10 | 9 | 1 | 36 | 234 |
| 08:45 AM | 7 | 49 | 13 | 4 | 73 | 8 | 6 | 7 | 2 | 23 | 1 | 57 | 9 | 4 | 71 | 11 | 12 | 10 | 7 | 40 | 207 |
| Total | 23 | 222 | 53 | 14 | 312 | 25 | 51 | 31 | 13 | 120 | 14 | 214 | 30 | 13 | 271 | 59 | 52 | 37 | 12 | 160 | 863 |
| Grand Total | 91 | 537 | 142 | 38 | 808 | 65 | 150 | 81 | 51 | 347 | 44 | 498 | 103 | 35 | 680 | 132 | 163 | 68 | 44 | 407 | 2242 |
| Apprch % | 11.3 | 66.5 | 17.6 | 4.7 | | 18.7 | 43.2 | 23.3 | 14.7 | | 6.5 | 73.2 | 15.1 | 5.1 | | 32.4 | 40 | 16.7 | 10.8 | | |
| Total % | 4.1 | 24 | 6.3 | 1.7 | 36 | 2.9 | 6.7 | 3.6 | 2.3 | 15.5 | 2 | 22.2 | 4.6 | 1.6 | 30.3 | 5.9 | 7.3 | 3 | 2 | 18.2 | |

| | Cooke Street Southbound | | | | Halekauwila Street Westbound | | | | Cooke 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 10 | 56 | 14 | 80 | 9 | 21 | 8 | 38 | 6 | 47 | 10 | 63 | 13 | 22 | 6 | 41 | 222 |
| 08:00 AM | 4 | 54 | 13 | 71 | 9 | 12 | 7 | 28 | 5 | 49 | 9 | 63 | 14 | 14 | 3 | 31 | 193 |
| 08:15 AM | 5 | 64 | 15 | 84 | 6 | 16 | 9 | 31 | 4 | 40 | 3 | 47 | 18 | 16 | 15 | 49 | 211 |
| 08:30 AM | 7 | 55 | 12 | 74 | 2 | 17 | 8 | 27 | 4 | 68 | 9 | 81 | 16 | 10 | 9 | 35 | 217 |
| Total Volume | 26 | 229 | 54 | 309 | 26 | 66 | 32 | 124 | 19 | 204 | 31 | 254 | 61 | 62 | 33 | 156 | 843 |
| % App. Total | 8.4 | 74.1 | 17.5 | | 21 | 53.2 | 25.8 | | 7.5 | 80.3 | 12.2 | | 39.1 | 39.7 | 21.2 | | |
| PHF | .650 | .895 | .900 | .920 | .722 | .786 | .889 | .816 | .792 | .750 | .775 | .784 | .847 | .705 | .550 | .796 | .949 |

# Wilson Okamoto Corporation

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

Counted By: EV
Counters: D4-3889
Weather: CLEAR

File Name : COO HAL PM
Site Code : 00000002
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Halekauwila Street Westbound | | | | | Cooke 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 |
| 03:00 PM | 17 | 65 | 11 | 3 | 96 | 15 | 26 | 14 | 7 | 62 | 7 | 62 | 6 | 0 | 75 | 11 | 13 | 6 | 4 | 34 | 267 |
| 03:15 PM | 12 | 68 | 9 | 12 | 101 | 6 | 24 | 10 | 23 | 63 | 3 | 70 | 1 | 1 | 75 | 18 | 17 | 7 | 7 | 49 | 288 |
| 03:30 PM | 9 | 62 | 14 | 1 | 86 | 16 | 27 | 16 | 12 | 71 | 4 | 48 | 2 | 6 | 60 | 10 | 22 | 14 | 2 | 48 | 265 |
| 03:45 PM | 11 | 69 | 9 | 4 | 93 | 11 | 15 | 11 | 3 | 40 | 1 | 64 | 7 | 0 | 72 | 18 | 32 | 6 | 2 | 58 | 263 |
| Total | 49 | 264 | 43 | 20 | 376 | 48 | 92 | 51 | 45 | 236 | 15 | 244 | 16 | 7 | 282 | 57 | 84 | 33 | 15 | 189 | 1083 |
| 04:00 PM | 5 | 66 | 11 | 7 | 89 | 13 | 17 | 10 | 4 | 44 | 5 | 63 | 14 | 4 | 86 | 14 | 27 | 10 | 1 | 52 | 271 |
| 04:15 PM | 3 | 86 | 8 | 4 | 101 | 11 | 21 | 5 | 2 | 39 | 7 | 63 | 11 | 2 | 83 | 18 | 32 | 17 | 12 | 79 | 302 |
| 04:30 PM | 6 | 67 | 14 | 0 | 87 | 11 | 14 | 11 | 5 | 41 | 5 | 60 | 13 | 5 | 83 | 22 | 59 | 10 | 1 | 92 | 303 |
| 04:45 PM | 14 | 76 | 10 | 3 | 103 | 12 | 18 | 18 | 4 | 52 | 1 | 66 | 8 | 6 | 81 | 24 | 56 | 9 | 9 | 98 | 334 |
| Total | 28 | 295 | 43 | 14 | 380 | 47 | 70 | 44 | 15 | 176 | 18 | 252 | 46 | 17 | 333 | 78 | 174 | 46 | 23 | 321 | 1210 |
| 05:00 PM | 10 | 75 | 9 | 5 | 99 | 13 | 17 | 15 | 5 | 50 | 7 | 72 | 11 | 5 | 95 | 25 | 31 | 18 | 7 | 81 | 325 |
| 05:15 PM | 11 | 67 | 13 | 1 | 92 | 15 | 19 | 12 | 5 | 51 | 4 | 67 | 13 | 5 | 89 | 24 | 39 | 8 | 14 | 85 | 317 |
| 05:30 PM | 11 | 50 | 11 | 5 | 77 | 15 | 18 | 16 | 5 | 54 | 4 | 61 | 12 | 7 | 84 | 16 | 34 | 10 | 9 | 69 | 284 |
| 05:45 PM | 8 | 51 | 11 | 5 | 75 | 6 | 18 | 10 | 4 | 38 | 7 | 48 | 6 | 3 | 64 | 17 | 37 | 11 | 12 | 77 | 254 |
| Total | 40 | 243 | 44 | 16 | 343 | 49 | 72 | 53 | 19 | 193 | 22 | 248 | 42 | 20 | 332 | 82 | 141 | 47 | 42 | 312 | 1180 |
| Grand Total | 117 | 802 | 130 | 50 | 1099 | 144 | 234 | 148 | 79 | 605 | 55 | 744 | 104 | 44 | 947 | 217 | 399 | 126 | 80 | 822 | 3473 |
| Apprch % | 10.6 | 73 | 11.8 | 4.5 | | 23.8 | 38.7 | 24.5 | 13.1 | | 5.8 | 78.6 | 11 | 4.6 | | 26.4 | 48.5 | 15.3 | 9.7 | | |
| Total % | 3.4 | 23.1 | 3.7 | 1.4 | 31.6 | 4.1 | 6.7 | 4.3 | 2.3 | 17.4 | 1.6 | 21.4 | 3 | 1.3 | 27.3 | 6.2 | 11.5 | 3.6 | 2.3 | 23.7 | |

| | Cooke Street Southbound | | | | Halekauwila Street Westbound | | | | Cooke 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 6 | 67 | 14 | 87 | 11 | 14 | 11 | 36 | 5 | 60 | 13 | 78 | 22 | 59 | 10 | 91 | 292 |
| 04:45 PM | 14 | 76 | 10 | 100 | 12 | 18 | 18 | 48 | 1 | 66 | 8 | 75 | 24 | 56 | 9 | 89 | 312 |
| 05:00 PM | 10 | 75 | 9 | 94 | 13 | 17 | 15 | 45 | 7 | 72 | 11 | 90 | 25 | 31 | 18 | 74 | 303 |
| 05:15 PM | 11 | 67 | 13 | 91 | 15 | 19 | 12 | 46 | 4 | 67 | 13 | 84 | 24 | 39 | 8 | 71 | 292 |
| Total Volume | 41 | 285 | 46 | 372 | 51 | 68 | 56 | 175 | 17 | 265 | 45 | 327 | 95 | 185 | 45 | 325 | 1199 |
| % App. Total | 11 | 76.6 | 12.4 | | 29.1 | 38.9 | 32 | | 5.2 | 81 | 13.8 | | 29.2 | 56.9 | 13.8 | | |
| PHF | .732 | .938 | .821 | .930 | .850 | .895 | .778 | .911 | .607 | .920 | .865 | .908 | .950 | .784 | .625 | .893 | .961 |

# Wilson Okamoto Corporation

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

Counted By: WL
Counters: D4-5677
Weather: CLEAR

File Name : COO POH AM
Site Code : 00000003
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Pohukaina Street Westbound | | | | | Cooke 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 | 3 | 14 | 6 | 2 | 25 | 5 | 3 | 2 | 4 | 14 | 4 | 21 | 6 | 3 | 34 | 3 | 5 | 2 | 2 | 12 | 85 |
| 06:15 AM | 8 | 20 | 6 | 3 | 37 | 3 | 7 | 4 | 5 | 19 | 0 | 25 | 6 | 4 | 35 | 3 | 5 | 2 | 3 | 13 | 104 |
| 06:30 AM | 6 | 21 | 12 | 1 | 40 | 4 | 10 | 4 | 3 | 21 | 1 | 31 | 10 | 4 | 46 | 6 | 9 | 2 | 2 | 19 | 126 |
| 06:45 AM | 10 | 21 | 10 | 3 | 44 | 5 | 10 | 9 | 4 | 28 | 4 | 34 | 9 | 4 | 51 | 6 | 8 | 2 | 5 | 21 | 144 |
| Total | 27 | 76 | 34 | 9 | 146 | 17 | 30 | 19 | 16 | 82 | 9 | 111 | 31 | 15 | 166 | 18 | 27 | 8 | 12 | 65 | 459 |
| 07:00 AM | 10 | 24 | 24 | 2 | 60 | 4 | 23 | 13 | 4 | 44 | 4 | 39 | 6 | 9 | 58 | 8 | 7 | 4 | 3 | 22 | 184 |
| 07:15 AM | 9 | 28 | 17 | 3 | 57 | 5 | 41 | 7 | 2 | 55 | 3 | 39 | 9 | 1 | 52 | 9 | 12 | 3 | 0 | 24 | 188 |
| 07:30 AM | 5 | 33 | 26 | 2 | 66 | 9 | 27 | 11 | 5 | 52 | 5 | 36 | 8 | 5 | 54 | 16 | 10 | 3 | 6 | 35 | 207 |
| 07:45 AM | 6 | 38 | 22 | 6 | 72 | 8 | 25 | 7 | 3 | 43 | 5 | 39 | 6 | 2 | 52 | 15 | 17 | 2 | 3 | 37 | 204 |
| Total | 30 | 123 | 89 | 13 | 255 | 26 | 116 | 38 | 14 | 194 | 17 | 153 | 29 | 17 | 216 | 48 | 46 | 12 | 12 | 118 | 783 |
| 08:00 AM | 2 | 38 | 24 | 2 | 66 | 7 | 29 | 12 | 4 | 52 | 8 | 39 | 5 | 5 | 57 | 14 | 16 | 3 | 0 | 33 | 208 |
| 08:15 AM | 9 | 38 | 34 | 2 | 83 | 6 | 29 | 4 | 3 | 42 | 4 | 32 | 7 | 0 | 43 | 7 | 24 | 5 | 1 | 37 | 205 |
| 08:30 AM | 5 | 42 | 23 | 2 | 72 | 8 | 22 | 16 | 1 | 47 | 7 | 38 | 10 | 3 | 58 | 25 | 16 | 4 | 1 | 46 | 223 |
| 08:45 AM | 8 | 34 | 21 | 12 | 75 | 7 | 15 | 10 | 5 | 37 | 0 | 43 | 8 | 3 | 54 | 15 | 22 | 3 | 5 | 45 | 211 |
| Total | 24 | 152 | 102 | 18 | 296 | 28 | 95 | 42 | 13 | 178 | 19 | 152 | 30 | 11 | 212 | 61 | 78 | 15 | 7 | 161 | 847 |
| Grand Total | 81 | 351 | 225 | 40 | 697 | 71 | 241 | 99 | 43 | 454 | 45 | 416 | 90 | 43 | 594 | 127 | 151 | 35 | 31 | 344 | 2089 |
| Apprch % | 11.6 | 50.4 | 32.3 | 5.7 | | 15.6 | 53.1 | 21.8 | 9.5 | | 7.6 | 70 | 15.2 | 7.2 | | 36.9 | 43.9 | 10.2 | 9 | | |
| Total % | 3.9 | 16.8 | 10.8 | 1.9 | 33.4 | 3.4 | 11.5 | 4.7 | 2.1 | 21.7 | 2.2 | 19.9 | 4.3 | 2.1 | 28.4 | 6.1 | 7.2 | 1.7 | 1.5 | 16.5 | |

| | Cooke Street Southbound | | | | Pohukaina Street Westbound | | | | Cooke 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 6 | 38 | 22 | 66 | 8 | 25 | 7 | 40 | 5 | 39 | 6 | 50 | 15 | 17 | 2 | 34 | 190 |
| 08:00 AM | 2 | 38 | 24 | 64 | 7 | 29 | 12 | 48 | 8 | 39 | 5 | 52 | 14 | 16 | 3 | 33 | 197 |
| 08:15 AM | 9 | 38 | 34 | 81 | 6 | 29 | 4 | 39 | 4 | 32 | 7 | 43 | 7 | 24 | 5 | 36 | 199 |
| 08:30 AM | 5 | 42 | 23 | 70 | 8 | 22 | 16 | 46 | 7 | 38 | 10 | 55 | 25 | 16 | 4 | 45 | 216 |
| Total Volume | 22 | 156 | 103 | 281 | 29 | 105 | 39 | 173 | 24 | 148 | 28 | 200 | 61 | 73 | 14 | 148 | 802 |
| % App. Total | 7.8 | 55.5 | 36.7 | | 16.8 | 60.7 | 22.5 | | 12 | 74 | 14 | | 41.2 | 49.3 | 9.5 | | |
| PHF | .611 | .929 | .757 | .867 | .906 | .905 | .609 | .901 | .750 | .949 | .700 | .909 | .610 | .760 | .700 | .822 | .928 |

# Wilson Okamoto Corporation

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

Counted By: WL
Counters: D4-5677
Weather: CLEAR

File Name : COO POH PM
Site Code : 00000003
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Pohukaina Street Westbound | | | | | Cooke 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 |
| 03:00 PM | 10 | 55 | 23 | 3 | 91 | 12 | 26 | 15 | 3 | 56 | 7 | 33 | 12 | 7 | 59 | 23 | 18 | 7 | 16 | 64 | 270 |
| 03:15 PM | 17 | 43 | 20 | 9 | 89 | 13 | 21 | 8 | 13 | 55 | 3 | 37 | 13 | 7 | 60 | 22 | 20 | 6 | 8 | 56 | 260 |
| 03:30 PM | 14 | 58 | 20 | 5 | 97 | 16 | 24 | 9 | 4 | 53 | 3 | 34 | 10 | 16 | 63 | 15 | 34 | 3 | 9 | 61 | 274 |
| 03:45 PM | 8 | 51 | 23 | 8 | 90 | 15 | 20 | 6 | 4 | 45 | 8 | 33 | 16 | 16 | 73 | 32 | 30 | 11 | 7 | 80 | 288 |
| Total | 49 | 207 | 86 | 25 | 367 | 56 | 91 | 38 | 24 | 209 | 21 | 137 | 51 | 46 | 255 | 92 | 102 | 27 | 40 | 261 | 1092 |
| 04:00 PM | 18 | 48 | 22 | 10 | 98 | 9 | 20 | 11 | 5 | 45 | 3 | 44 | 6 | 13 | 66 | 30 | 33 | 6 | 5 | 74 | 283 |
| 04:15 PM | 14 | 75 | 29 | 5 | 123 | 17 | 17 | 8 | 2 | 44 | 3 | 38 | 14 | 5 | 60 | 32 | 30 | 7 | 7 | 76 | 303 |
| 04:30 PM | 16 | 52 | 20 | 11 | 99 | 10 | 29 | 11 | 3 | 53 | 3 | 31 | 11 | 13 | 58 | 35 | 36 | 12 | 6 | 89 | 299 |
| 04:45 PM | 8 | 60 | 29 | 16 | 113 | 17 | 22 | 5 | 14 | 58 | 6 | 54 | 15 | 21 | 96 | 17 | 43 | 12 | 12 | 84 | 351 |
| Total | 56 | 235 | 100 | 42 | 433 | 53 | 88 | 35 | 24 | 200 | 15 | 167 | 46 | 52 | 280 | 114 | 142 | 37 | 30 | 323 | 1236 |
| 05:00 PM | 14 | 57 | 28 | 15 | 114 | 16 | 19 | 6 | 9 | 50 | 8 | 40 | 13 | 15 | 76 | 40 | 34 | 7 | 16 | 97 | 337 |
| 05:15 PM | 8 | 55 | 19 | 12 | 94 | 11 | 16 | 11 | 20 | 58 | 3 | 41 | 14 | 20 | 78 | 40 | 27 | 10 | 10 | 87 | 317 |
| 05:30 PM | 13 | 46 | 16 | 14 | 89 | 9 | 20 | 7 | 21 | 57 | 3 | 39 | 10 | 24 | 76 | 27 | 26 | 10 | 12 | 75 | 297 |
| 05:45 PM | 11 | 38 | 22 | 12 | 83 | 13 | 25 | 13 | 9 | 60 | 9 | 38 | 12 | 23 | 82 | 12 | 24 | 13 | 6 | 55 | 280 |
| Total | 46 | 196 | 85 | 53 | 380 | 49 | 80 | 37 | 59 | 225 | 23 | 158 | 49 | 82 | 312 | 119 | 111 | 40 | 44 | 314 | 1231 |
| Grand Total | 151 | 638 | 271 | 120 | 1180 | 158 | 259 | 110 | 107 | 634 | 59 | 462 | 146 | 180 | 847 | 325 | 355 | 104 | 114 | 898 | 3559 |
| Apprch % | 12.8 | 54.1 | 23 | 10.2 | | 24.9 | 40.9 | 17.4 | 16.9 | | 7 | 54.5 | 17.2 | 21.3 | | 36.2 | 39.5 | 11.6 | 12.7 | | |
| Total % | 4.2 | 17.9 | 7.6 | 3.4 | 33.2 | 4.4 | 7.3 | 3.1 | 3 | 17.8 | 1.7 | 13 | 4.1 | 5.1 | 23.8 | 9.1 | 10 | 2.9 | 3.2 | 25.2 | |

| | Cooke Street Southbound | | | | Pohukaina Street Westbound | | | | Cooke 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 14 | 75 | 29 | 118 | 17 | 17 | 8 | 42 | 3 | 38 | 14 | 55 | 32 | 30 | 7 | 69 | 284 |
| 04:30 PM | 16 | 52 | 20 | 88 | 10 | 29 | 11 | 50 | 3 | 31 | 11 | 45 | 35 | 36 | 12 | 83 | 266 |
| 04:45 PM | 8 | 60 | 29 | 97 | 17 | 22 | 5 | 44 | 6 | 54 | 15 | 75 | 17 | 43 | 12 | 72 | 288 |
| 05:00 PM | 14 | 57 | 28 | 99 | 16 | 19 | 6 | 41 | 8 | 40 | 13 | 61 | 40 | 34 | 7 | 81 | 282 |
| Total Volume | 52 | 244 | 106 | 402 | 60 | 87 | 30 | 177 | 20 | 163 | 53 | 236 | 124 | 143 | 38 | 305 | 1120 |
| % App. Total | 12.9 | 60.7 | 26.4 | | 33.9 | 49.2 | 16.9 | | 8.5 | 69.1 | 22.5 | | 40.7 | 46.9 | 12.5 | | |
| PHF | .813 | .813 | .914 | .852 | .882 | .750 | .682 | .885 | .625 | .755 | .883 | .787 | .775 | .831 | .792 | .919 | .972 |

# Wilson Okamoto Corporation

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

Counted By: BE, LF
Counters: D4-5672, D4-3888
Weather: CLEAR

File Name : COO AUA AM
Site Code : 00000004
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Auahi Street Westbound | | | | | Cooke Street Northbound | | | | | Auahi 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 | 16 | 5 | 0 | 22 | 0 | 4 | 10 | 1 | 15 | 1 | 12 | 1 | 1 | 15 | 7 | 0 | 0 | 1 | 8 | 60 |
| 06:15 AM | 4 | 17 | 5 | 1 | 27 | 1 | 2 | 6 | 1 | 10 | 3 | 21 | 1 | 2 | 27 | 1 | 2 | 0 | 2 | 5 | 69 |
| 06:30 AM | 4 | 22 | 1 | 1 | 28 | 0 | 2 | 10 | 1 | 13 | 1 | 32 | 1 | 2 | 36 | 5 | 1 | 1 | 2 | 9 | 86 |
| 06:45 AM | 3 | 18 | 7 | 3 | 31 | 0 | 4 | 10 | 0 | 14 | 3 | 37 | 0 | 0 | 40 | 13 | 2 | 4 | 1 | 20 | 105 |
| Total | 12 | 73 | 18 | 5 | 108 | 1 | 12 | 36 | 3 | 52 | 8 | 102 | 3 | 5 | 118 | 26 | 5 | 5 | 6 | 42 | 320 |
| 07:00 AM | 3 | 22 | 7 | 4 | 36 | 0 | 5 | 8 | 2 | 15 | 8 | 22 | 2 | 2 | 34 | 10 | 0 | 0 | 2 | 12 | 97 |
| 07:15 AM | 4 | 25 | 8 | 2 | 39 | 1 | 4 | 8 | 2 | 15 | 8 | 29 | 0 | 4 | 41 | 10 | 2 | 1 | 4 | 17 | 112 |
| 07:30 AM | 5 | 28 | 9 | 3 | 45 | 0 | 3 | 8 | 2 | 13 | 2 | 35 | 0 | 1 | 38 | 16 | 2 | 4 | 1 | 23 | 119 |
| 07:45 AM | 1 | 30 | 18 | 2 | 51 | 1 | 5 | 7 | 0 | 13 | 7 | 30 | 1 | 2 | 40 | 8 | 0 | 1 | 2 | 11 | 115 |
| Total | 13 | 105 | 42 | 11 | 171 | 2 | 17 | 31 | 6 | 56 | 25 | 116 | 3 | 9 | 153 | 44 | 4 | 6 | 9 | 63 | 443 |
| 08:00 AM | 8 | 22 | 13 | 0 | 43 | 0 | 3 | 8 | 1 | 12 | 7 | 34 | 1 | 0 | 42 | 15 | 1 | 4 | 0 | 20 | 117 |
| 08:15 AM | 6 | 31 | 9 | 4 | 50 | 2 | 1 | 12 | 0 | 15 | 6 | 28 | 0 | 0 | 34 | 6 | 7 | 3 | 2 | 18 | 117 |
| 08:30 AM | 7 | 32 | 14 | 4 | 57 | 3 | 5 | 14 | 1 | 23 | 2 | 42 | 3 | 0 | 47 | 8 | 2 | 5 | 0 | 15 | 142 |
| 08:45 AM | 9 | 25 | 12 | 3 | 49 | 1 | 2 | 9 | 2 | 14 | 2 | 27 | 4 | 2 | 35 | 6 | 2 | 1 | 5 | 14 | 112 |
| Total | 30 | 110 | 48 | 11 | 199 | 6 | 11 | 43 | 4 | 64 | 17 | 131 | 8 | 2 | 158 | 35 | 12 | 13 | 7 | 67 | 488 |
| Grand Total | 55 | 288 | 108 | 27 | 478 | 9 | 40 | 110 | 13 | 172 | 50 | 349 | 14 | 16 | 429 | 105 | 21 | 24 | 22 | 172 | 1251 |
| Apprch % | 11.5 | 60.3 | 22.6 | 5.6 | | 5.2 | 23.3 | 64 | 7.6 | | 11.7 | 81.4 | 3.3 | 3.7 | | 61 | 12.2 | 14 | 12.8 | | |
| Total % | 4.4 | 23 | 8.6 | 2.2 | 38.2 | 0.7 | 3.2 | 8.8 | 1 | 13.7 | 4 | 27.9 | 1.1 | 1.3 | 34.3 | 8.4 | 1.7 | 1.9 | 1.8 | 13.7 | |

| | Cooke Street Southbound | | | | Auahi Street Westbound | | | | Cooke Street Northbound | | | | Auahi 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 1 | 30 | 18 | 49 | 1 | 5 | 7 | 13 | 7 | 30 | 1 | 38 | 8 | 0 | 1 | 9 | 109 |
| 08:00 AM | 8 | 22 | 13 | 43 | 0 | 3 | 8 | 11 | 7 | 34 | 1 | 42 | 15 | 1 | 4 | 20 | 116 |
| 08:15 AM | 6 | 31 | 9 | 46 | 2 | 1 | 12 | 15 | 6 | 28 | 0 | 34 | 6 | 7 | 3 | 16 | 111 |
| 08:30 AM | 7 | 32 | 14 | 53 | 3 | 5 | 14 | 22 | 2 | 42 | 3 | 47 | 8 | 2 | 5 | 15 | 137 |
| Total Volume | 22 | 115 | 54 | 191 | 6 | 14 | 41 | 61 | 22 | 134 | 5 | 161 | 37 | 10 | 13 | 60 | 473 |
| % App. Total | 11.5 | 60.2 | 28.3 | | 9.8 | 23 | 67.2 | | 13.7 | 83.2 | 3.1 | | 61.7 | 16.7 | 21.7 | | |
| PHF | .688 | .898 | .750 | .901 | .500 | .700 | .732 | .693 | .786 | .798 | .417 | .856 | .617 | .357 | .650 | .750 | .863 |

# Wilson Okamoto Corporation

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

Counted By: BE, LF
Counters: D4-5672, D4-3888
Weather: CLEAR

File Name : COO AUA PM
Site Code : 00000004
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Auahi Street Westbound | | | | | Cooke Street Northbound | | | | | Auahi 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 |
| 03:00 PM | 10 | 39 | 22 | 14 | 85 | 1 | 8 | 15 | 1 | 25 | 5 | 28 | 1 | 11 | 45 | 10 | 4 | 3 | 11 | 28 | 183 |
| 03:15 PM | 5 | 40 | 17 | 7 | 69 | 3 | 8 | 9 | 0 | 20 | 9 | 25 | 4 | 4 | 42 | 14 | 3 | 6 | 11 | 34 | 165 |
| 03:30 PM | 13 | 49 | 15 | 2 | 79 | 2 | 8 | 14 | 0 | 24 | 4 | 23 | 2 | 6 | 35 | 11 | 4 | 2 | 14 | 31 | 169 |
| 03:45 PM | 14 | 40 | 21 | 6 | 81 | 1 | 3 | 18 | 4 | 26 | 6 | 19 | 3 | 12 | 40 | 18 | 2 | 8 | 12 | 40 | 187 |
| Total | 42 | 168 | 75 | 29 | 314 | 7 | 27 | 56 | 5 | 95 | 24 | 95 | 10 | 33 | 162 | 53 | 13 | 19 | 48 | 133 | 704 |
| 04:00 PM | 10 | 38 | 12 | 8 | 68 | 1 | 4 | 15 | 0 | 20 | 3 | 16 | 2 | 9 | 30 | 10 | 8 | 6 | 7 | 31 | 149 |
| 04:15 PM | 11 | 56 | 26 | 6 | 99 | 1 | 4 | 12 | 1 | 18 | 7 | 22 | 3 | 2 | 34 | 20 | 5 | 5 | 0 | 30 | 181 |
| 04:30 PM | 15 | 52 | 13 | 10 | 90 | 4 | 4 | 12 | 0 | 20 | 8 | 16 | 3 | 9 | 36 | 13 | 12 | 7 | 1 | 33 | 179 |
| 04:45 PM | 13 | 52 | 18 | 3 | 86 | 3 | 13 | 18 | 1 | 35 | 7 | 28 | 10 | 4 | 49 | 26 | 11 | 6 | 4 | 47 | 217 |
| Total | 49 | 198 | 69 | 27 | 343 | 9 | 25 | 57 | 2 | 93 | 25 | 82 | 18 | 24 | 149 | 69 | 36 | 24 | 12 | 141 | 726 |
| 05:00 PM | 14 | 53 | 12 | 9 | 88 | 0 | 5 | 19 | 0 | 24 | 9 | 24 | 2 | 5 | 40 | 16 | 4 | 7 | 6 | 33 | 185 |
| 05:15 PM | 12 | 54 | 9 | 16 | 91 | 0 | 5 | 10 | 5 | 20 | 7 | 24 | 3 | 9 | 43 | 18 | 6 | 11 | 8 | 43 | 197 |
| 05:30 PM | 7 | 36 | 17 | 12 | 72 | 4 | 4 | 7 | 4 | 19 | 3 | 28 | 1 | 2 | 34 | 13 | 4 | 7 | 1 | 25 | 150 |
| 05:45 PM | 12 | 31 | 17 | 1 | 61 | 1 | 4 | 7 | 2 | 14 | 5 | 32 | 2 | 16 | 55 | 21 | 7 | 7 | 13 | 48 | 178 |
| Total | 45 | 174 | 55 | 38 | 312 | 5 | 18 | 43 | 11 | 77 | 24 | 108 | 8 | 32 | 172 | 68 | 21 | 32 | 28 | 149 | 710 |
| Grand Total | 136 | 540 | 199 | 94 | 969 | 21 | 70 | 156 | 18 | 265 | 73 | 285 | 36 | 89 | 483 | 190 | 70 | 75 | 88 | 423 | 2140 |
| Apprch % | 14 | 55.7 | 20.5 | 9.7 | | 7.9 | 26.4 | 58.9 | 6.8 | | 15.1 | 59 | 7.5 | 18.4 | | 44.9 | 16.5 | 17.7 | 20.8 | | |
| Total % | 6.4 | 25.2 | 9.3 | 4.4 | 45.3 | 1 | 3.3 | 7.3 | 0.8 | 12.4 | 3.4 | 13.3 | 1.7 | 4.2 | 22.6 | 8.9 | 3.3 | 3.5 | 4.1 | 19.8 | |

| | Cooke Street Southbound | | | | Auahi Street Westbound | | | | Cooke Street Northbound | | | | Auahi 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 11 | 56 | 26 | 93 | 1 | 4 | 12 | 17 | 7 | 22 | 3 | 32 | 20 | 5 | 5 | 30 | 172 |
| 04:30 PM | 15 | 52 | 13 | 80 | 4 | 4 | 12 | 20 | 8 | 16 | 3 | 27 | 13 | 12 | 7 | 32 | 159 |
| 04:45 PM | 13 | 52 | 18 | 83 | 3 | 13 | 18 | 34 | 7 | 28 | 10 | 45 | 26 | 11 | 6 | 43 | 205 |
| 05:00 PM | 14 | 53 | 12 | 79 | 0 | 5 | 19 | 24 | 9 | 24 | 2 | 35 | 16 | 4 | 7 | 27 | 165 |
| Total Volume | 53 | 213 | 69 | 335 | 8 | 26 | 61 | 95 | 31 | 90 | 18 | 139 | 75 | 32 | 25 | 132 | 701 |
| % App. Total | 15.8 | 63.6 | 20.6 | | 8.4 | 27.4 | 64.2 | | 22.3 | 64.7 | 12.9 | | 56.8 | 24.2 | 18.9 | | |
| PHF | .883 | .951 | .663 | .901 | .500 | .500 | .803 | .699 | .861 | .804 | .450 | .772 | .721 | .667 | .893 | .767 | .855 |

# Wilson Okamoto Corporation

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

Counted By: MM, DY
Counters: D4-5675, D4-5674
Weather: CLEAR

File Name : ALA COO AM
Site Code : 00000005
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Cooke Street Northbound | | | | | Ala Moana Boulevard 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 | 4 | 1 | 6 | 1 | 12 | 0 | 140 | 3 | 0 | 143 | 0 | 0 | 0 | 3 | 3 | 7 | 237 | 2 | 1 | 247 | 405 |
| 06:15 AM | 5 | 3 | 10 | 5 | 23 | 1 | 196 | 6 | 0 | 203 | 3 | 3 | 0 | 3 | 9 | 18 | 294 | 4 | 1 | 317 | 552 |
| 06:30 AM | 7 | 7 | 9 | 4 | 27 | 6 | 248 | 8 | 3 | 265 | 3 | 4 | 0 | 6 | 13 | 21 | 323 | 7 | 0 | 351 | 656 |
| 06:45 AM | 6 | 2 | 9 | 2 | 19 | 2 | 296 | 13 | 1 | 312 | 2 | 3 | 1 | 4 | 10 | 22 | 447 | 4 | 6 | 479 | 820 |
| Total | 22 | 13 | 34 | 12 | 81 | 9 | 880 | 30 | 4 | 923 | 8 | 10 | 1 | 16 | 35 | 68 | 1301 | 17 | 8 | 1394 | 2433 |
| 07:00 AM | 4 | 3 | 12 | 2 | 21 | 1 | 378 | 16 | 1 | 396 | 4 | 4 | 0 | 4 | 12 | 10 | 412 | 8 | 0 | 430 | 859 |
| 07:15 AM | 3 | 6 | 13 | 1 | 23 | 4 | 348 | 9 | 1 | 362 | 3 | 6 | 1 | 2 | 12 | 19 | 428 | 4 | 2 | 453 | 850 |
| 07:30 AM | 13 | 0 | 21 | 4 | 38 | 2 | 448 | 10 | 3 | 463 | 2 | 3 | 1 | 3 | 9 | 15 | 426 | 6 | 1 | 448 | 958 |
| 07:45 AM | 6 | 10 | 17 | 3 | 36 | 4 | 416 | 12 | 0 | 432 | 5 | 4 | 3 | 1 | 13 | 23 | 458 | 7 | 1 | 489 | 970 |
| Total | 26 | 19 | 63 | 10 | 118 | 11 | 1590 | 47 | 5 | 1653 | 14 | 17 | 5 | 10 | 46 | 67 | 1724 | 25 | 4 | 1820 | 3637 |
| 08:00 AM | 11 | 4 | 10 | 4 | 29 | 3 | 455 | 21 | 0 | 479 | 0 | 6 | 1 | 3 | 10 | 17 | 453 | 7 | 0 | 477 | 995 |
| 08:15 AM | 12 | 7 | 13 | 0 | 32 | 4 | 325 | 17 | 0 | 346 | 5 | 6 | 2 | 2 | 15 | 9 | 450 | 9 | 3 | 471 | 864 |
| 08:30 AM | 8 | 7 | 20 | 3 | 38 | 2 | 286 | 14 | 0 | 302 | 7 | 7 | 1 | 6 | 21 | 21 | 414 | 10 | 4 | 449 | 810 |
| 08:45 AM | 8 | 5 | 14 | 8 | 35 | 6 | 337 | 9 | 3 | 355 | 2 | 4 | 1 | 1 | 8 | 20 | 444 | 9 | 1 | 474 | 872 |
| Total | 39 | 23 | 57 | 15 | 134 | 15 | 1403 | 61 | 3 | 1482 | 14 | 23 | 5 | 12 | 54 | 67 | 1761 | 35 | 8 | 1871 | 3541 |
| Grand Total | 87 | 55 | 154 | 37 | 333 | 35 | 3873 | 138 | 12 | 4058 | 36 | 50 | 11 | 38 | 135 | 202 | 4786 | 77 | 20 | 5085 | 9611 |
| Apprch % | 26.1 | 16.5 | 46.2 | 11.1 | | 0.9 | 95.4 | 3.4 | 0.3 | | 26.7 | 37 | 8.1 | 28.1 | | 4 | 94.1 | 1.5 | 0.4 | | |
| Total % | 0.9 | 0.6 | 1.6 | 0.4 | 3.5 | 0.4 | 40.3 | 1.4 | 0.1 | 42.2 | 0.4 | 0.5 | 0.1 | 0.4 | 1.4 | 2.1 | 49.8 | 0.8 | 0.2 | 52.9 | |

| | Cooke Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Cooke Street Northbound | | | | Ala Moana Boulevard 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 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 13 | 0 | 21 | 34 | 2 | 448 | 10 | 460 | 2 | 3 | 1 | 6 | 15 | 426 | 6 | 447 | 947 |
| 07:45 AM | 6 | 10 | 17 | 33 | 4 | 416 | 12 | 432 | 5 | 4 | 3 | 12 | 23 | 458 | 7 | 488 | 965 |
| 08:00 AM | 11 | 4 | 10 | 25 | 3 | 455 | 21 | 479 | 0 | 6 | 1 | 7 | 17 | 453 | 7 | 477 | 988 |
| 08:15 AM | 12 | 7 | 13 | 32 | 4 | 325 | 17 | 346 | 5 | 6 | 2 | 13 | 9 | 450 | 9 | 468 | 859 |
| Total Volume | 42 | 21 | 61 | 124 | 13 | 1644 | 60 | 1717 | 12 | 19 | 7 | 38 | 64 | 1787 | 29 | 1880 | 3759 |
| % App. Total | 33.9 | 16.9 | 49.2 | | 0.8 | 95.7 | 3.5 | | 31.6 | 50 | 18.4 | | 3.4 | 95.1 | 1.5 | | |
| PHF | .808 | .525 | .726 | .912 | .813 | .903 | .714 | .896 | .600 | .792 | .583 | .731 | .696 | .975 | .806 | .963 | .951 |

# Wilson Okamoto Corporation

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

Counted By: GH, DY
Counters: D4-5675, D4-5674
Weather: CLEAR

File Name : ALA COO PM
Site Code : 00000005
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

| | Cooke Street Southbound | | | | | Ala Moana Boulevard Westbound | | | | | Cooke Street Northbound | | | | | Ala Moana Boulevard 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 |
| 03:00 PM | 3 | 4 | 34 | 3 | 44 | 3 | 417 | 15 | 0 | 435 | 5 | 7 | 7 | 3 | 22 | 13 | 430 | 5 | 0 | 448 | 949 |
| 03:15 PM | 5 | 6 | 34 | 5 | 50 | 1 | 394 | 15 | 7 | 417 | 7 | 10 | 1 | 7 | 25 | 15 | 462 | 7 | 4 | 488 | 980 |
| 03:30 PM | 9 | 1 | 40 | 5 | 55 | 1 | 340 | 12 | 5 | 358 | 13 | 7 | 2 | 9 | 31 | 11 | 504 | 7 | 5 | 527 | 971 |
| 03:45 PM | 8 | 7 | 34 | 7 | 56 | 2 | 358 | 18 | 2 | 380 | 10 | 5 | 6 | 6 | 27 | 9 | 483 | 4 | 7 | 503 | 966 |
| Total | 25 | 18 | 142 | 20 | 205 | 7 | 1509 | 60 | 14 | 1590 | 35 | 29 | 16 | 25 | 105 | 48 | 1879 | 23 | 16 | 1966 | 3866 |
| 04:00 PM | 17 | 2 | 22 | 3 | 44 | 0 | 319 | 8 | 3 | 330 | 5 | 9 | 2 | 5 | 21 | 5 | 509 | 3 | 6 | 523 | 918 |
| 04:15 PM | 13 | 12 | 39 | 2 | 66 | 0 | 431 | 12 | 3 | 446 | 8 | 9 | 5 | 2 | 24 | 13 | 527 | 3 | 7 | 550 | 1086 |
| 04:30 PM | 14 | 3 | 44 | 9 | 70 | 1 | 358 | 11 | 2 | 372 | 6 | 7 | 4 | 8 | 25 | 12 | 480 | 2 | 8 | 502 | 969 |
| 04:45 PM | 13 | 6 | 39 | 3 | 61 | 2 | 381 | 19 | 3 | 405 | 2 | 9 | 4 | 8 | 23 | 15 | 483 | 2 | 7 | 507 | 996 |
| Total | 57 | 23 | 144 | 17 | 241 | 3 | 1489 | 50 | 11 | 1553 | 21 | 34 | 15 | 23 | 93 | 45 | 1999 | 10 | 28 | 2082 | 3969 |
| 05:00 PM | 12 | 7 | 40 | 14 | 73 | 0 | 315 | 20 | 2 | 337 | 5 | 9 | 1 | 8 | 23 | 9 | 471 | 4 | 8 | 492 | 925 |
| 05:15 PM | 15 | 6 | 34 | 7 | 62 | 2 | 379 | 12 | 1 | 394 | 5 | 15 | 4 | 13 | 37 | 10 | 480 | 1 | 17 | 508 | 1001 |
| 05:30 PM | 11 | 3 | 26 | 10 | 50 | 0 | 334 | 17 | 5 | 356 | 6 | 9 | 3 | 11 | 29 | 7 | 527 | 6 | 4 | 544 | 979 |
| 05:45 PM | 12 | 6 | 24 | 8 | 50 | 1 | 273 | 17 | 2 | 293 | 4 | 7 | 2 | 9 | 22 | 11 | 502 | 6 | 1 | 520 | 885 |
| Total | 50 | 22 | 124 | 39 | 235 | 3 | 1301 | 66 | 10 | 1380 | 20 | 40 | 10 | 41 | 111 | 37 | 1980 | 17 | 30 | 2064 | 3790 |
| Grand Total | 132 | 63 | 410 | 76 | 681 | 13 | 4299 | 176 | 35 | 4523 | 76 | 103 | 41 | 89 | 309 | 130 | 5858 | 50 | 74 | 6112 | 11625 |
| Apprch % | 19.4 | 9.3 | 60.2 | 11.2 | | 0.3 | 95 | 3.9 | 0.8 | | 24.6 | 33.3 | 13.3 | 28.8 | | 2.1 | 95.8 | 0.8 | 1.2 | | |
| Total % | 1.1 | 0.5 | 3.5 | 0.7 | 5.9 | 0.1 | 37 | 1.5 | 0.3 | 38.9 | 0.7 | 0.9 | 0.4 | 0.8 | 2.7 | 1.1 | 50.4 | 0.4 | 0.6 | 52.6 | |

| | Cooke Street Southbound | | | | Ala Moana Boulevard Westbound | | | | Cooke Street Northbound | | | | Ala Moana Boulevard 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 03:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 17 | 2 | 22 | 41 | 0 | 319 | 8 | 327 | 5 | 9 | 2 | 16 | 5 | 509 | 3 | 517 | 901 |
| 04:15 PM | 13 | 12 | 39 | 64 | 0 | 431 | 12 | 443 | 8 | 9 | 5 | 22 | 13 | 527 | 3 | 543 | 1072 |
| 04:30 PM | 14 | 3 | 44 | 61 | 1 | 358 | 11 | 370 | 6 | 7 | 4 | 17 | 12 | 480 | 2 | 494 | 942 |
| 04:45 PM | 13 | 6 | 39 | 58 | 2 | 381 | 19 | 402 | 2 | 9 | 4 | 15 | 15 | 483 | 2 | 500 | 975 |
| Total Volume | 57 | 23 | 144 | 224 | 3 | 1489 | 50 | 1542 | 21 | 34 | 15 | 70 | 45 | 1999 | 10 | 2054 | 3890 |
| % App. Total | 25.4 | 10.3 | 64.3 | | 0.2 | 96.6 | 3.2 | | 30 | 48.6 | 21.4 | | 2.2 | 97.3 | 0.5 | | |
| PHF | .838 | .479 | .818 | .875 | .375 | .864 | .658 | .870 | .656 | .944 | .750 | .795 | .750 | .948 | .833 | .946 | .907 |

# Wilson Okamoto Corporation

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

Counted By: SH
Counters: D4-5675
Weather: CLEAR

File Name : KAM HAL AM
Site Code : 00000001
Start Date : 8/14/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee St Southbound | | | | Kamakee St Northbound | | | | Halekauwila St Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 07:30 AM | 55 | 11 | 2 | 68 | 4 | 28 | 1 | 33 | 3 | 4 | 10 | 17 | 118 |
| 07:45 AM | 50 | 15 | 5 | 70 | 12 | 35 | 2 | 49 | 5 | 17 | 15 | 37 | 156 |
| Total | 105 | 26 | 7 | 138 | 16 | 63 | 3 | 82 | 8 | 21 | 25 | 54 | 274 |
| 08:00 AM | 52 | 16 | 3 | 71 | 7 | 35 | 4 | 46 | 6 | 7 | 6 | 19 | 136 |
| 08:15 AM | 49 | 9 | 7 | 65 | 4 | 36 | 3 | 43 | 9 | 17 | 5 | 31 | 139 |
| Grand Total | 206 | 51 | 17 | 274 | 27 | 134 | 10 | 171 | 23 | 45 | 36 | 104 | 549 |
| Apprch % | 75.2 | 18.6 | 6.2 | | 15.8 | 78.4 | 5.8 | | 22.1 | 43.3 | 34.6 | | |
| Total % | 37.5 | 9.3 | 3.1 | 49.9 | 4.9 | 24.4 | 1.8 | 31.1 | 4.2 | 8.2 | 6.6 | 18.9 | |

| | Kamakee St Southbound | | | Kamakee St Northbound | | | Halekauwila St Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | App. Total | Left | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | 55 | 11 | 66 | 4 | 28 | 32 | 3 | 4 | 7 | 105 |
| 07:45 AM | 50 | 15 | 65 | 12 | 35 | 47 | 5 | 17 | 22 | 134 |
| 08:00 AM | 52 | 16 | 68 | 7 | 35 | 42 | 6 | 7 | 13 | 123 |
| 08:15 AM | 49 | 9 | 58 | 4 | 36 | 40 | 9 | 17 | 26 | 124 |
| Total Volume | 206 | 51 | 257 | 27 | 134 | 161 | 23 | 45 | 68 | 486 |
| % App. Total | 80.2 | 19.8 | | 16.8 | 83.2 | | 33.8 | 66.2 | | |
| PHF | .936 | .797 | .945 | .563 | .931 | .856 | .639 | .662 | .654 | .907 |

# Wilson Okamoto Corporation

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

Counted by:CA
Counters:D4-5675
Weather:CLEAR

File Name : KAM HAL PM
Site Code : 00000001
Start Date : 8/14/2018
Page No : 1

Groups Printed- Unshifted

| | Kamakee St Southbound | | | | Kamakee St Northbound | | | | Halekauwila St Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | Peds | App. Total | Left | Thru | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 04:30 PM | 89 | 19 | 20 | 128 | 18 | 50 | 8 | 76 | 17 | 12 | 45 | 74 | 278 |
| 04:45 PM | 75 | 18 | 5 | 98 | 6 | 52 | 4 | 62 | 10 | 16 | 80 | 106 | 266 |
| Total | 164 | 37 | 25 | 226 | 24 | 102 | 12 | 138 | 27 | 28 | 125 | 180 | 544 |
| | | | | | | | | | | | | | |
| 05:00 PM | 87 | 20 | 20 | 127 | 16 | 49 | 7 | 72 | 15 | 13 | 60 | 88 | 287 |
| 05:15 PM | 81 | 17 | 11 | 109 | 11 | 55 | 22 | 88 | 19 | 17 | 45 | 81 | 278 |
| Grand Total | 332 | 74 | 56 | 462 | 51 | 206 | 41 | 298 | 61 | 58 | 230 | 349 | 1109 |
| Apprch % | 71.9 | 16 | 12.1 | | 17.1 | 69.1 | 13.8 | | 17.5 | 16.6 | 65.9 | | |
| Total % | 29.9 | 6.7 | 5 | 41.7 | 4.6 | 18.6 | 3.7 | 26.9 | 5.5 | 5.2 | 20.7 | 31.5 | |

| | Kamakee St Southbound | | | Kamakee St Northbound | | | Halekauwila St Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Thru | Right | App. Total | Left | Thru | App. Total | Left | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | |
| 04:30 PM | 89 | 19 | 108 | 18 | 50 | 68 | 17 | 12 | 29 | 205 |
| 04:45 PM | 75 | 18 | 93 | 6 | 52 | 58 | 10 | 16 | 26 | 177 |
| 05:00 PM | 87 | 20 | 107 | 16 | 49 | 65 | 15 | 13 | 28 | 200 |
| 05:15 PM | 81 | 17 | 98 | 11 | 55 | 66 | 19 | 17 | 36 | 200 |
| Total Volume | 332 | 74 | 406 | 51 | 206 | 257 | 61 | 58 | 119 | 782 |
| % App. Total | 81.8 | 18.2 | | 19.8 | 80.2 | | 51.3 | 48.7 | | |
| PHF | .933 | .925 | .940 | .708 | .936 | .945 | .803 | .853 | .826 | .954 |

## APPENDIX B

## LEVEL OF SERVICE DEFINITIONS

## 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.



**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.

## 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.

# APPENDIX C

## CAPACITY ANALYSIS CALCULATIONS
## BASELINE PEAK PERIOD TRAFFIC ANALYSIS

## HCM Signalized Intersection Capacity Analysis
## 15: Ward Ave & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 53 | 169 | 62 | 87 | 352 | 90 | 50 | 436 | 81 | 69 | 701 | 243 |
| Future Volume (vph) | 53 | 169 | 62 | 87 | 352 | 90 | 50 | 436 | 81 | 69 | 701 | 243 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1761 | 1777 | | 1756 | 1797 | | 1770 | 3420 | | 1770 | 3354 | |
| Flt Permitted | 0.26 | 1.00 | | 0.55 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 485 | 1777 | | 1013 | 1797 | | 1770 | 3420 | | 1770 | 3354 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 56 | 178 | 65 | 92 | 371 | 95 | 53 | 459 | 85 | 73 | 738 | 256 |
| RTOR Reduction (vph) | 0 | 15 | 0 | 0 | 11 | 0 | 0 | 17 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 56 | 228 | 0 | 92 | 455 | 0 | 53 | 527 | 0 | 73 | 956 | 0 |
| Confl. Peds. (#/hr) | 15 | | 15 | 15 | | 15 | | | 40 | | | 30 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 24.5 | 24.5 | | 24.5 | 24.5 | | 3.4 | 26.2 | | 6.2 | 29.0 | |
| Effective Green, g (s) | 24.5 | 24.5 | | 24.5 | 24.5 | | 3.4 | 26.2 | | 6.2 | 29.0 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.34 | 0.34 | | 0.05 | 0.36 | | 0.09 | 0.40 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 165 | 605 | | 345 | 612 | | 83 | 1246 | | 152 | 1352 | |
| v/s Ratio Prot | | 0.13 | | | c0.25 | | 0.03 | 0.15 | | c0.04 | c0.29 | |
| v/s Ratio Perm | 0.12 | | | 0.09 | | | | | | | | |
| v/c Ratio | 0.34 | 0.38 | | 0.27 | 0.74 | | 0.64 | 0.42 | | 0.48 | 0.71 | |
| Uniform Delay, d1 | 17.7 | 17.9 | | 17.2 | 20.9 | | 33.6 | 17.2 | | 31.3 | 17.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 0.4 | | 0.4 | 4.9 | | 15.0 | 0.2 | | 2.4 | 1.7 | |
| Delay (s) | 18.9 | 18.3 | | 17.6 | 25.8 | | 48.7 | 17.4 | | 33.7 | 19.6 | |
| Level of Service | B | B | | B | C | | D | B | | C | B | |
| Approach Delay (s) | | 18.4 | | | 24.5 | | | 20.2 | | | 20.6 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 71.9 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 75.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 15: Ward Ave & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 105 | 430 | 104 | 90 | 337 | 85 | 73 | 673 | 147 | 141 | 677 | 137 |
| Future Volume (vph) | 105 | 430 | 104 | 90 | 337 | 85 | 73 | 673 | 147 | 141 | 677 | 137 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1758 | 1798 | | 1760 | 1797 | | 1770 | 3385 | | 1770 | 3398 | |
| Flt Permitted | 0.29 | 1.00 | | 0.15 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 535 | 1798 | | 286 | 1797 | | 1770 | 3385 | | 1770 | 3398 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 111 | 453 | 109 | 95 | 355 | 89 | 77 | 708 | 155 | 148 | 713 | 144 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 21 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 111 | 552 | 0 | 95 | 434 | 0 | 77 | 842 | 0 | 148 | 839 | 0 |
| Confl. Peds. (#/hr) | 18 | | 21 | 21 | | 18 | | | 55 | | | 52 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 29.3 | 29.3 | | 29.3 | 29.3 | | 5.9 | 28.9 | | 9.7 | 32.7 | |
| Effective Green, g (s) | 29.3 | 29.3 | | 29.3 | 29.3 | | 5.9 | 28.9 | | 9.7 | 32.7 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.35 | 0.35 | | 0.07 | 0.35 | | 0.12 | 0.39 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 189 | 635 | | 101 | 635 | | 125 | 1180 | | 207 | 1340 | |
| v/s Ratio Prot | | 0.31 | | | 0.24 | | 0.04 | c0.25 | | c0.08 | c0.25 | |
| v/s Ratio Perm | 0.21 | | | c0.33 | | | | | | | | |
| v/c Ratio | 0.59 | 0.87 | | 0.94 | 0.68 | | 0.62 | 0.71 | | 0.71 | 0.63 | |
| Uniform Delay, d1 | 21.9 | 25.0 | | 26.0 | 22.8 | | 37.4 | 23.4 | | 35.3 | 20.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.6 | 12.2 | | 70.3 | 3.0 | | 8.7 | 2.1 | | 11.1 | 0.9 | |
| Delay (s) | 26.5 | 37.2 | | 96.2 | 25.9 | | 46.1 | 25.5 | | 46.4 | 21.1 | |
| Level of Service | C | D | | F | C | | D | C | | D | C | |
| Approach Delay (s) | | 35.4 | | | 38.3 | | | 27.2 | | | 24.8 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 82.9 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 83.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 220 | 38 | 130 | 310 | 24 | 19 | 93 | 55 | 21 | 157 | 77 |
| Future Volume (vph) | 43 | 220 | 38 | 130 | 310 | 24 | 19 | 93 | 55 | 21 | 157 | 77 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 0.99 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.95 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 1.00 | |
| Satd. Flow (prot) | | 3436 | | 1770 | 3496 | | | 3326 | | | 3340 | |
| Flt Permitted | | 0.85 | | 0.95 | 1.00 | | | 0.91 | | | 0.92 | |
| Satd. Flow (perm) | | 2956 | | 1770 | 3496 | | | 3029 | | | 3099 | |
| 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) | 45 | 229 | 40 | 135 | 323 | 25 | 20 | 97 | 57 | 22 | 164 | 80 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 7 | 0 | 0 | 39 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 0 | 304 | 0 | 135 | 341 | 0 | 0 | 135 | 0 | 0 | 228 | 0 |
| Confl. Peds. (#/hr) | 12 | | 10 | | | 12 | 19 | | 5 | 5 | | 19 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 13.6 | | 8.1 | 26.7 | | | 17.0 | | | 17.0 | |
| Effective Green, g (s) | | 13.6 | | 8.1 | 26.7 | | | 17.0 | | | 17.0 | |
| Actuated g/C Ratio | | 0.25 | | 0.15 | 0.50 | | | 0.32 | | | 0.32 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 748 | | 266 | 1738 | | | 958 | | | 981 | |
| v/s Ratio Prot | | | | c0.08 | 0.10 | | | | | | | |
| v/s Ratio Perm | | c0.10 | | | | | | 0.04 | | | c0.07 | |
| v/c Ratio | | 0.41 | | 0.51 | 0.20 | | | 0.14 | | | 0.23 | |
| Uniform Delay, d1 | | 16.7 | | 21.0 | 7.5 | | | 13.1 | | | 13.5 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.4 | | 1.5 | 0.1 | | | 0.1 | | | 0.1 | |
| Delay (s) | | 17.0 | | 22.5 | 7.6 | | | 13.2 | | | 13.7 | |
| Level of Service | | B | | C | A | | | B | | | B | |
| Approach Delay (s) | | 17.0 | | | 11.7 | | | 13.2 | | | 13.7 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.35 | | |
| Actuated Cycle Length (s) | 53.7 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 60.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 64 | 447 | 67 | 193 | 397 | 38 | 22 | 111 | 65 | 64 | 119 | 37 |
| Future Volume (vph) | 64 | 447 | 67 | 193 | 397 | 38 | 22 | 111 | 65 | 64 | 119 | 37 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | 1.00 | 1.00 | | | 0.99 | | | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 0.99 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.97 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 3428 | | 1770 | 3483 | | | 3293 | | | 3318 | |
| Flt Permitted | | 0.85 | | 0.95 | 1.00 | | | 0.90 | | | 0.80 | |
| Satd. Flow (perm) | | 2919 | | 1770 | 3483 | | | 2986 | | | 2700 | |
| 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) | 67 | 466 | 70 | 201 | 414 | 40 | 23 | 116 | 68 | 67 | 124 | 39 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 8 | 0 | 0 | 48 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 0 | 593 | 0 | 201 | 446 | 0 | 0 | 159 | 0 | 0 | 216 | 0 |
| Confl. Peds. (#/hr) | 15 | | 46 | | | 15 | 56 | | 8 | 8 | | 56 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | 13.4 | 39.4 | | | 14.3 | | | 14.3 | |
| Effective Green, g (s) | | 21.0 | | 13.4 | 39.4 | | | 14.3 | | | 14.3 | |
| Actuated g/C Ratio | | 0.33 | | 0.21 | 0.62 | | | 0.22 | | | 0.22 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 962 | | 372 | 2154 | | | 670 | | | 606 | |
| v/s Ratio Prot | | | | c0.11 | 0.13 | | | | | | | |
| v/s Ratio Perm | | c0.20 | | | | | | 0.05 | | | c0.08 | |
| v/c Ratio | | 0.62 | | 0.54 | 0.21 | | | 0.24 | | | 0.36 | |
| Uniform Delay, d1 | | 18.0 | | 22.4 | 5.3 | | | 20.2 | | | 20.8 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 1.2 | | 1.6 | 0.0 | | | 0.2 | | | 0.4 | |
| Delay (s) | | 19.1 | | 24.0 | 5.4 | | | 20.4 | | | 21.2 | |
| Level of Service | | B | | C | A | | | C | | | C | |
| Approach Delay (s) | | 19.1 | | | 11.1 | | | 20.4 | | | 21.2 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 63.7 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 66.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Unsignalized Intersection Capacity Analysis
## 17: Queens Ln & Queen St

04/16/2019

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 286 | 16 | 98 | 381 | 32 | 100 |
| Future Volume (Veh/h) | 286 | 16 | 98 | 381 | 32 | 100 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 318 | 18 | 109 | 423 | 36 | 111 |
| Pedestrians | | | | | 8 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 680 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 344 | | 764 | 176 |
| vC1, stage 1 conf vol | | | | | 335 | |
| vC2, stage 2 conf vol | | | | | 430 | |
| vCu, unblocked vol | | | 344 | | 764 | 176 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 91 | | 94 | 87 |
| cM capacity (veh/h) | | | 1204 | | 572 | 874 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 212 | 124 | 109 | 212 | 212 | 147 |
| Volume Left | 0 | 0 | 109 | 0 | 0 | 36 |
| Volume Right | 0 | 18 | 0 | 0 | 0 | 111 |
| cSH | 1700 | 1700 | 1204 | 1700 | 1700 | 774 |
| Volume to Capacity | 0.12 | 0.07 | 0.09 | 0.12 | 0.12 | 0.19 |
| Queue Length 95th (ft) | 0 | 0 | 7 | 0 | 0 | 17 |
| Control Delay (s) | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 10.7 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.7 | | | 10.7 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.4 | | | |
| Intersection Capacity Utilization | 33.0% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

* User Entered Value



HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St
04/16/2019

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 637 | 51 | 121 | 607 | 47 | 232 |
| Future Volume (Veh/h) | 637 | 51 | 121 | 607 | 47 | 232 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 671 | 54 | 127 | 639 | 49 | 244 |
| Pedestrians | | | | | 27 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 687 | | |
| pX, platoon unblocked | | | 0.94 | | 0.94 | 0.94 |
| vC, conflicting volume | | | 752 | | 1298 | 390 |
| vC1, stage 1 conf vol | | | | | 725 | |
| vC2, stage 2 conf vol | | | | | 574 | |
| vCu, unblocked vol | | | 617 | | 1196 | 233 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 86 | | 88 | 68 |
| cM capacity (veh/h) | | | 884 | | 422 | 759 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 447 | 278 | 127 | 320 | 320 | 293 |
| Volume Left | 0 | 0 | 127 | 0 | 0 | 49 |
| Volume Right | 0 | 54 | 0 | 0 | 0 | 244 |
| cSH | 1700 | 1700 | 884 | 1700 | 1700 | 669 |
| Volume to Capacity | 0.26 | 0.16 | 0.14 | 0.19 | 0.19 | 0.44 |
| Queue Length 95th (ft) | 0 | 0 | 13 | 0 | 0 | 56 |
| Control Delay (s) | 0.0 | 0.0 | 9.8 | 0.0 | 0.0 | 14.5 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.6 | | | 14.5 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.1 | | | |
| Intersection Capacity Utilization | 53.0% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

* User Entered Value

## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 124 | 4 | 18 | 0 | 0 | 0 | 33 | 415 | 3 | 6 | 574 | 228 |
| Future Volume (vph) | 124 | 4 | 18 | 0 | 0 | 0 | 33 | 415 | 3 | 6 | 574 | 228 |
| 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 | 5.0 | 5.0 |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | 1.00 |
| Frpb, ped/bikes | | 0.99 | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.91 |
| Flpb, ped/bikes | | 1.00 | | | | | 0.97 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | | 0.98 | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | 1748 | | | | | 1715 | 3536 | | 1770 | 3539 | 1443 |
| Flt Permitted | | 0.96 | | | | | 0.42 | 1.00 | | 0.50 | 1.00 | 1.00 |
| Satd. Flow (perm) | | 1748 | | | | | 766 | 3536 | | 933 | 3539 | 1443 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 128 | 4 | 19 | 0 | 0 | 0 | 34 | 428 | 3 | 6 | 592 | 235 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 119 |
| Lane Group Flow (vph) | 0 | 145 | 0 | 0 | 0 | 0 | 34 | 430 | 0 | 6 | 592 | 116 |
| Confl. Peds. (#/hr) | | | 51 | | | | 57 | | | | | 57 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | | 15.0 | | | | | 24.3 | 24.3 | | 24.3 | 24.3 | 24.3 |
| Effective Green, g (s) | | 15.0 | | | | | 24.3 | 24.3 | | 24.3 | 24.3 | 24.3 |
| Actuated g/C Ratio | | 0.30 | | | | | 0.49 | 0.49 | | 0.49 | 0.49 | 0.49 |
| Clearance Time (s) | | 5.0 | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 531 | | | | | | 377 | 1742 | | 459 | 1744 | 711 |
| v/s Ratio Prot | | | | | | | | 0.12 | | | c0.17 | |
| v/s Ratio Perm | 0.08 | | | | | | 0.04 | | | 0.01 | | 0.08 |
| v/c Ratio | 0.27 | | | | | | 0.09 | 0.25 | | 0.01 | 0.34 | 0.16 |
| Uniform Delay, d1 | 13.0 | | | | | | 6.6 | 7.2 | | 6.4 | 7.6 | 6.9 |
| Progression Factor | 1.00 | | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | | | | | | 0.1 | 0.1 | | 0.0 | 0.1 | 0.1 |
| Delay (s) | 13.3 | | | | | | 6.7 | 7.3 | | 6.4 | 7.7 | 7.0 |
| Level of Service | B | | | | | | A | A | | A | A | A |
| Approach Delay (s) | 13.3 | | 0.0 | | | | | 7.3 | | | 7.5 | |
| Approach LOS | B | | A | | | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.31 | | |
| Actuated Cycle Length (s) | 49.3 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 51.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St/Driveway

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 292 | 14 | 87 | 0 | 0 | 0 | 34 | 541 | 3 | 18 | 655 | 125 |
| Future Volume (vph) | 292 | 14 | 87 | 0 | 0 | 0 | 34 | 541 | 3 | 18 | 655 | 125 |
| 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 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1718 | | | | | 1730 | 3536 | | 1770 | 3400 | |
| Flt Permitted | | 0.96 | | | | | 0.26 | 1.00 | | 0.41 | 1.00 | |
| Satd. Flow (perm) | | 1718 | | | | | 466 | 3536 | | 755 | 3400 | |
| 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) | 304 | 15 | 91 | 0 | 0 | 0 | 35 | 564 | 3 | 19 | 682 | 130 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 0 | 398 | 0 | 0 | 0 | 0 | 35 | 566 | 0 | 19 | 792 | 0 |
| Confl. Peds. (#/hr) | | | 84 | | | | 59 | | | | | 59 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 23.0 | | | | | 20.4 | 20.4 | | 20.4 | 20.4 | |
| Effective Green, g (s) | | 23.0 | | | | | 20.4 | 20.4 | | 20.4 | 20.4 | |
| Actuated g/C Ratio | | 0.43 | | | | | 0.38 | 0.38 | | 0.38 | 0.38 | |
| Clearance Time (s) | 5.0 | | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 739 | | | | | | 178 | 1350 | | 288 | 1298 | |
| v/s Ratio Prot | | | | | | | | 0.16 | | | c0.23 | |
| v/s Ratio Perm | 0.23 | | | | | | 0.08 | | | 0.03 | | |
| v/c Ratio | 0.54 | | | | | | 0.20 | 0.42 | | 0.07 | 0.61 | |
| Uniform Delay, d1 | 11.3 | | | | | | 11.0 | 12.1 | | 10.5 | 13.3 | |
| Progression Factor | 1.00 | | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | | | | | | 0.5 | 0.2 | | 0.1 | 0.9 | |
| Delay (s) | 12.0 | | | | | | 11.6 | 12.4 | | 10.6 | 14.2 | |
| Level of Service | B | | | | | | B | B | | B | B | |
| Approach Delay (s) | 12.0 | | 0.0 | | | | | 12.3 | | | 14.1 | |
| Approach LOS | B | | A | | | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 53.4 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 60.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 34: Ward Ave & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 38 | 38 | 78 | 85 | 78 | 63 | 309 | 41 | 56 | 416 | 47 |
| Future Volume (vph) | 18 | 38 | 38 | 78 | 85 | 78 | 63 | 309 | 41 | 56 | 416 | 47 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.93 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3477 | 1559 | 1764 | 1714 | | 1762 | 3467 | | 1757 | 3475 | |
| Flt Permitted | | 0.87 | 1.00 | 0.72 | 1.00 | | 0.48 | 1.00 | | 0.53 | 1.00 | |
| Satd. Flow (perm) | | 3058 | 1559 | 1331 | 1714 | | 885 | 3467 | | 988 | 3475 | |
| 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) | 19 | 40 | 40 | 81 | 89 | 81 | 66 | 322 | 43 | 58 | 433 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 28 | 0 | 44 | 0 | 0 | 11 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 0 | 59 | 12 | 81 | 126 | 0 | 66 | 354 | 0 | 58 | 473 | 0 |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 10 | | 23 | 23 | | 10 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 14.7 | 14.7 | 14.7 | 14.7 | | 22.9 | 22.9 | | 22.9 | 22.9 | |
| Effective Green, g (s) | | 14.7 | 14.7 | 14.7 | 14.7 | | 22.9 | 22.9 | | 22.9 | 22.9 | |
| Actuated g/C Ratio | | 0.31 | 0.31 | 0.31 | 0.31 | | 0.48 | 0.48 | | 0.48 | 0.48 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 944 | 481 | 411 | 529 | | 425 | 1667 | | 475 | 1671 | |
| v/s Ratio Prot | | | | | c0.07 | | | 0.10 | | | c0.14 | |
| v/s Ratio Perm | | 0.02 | 0.01 | 0.06 | | | 0.07 | | | 0.06 | | |
| v/c Ratio | | 0.06 | 0.03 | 0.20 | 0.24 | | 0.16 | 0.21 | | 0.12 | 0.28 | |
| Uniform Delay, d1 | | 11.6 | 11.5 | 12.1 | 12.3 | | 6.9 | 7.1 | | 6.8 | 7.4 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.2 | 0.2 | | 0.2 | 0.1 | | 0.1 | 0.1 | |
| Delay (s) | | 11.6 | 11.5 | 12.3 | 12.5 | | 7.1 | 7.2 | | 6.9 | 7.5 | |
| Level of Service | | B | B | B | B | | A | A | | A | A | |
| Approach Delay (s) | | 11.6 | | | 12.5 | | | 7.2 | | | 7.4 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.27 | | |
| Actuated Cycle Length (s) | 47.6 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 51.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 34: Ward Ave & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 91 | 57 | 203 | 71 | 218 | 59 | 333 | 69 | 111 | 391 | 64 |
| Future Volume (vph) | 34 | 91 | 57 | 203 | 71 | 218 | 59 | 333 | 69 | 111 | 391 | 64 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | | 0.99 | 1.00 | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flt Protected | | 0.99 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3461 | 1545 | 1752 | 1572 | | 1749 | 3421 | | 1736 | 3444 | |
| Flt Permitted | | 0.84 | 1.00 | 0.67 | 1.00 | | 0.45 | 1.00 | | 0.49 | 1.00 | |
| Satd. Flow (perm) | | 2947 | 1545 | 1226 | 1572 | | 828 | 3421 | | 901 | 3444 | |
| 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) | 37 | 100 | 63 | 223 | 78 | 240 | 65 | 366 | 76 | 122 | 430 | 70 |
| RTOR Reduction (vph) | 0 | 0 | 36 | 0 | 130 | 0 | 0 | 20 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 0 | 137 | 27 | 223 | 188 | 0 | 65 | 422 | 0 | 122 | 484 | 0 |
| Confl. Peds. (#/hr) | 92 | | 21 | 21 | | 92 | 23 | | 56 | 56 | | 23 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.2 | 23.2 | | 23.2 | 23.2 | |
| Effective Green, g (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.2 | 23.2 | | 23.2 | 23.2 | |
| Actuated g/C Ratio | | 0.43 | 0.43 | 0.43 | 0.43 | | 0.40 | 0.40 | | 0.40 | 0.40 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1254 | 657 | 521 | 669 | | 332 | 1373 | | 361 | 1382 | |
| v/s Ratio Prot | | | | | 0.12 | | | 0.12 | | | c0.14 | |
| v/s Ratio Perm | | 0.05 | 0.02 | c0.18 | | | 0.08 | | | 0.14 | | |
| v/c Ratio | | 0.11 | 0.04 | 0.43 | 0.28 | | 0.20 | 0.31 | | 0.34 | 0.35 | |
| Uniform Delay, d1 | | 10.0 | 9.7 | 11.7 | 10.8 | | 11.2 | 11.8 | | 12.0 | 12.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.6 | 0.2 | | 0.3 | 0.1 | | 0.6 | 0.2 | |
| Delay (s) | | 10.0 | 9.7 | 12.2 | 11.1 | | 11.5 | 11.9 | | 12.5 | 12.2 | |
| Level of Service | | B | A | B | B | | B | B | | B | B | |
| Approach Delay (s) | | 9.9 | | | 11.5 | | | 11.9 | | | 12.3 | |
| Approach LOS | | A | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.39 | | |
| Actuated Cycle Length (s) | 57.8 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 97 | 32 | 12 | 64 | 41 | 27 | 132 | 30 | 22 | 215 | 97 |
| Future Volume (vph) | 20 | 97 | 32 | 12 | 64 | 41 | 27 | 132 | 30 | 22 | 215 | 97 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.96 | | 1.00 | 0.94 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3388 | | 1770 | 3295 | | 1756 | 3426 | | 1750 | 1863 | 1548 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.62 | 1.00 | | 0.65 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3388 | | 1770 | 3295 | | 1143 | 3426 | | 1188 | 1863 | 1548 |
| 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) | 21 | 101 | 33 | 12 | 67 | 43 | 28 | 138 | 31 | 23 | 224 | 101 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 32 | 0 | 0 | 18 | 0 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 21 | 110 | 0 | 13 | 78 | 0 | 28 | 151 | 0 | 23 | 224 | 42 |
| Confl. Peds. (#/hr) | | | 17 | | | 36 | 19 | | 25 | 25 | | 19 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 1.6 | 14.2 | | 0.7 | 13.3 | | 21.0 | 21.0 | | 21.0 | 21.0 | 21.0 |
| Effective Green, g (s) | 1.6 | 14.2 | | 0.7 | 13.3 | | 21.0 | 21.0 | | 21.0 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.03 | 0.28 | | 0.01 | 0.26 | | 0.41 | 0.41 | | 0.41 | 0.41 | 0.41 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 55 | 945 | | 24 | 860 | | 471 | 1413 | | 490 | 768 | 638 |
| v/s Ratio Prot | c0.01 | c0.03 | | 0.01 | 0.02 | | | 0.04 | | | c0.12 | |
| v/s Ratio Perm | | | | | | | 0.02 | | | 0.02 | | 0.03 |
| v/c Ratio | 0.38 | 0.12 | | 0.54 | 0.09 | | 0.06 | 0.11 | | 0.05 | 0.29 | 0.07 |
| Uniform Delay, d1 | 24.2 | 13.7 | | 24.9 | 14.2 | | 9.0 | 9.2 | | 9.0 | 10.0 | 9.0 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 4.4 | 0.1 | | 22.7 | 0.0 | | 0.1 | 0.0 | | 0.0 | 0.2 | 0.0 |
| Delay (s) | 28.5 | 13.7 | | 47.6 | 14.3 | | 9.1 | 9.2 | | 9.0 | 10.2 | 9.1 |
| Level of Service | C | B | | D | B | | A | A | | A | B | A |
| Approach Delay (s) | | 15.7 | | | 17.8 | | | 9.2 | | | 9.8 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.23 | | |
| Actuated Cycle Length (s) | 50.9 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 53.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 56 | 225 | 48 | 34 | 144 | 35 | 53 | 148 | 44 | 53 | 207 | 74 |
| Future Volume (vph) | 56 | 225 | 48 | 34 | 144 | 35 | 53 | 148 | 44 | 53 | 207 | 74 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.98 | | 1.00 | 0.98 | | 1.00 | 1.00 | 0.93 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 0.93 | 1.00 | 1.00 |
| Frt | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3383 | | 1770 | 3372 | | 1697 | 3335 | | 1641 | 1863 | 1476 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.59 | 1.00 | | 0.63 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3383 | | 1770 | 3372 | | 1054 | 3335 | | 1086 | 1863 | 1476 |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 57 | 230 | 49 | 35 | 147 | 36 | 54 | 151 | 45 | 54 | 211 | 76 |
| RTOR Reduction (vph) | 0 | 21 | 0 | 0 | 21 | 0 | 0 | 31 | 0 | 0 | 0 | 53 |
| Lane Group Flow (vph) | 57 | 258 | 0 | 35 | 162 | 0 | 54 | 165 | 0 | 54 | 211 | 23 |
| Confl. Peds. (#/hr) | | | 98 | | | 140 | 65 | | 114 | 114 | | 65 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 4.3 | 27.7 | | 3.8 | 27.2 | | 20.5 | 20.5 | | 20.5 | 20.5 | 20.5 |
| Effective Green, g (s) | 4.3 | 27.7 | | 3.8 | 27.2 | | 20.5 | 20.5 | | 20.5 | 20.5 | 20.5 |
| Actuated g/C Ratio | 0.06 | 0.41 | | 0.06 | 0.41 | | 0.31 | 0.31 | | 0.31 | 0.31 | 0.31 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 113 | 1398 | | 100 | 1368 | | 322 | 1020 | | 332 | 570 | 451 |
| v/s Ratio Prot | c0.03 | c0.08 | | 0.02 | 0.05 | | | 0.05 | | | c0.11 | |
| v/s Ratio Perm | | | | | | | 0.05 | | | 0.05 | | 0.02 |
| v/c Ratio | 0.50 | 0.18 | | 0.35 | 0.12 | | 0.17 | 0.16 | | 0.16 | 0.37 | 0.05 |
| Uniform Delay, d1 | 30.3 | 12.5 | | 30.4 | 12.4 | | 17.0 | 17.0 | | 17.0 | 18.2 | 16.4 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.5 | 0.1 | | 2.1 | 0.0 | | 0.2 | 0.1 | | 0.2 | 0.4 | 0.0 |
| Delay (s) | 33.8 | 12.5 | | 32.5 | 12.5 | | 17.3 | 17.0 | | 17.2 | 18.6 | 16.4 |
| Level of Service | C | B | | C | B | | B | B | | B | B | B |
| Approach Delay (s) | | 16.2 | | | 15.7 | | | 17.1 | | | 17.9 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.29 | | |
| Actuated Cycle Length (s) | 67.0 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 71.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 36: Queens Lane/Queens Ln & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 4 | 23 | 0 | 0 | 0 | 77 | 74 | 7 | 5 | 39 | 58 |
| Future Volume (vph) | 51 | 4 | 23 | 0 | 0 | 0 | 77 | 74 | 7 | 5 | 39 | 58 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | | | | 1.00 | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | | 0.97 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.92 | |
| Flt Protected | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1727 | 1546 | | | | 1770 | 1832 | | | 1653 | |
| Flt Permitted | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 0.99 | |
| Satd. Flow (perm) | | 1727 | 1546 | | | | 1770 | 1832 | | | 1642 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 54 | 4 | 24 | 0 | 0 | 0 | 81 | 78 | 7 | 5 | 41 | 61 |
| RTOR Reduction (vph) | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 36 | 0 |
| Lane Group Flow (vph) | 0 | 58 | 4 | 0 | 0 | 0 | 81 | 82 | 0 | 0 | 71 | 0 |
| Confl. Peds. (#/hr) | 23 | | 14 | 14 | | 23 | | | 21 | 21 | | 60 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 8.5 | 8.5 | | | | 6.2 | 31.9 | | | 20.7 | |
| Effective Green, g (s) | | 8.5 | 8.5 | | | | 6.2 | 31.9 | | | 20.7 | |
| Actuated g/C Ratio | | 0.17 | 0.17 | | | | 0.12 | 0.63 | | | 0.41 | |
| Clearance Time (s) | | 5.0 | 5.0 | | | | 5.0 | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 291 | 260 | | | | 217 | 1159 | | | 674 | |
| v/s Ratio Prot | | | | | | | c0.05 | 0.04 | | | | |
| v/s Ratio Perm | | 0.03 | 0.00 | | | | | | | | c0.04 | |
| v/c Ratio | | 0.20 | 0.02 | | | | 0.37 | 0.07 | | | 0.11 | |
| Uniform Delay, d1 | | 18.0 | 17.5 | | | | 20.3 | 3.6 | | | 9.1 | |
| Progression Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.3 | 0.0 | | | | 1.1 | 0.0 | | | 0.1 | |
| Delay (s) | | 18.4 | 17.5 | | | | 21.4 | 3.6 | | | 9.2 | |
| Level of Service | | B | B | | | | C | A | | | A | |
| Approach Delay (s) | | 18.1 | | | 0.0 | | | 12.3 | | | 9.2 | |
| Approach LOS | | B | | | A | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.17 | | |
| Actuated Cycle Length (s) | 50.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 36: Queens Lane/Queens Ln & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 141 | 6 | 126 | 0 | 0 | 0 | 104 | 110 | 11 | 3 | 91 | 86 |
| Future Volume (vph) | 141 | 6 | 126 | 0 | 0 | 0 | 104 | 110 | 11 | 3 | 91 | 86 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.95 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flpb, ped/bikes | | 0.88 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flt Protected | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1570 | 1496 | | | | 1770 | 1815 | | | 1639 | |
| Flt Permitted | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | 1570 | 1496 | | | | 1770 | 1815 | | | 1635 | |
| Peak-hour factor, PHF | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Adj. Flow (vph) | 142 | 6 | 127 | 0 | 0 | 0 | 105 | 111 | 11 | 3 | 92 | 87 |
| RTOR Reduction (vph) | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 35 | 0 |
| Lane Group Flow (vph) | 0 | 148 | 31 | 0 | 0 | 0 | 105 | 118 | 0 | 0 | 147 | 0 |
| Confl. Peds. (#/hr) | 80 | | 48 | 48 | | 80 | | | 77 | 77 | | 120 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 13.4 | 13.4 | | | | 7.1 | 31.4 | | | 19.3 | |
| Effective Green, g (s) | | 13.4 | 13.4 | | | | 7.1 | 31.4 | | | 19.3 | |
| Actuated g/C Ratio | | 0.24 | 0.24 | | | | 0.13 | 0.57 | | | 0.35 | |
| Clearance Time (s) | | 5.0 | 5.0 | | | | 5.0 | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 383 | 365 | | | | 229 | 1039 | | | 575 | |
| v/s Ratio Prot | | | | | | | c0.06 | 0.07 | | | | |
| v/s Ratio Perm | | 0.09 | 0.02 | | | | | | | | c0.09 | |
| v/c Ratio | | 0.39 | 0.09 | | | | 0.46 | 0.11 | | | 0.26 | |
| Uniform Delay, d1 | | 17.3 | 16.0 | | | | 22.1 | 5.3 | | | 12.6 | |
| Progression Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.6 | 0.1 | | | | 1.5 | 0.0 | | | 0.2 | |
| Delay (s) | | 17.9 | 16.1 | | | | 23.5 | 5.4 | | | 12.9 | |
| Level of Service | | B | B | | | | C | A | | | B | |
| Approach Delay (s) | | 17.1 | | | 0.0 | | | 13.8 | | | 12.9 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 54.8 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 56.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 240 | 1589 | 12 | 94 | 1690 | 177 | 2 | 39 | 42 | 173 | 113 | 186 |
| Future Volume (vph) | 240 | 1589 | 12 | 94 | 1690 | 177 | 2 | 39 | 42 | 173 | 113 | 186 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.97 | | 1.00 | 0.98 | 1.00 | 0.98 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.91 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3029 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3029 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 253 | 1673 | 13 | 99 | 1779 | 186 | 2 | 41 | 44 | 182 | 119 | 196 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 161 | 0 |
| Lane Group Flow (vph) | 253 | 1685 | 0 | 99 | 1779 | 106 | 0 | 43 | 44 | 164 | 172 | 0 |
| Confl. Peds. (#/hr) | | | 13 | | | 14 | | | 11 | | | 13 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 18.8 | 57.8 | | 10.0 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Effective Green, g (s) | 18.8 | 57.8 | | 10.0 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Actuated g/C Ratio | 0.14 | 0.42 | | 0.07 | 0.35 | 0.35 | | 0.19 | 0.19 | 0.18 | 0.18 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 239 | 2116 | | 127 | 1796 | 540 | | 656 | 287 | 291 | 548 | |
| v/s Ratio Prot | c0.14 | 0.33 | | 0.06 | c0.35 | | | 0.01 | | c0.10 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.07 | | | c0.03 | | | |
| v/c Ratio | 1.06 | 0.80 | | 0.78 | 0.99 | 0.20 | | 0.07 | 0.15 | 0.56 | 0.31 | |
| Uniform Delay, d1 | 59.9 | 35.3 | | 63.3 | 44.6 | 31.2 | | 46.5 | 47.3 | 51.8 | 49.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 74.5 | 2.2 | | 25.4 | 18.9 | 0.2 | | 0.0 | 0.2 | 2.5 | 0.3 | |
| Delay (s) | 134.5 | 37.5 | | 88.7 | 63.6 | 31.3 | | 46.6 | 47.5 | 54.3 | 49.7 | |
| Level of Service | F | D | | F | E | C | | D | D | D | D | |
| Approach Delay (s) | | 50.1 | | | 61.9 | | | 47.1 | | | 51.2 | |
| Approach LOS | | D | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 55.5 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 138.7 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 76.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 200 | 1922 | 2 | 50 | 1336 | 223 | 6 | 105 | 156 | 271 | 67 | 258 |
| Future Volume (vph) | 200 | 1922 | 2 | 50 | 1336 | 223 | 6 | 105 | 156 | 271 | 67 | 258 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.93 | | 1.00 | 0.94 | 1.00 | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.90 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (prot) | 1770 | 5084 | | 1770 | 5085 | 1467 | | 3530 | 1494 | 1610 | 2945 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (perm) | 1770 | 5084 | | 1770 | 5085 | 1467 | | 3530 | 1494 | 1610 | 2945 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 211 | 2023 | 2 | 53 | 1406 | 235 | 6 | 111 | 164 | 285 | 71 | 272 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 0 | 0 | 0 | 225 | 0 |
| Lane Group Flow (vph) | 211 | 2025 | 0 | 53 | 1406 | 109 | 0 | 117 | 164 | 219 | 184 | 0 |
| Confl. Peds. (#/hr) | | | 41 | | | 35 | | | 34 | | | 19 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 21.3 | 67.3 | | 5.4 | 51.4 | 51.4 | | 35.3 | 35.3 | 27.0 | 27.0 | |
| Effective Green, g (s) | 21.3 | 67.3 | | 5.4 | 51.4 | 51.4 | | 35.3 | 35.3 | 27.0 | 27.0 | |
| Actuated g/C Ratio | 0.14 | 0.43 | | 0.03 | 0.33 | 0.33 | | 0.23 | 0.23 | 0.17 | 0.17 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 243 | 2207 | | 61 | 1686 | 486 | | 803 | 340 | 280 | 513 | |
| v/s Ratio Prot | c0.12 | c0.40 | | 0.03 | 0.28 | | | 0.03 | | c0.14 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.07 | | | c0.11 | | | |
| v/c Ratio | 0.87 | 0.92 | | 0.87 | 0.83 | 0.22 | | 0.15 | 0.48 | 0.78 | 0.36 | |
| Uniform Delay, d1 | 65.5 | 41.2 | | 74.4 | 47.9 | 37.4 | | 47.8 | 51.9 | 61.2 | 56.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 26.3 | 6.6 | | 69.6 | 3.7 | 0.2 | | 0.1 | 1.1 | 13.3 | 0.4 | |
| Delay (s) | 91.7 | 47.8 | | 144.1 | 51.6 | 37.6 | | 47.9 | 53.0 | 74.4 | 56.8 | |
| Level of Service | F | D | | F | D | D | | D | D | E | E | |
| Approach Delay (s) | | 52.0 | | | 52.5 | | | 50.9 | | | 63.0 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 53.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 155.0 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 92.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 1524 | 89 | 13 | 1816 | 98 | 87 | 21 | 14 | 101 | 29 | 108 |
| Future Volume (vph) | 83 | 1524 | 89 | 13 | 1816 | 98 | 87 | 21 | 14 | 101 | 29 | 108 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.97 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.94 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.96 | 1.00 |
| Satd. Flow (prot) | 1770 | 5027 | | 1770 | 5031 | | 1770 | 1703 | | | 1709 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.60 | 1.00 | | | 0.75 | 1.00 |
| Satd. Flow (perm) | 1770 | 5027 | | 1770 | 5031 | | 1111 | 1703 | | | 1332 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 86 | 1571 | 92 | 13 | 1872 | 101 | 90 | 22 | 14 | 104 | 30 | 111 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 11 | 0 | 0 | 0 | 87 |
| Lane Group Flow (vph) | 86 | 1659 | 0 | 13 | 1970 | 0 | 90 | 25 | 0 | 0 | 134 | 24 |
| Confl. Peds. (#/hr) | | | 18 | | | 27 | | | 55 | 55 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 11.7 | 83.2 | | 1.7 | 73.2 | | 27.3 | 27.3 | | | 27.3 | 27.3 |
| Effective Green, g (s) | 11.7 | 83.2 | | 1.7 | 73.2 | | 27.3 | 27.3 | | | 27.3 | 27.3 |
| Actuated g/C Ratio | 0.09 | 0.65 | | 0.01 | 0.58 | | 0.21 | 0.21 | | | 0.21 | 0.21 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 162 | 3288 | | 23 | 2895 | | 238 | 365 | | | 285 | 339 |
| v/s Ratio Prot | c0.05 | 0.33 | | 0.01 | c0.39 | | | 0.01 | | | | |
| v/s Ratio Perm | | | | | | | 0.08 | | | | c0.10 | 0.02 |
| v/c Ratio | 0.53 | 0.50 | | 0.57 | 0.68 | | 0.38 | 0.07 | | | 0.47 | 0.07 |
| Uniform Delay, d1 | 55.1 | 11.4 | | 62.4 | 18.8 | | 42.7 | 39.8 | | | 43.6 | 39.8 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.3 | 0.1 | | 28.1 | 0.7 | | 1.0 | 0.1 | | | 1.2 | 0.1 |
| Delay (s) | 58.4 | 11.5 | | 90.5 | 19.5 | | 43.7 | 39.9 | | | 44.9 | 39.9 |
| Level of Service | E | B | | F | B | | D | D | | | D | D |
| Approach Delay (s) | | 13.8 | | | 20.0 | | | 42.6 | | | 42.6 | |
| Approach LOS | | B | | | B | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 127.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 80.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 2192 | 192 | 35 | 1511 | 150 | 59 | 20 | 45 | 100 | 54 | 144 |
| Future Volume (vph) | 60 | 2192 | 192 | 35 | 1511 | 150 | 59 | 20 | 45 | 100 | 54 | 144 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.93 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 4983 | | 1770 | 4978 | | 1770 | 1559 | | | 1711 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.54 | 1.00 | | | 0.76 | 1.00 |
| Satd. Flow (perm) | 1770 | 4983 | | 1770 | 4978 | | 998 | 1559 | | | 1349 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 62 | 2260 | 198 | 36 | 1558 | 155 | 61 | 21 | 46 | 103 | 56 | 148 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 7 | 0 | 0 | 36 | 0 | 0 | 0 | 92 |
| Lane Group Flow (vph) | 62 | 2452 | 0 | 36 | 1706 | 0 | 61 | 31 | 0 | 0 | 159 | 56 |
| Confl. Peds. (#/hr) | | | 33 | | | 35 | | | 65 | 65 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.6 | 93.4 | | 6.4 | 91.2 | | 33.4 | 33.4 | | | 33.4 | 33.4 |
| Effective Green, g (s) | 8.6 | 93.4 | | 6.4 | 91.2 | | 33.4 | 33.4 | | | 33.4 | 33.4 |
| Actuated g/C Ratio | 0.06 | 0.63 | | 0.04 | 0.62 | | 0.23 | 0.23 | | | 0.23 | 0.23 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 102 | 3140 | | 76 | 3063 | | 224 | 351 | | | 304 | 356 |
| v/s Ratio Prot | c0.04 | c0.49 | | 0.02 | 0.34 | | | 0.02 | | | | |
| v/s Ratio Perm | | | | | | | 0.06 | | | | c0.12 | 0.04 |
| v/c Ratio | 0.61 | 0.78 | | 0.47 | 0.56 | | 0.27 | 0.09 | | | 0.52 | 0.16 |
| Uniform Delay, d1 | 68.2 | 20.0 | | 69.3 | 16.7 | | 47.4 | 45.4 | | | 50.4 | 46.1 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 9.8 | 1.3 | | 4.6 | 0.2 | | 0.7 | 0.1 | | | 1.6 | 0.2 |
| Delay (s) | 78.0 | 21.3 | | 73.9 | 16.9 | | 48.0 | 45.5 | | | 52.0 | 46.3 |
| Level of Service | E | C | | E | B | | D | D | | | D | D |
| Approach Delay (s) | | 22.7 | | | 18.1 | | | 46.7 | | | 49.3 | |
| Approach LOS | | C | | | B | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 148.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 83.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# APPENDIX D

# TRIP GENERATIONS CALCULATIONS

**Trip Generation** 9th Edition

| Number of Units | Units | Land Use Number | Land Use No./Type | Weekday Trip Rate per Unit | Weekday Total Trips | Trip Rate per Unit | Number of Trips | AM PEAK In % | AM PEAK In Rate | AM PEAK In Trips | AM PEAK Out % | AM PEAK Out Rate | AM PEAK Out Trips | PM PEAK Trip Rate per Unit | PM PEAK Number of Trips | PM PEAK In % | PM PEAK In Rate | PM PEAK In Trips | PM PEAK Out % | PM PEAK Out Rate | PM PEAK Out Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Block C West - Phase 2B** | | | | | | | | | | | | | | | | | | | | | |
| | | | *Existing (Retail)* | | *0* | | *0* | | | *0* | | | *0* | | *0* | | | *0* | | | *0* |
| | | | *Internal Capture* | | *0* | | *0* | | | *0* | | | *0* | | *0* | | | *0* | | | *0* |
| | | | *Existing Total* | | *0* | | *0* | | | *0* | | | *0* | | *0* | | | *0* | | | *0* |
| **Proposed** | | | | | | | | | | | | | | | | | | | | | |
| 360 | units | 222 | High-Rise Apartment | 4.45 | 1602 | 0.31 | 112 | 24 | 0.07 | 27 | 76 | 0.24 | 85 | 0.36 | 130 | 61 | 0.22 | 79 | 39 | 0.14 | 51 |
| Block C West - Residential Alt | | P1-4 | | | **-245** | | **-25** | | | **-6** | | | **-19** | | **-20** | | | **-13** | | | **-7** |
| Mode Trip Reduction | | P1-5 | | | **-290** | | **-29** | | | **-7** | | | **-22** | | **-23** | | | **-15** | | | **-8** |
| **Block C West Residential** | | **P1-4** | | | **1357** | | **87** | | | **21** | | | **66** | | **110** | | | **66** | | | **44** |
| | | **P1-5** | | | **1312** | | **83** | | | **20** | | | **63** | | **107** | | | **64** | | | **43** |

**APPENDIX E**

**CAPACITY ANALYSIS CALCULATIONS**
**PROJECTED YEAR 2023 PEAK PERIOD TRAFFIC**
**ANALYSIS WITHOUT PROJECT**

HCM Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St 04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 183 | 62 | 88 | 372 | 90 | 51 | 442 | 82 | 70 | 711 | 247 |
| Future Volume (vph) | 54 | 183 | 62 | 88 | 372 | 90 | 51 | 442 | 82 | 70 | 711 | 247 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1761 | 1772 | | 1731 | 1800 | | 1770 | 3420 | | 1770 | 3353 | |
| Flt Permitted | 0.24 | 1.00 | | 0.53 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 447 | 1772 | | 962 | 1800 | | 1770 | 3420 | | 1770 | 3353 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 193 | 65 | 93 | 392 | 95 | 54 | 465 | 86 | 74 | 748 | 260 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 10 | 0 | 0 | 17 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 57 | 244 | 0 | 93 | 477 | 0 | 54 | 534 | 0 | 74 | 970 | 0 |
| Confl. Peds. (#/hr) | 15 | | 42 | 42 | | 15 | | | 40 | | | 30 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 25.4 | 25.4 | | 25.4 | 25.4 | | 3.6 | 27.3 | | 5.7 | 29.4 | |
| Effective Green, g (s) | 25.4 | 25.4 | | 25.4 | 25.4 | | 3.6 | 27.3 | | 5.7 | 29.4 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.35 | 0.35 | | 0.05 | 0.37 | | 0.08 | 0.40 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 154 | 613 | | 332 | 622 | | 86 | 1272 | | 137 | 1343 | |
| v/s Ratio Prot | | 0.14 | | | c0.26 | | 0.03 | 0.16 | | c0.04 | c0.29 | |
| v/s Ratio Perm | 0.13 | | | 0.10 | | | | | | | | |
| v/c Ratio | 0.37 | 0.40 | | 0.28 | 0.77 | | 0.63 | 0.42 | | 0.54 | 0.72 | |
| Uniform Delay, d1 | 18.0 | 18.2 | | 17.4 | 21.4 | | 34.2 | 17.2 | | 32.6 | 18.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 0.4 | | 0.5 | 5.6 | | 13.5 | 0.2 | | 4.3 | 1.9 | |
| Delay (s) | 19.5 | 18.6 | | 17.8 | 27.0 | | 47.7 | 17.4 | | 36.9 | 20.5 | |
| Level of Service | B | B | | B | C | | D | B | | D | C | |
| Approach Delay (s) | | 18.8 | | | 25.5 | | | 20.1 | | | 21.6 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 73.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 76.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 15: Ward Ave & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 107 | 482 | 106 | 91 | 453 | 85 | 74 | 683 | 148 | 142 | 687 | 139 |
| Future Volume (vph) | 107 | 482 | 106 | 91 | 453 | 85 | 74 | 683 | 148 | 142 | 687 | 139 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.97 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1761 | 1802 | | 1761 | 1811 | | 1770 | 3382 | | 1770 | 3396 | |
| Flt Permitted | 0.19 | 1.00 | | 0.13 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 346 | 1802 | | 245 | 1811 | | 1770 | 3382 | | 1770 | 3396 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 113 | 507 | 112 | 96 | 477 | 89 | 78 | 719 | 156 | 149 | 723 | 146 |
| RTOR Reduction (vph) | 0 | 9 | 0 | 0 | 7 | 0 | 0 | 21 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 113 | 610 | 0 | 96 | 559 | 0 | 78 | 854 | 0 | 149 | 851 | 0 |
| Confl. Peds. (#/hr) | 18 | | 21 | 21 | | 18 | | | 55 | | | 52 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 32.6 | 32.6 | | 32.6 | 32.6 | | 6.0 | 28.5 | | 9.1 | 31.6 | |
| Effective Green, g (s) | 32.6 | 32.6 | | 32.6 | 32.6 | | 6.0 | 28.5 | | 9.1 | 31.6 | |
| Actuated g/C Ratio | 0.38 | 0.38 | | 0.38 | 0.38 | | 0.07 | 0.33 | | 0.11 | 0.37 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 132 | 689 | | 93 | 692 | | 124 | 1131 | | 189 | 1259 | |
| v/s Ratio Prot | | 0.34 | | | 0.31 | | 0.04 | c0.25 | | c0.08 | c0.25 | |
| v/s Ratio Perm | 0.33 | | | c0.39 | | | | | | | | |
| v/c Ratio | 0.86 | 0.88 | | 1.03 | 0.81 | | 0.63 | 0.76 | | 0.79 | 0.68 | |
| Uniform Delay, d1 | 24.1 | 24.5 | | 26.3 | 23.5 | | 38.5 | 25.2 | | 37.1 | 22.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 38.6 | 13.0 | | 102.4 | 6.9 | | 9.6 | 2.9 | | 19.2 | 1.5 | |
| Delay (s) | 62.8 | 37.5 | | 128.7 | 30.4 | | 48.1 | 28.2 | | 56.4 | 24.0 | |
| Level of Service | E | D | | F | C | | D | C | | E | C | |
| Approach Delay (s) | | 41.4 | | | 44.6 | | | 29.8 | | | 28.7 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 85.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 86.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 234 | 38 | 131 | 330 | 25 | 19 | 94 | 55 | 22 | 158 | 78 |
| Future Volume (vph) | 43 | 234 | 38 | 131 | 330 | 25 | 19 | 94 | 55 | 22 | 158 | 78 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | 1.00 | 1.00 | | | 1.00 | | | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.95 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 1.00 | |
| Satd. Flow (prot) | | 3425 | | 1770 | 3497 | | | 3318 | | | 3303 | |
| Flt Permitted | | 0.85 | | 0.95 | 1.00 | | | 0.91 | | | 0.92 | |
| Satd. Flow (perm) | | 2946 | | 1770 | 3497 | | | 3021 | | | 3060 | |
| 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) | 45 | 244 | 40 | 136 | 344 | 26 | 20 | 98 | 57 | 23 | 165 | 81 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 6 | 0 | 0 | 39 | 0 | 0 | 39 | 0 |
| Lane Group Flow (vph) | 0 | 319 | 0 | 136 | 364 | 0 | 0 | 136 | 0 | 0 | 230 | 0 |
| Confl. Peds. (#/hr) | 12 | | 64 | | | 12 | 73 | | 5 | 5 | | 73 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 13.9 | | 8.2 | 27.1 | | | 17.1 | | | 17.1 | |
| Effective Green, g (s) | | 13.9 | | 8.2 | 27.1 | | | 17.1 | | | 17.1 | |
| Actuated g/C Ratio | | 0.26 | | 0.15 | 0.50 | | | 0.32 | | | 0.32 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 755 | 267 | | 1748 | | | | 953 | | | 965 | |
| v/s Ratio Prot | | c0.08 | | 0.10 | | | | | | | | |
| v/s Ratio Perm | c0.11 | | | | | | | 0.05 | | | c0.08 | |
| v/c Ratio | 0.42 | 0.51 | | 0.21 | | | | 0.14 | | | 0.24 | |
| Uniform Delay, d1 | 16.8 | 21.2 | | 7.6 | | | | 13.3 | | | 13.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.4 | 1.5 | | 0.1 | | | | 0.1 | | | 0.1 | |
| Delay (s) | 17.2 | 22.7 | | 7.6 | | | | 13.4 | | | 13.9 | |
| Level of Service | B | C | | A | | | | B | | | B | |
| Approach Delay (s) | 17.2 | | | 11.7 | | | | 13.4 | | | 13.9 | |
| Approach LOS | B | | | B | | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.36 | | |
| Actuated Cycle Length (s) | 54.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 69.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 65 | 500 | 68 | 195 | 514 | 39 | 23 | 112 | 65 | 65 | 120 | 37 |
| Future Volume (vph) | 65 | 500 | 68 | 195 | 514 | 39 | 23 | 112 | 65 | 65 | 120 | 37 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.98 | | 1.00 | 1.00 | | | 0.99 | | | 0.95 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 0.98 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.97 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 3402 | | 1770 | 3494 | | | 3248 | | | 3230 | |
| Flt Permitted | | 0.83 | | 0.95 | 1.00 | | | 0.90 | | | 0.80 | |
| Satd. Flow (perm) | | 2843 | | 1770 | 3494 | | | 2936 | | | 2615 | |
| 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) | 68 | 521 | 71 | 203 | 535 | 41 | 24 | 117 | 68 | 68 | 125 | 39 |
| RTOR Reduction (vph) | 0 | 9 | 0 | 0 | 6 | 0 | 0 | 47 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 0 | 651 | 0 | 203 | 570 | 0 | 0 | 162 | 0 | 0 | 219 | 0 |
| Confl. Peds. (#/hr) | 15 | | 117 | | | 15 | 127 | | 8 | 8 | | 127 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 24.5 | | 14.0 | 43.5 | | | 14.7 | | | 14.7 | |
| Effective Green, g (s) | | 24.5 | | 14.0 | 43.5 | | | 14.7 | | | 14.7 | |
| Actuated g/C Ratio | | 0.36 | | 0.21 | 0.64 | | | 0.22 | | | 0.22 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1021 | | 363 | 2228 | | | 632 | | | 563 | |
| v/s Ratio Prot | | | | c0.11 | 0.16 | | | | | | | |
| v/s Ratio Perm | | c0.23 | | | | | | 0.06 | | | c0.08 | |
| v/c Ratio | | 0.64 | | 0.56 | 0.26 | | | 0.26 | | | 0.39 | |
| Uniform Delay, d1 | | 18.2 | | 24.3 | 5.3 | | | 22.2 | | | 22.9 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 1.3 | | 1.9 | 0.1 | | | 0.2 | | | 0.4 | |
| Delay (s) | | 19.5 | | 26.2 | 5.4 | | | 22.4 | | | 23.3 | |
| Level of Service | | B | | C | A | | | C | | | C | |
| Approach Delay (s) | | 19.5 | | | 10.8 | | | 22.4 | | | 23.3 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 68.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 71.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Unsignalized Intersection Capacity Analysis
## 17: Queens Ln & Queen St

04/16/2019

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 301 | 16 | 99 | 402 | 32 | 101 |
| Future Volume (Veh/h) | 301 | 16 | 99 | 402 | 32 | 101 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 334 | 18 | 110 | 447 | 36 | 112 |
| Pedestrians | | | | | 8 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 680 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 360 | | 794 | 184 |
| vC1, stage 1 conf vol | | | | | 351 | |
| vC2, stage 2 conf vol | | | | | 444 | |
| vCu, unblocked vol | | | 360 | | 794 | 184 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 91 | | 94 | 87 |
| cM capacity (veh/h) | | | 1187 | | 561 | 866 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 223 | 129 | 110 | 224 | 224 | 148 |
| Volume Left | 0 | 0 | 110 | 0 | 0 | 36 |
| Volume Right | 0 | 18 | 0 | 0 | 0 | 112 |
| cSH | 1700 | 1700 | 1187 | 1700 | 1700 | 765 |
| Volume to Capacity | 0.13 | 0.08 | 0.09 | 0.13 | 0.13 | 0.19 |
| Queue Length 95th (ft) | 0 | 0 | 8 | 0 | 0 | 18 |
| Control Delay (s) | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 10.8 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.6 | | | 10.8 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 33.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

* User Entered Value

## HCM Unsignalized Intersection Capacity Analysis
## 17: Queens Ln & Queen St

04/16/2019

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 693 | 52 | 123 | 726 | 47 | 236 |
| Future Volume (Veh/h) | 693 | 52 | 123 | 726 | 47 | 236 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 729 | 55 | 129 | 764 | 49 | 248 |
| Pedestrians | | | | | 27 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 687 | | |
| pX, platoon unblocked | | | 0.92 | | 0.92 | 0.92 |
| vC, conflicting volume | | | 811 | | 1424 | 419 |
| vC1, stage 1 conf vol | | | | | 784 | |
| vC2, stage 2 conf vol | | | | | 640 | |
| vCu, unblocked vol | | | 619 | | 1285 | 192 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 85 | | 88 | 68 |
| cM capacity (veh/h) | | | 860 | | 396 | 776 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 486 | 298 | 129 | 382 | 382 | 297 |
| Volume Left | 0 | 0 | 129 | 0 | 0 | 49 |
| Volume Right | 0 | 55 | 0 | 0 | 0 | 248 |
| cSH | 1700 | 1700 | 860 | 1700 | 1700 | 670 |
| Volume to Capacity | 0.29 | 0.18 | 0.15 | 0.22 | 0.22 | 0.44 |
| Queue Length 95th (ft) | 0 | 0 | 13 | 0 | 0 | 57 |
| Control Delay (s) | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 | 14.6 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.4 | | | 14.6 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

* User Entered Value



## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 126 | 4 | 17 | 0 | 0 | 0 | 33 | 421 | 3 | 6 | 583 | 231 |
| Future Volume (vph) | 126 | 4 | 17 | 0 | 0 | 0 | 33 | 421 | 3 | 6 | 583 | 231 |
| 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 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | | | 1.00 | 1.00 | | 1.00 | 0.96 | |
| Flpb, ped/bikes | | 1.00 | | | | | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | | | 1.00 | 1.00 | | 1.00 | 0.96 | |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1746 | | | | | 1713 | 3536 | | 1770 | 3264 | |
| Flt Permitted | | 0.96 | | | | | 0.30 | 1.00 | | 0.50 | 1.00 | |
| Satd. Flow (perm) | | 1746 | | | | | 538 | 3536 | | 928 | 3264 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 130 | 4 | 18 | 0 | 0 | 0 | 34 | 434 | 3 | 6 | 601 | 238 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 |
| Lane Group Flow (vph) | 0 | 146 | 0 | 0 | 0 | 0 | 34 | 437 | 0 | 6 | 792 | 0 |
| Confl. Peds. (#/hr) | | | 78 | | | | 85 | | | | | 85 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 15.0 | | | | | 27.7 | 27.7 | | 27.7 | 27.7 | |
| Effective Green, g (s) | | 15.0 | | | | | 27.7 | 27.7 | | 27.7 | 27.7 | |
| Actuated g/C Ratio | | 0.28 | | | | | 0.53 | 0.53 | | 0.53 | 0.53 | |
| Clearance Time (s) | | 5.0 | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 496 | | | | | | 282 | 1858 | | 487 | 1715 | |
| v/s Ratio Prot | | | | | | | | 0.12 | | | c0.24 | |
| v/s Ratio Perm | 0.08 | | | | | | 0.06 | | | 0.01 | | |
| v/c Ratio | 0.29 | | | | | | 0.12 | 0.23 | | 0.01 | 0.46 | |
| Uniform Delay, d1 | 14.7 | | | | | | 6.3 | 6.8 | | 6.0 | 7.8 | |
| Progression Factor | 1.00 | | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | | | | | | 0.2 | 0.1 | | 0.0 | 0.2 | |
| Delay (s) | 15.1 | | | | | | 6.5 | 6.8 | | 6.0 | 8.0 | |
| Level of Service | B | | | | | | A | A | | A | A | |
| Approach Delay (s) | 15.1 | | 0.0 | | | | | 6.8 | | | 8.0 | |
| Approach LOS | B | | A | | | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.40 | | |
| Actuated Cycle Length (s) | 52.7 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 56.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St/Driveway

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 296 | 14 | 88 | 0 | 0 | 0 | 34 | 548 | 3 | 18 | 664 | 127 |
| Future Volume (vph) | 296 | 14 | 88 | 0 | 0 | 0 | 34 | 548 | 3 | 18 | 664 | 127 |
| 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 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | | | 1.00 | 1.00 | | 1.00 | 0.88 | |
| Flpb, ped/bikes | | 1.00 | | | | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1699 | | | | | 1729 | 3536 | | 1770 | 3023 | |
| Flt Permitted | | 0.96 | | | | | 0.26 | 1.00 | | 0.40 | 1.00 | |
| Satd. Flow (perm) | | 1699 | | | | | 466 | 3536 | | 746 | 3023 | |
| 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) | 308 | 15 | 92 | 0 | 0 | 0 | 35 | 571 | 3 | 19 | 692 | 132 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 0 | 415 | 0 | 0 | 0 | 0 | 35 | 573 | 0 | 19 | 806 | 0 |
| Confl. Peds. (#/hr) | | | 155 | | | | 59 | | | | | 1300 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 24.2 | | | | | 23.4 | 23.4 | | 23.4 | 23.4 | |
| Effective Green, g (s) | | 24.2 | | | | | 23.4 | 23.4 | | 23.4 | 23.4 | |
| Actuated g/C Ratio | | 0.42 | | | | | 0.41 | 0.41 | | 0.41 | 0.41 | |
| Clearance Time (s) | | 5.0 | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 713 | | | | | 189 | 1436 | | 303 | 1228 | |
| v/s Ratio Prot | | | | | | | | 0.16 | | | c0.27 | |
| v/s Ratio Perm | | 0.24 | | | | | 0.08 | | | 0.03 | | |
| v/c Ratio | | 0.58 | | | | | 0.19 | 0.40 | | 0.06 | 0.66 | |
| Uniform Delay, d1 | | 12.8 | | | | | 11.0 | 12.1 | | 10.4 | 13.8 | |
| Progression Factor | | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 1.2 | | | | | 0.5 | 0.2 | | 0.1 | 1.3 | |
| Delay (s) | | 14.0 | | | | | 11.5 | 12.3 | | 10.5 | 15.1 | |
| Level of Service | | B | | | | | B | B | | B | B | |
| Approach Delay (s) | | 14.0 | | 0.0 | | | | 12.3 | | | 15.0 | |
| Approach LOS | | B | | A | | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 57.6 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 60.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 34: Ward Ave & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 38 | 39 | 79 | 86 | 79 | 64 | 313 | 42 | 57 | 422 | 47 |
| Future Volume (vph) | 18 | 38 | 39 | 79 | 86 | 79 | 64 | 313 | 42 | 57 | 422 | 47 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.93 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3477 | 1559 | 1764 | 1714 | | 1762 | 3466 | | 1757 | 3476 | |
| Flt Permitted | | 0.87 | 1.00 | 0.72 | 1.00 | | 0.47 | 1.00 | | 0.53 | 1.00 | |
| Satd. Flow (perm) | | 3056 | 1559 | 1331 | 1714 | | 879 | 3466 | | 983 | 3476 | |
| 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) | 19 | 40 | 41 | 82 | 90 | 82 | 67 | 326 | 44 | 59 | 440 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 28 | 0 | 44 | 0 | 0 | 11 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 0 | 59 | 13 | 82 | 128 | 0 | 67 | 359 | 0 | 59 | 480 | 0 |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 10 | | 23 | 23 | | 10 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 14.7 | 14.7 | 14.7 | 14.7 | | 22.9 | 22.9 | | 22.9 | 22.9 | |
| Effective Green, g (s) | | 14.7 | 14.7 | 14.7 | 14.7 | | 22.9 | 22.9 | | 22.9 | 22.9 | |
| Actuated g/C Ratio | | 0.31 | 0.31 | 0.31 | 0.31 | | 0.48 | 0.48 | | 0.48 | 0.48 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 943 | 481 | 411 | 529 | | 422 | 1667 | | 472 | 1672 | |
| v/s Ratio Prot | | | | | c0.07 | | | 0.10 | | | c0.14 | |
| v/s Ratio Perm | | 0.02 | 0.01 | 0.06 | | | 0.08 | | | 0.06 | | |
| v/c Ratio | | 0.06 | 0.03 | 0.20 | 0.24 | | 0.16 | 0.22 | | 0.12 | 0.29 | |
| Uniform Delay, d1 | | 11.6 | 11.5 | 12.1 | 12.3 | | 6.9 | 7.1 | | 6.8 | 7.4 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.2 | 0.2 | | 0.2 | 0.1 | | 0.1 | 0.1 | |
| Delay (s) | | 11.6 | 11.5 | 12.4 | 12.5 | | 7.1 | 7.2 | | 6.9 | 7.5 | |
| Level of Service | | B | B | B | B | | A | A | | A | A | |
| Approach Delay (s) | | 11.6 | | | 12.5 | | | 7.2 | | | 7.5 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.27 | | |
| Actuated Cycle Length (s) | 47.6 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 52.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 34: Ward Ave & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 92 | 58 | 206 | 72 | 221 | 60 | 338 | 70 | 113 | 397 | 65 |
| Future Volume (vph) | 34 | 92 | 58 | 206 | 72 | 221 | 60 | 338 | 70 | 113 | 397 | 65 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.92 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | | 0.98 | 1.00 | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.96 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flt Protected | | 0.99 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3436 | 1545 | 1752 | 1517 | | 1749 | 3393 | | 1691 | 3444 | |
| Flt Permitted | | 0.84 | 1.00 | 0.66 | 1.00 | | 0.44 | 1.00 | | 0.49 | 1.00 | |
| Satd. Flow (perm) | | 2925 | 1545 | 1225 | 1517 | | 819 | 3393 | | 869 | 3444 | |
| 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) | 37 | 101 | 64 | 226 | 79 | 243 | 66 | 371 | 77 | 124 | 436 | 71 |
| RTOR Reduction (vph) | 0 | 0 | 37 | 0 | 90 | 0 | 0 | 20 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 0 | 138 | 27 | 226 | 232 | 0 | 66 | 428 | 0 | 124 | 491 | 0 |
| Confl. Peds. (#/hr) | 170 | | 21 | 21 | | 170 | 23 | | 134 | 134 | | 23 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.2 | 23.2 | | 23.2 | 23.2 | |
| Effective Green, g (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.2 | 23.2 | | 23.2 | 23.2 | |
| Actuated g/C Ratio | | 0.43 | 0.43 | 0.43 | 0.43 | | 0.40 | 0.40 | | 0.40 | 0.40 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1244 | 657 | 521 | 645 | | 328 | 1361 | | 348 | 1382 | |
| v/s Ratio Prot | | | | | 0.15 | | | 0.13 | | | c0.14 | |
| v/s Ratio Perm | | 0.05 | 0.02 | c0.18 | | | 0.08 | | | 0.14 | | |
| v/c Ratio | | 0.11 | 0.04 | 0.43 | 0.36 | | 0.20 | 0.31 | | 0.36 | 0.36 | |
| Uniform Delay, d1 | | 10.0 | 9.7 | 11.7 | 11.3 | | 11.3 | 11.9 | | 12.1 | 12.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.6 | 0.3 | | 0.3 | 0.1 | | 0.6 | 0.2 | |
| Delay (s) | | 10.0 | 9.7 | 12.3 | 11.6 | | 11.6 | 12.0 | | 12.7 | 12.2 | |
| Level of Service | | B | A | B | B | | B | B | | B | B | |
| Approach Delay (s) | | 9.9 | | | 11.9 | | | 11.9 | | | 12.3 | |
| Approach LOS | | A | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.40 | | |
| Actuated Cycle Length (s) | 57.8 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 71.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 98 | 32 | 12 | 65 | 42 | 28 | 134 | 30 | 23 | 218 | 99 |
| Future Volume (vph) | 20 | 98 | 32 | 12 | 65 | 42 | 28 | 134 | 30 | 23 | 218 | 99 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.96 | | 1.00 | 0.94 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3369 | | 1770 | 3294 | | 1724 | 3427 | | 1750 | 1863 | 1509 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.62 | 1.00 | | 0.64 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3369 | | 1770 | 3294 | | 1119 | 3427 | | 1186 | 1863 | 1509 |
| 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) | 21 | 102 | 33 | 12 | 68 | 44 | 29 | 140 | 31 | 24 | 227 | 103 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 33 | 0 | 0 | 18 | 0 | 0 | 0 | 61 |
| Lane Group Flow (vph) | 21 | 111 | 0 | 13 | 79 | 0 | 29 | 153 | 0 | 24 | 227 | 42 |
| Confl. Peds. (#/hr) | | | 51 | | | 36 | 63 | | 25 | 25 | | 63 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 1.6 | 14.2 | | 0.7 | 13.3 | | 21.0 | 21.0 | | 21.0 | 21.0 | 21.0 |
| Effective Green, g (s) | 1.6 | 14.2 | | 0.7 | 13.3 | | 21.0 | 21.0 | | 21.0 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.03 | 0.28 | | 0.01 | 0.26 | | 0.41 | 0.41 | | 0.41 | 0.41 | 0.41 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 55 | 939 | | 24 | 860 | | 461 | 1413 | | 489 | 768 | 622 |
| v/s Ratio Prot | c0.01 | c0.03 | | 0.01 | 0.02 | | | 0.04 | | | c0.12 | |
| v/s Ratio Perm | | | | | | | 0.03 | | | 0.02 | | 0.03 |
| v/c Ratio | 0.38 | 0.12 | | 0.54 | 0.09 | | 0.06 | 0.11 | | 0.05 | 0.30 | 0.07 |
| Uniform Delay, d1 | 24.2 | 13.7 | | 24.9 | 14.2 | | 9.0 | 9.2 | | 9.0 | 10.0 | 9.0 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 4.4 | 0.1 | | 22.7 | 0.0 | | 0.1 | 0.0 | | 0.0 | 0.2 | 0.0 |
| Delay (s) | 28.5 | 13.7 | | 47.6 | 14.3 | | 9.1 | 9.2 | | 9.0 | 10.2 | 9.1 |
| Level of Service | C | B | | D | B | | A | A | | A | B | A |
| Approach Delay (s) | | 15.7 | | | 17.7 | | | 9.2 | | | 9.8 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.24 | | |
| Actuated Cycle Length (s) | 50.9 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 58.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 57 | 228 | 49 | 34 | 147 | 36 | 54 | 149 | 44 | 54 | 209 | 75 |
| Future Volume (vph) | 57 | 228 | 49 | 34 | 147 | 36 | 54 | 149 | 44 | 54 | 209 | 75 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 1.00 | 0.87 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.92 | 1.00 | | 0.93 | 1.00 | 1.00 |
| Frt | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3351 | | 1770 | 3340 | | 1635 | 3335 | | 1641 | 1863 | 1370 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.59 | 1.00 | | 0.63 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3351 | | 1770 | 3340 | | 1008 | 3335 | | 1085 | 1863 | 1370 |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 58 | 233 | 50 | 35 | 150 | 37 | 55 | 152 | 45 | 55 | 213 | 77 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 22 | 0 | 0 | 31 | 0 | 0 | 0 | 54 |
| Lane Group Flow (vph) | 58 | 263 | 0 | 35 | 165 | 0 | 55 | 166 | 0 | 55 | 213 | 23 |
| Confl. Peds. (#/hr) | | | 153 | | | 218 | 120 | | 114 | 114 | | 143 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 4.5 | 27.8 | | 3.9 | 27.2 | | 20.4 | 20.4 | | 20.4 | 20.4 | 20.4 |
| Effective Green, g (s) | 4.5 | 27.8 | | 3.9 | 27.2 | | 20.4 | 20.4 | | 20.4 | 20.4 | 20.4 |
| Actuated g/C Ratio | 0.07 | 0.41 | | 0.06 | 0.41 | | 0.30 | 0.30 | | 0.30 | 0.30 | 0.30 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 118 | 1388 | | 102 | 1353 | | 306 | 1013 | | 329 | 566 | 416 |
| v/s Ratio Prot | c0.03 | c0.08 | | 0.02 | 0.05 | | | 0.05 | | | c0.11 | |
| v/s Ratio Perm | | | | | | | 0.05 | | | 0.05 | | 0.02 |
| v/c Ratio | 0.49 | 0.19 | | 0.34 | 0.12 | | 0.18 | 0.16 | | 0.17 | 0.38 | 0.06 |
| Uniform Delay, d1 | 30.2 | 12.5 | | 30.4 | 12.5 | | 17.2 | 17.1 | | 17.1 | 18.4 | 16.5 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.2 | 0.1 | | 2.0 | 0.0 | | 0.3 | 0.1 | | 0.2 | 0.4 | 0.1 |
| Delay (s) | 33.4 | 12.6 | | 32.4 | 12.5 | | 17.5 | 17.2 | | 17.4 | 18.8 | 16.6 |
| Level of Service | C | B | | C | B | | B | B | | B | B | B |
| Approach Delay (s) | | 16.1 | | | 15.7 | | | 17.2 | | | 18.1 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.29 | | |
| Actuated Cycle Length (s) | 67.1 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 71.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 36: Queens Lane/Queens Ln & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 52 | 4 | 24 | 0 | 0 | 0 | 79 | 75 | 8 | 5 | 40 | 59 |
| Future Volume (vph) | 52 | 4 | 24 | 0 | 0 | 0 | 79 | 75 | 8 | 5 | 40 | 59 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | | | | 1.00 | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | | 0.97 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.92 | |
| Flt Protected | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1726 | 1546 | | | | 1770 | 1829 | | | 1654 | |
| Flt Permitted | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 0.99 | |
| Satd. Flow (perm) | | 1726 | 1546 | | | | 1770 | 1829 | | | 1643 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 55 | 4 | 25 | 0 | 0 | 0 | 83 | 79 | 8 | 5 | 42 | 62 |
| RTOR Reduction (vph) | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 37 | 0 |
| Lane Group Flow (vph) | 0 | 59 | 4 | 0 | 0 | 0 | 83 | 84 | 0 | 0 | 72 | 0 |
| Confl. Peds. (#/hr) | 23 | | 14 | 14 | | 23 | | | 21 | 21 | | 60 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 8.5 | 8.5 | | | | 6.3 | 31.9 | | | 20.6 | |
| Effective Green, g (s) | | 8.5 | 8.5 | | | | 6.3 | 31.9 | | | 20.6 | |
| Actuated g/C Ratio | | 0.17 | 0.17 | | | | 0.12 | 0.63 | | | 0.41 | |
| Clearance Time (s) | 5.0 | 5.0 | | | | | 5.0 | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 291 | 260 | | | | | 221 | 1157 | | | 671 | |
| v/s Ratio Prot | | | | | | | c0.05 | 0.05 | | | | |
| v/s Ratio Perm | 0.03 | 0.00 | | | | | | | | | c0.04 | |
| v/c Ratio | 0.20 | 0.02 | | | | | 0.38 | 0.07 | | | 0.11 | |
| Uniform Delay, d1 | 18.0 | 17.5 | | | | | 20.2 | 3.6 | | | 9.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | | | | | 1.1 | 0.0 | | | 0.1 | |
| Delay (s) | 18.4 | 17.5 | | | | | 21.3 | 3.6 | | | 9.3 | |
| Level of Service | B | B | | | | | C | A | | | A | |
| Approach Delay (s) | 18.1 | | 0.0 | | | | | 12.2 | | | 9.3 | |
| Approach LOS | B | | A | | | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.18 | | |
| Actuated Cycle Length (s) | 50.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 36: Queens Lane/Queens Ln & Auahi St

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 143 | 6 | 128 | 0 | 0 | 0 | 106 | 112 | 11 | 3 | 93 | 87 |
| Future Volume (vph) | 143 | 6 | 128 | 0 | 0 | 0 | 106 | 112 | 11 | 3 | 93 | 87 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.95 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flpb, ped/bikes | | 0.88 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flt Protected | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1570 | 1496 | | | | 1770 | 1816 | | | 1640 | |
| Flt Permitted | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | 1570 | 1496 | | | | 1770 | 1816 | | | 1636 | |
| Peak-hour factor, PHF | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Adj. Flow (vph) | 144 | 6 | 129 | 0 | 0 | 0 | 107 | 113 | 11 | 3 | 94 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 35 | 0 |
| Lane Group Flow (vph) | 0 | 150 | 32 | 0 | 0 | 0 | 107 | 120 | 0 | 0 | 150 | 0 |
| Confl. Peds. (#/hr) | 80 | | 48 | 48 | | 80 | | | 77 | 77 | | 120 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 13.5 | 13.5 | | | | 7.1 | 31.2 | | | 19.1 | |
| Effective Green, g (s) | | 13.5 | 13.5 | | | | 7.1 | 31.2 | | | 19.1 | |
| Actuated g/C Ratio | | 0.25 | 0.25 | | | | 0.13 | 0.57 | | | 0.35 | |
| Clearance Time (s) | | 5.0 | 5.0 | | | | | 5.0 | 5.0 | | | 5.0 |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 387 | 369 | | | | | 229 | 1035 | | | 571 | |
| v/s Ratio Prot | | | | | | | c0.06 | 0.07 | | | | |
| v/s Ratio Perm | 0.10 | 0.02 | | | | | | | | | c0.09 | |
| v/c Ratio | 0.39 | 0.09 | | | | | 0.47 | 0.12 | | | 0.26 | |
| Uniform Delay, d1 | 17.2 | 15.9 | | | | | 22.0 | 5.4 | | | 12.8 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.1 | | | | | 1.5 | 0.1 | | | 0.2 | |
| Delay (s) | 17.8 | 16.0 | | | | | 23.6 | 5.5 | | | 13.0 | |
| Level of Service | B | B | | | | | C | A | | | B | |
| Approach Delay (s) | 16.9 | | | 0.0 | | | | 13.8 | | | 13.0 | |
| Approach LOS | B | | | A | | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 54.7 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 56.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 244 | 1622 | 12 | 96 | 1721 | 180 | 2 | 40 | 43 | 176 | 114 | 189 |
| Future Volume (vph) | 244 | 1622 | 12 | 96 | 1721 | 180 | 2 | 40 | 43 | 176 | 114 | 189 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.97 | | 1.00 | 0.98 | 1.00 | 0.98 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.91 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3028 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3028 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 257 | 1707 | 13 | 101 | 1812 | 189 | 2 | 42 | 45 | 185 | 120 | 199 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 163 | 0 |
| Lane Group Flow (vph) | 257 | 1719 | 0 | 101 | 1812 | 109 | 0 | 44 | 45 | 166 | 175 | 0 |
| Confl. Peds. (#/hr) | | | 13 | | | 14 | | | 11 | | | 13 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 18.8 | 58.4 | | 9.4 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Effective Green, g (s) | 18.8 | 58.4 | | 9.4 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Actuated g/C Ratio | 0.14 | 0.42 | | 0.07 | 0.35 | 0.35 | | 0.19 | 0.19 | 0.18 | 0.18 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 239 | 2138 | | 119 | 1796 | 540 | | 656 | 287 | 291 | 547 | |
| v/s Ratio Prot | c0.15 | 0.34 | | 0.06 | c0.36 | | | 0.01 | | c0.10 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.07 | | | c0.03 | | | |
| v/c Ratio | 1.08 | 0.80 | | 0.85 | 1.01 | 0.20 | | 0.07 | 0.16 | 0.57 | 0.32 | |
| Uniform Delay, d1 | 59.9 | 35.1 | | 63.9 | 44.8 | 31.2 | | 46.5 | 47.3 | 51.9 | 49.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 79.6 | 2.3 | | 39.8 | 23.4 | 0.2 | | 0.0 | 0.3 | 2.7 | 0.3 | |
| Delay (s) | 139.6 | 37.4 | | 103.8 | 68.3 | 31.4 | | 46.6 | 47.6 | 54.6 | 49.7 | |
| Level of Service | F | D | | F | E | C | | D | D | D | D | |
| Approach Delay (s) | | 50.7 | | | 66.7 | | | 47.1 | | | 51.3 | |
| Approach LOS | | D | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 57.9 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 138.7 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 77.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 203 | 1975 | 2 | 51 | 1389 | 226 | 6 | 107 | 158 | 275 | 68 | 261 |
| Future Volume (vph) | 203 | 1975 | 2 | 51 | 1389 | 226 | 6 | 107 | 158 | 275 | 68 | 261 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.93 | | 1.00 | 0.94 | 1.00 | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.90 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (prot) | 1770 | 5084 | | 1770 | 5085 | 1466 | | 3530 | 1493 | 1610 | 2944 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (perm) | 1770 | 5084 | | 1770 | 5085 | 1466 | | 3530 | 1493 | 1610 | 2944 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 214 | 2079 | 2 | 54 | 1462 | 238 | 6 | 113 | 166 | 289 | 72 | 275 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 121 | 0 | 0 | 0 | 0 | 227 | 0 |
| Lane Group Flow (vph) | 214 | 2081 | 0 | 54 | 1462 | 117 | 0 | 119 | 166 | 223 | 186 | 0 |
| Confl. Peds. (#/hr) | | | 41 | | | 35 | | | 34 | | | 19 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 22.1 | 69.1 | | 6.0 | 53.0 | 53.0 | | 35.0 | 35.0 | 27.4 | 27.4 | |
| Effective Green, g (s) | 22.1 | 69.1 | | 6.0 | 53.0 | 53.0 | | 35.0 | 35.0 | 27.4 | 27.4 | |
| Actuated g/C Ratio | 0.14 | 0.44 | | 0.04 | 0.34 | 0.34 | | 0.22 | 0.22 | 0.17 | 0.17 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 248 | 2230 | | 67 | 1711 | 493 | | 784 | 331 | 280 | 512 | |
| v/s Ratio Prot | c0.12 | c0.41 | | 0.03 | 0.29 | | | 0.03 | | c0.14 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.08 | | | c0.11 | | | |
| v/c Ratio | 0.86 | 0.93 | | 0.81 | 0.85 | 0.24 | | 0.15 | 0.50 | 0.80 | 0.36 | |
| Uniform Delay, d1 | 66.2 | 42.0 | | 75.2 | 48.7 | 37.7 | | 49.3 | 53.6 | 62.4 | 57.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 25.2 | 7.9 | | 48.7 | 4.4 | 0.3 | | 0.1 | 1.2 | 14.5 | 0.4 | |
| Delay (s) | 91.4 | 49.9 | | 123.9 | 53.1 | 37.9 | | 49.4 | 54.8 | 76.8 | 57.8 | |
| Level of Service | F | D | | F | D | D | | D | D | E | E | |
| Approach Delay (s) | | 53.8 | | | 53.2 | | | 52.5 | | | 64.5 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 54.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 157.5 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 93.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 1556 | 90 | 13 | 1848 | 98 | 88 | 22 | 14 | 102 | 29 | 109 |
| Future Volume (vph) | 84 | 1556 | 90 | 13 | 1848 | 98 | 88 | 22 | 14 | 102 | 29 | 109 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.97 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.94 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.96 | 1.00 |
| Satd. Flow (prot) | 1770 | 5028 | | 1770 | 5031 | | 1770 | 1707 | | | 1708 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.59 | 1.00 | | | 0.75 | 1.00 |
| Satd. Flow (perm) | 1770 | 5028 | | 1770 | 5031 | | 1103 | 1707 | | | 1329 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 87 | 1604 | 93 | 13 | 1905 | 101 | 91 | 23 | 14 | 105 | 30 | 112 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 11 | 0 | 0 | 0 | 88 |
| Lane Group Flow (vph) | 87 | 1693 | 0 | 13 | 2003 | 0 | 91 | 26 | 0 | 0 | 135 | 24 |
| Confl. Peds. (#/hr) | | | 18 | | | 27 | | | 55 | 55 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 11.9 | 84.5 | | 1.8 | 74.4 | | 27.4 | 27.4 | | | 27.4 | 27.4 |
| Effective Green, g (s) | 11.9 | 84.5 | | 1.8 | 74.4 | | 27.4 | 27.4 | | | 27.4 | 27.4 |
| Actuated g/C Ratio | 0.09 | 0.66 | | 0.01 | 0.58 | | 0.21 | 0.21 | | | 0.21 | 0.21 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 163 | 3301 | | 24 | 2908 | | 234 | 363 | | | 282 | 337 |
| v/s Ratio Prot | c0.05 | 0.34 | | 0.01 | c0.40 | | | 0.02 | | | | |
| v/s Ratio Perm | | | | | | | 0.08 | | | | c0.10 | 0.02 |
| v/c Ratio | 0.53 | 0.51 | | 0.54 | 0.69 | | 0.39 | 0.07 | | | 0.48 | 0.07 |
| Uniform Delay, d1 | 55.8 | 11.4 | | 63.0 | 19.0 | | 43.5 | 40.5 | | | 44.4 | 40.5 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.3 | 0.1 | | 22.7 | 0.7 | | 1.1 | 0.1 | | | 1.3 | 0.1 |
| Delay (s) | 59.1 | 11.6 | | 85.7 | 19.7 | | 44.5 | 40.6 | | | 45.7 | 40.6 |
| Level of Service | E | B | | F | B | | D | D | | | D | D |
| Approach Delay (s) | | 13.9 | | | 20.1 | | | 43.4 | | | 43.4 | |
| Approach LOS | | B | | | C | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 128.7 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 81.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd 04/16/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 61 | 2250 | 195 | 36 | 1566 | 151 | 60 | 20 | 45 | 101 | 55 | 146 |
| Future Volume (vph) | 61 | 2250 | 195 | 36 | 1566 | 151 | 60 | 20 | 45 | 101 | 55 | 146 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.93 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 4984 | | 1770 | 4980 | | 1770 | 1557 | | | 1710 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.53 | 1.00 | | | 0.76 | 1.00 |
| Satd. Flow (perm) | 1770 | 4984 | | 1770 | 4980 | | 983 | 1557 | | | 1349 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 63 | 2320 | 201 | 37 | 1614 | 156 | 62 | 21 | 46 | 104 | 57 | 151 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 7 | 0 | 0 | 36 | 0 | 0 | 0 | 90 |
| Lane Group Flow (vph) | 63 | 2515 | 0 | 37 | 1763 | 0 | 62 | 31 | 0 | 0 | 161 | 61 |
| Confl. Peds. (#/hr) | | | 33 | | | 35 | | | 65 | 65 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.4 | 95.4 | | 6.5 | 93.5 | | 33.3 | 33.3 | | | 33.3 | 33.3 |
| Effective Green, g (s) | 8.4 | 95.4 | | 6.5 | 93.5 | | 33.3 | 33.3 | | | 33.3 | 33.3 |
| Actuated g/C Ratio | 0.06 | 0.64 | | 0.04 | 0.62 | | 0.22 | 0.22 | | | 0.22 | 0.22 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 98 | 3165 | | 76 | 3100 | | 217 | 345 | | | 299 | 350 |
| v/s Ratio Prot | c0.04 | c0.50 | | 0.02 | 0.35 | | | 0.02 | | | | |
| v/s Ratio Perm | | | | | | | 0.06 | | | | c0.12 | 0.04 |
| v/c Ratio | 0.64 | 0.79 | | 0.49 | 0.57 | | 0.29 | 0.09 | | | 0.54 | 0.17 |
| Uniform Delay, d1 | 69.4 | 20.2 | | 70.2 | 16.6 | | 48.6 | 46.4 | | | 51.7 | 47.3 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.5 | 1.4 | | 4.8 | 0.2 | | 0.7 | 0.1 | | | 1.9 | 0.2 |
| Delay (s) | 83.0 | 21.6 | | 75.1 | 16.8 | | 49.3 | 46.5 | | | 53.5 | 47.5 |
| Level of Service | F | C | | E | B | | D | D | | | D | D |
| Approach Delay (s) | | 23.1 | | | 18.0 | | | 47.9 | | | 50.6 | |
| Approach LOS | | C | | | B | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 150.2 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 84.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



**APPENDIX F**

**CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2023 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT**

## HCM Signalized Intersection Capacity Analysis
## 15: Ward Ave & Queen St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 183 | 64 | 88 | 372 | 90 | 58 | 453 | 82 | 70 | 715 | 247 |
| Future Volume (vph) | 54 | 183 | 64 | 88 | 372 | 90 | 58 | 453 | 82 | 70 | 715 | 247 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.96 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1761 | 1770 | | 1731 | 1800 | | 1770 | 3422 | | 1770 | 3354 | |
| Flt Permitted | 0.23 | 1.00 | | 0.52 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 434 | 1770 | | 951 | 1800 | | 1770 | 3422 | | 1770 | 3354 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 193 | 67 | 93 | 392 | 95 | 61 | 477 | 86 | 74 | 753 | 260 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 10 | 0 | 0 | 16 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 57 | 246 | 0 | 93 | 477 | 0 | 61 | 547 | 0 | 74 | 975 | 0 |
| Confl. Peds. (#/hr) | 15 | | 42 | 42 | | 15 | | | 40 | | | 30 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 25.3 | 25.3 | | 25.3 | 25.3 | | 4.3 | 27.7 | | 6.1 | 29.5 | |
| Effective Green, g (s) | 25.3 | 25.3 | | 25.3 | 25.3 | | 4.3 | 27.7 | | 6.1 | 29.5 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.34 | 0.34 | | 0.06 | 0.37 | | 0.08 | 0.40 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 148 | 604 | | 324 | 614 | | 102 | 1279 | | 145 | 1335 | |
| v/s Ratio Prot | | 0.14 | | | c0.27 | | 0.03 | 0.16 | | c0.04 | c0.29 | |
| v/s Ratio Perm | 0.13 | | | 0.10 | | | | | | | | |
| v/c Ratio | 0.39 | 0.41 | | 0.29 | 0.78 | | 0.60 | 0.43 | | 0.51 | 0.73 | |
| Uniform Delay, d1 | 18.5 | 18.7 | | 17.8 | 21.9 | | 34.1 | 17.3 | | 32.6 | 18.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.7 | 0.4 | | 0.5 | 6.1 | | 9.1 | 0.2 | | 3.0 | 2.1 | |
| Delay (s) | 20.2 | 19.1 | | 18.3 | 28.0 | | 43.2 | 17.5 | | 35.6 | 21.0 | |
| Level of Service | C | B | | B | C | | D | B | | D | C | |
| Approach Delay (s) | | 19.3 | | | 26.5 | | | 20.0 | | | 22.0 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 74.1 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 77.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 15: Ward Ave & Queen St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 107 | 483 | 113 | 91 | 453 | 86 | 79 | 690 | 148 | 142 | 698 | 139 |
| Future Volume (vph) | 107 | 483 | 113 | 91 | 453 | 86 | 79 | 690 | 148 | 142 | 698 | 139 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1761 | 1799 | | 1761 | 1810 | | 1770 | 3381 | | 1770 | 3398 | |
| Flt Permitted | 0.19 | 1.00 | | 0.13 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 360 | 1799 | | 250 | 1810 | | 1770 | 3381 | | 1770 | 3398 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 113 | 508 | 119 | 96 | 477 | 91 | 83 | 726 | 156 | 149 | 735 | 146 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 8 | 0 | 0 | 20 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 113 | 617 | 0 | 96 | 560 | 0 | 83 | 862 | 0 | 149 | 863 | 0 |
| Confl. Peds. (#/hr) | 18 | | 21 | 21 | | 18 | | | 55 | | | 52 |
| Turn Type | Perm | NA | | Perm | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | | | |
| Actuated Green, G (s) | 33.3 | 33.3 | | 33.3 | 33.3 | | 5.3 | 28.9 | | 8.1 | 31.7 | |
| Effective Green, g (s) | 33.3 | 33.3 | | 33.3 | 33.3 | | 5.3 | 28.9 | | 8.1 | 31.7 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.39 | 0.39 | | 0.06 | 0.34 | | 0.09 | 0.37 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 140 | 702 | | 97 | 706 | | 109 | 1145 | | 168 | 1262 | |
| v/s Ratio Prot | | 0.34 | | | 0.31 | | 0.05 | c0.25 | | c0.08 | c0.25 | |
| v/s Ratio Perm | 0.31 | | | c0.38 | | | | | | | | |
| v/c Ratio | 0.81 | 0.88 | | 0.99 | 0.79 | | 0.76 | 0.75 | | 0.89 | 0.68 | |
| Uniform Delay, d1 | 23.1 | 24.1 | | 25.8 | 23.0 | | 39.4 | 25.0 | | 38.1 | 22.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 27.7 | 12.1 | | 87.2 | 6.1 | | 26.4 | 2.8 | | 38.6 | 1.6 | |
| Delay (s) | 50.9 | 36.2 | | 113.0 | 29.1 | | 65.8 | 27.9 | | 76.8 | 24.1 | |
| Level of Service | D | D | | F | C | | E | C | | E | C | |
| Approach Delay (s) | | 38.5 | | | 41.2 | | | 31.1 | | | 31.7 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 85.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 86.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 234 | 38 | 133 | 330 | 25 | 19 | 98 | 66 | 22 | 163 | 78 |
| Future Volume (vph) | 43 | 234 | 38 | 133 | 330 | 25 | 19 | 98 | 66 | 22 | 163 | 78 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | 1.00 | 1.00 | | | 0.99 | | | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.96 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 1.00 | |
| Satd. Flow (prot) | | 3425 | | 1770 | 3497 | | | 3300 | | | 3307 | |
| Flt Permitted | | 0.85 | | 0.95 | 1.00 | | | 0.91 | | | 0.92 | |
| Satd. Flow (perm) | | 2947 | | 1770 | 3497 | | | 3013 | | | 3061 | |
| 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) | 45 | 244 | 40 | 139 | 344 | 26 | 20 | 102 | 69 | 23 | 170 | 81 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 6 | 0 | 0 | 47 | 0 | 0 | 37 | 0 |
| Lane Group Flow (vph) | 0 | 319 | 0 | 139 | 364 | 0 | 0 | 144 | 0 | 0 | 237 | 0 |
| Confl. Peds. (#/hr) | 12 | | 64 | | | 12 | 73 | | 5 | 5 | | 73 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 14.0 | | 8.2 | 27.2 | | | 17.1 | | | 17.1 | |
| Effective Green, g (s) | | 14.0 | | 8.2 | 27.2 | | | 17.1 | | | 17.1 | |
| Actuated g/C Ratio | | 0.26 | | 0.15 | 0.50 | | | 0.31 | | | 0.31 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 759 | | 267 | 1751 | | | 948 | | | | 963 | |
| v/s Ratio Prot | | | c0.08 | 0.10 | | | | | | | | |
| v/s Ratio Perm | c0.11 | | | | | | 0.05 | | | | c0.08 | |
| v/c Ratio | 0.42 | | 0.52 | 0.21 | | | 0.15 | | | | 0.25 | |
| Uniform Delay, d1 | 16.8 | | 21.2 | 7.5 | | | 13.4 | | | | 13.8 | |
| Progression Factor | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 1.8 | 0.1 | | | 0.1 | | | | 0.1 | |
| Delay (s) | 17.2 | | 23.1 | 7.6 | | | 13.5 | | | | 13.9 | |
| Level of Service | B | | C | A | | | B | | | | B | |
| Approach Delay (s) | 17.2 | | | 11.8 | | | 13.5 | | | | 13.9 | |
| Approach LOS | B | | | B | | | B | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.37 | | |
| Actuated Cycle Length (s) | 54.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 69.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 16: Kamakee St & Queen St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 65 | 500 | 68 | 216 | 514 | 39 | 23 | 116 | 72 | 65 | 121 | 37 |
| Future Volume (vph) | 65 | 500 | 68 | 216 | 514 | 39 | 23 | 116 | 72 | 65 | 121 | 37 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | 1.00 | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.98 | | 1.00 | 1.00 | | | 0.99 | | | 0.95 | |
| Flpb, ped/bikes | | 1.00 | | 1.00 | 1.00 | | | 0.98 | | | 1.00 | |
| Frt | | 0.98 | | 1.00 | 0.99 | | | 0.95 | | | 0.97 | |
| Flt Protected | | 0.99 | | 0.95 | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 3401 | | 1770 | 3494 | | | 3242 | | | 3227 | |
| Flt Permitted | | 0.83 | | 0.95 | 1.00 | | | 0.90 | | | 0.79 | |
| Satd. Flow (perm) | | 2839 | | 1770 | 3494 | | | 2936 | | | 2600 | |
| 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) | 68 | 521 | 71 | 225 | 535 | 41 | 24 | 121 | 75 | 68 | 126 | 39 |
| RTOR Reduction (vph) | 0 | 9 | 0 | 0 | 6 | 0 | 0 | 53 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 0 | 651 | 0 | 225 | 570 | 0 | 0 | 167 | 0 | 0 | 220 | 0 |
| Confl. Peds. (#/hr) | 15 | | 117 | | | 15 | 127 | | 8 | 8 | | 127 |
| Turn Type | Perm | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 25.0 | | 15.1 | 45.1 | | | 14.8 | | | 14.8 | |
| Effective Green, g (s) | | 25.0 | | 15.1 | 45.1 | | | 14.8 | | | 14.8 | |
| Actuated g/C Ratio | | 0.36 | | 0.22 | 0.65 | | | 0.21 | | | 0.21 | |
| Clearance Time (s) | | 5.0 | | 5.0 | 5.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 1015 | | 382 | 2254 | | | 621 | | | | 550 | |
| v/s Ratio Prot | | | c0.13 | 0.16 | | | | | | | | |
| v/s Ratio Perm | c0.23 | | | | | | 0.06 | | | | c0.08 | |
| v/c Ratio | 0.64 | | 0.59 | 0.25 | | | 0.27 | | | | 0.40 | |
| Uniform Delay, d1 | 18.7 | | 24.6 | 5.3 | | | 23.0 | | | | 23.7 | |
| Progression Factor | 1.00 | | 1.00 | 1.00 | | | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 1.4 | | 2.3 | 0.1 | | | 0.2 | | | | 0.5 | |
| Delay (s) | 20.1 | | 26.9 | 5.3 | | | 23.3 | | | | 24.2 | |
| Level of Service | C | | C | A | | | C | | | | C | |
| Approach Delay (s) | 20.1 | | | 11.4 | | | 23.3 | | | | 24.2 | |
| Approach LOS | C | | | B | | | C | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 69.9 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 72.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 311 | 16 | 99 | 404 | 32 | 101 |
| Future Volume (Veh/h) | 311 | 16 | 99 | 404 | 32 | 101 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 346 | 18 | 110 | 449 | 36 | 112 |
| Pedestrians | | | | | 8 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 680 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 372 | | 808 | 190 |
| vC1, stage 1 conf vol | | | | | 363 | |
| vC2, stage 2 conf vol | | | | | 444 | |
| vCu, unblocked vol | | | 372 | | 808 | 190 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 91 | | 94 | 87 |
| cM capacity (veh/h) | | | 1175 | | 557 | 860 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 231 | 133 | 110 | 224 | 224 | 148 |
| Volume Left | 0 | 0 | 110 | 0 | 0 | 36 |
| Volume Right | 0 | 18 | 0 | 0 | 0 | 112 |
| cSH | 1700 | 1700 | 1175 | 1700 | 1700 | 760 |
| Volume to Capacity | 0.14 | 0.08 | 0.09 | 0.13 | 0.13 | 0.19 |
| Queue Length 95th (ft) | 0 | 0 | 8 | 0 | 0 | 18 |
| Control Delay (s) | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 10.9 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.6 | | | 10.9 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.4 | | | |
| Intersection Capacity Utilization | 33.6% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

* User Entered Value





| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 701 | 52 | 123 | 747 | 47 | 236 |
| Future Volume (Veh/h) | 701 | 52 | 123 | 747 | 47 | 236 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 738 | 55 | 129 | 786 | 49 | 248 |
| Pedestrians | | | | | 27 | |
| Lane Width (ft) | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | TWLTL | | | None | | |
| Median storage veh) | 2 | | | | | |
| Upstream signal (ft) | 564 | | | 687 | | |
| pX, platoon unblocked | | | 0.92 | | 0.92 | 0.92 |
| vC, conflicting volume | | | 820 | | 1444 | 424 |
| vC1, stage 1 conf vol | | | | | 792 | |
| vC2, stage 2 conf vol | | | | | 651 | |
| vCu, unblocked vol | | | 621 | | 1302 | 189 |
| tC, single (s) | | | 4.1 | | *5.8 | *5.9 |
| tC, 2 stage (s) | | | | | 4.8 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 85 | | 87 | 68 |
| cM capacity (veh/h) | | | 856 | | 392 | 777 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 492 | 301 | 129 | 393 | 393 | 297 |
| Volume Left | 0 | 0 | 129 | 0 | 0 | 49 |
| Volume Right | 0 | 55 | 0 | 0 | 0 | 248 |
| cSH | 1700 | 1700 | 856 | 1700 | 1700 | 668 |
| Volume to Capacity | 0.29 | 0.18 | 0.15 | 0.23 | 0.23 | 0.44 |
| Queue Length 95th (ft) | 0 | 0 | 13 | 0 | 0 | 57 |
| Control Delay (s) | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 14.6 |
| Lane LOS | | | A | | | B |
| Approach Delay (s) | 0.0 | | 1.4 | | | 14.6 |
| Approach LOS | | | | | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.8 | | | |
| Intersection Capacity Utilization | 55.2% | ICU Level of Service | | B |
| Analysis Period (min) | 15 | | | |

* User Entered Value

## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 126 | 4 | 19 | 0 | 0 | 0 | 39 | 440 | 3 | 6 | 589 | 231 |
| Future Volume (vph) | 126 | 4 | 19 | 0 | 0 | 0 | 39 | 440 | 3 | 6 | 589 | 231 |
| 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 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | | | 1.00 | 1.00 | | 1.00 | 0.96 | |
| Flpb, ped/bikes | | 1.00 | | | | | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | | | 1.00 | 1.00 | | 1.00 | 0.96 | |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1743 | | | | | 1713 | 3536 | | 1770 | 3266 | |
| Flt Permitted | | 0.96 | | | | | 0.30 | 1.00 | | 0.49 | 1.00 | |
| Satd. Flow (perm) | | 1743 | | | | | 533 | 3536 | | 910 | 3266 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 130 | 4 | 20 | 0 | 0 | 0 | 40 | 454 | 3 | 6 | 607 | 238 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 |
| Lane Group Flow (vph) | 0 | 148 | 0 | 0 | 0 | 0 | 40 | 457 | 0 | 6 | 798 | 0 |
| Confl. Peds. (#/hr) | | | 78 | | | | 85 | | | | | 85 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 15.0 | | | | | 27.7 | 27.7 | | 27.7 | 27.7 | |
| Effective Green, g (s) | | 15.0 | | | | | 27.7 | 27.7 | | 27.7 | 27.7 | |
| Actuated g/C Ratio | | 0.28 | | | | | 0.53 | 0.53 | | 0.53 | 0.53 | |
| Clearance Time (s) | | 5.0 | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 496 | | | | | | 280 | 1858 | | 478 | 1716 | |
| v/s Ratio Prot | | | | | | | | 0.13 | | | c0.24 | |
| v/s Ratio Perm | 0.08 | | | | | | 0.08 | | | 0.01 | | |
| v/c Ratio | 0.30 | | | | | | 0.14 | 0.25 | | 0.01 | 0.47 | |
| Uniform Delay, d1 | 14.7 | | | | | | 6.4 | 6.8 | | 6.0 | 7.8 | |
| Progression Factor | 1.00 | | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | | | | | | 0.2 | 0.1 | | 0.0 | 0.2 | |
| Delay (s) | 15.1 | | | | | | 6.6 | 6.9 | | 6.0 | 8.0 | |
| Level of Service | B | | | | | | A | A | | A | A | |
| Approach Delay (s) | 15.1 | | 0.0 | | | | | 6.9 | | | 8.0 | |
| Approach LOS | B | | A | | | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.41 | | |
| Actuated Cycle Length (s) | 52.7 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 61.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 24: Ward Ave & Halekauwila St/Driveway

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 297 | 14 | 94 | 0 | 0 | 0 | 38 | 560 | 3 | 18 | 683 | 127 |
| Future Volume (vph) | 297 | 14 | 94 | 0 | 0 | 0 | 38 | 560 | 3 | 18 | 683 | 127 |
| 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 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | | | 1.00 | 1.00 | | 1.00 | 0.88 | |
| Flpb, ped/bikes | | 1.00 | | | | | 0.98 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | | | 1.00 | 1.00 | | 1.00 | 0.98 | |
| Flt Protected | | 0.96 | | | | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1694 | | | | | 1730 | 3536 | | 1770 | 3031 | |
| Flt Permitted | | 0.96 | | | | | 0.25 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | | 1694 | | | | | 449 | 3536 | | 731 | 3031 | |
| 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) | 309 | 15 | 98 | 0 | 0 | 0 | 40 | 583 | 3 | 19 | 711 | 132 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 0 | 422 | 0 | 0 | 0 | 0 | 40 | 585 | 0 | 19 | 825 | 0 |
| Confl. Peds. (#/hr) | | | 155 | | | | 59 | | | | | 1300 |
| Turn Type | Perm | NA | | | | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 24.6 | | | | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 24.6 | | | | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Actuated g/C Ratio | | 0.42 | | | | | 0.41 | 0.41 | | 0.41 | 0.41 | |
| Clearance Time (s) | | 5.0 | | | | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 711 | | | | | | 183 | 1448 | | 299 | 1241 | |
| v/s Ratio Prot | | | | | | | | 0.17 | | | c0.27 | |
| v/s Ratio Perm | 0.25 | | | | | | 0.09 | | | 0.03 | | |
| v/c Ratio | 0.59 | | | | | | 0.22 | 0.40 | | 0.06 | 0.67 | |
| Uniform Delay, d1 | 13.1 | | | | | | 11.2 | 12.2 | | 10.5 | 14.0 | |
| Progression Factor | 1.00 | | | | | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.3 | | | | | | 0.6 | 0.2 | | 0.1 | 1.4 | |
| Delay (s) | 14.5 | | | | | | 11.8 | 12.4 | | 10.6 | 15.4 | |
| Level of Service | B | | | | | | B | B | | B | B | |
| Approach Delay (s) | 14.5 | | 0.0 | | | | | 12.4 | | | 15.3 | |
| Approach LOS | B | | A | | | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 58.6 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 64.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Auahi St 04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 39 | 39 | 84 | 90 | 104 | 64 | 313 | 43 | 65 | 422 | 47 |
| Future Volume (vph) | 18 | 39 | 39 | 84 | 90 | 104 | 64 | 313 | 43 | 65 | 422 | 47 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3478 | 1559 | 1764 | 1696 | | 1762 | 3465 | | 1757 | 3476 | |
| Flt Permitted | | 0.86 | 1.00 | 0.72 | 1.00 | | 0.47 | 1.00 | | 0.53 | 1.00 | |
| Satd. Flow (perm) | | 3044 | 1559 | 1329 | 1696 | | 879 | 3465 | | 982 | 3476 | |
| 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) | 19 | 41 | 41 | 88 | 94 | 108 | 67 | 326 | 45 | 68 | 440 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 28 | 0 | 56 | 0 | 0 | 12 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 0 | 60 | 13 | 88 | 146 | 0 | 67 | 359 | 0 | 68 | 480 | 0 |
| Confl. Peds. (#/hr) | 14 | | 7 | 7 | | 14 | 10 | | 23 | 23 | | 10 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 14.9 | 14.9 | 14.9 | 14.9 | | 22.7 | 22.7 | | 22.7 | 22.7 | |
| Effective Green, g (s) | | 14.9 | 14.9 | 14.9 | 14.9 | | 22.7 | 22.7 | | 22.7 | 22.7 | |
| Actuated g/C Ratio | | 0.31 | 0.31 | 0.31 | 0.31 | | 0.48 | 0.48 | | 0.48 | 0.48 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 952 | 488 | 416 | 530 | | 419 | 1652 | | 468 | 1657 | |
| v/s Ratio Prot | | | | | c0.09 | | | 0.10 | | | c0.14 | |
| v/s Ratio Perm | | 0.02 | 0.01 | 0.07 | | | 0.08 | | | 0.07 | | |
| v/c Ratio | | 0.06 | 0.03 | 0.21 | 0.28 | | 0.16 | 0.22 | | 0.15 | 0.29 | |
| Uniform Delay, d1 | | 11.5 | 11.3 | 12.0 | 12.3 | | 7.1 | 7.3 | | 7.0 | 7.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.3 | 0.3 | | 0.2 | 0.1 | | 0.1 | 0.1 | |
| Delay (s) | | 11.5 | 11.3 | 12.3 | 12.6 | | 7.2 | 7.3 | | 7.1 | 7.7 | |
| Level of Service | | B | B | B | B | | A | A | | A | A | |
| Approach Delay (s) | | 11.4 | | | 12.5 | | | 7.3 | | | 7.6 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 8.8 | HCM 2000 Level of Service | A | |
| HCM 2000 Volume to Capacity ratio | 0.28 | | | |
| Actuated Cycle Length (s) | 47.6 | Sum of lost time (s) | 10.0 | |
| Intersection Capacity Utilization | 53.2% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |



HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Auahi St 04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 96 | 58 | 209 | 75 | 237 | 60 | 338 | 75 | 137 | 397 | 65 |
| Future Volume (vph) | 34 | 96 | 58 | 209 | 75 | 237 | 60 | 338 | 75 | 137 | 397 | 65 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | 1.00 | 0.92 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | | 0.98 | 1.00 | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.96 | 1.00 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flt Protected | | 0.99 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 3441 | 1545 | 1752 | 1514 | | 1749 | 3385 | | 1691 | 3444 | |
| Flt Permitted | | 0.84 | 1.00 | 0.66 | 1.00 | | 0.45 | 1.00 | | 0.48 | 1.00 | |
| Satd. Flow (perm) | | 2922 | 1545 | 1221 | 1514 | | 820 | 3385 | | 863 | 3444 | |
| 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) | 37 | 105 | 64 | 230 | 82 | 260 | 66 | 371 | 82 | 151 | 436 | 71 |
| RTOR Reduction (vph) | 0 | 0 | 37 | 0 | 104 | 0 | 0 | 23 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 0 | 142 | 27 | 230 | 238 | 0 | 66 | 430 | 0 | 151 | 491 | 0 |
| Confl. Peds. (#/hr) | 170 | | 21 | 21 | | 170 | 23 | | 134 | 134 | | 23 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.4 | 23.4 | | 23.4 | 23.4 | |
| Effective Green, g (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | 23.4 | 23.4 | | 23.4 | 23.4 | |
| Actuated g/C Ratio | | 0.42 | 0.42 | 0.42 | 0.42 | | 0.40 | 0.40 | | 0.40 | 0.40 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1239 | 655 | 517 | 642 | | 330 | 1365 | | 348 | 1389 | |
| v/s Ratio Prot | | | | | 0.16 | | | 0.13 | | | 0.14 | |
| v/s Ratio Perm | | 0.05 | 0.02 | c0.19 | | | 0.08 | | | c0.18 | | |
| v/c Ratio | | 0.11 | 0.04 | 0.44 | 0.37 | | 0.20 | 0.31 | | 0.43 | 0.35 | |
| Uniform Delay, d1 | | 10.1 | 9.8 | 11.9 | 11.4 | | 11.2 | 11.8 | | 12.5 | 12.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.0 | 0.0 | 0.6 | 0.4 | | 0.3 | 0.1 | | 0.9 | 0.2 | |
| Delay (s) | | 10.1 | 9.8 | 12.5 | 11.8 | | 11.5 | 12.0 | | 13.4 | 12.2 | |
| Level of Service | | B | A | B | B | | B | B | | B | B | |
| Approach Delay (s) | | 10.0 | | | 12.1 | | | 11.9 | | | 12.5 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 11.9 | HCM 2000 Level of Service | B | |
| HCM 2000 Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 58.0 | Sum of lost time (s) | 10.0 | |
| Intersection Capacity Utilization | 71.9% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 98 | 51 | 12 | 65 | 42 | 32 | 134 | 30 | 23 | 219 | 105 |
| Future Volume (vph) | 34 | 98 | 51 | 12 | 65 | 42 | 32 | 134 | 30 | 23 | 219 | 105 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.99 | 1.00 | 1.00 |
| Frt | 1.00 | 0.95 | | 1.00 | 0.94 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3302 | | 1770 | 3294 | | 1723 | 3427 | | 1750 | 1863 | 1509 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.62 | 1.00 | | 0.64 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3302 | | 1770 | 3294 | | 1118 | 3427 | | 1186 | 1863 | 1509 |
| 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) | 35 | 102 | 53 | 12 | 68 | 44 | 33 | 140 | 31 | 24 | 228 | 109 |
| RTOR Reduction (vph) | 0 | 38 | 0 | 0 | 33 | 0 | 0 | 18 | 0 | 0 | 0 | 64 |
| Lane Group Flow (vph) | 35 | 117 | 0 | 13 | 79 | 0 | 33 | 153 | 0 | 24 | 228 | 45 |
| Confl. Peds. (#/hr) | | | 51 | | | 36 | 63 | | 25 | 25 | | 63 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 1.9 | 14.6 | | 0.6 | 13.3 | | 21.1 | 21.1 | | 21.1 | 21.1 | 21.1 |
| Effective Green, g (s) | 1.9 | 14.6 | | 0.6 | 13.3 | | 21.1 | 21.1 | | 21.1 | 21.1 | 21.1 |
| Actuated g/C Ratio | 0.04 | 0.28 | | 0.01 | 0.26 | | 0.41 | 0.41 | | 0.41 | 0.41 | 0.41 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 65 | 939 | | 20 | 854 | | 459 | 1409 | | 487 | 766 | 620 |
| v/s Ratio Prot | c0.02 | c0.04 | | 0.01 | 0.02 | | | 0.04 | | | c0.12 | |
| v/s Ratio Perm | | | | | | | 0.03 | | | 0.02 | | 0.03 |
| v/c Ratio | 0.54 | 0.12 | | 0.65 | 0.09 | | 0.07 | 0.11 | | 0.05 | 0.30 | 0.07 |
| Uniform Delay, d1 | 24.3 | 13.6 | | 25.2 | 14.4 | | 9.2 | 9.3 | | 9.1 | 10.1 | 9.2 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 8.3 | 0.1 | | 56.6 | 0.0 | | 0.1 | 0.0 | | 0.0 | 0.2 | 0.0 |
| Delay (s) | 32.6 | 13.7 | | 81.8 | 14.5 | | 9.2 | 9.3 | | 9.1 | 10.3 | 9.2 |
| Level of Service | C | B | | F | B | | A | A | | A | B | A |
| Approach Delay (s) | | 17.2 | | | 21.5 | | | 9.3 | | | 9.9 | |
| Approach LOS | | B | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.25 | | |
| Actuated Cycle Length (s) | 51.3 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 58.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 35: Kamakee St & Auahi St

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 66 | 228 | 62 | 34 | 147 | 36 | 67 | 150 | 44 | 54 | 210 | 95 |
| Future Volume (vph) | 66 | 228 | 62 | 34 | 147 | 36 | 67 | 150 | 44 | 54 | 210 | 95 |
| 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 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 1.00 | 0.86 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.92 | 1.00 | | 0.92 | 1.00 | 1.00 |
| Frt | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 0.97 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 3309 | | 1770 | 3337 | | 1631 | 3334 | | 1636 | 1863 | 1363 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.57 | 1.00 | | 0.63 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1770 | 3309 | | 1770 | 3337 | | 986 | 3334 | | 1081 | 1863 | 1363 |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 67 | 233 | 63 | 35 | 150 | 37 | 68 | 153 | 45 | 55 | 214 | 97 |
| RTOR Reduction (vph) | 0 | 28 | 0 | 0 | 22 | 0 | 0 | 31 | 0 | 0 | 0 | 69 |
| Lane Group Flow (vph) | 67 | 268 | 0 | 35 | 165 | 0 | 68 | 167 | 0 | 55 | 214 | 28 |
| Confl. Peds. (#/hr) | | | 153 | | | 218 | 120 | | 114 | 114 | | 143 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | 8 | | | 4 | | 4 |
| Actuated Green, G (s) | 6.2 | 30.3 | | 3.9 | 28.0 | | 20.4 | 20.4 | | 20.4 | 20.4 | 20.4 |
| Effective Green, g (s) | 6.2 | 30.3 | | 3.9 | 28.0 | | 20.4 | 20.4 | | 20.4 | 20.4 | 20.4 |
| Actuated g/C Ratio | 0.09 | 0.44 | | 0.06 | 0.40 | | 0.29 | 0.29 | | 0.29 | 0.29 | 0.29 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 157 | 1440 | | 99 | 1342 | | 289 | 977 | | 316 | 546 | 399 |
| v/s Ratio Prot | c0.04 | c0.08 | | 0.02 | 0.05 | | | 0.05 | | | c0.11 | |
| v/s Ratio Perm | | | | | | | 0.07 | | | 0.05 | | 0.02 |
| v/c Ratio | 0.43 | 0.19 | | 0.35 | 0.12 | | 0.24 | 0.17 | | 0.17 | 0.39 | 0.07 |
| Uniform Delay, d1 | 30.0 | 12.1 | | 31.6 | 13.1 | | 18.7 | 18.3 | | 18.3 | 19.6 | 17.8 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.9 | 0.1 | | 2.2 | 0.0 | | 0.4 | 0.1 | | 0.3 | 0.5 | 0.1 |
| Delay (s) | 31.9 | 12.1 | | 33.8 | 13.1 | | 19.1 | 18.4 | | 18.6 | 20.1 | 17.8 |
| Level of Service | C | B | | C | B | | B | B | | B | C | B |
| Approach Delay (s) | | 15.8 | | | 16.4 | | | 18.6 | | | 19.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.30 | | |
| Actuated Cycle Length (s) | 69.6 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 71.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
36: Queens Lane/Queens Ln & Auahi St 04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 52 | 4 | 24 | 0 | 0 | 0 | 79 | 75 | 8 | 5 | 40 | 59 |
| Future Volume (vph) | 52 | 4 | 24 | 0 | 0 | 0 | 79 | 75 | 8 | 5 | 40 | 59 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.98 | | | | 1.00 | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | | 0.97 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.92 | |
| Flt Protected | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1726 | 1546 | | | | 1770 | 1829 | | | 1654 | |
| Flt Permitted | | 0.96 | 1.00 | | | | 0.95 | 1.00 | | | 0.99 | |
| Satd. Flow (perm) | | 1726 | 1546 | | | | 1770 | 1829 | | | 1643 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 55 | 4 | 25 | 0 | 0 | 0 | 83 | 79 | 8 | 5 | 42 | 62 |
| RTOR Reduction (vph) | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 37 | 0 |
| Lane Group Flow (vph) | 0 | 59 | 4 | 0 | 0 | 0 | 83 | 84 | 0 | 0 | 72 | 0 |
| Confl. Peds. (#/hr) | 23 | | 14 | 14 | | 23 | | | 21 | 21 | | 60 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 8.5 | 8.5 | | | | 6.3 | 31.9 | | | 20.6 | |
| Effective Green, g (s) | | 8.5 | 8.5 | | | | 6.3 | 31.9 | | | 20.6 | |
| Actuated g/C Ratio | | 0.17 | 0.17 | | | | 0.12 | 0.63 | | | 0.41 | |
| Clearance Time (s) | | 5.0 | 5.0 | | | | 5.0 | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 291 | 260 | | | | 221 | 1157 | | | 671 | |
| v/s Ratio Prot | | | | | | | c0.05 | 0.05 | | | | |
| v/s Ratio Perm | | 0.03 | 0.00 | | | | | | | | c0.04 | |
| v/c Ratio | | 0.20 | 0.02 | | | | 0.38 | 0.07 | | | 0.11 | |
| Uniform Delay, d1 | | 18.0 | 17.5 | | | | 20.2 | 3.6 | | | 9.2 | |
| Progression Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.3 | 0.0 | | | | 1.1 | 0.0 | | | 0.1 | |
| Delay (s) | | 18.4 | 17.5 | | | | 21.3 | 3.6 | | | 9.3 | |
| Level of Service | | B | B | | | | C | A | | | A | |
| Approach Delay (s) | | 18.1 | | | 0.0 | | | 12.2 | | | 9.3 | |
| Approach LOS | | B | | | A | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.18 | | |
| Actuated Cycle Length (s) | 50.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



HCM Signalized Intersection Capacity Analysis
36: Queens Lane/Queens Ln & Auahi St 04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 143 | 6 | 128 | 0 | 0 | 0 | 106 | 112 | 11 | 3 | 93 | 87 |
| Future Volume (vph) | 143 | 6 | 128 | 0 | 0 | 0 | 106 | 112 | 11 | 3 | 93 | 87 |
| 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 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | 0.95 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flpb, ped/bikes | | 0.88 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | | 1.00 | 0.85 | | | | 1.00 | 0.99 | | | 0.94 | |
| Flt Protected | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1570 | 1496 | | | | 1770 | 1816 | | | 1640 | |
| Flt Permitted | | 0.95 | 1.00 | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | 1570 | 1496 | | | | 1770 | 1816 | | | 1636 | |
| Peak-hour factor, PHF | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Adj. Flow (vph) | 144 | 6 | 129 | 0 | 0 | 0 | 107 | 113 | 11 | 3 | 94 | 88 |
| RTOR Reduction (vph) | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 35 | 0 |
| Lane Group Flow (vph) | 0 | 150 | 32 | 0 | 0 | 0 | 107 | 120 | 0 | 0 | 150 | 0 |
| Confl. Peds. (#/hr) | 80 | | 48 | 48 | | 80 | | | 77 | 77 | | 120 |
| Turn Type | Perm | NA | Perm | | | | Prot | NA | | Perm | NA | |
| Protected Phases | | 4 | | | | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | | 6 | | |
| Actuated Green, G (s) | | 13.5 | 13.5 | | | | 7.1 | 31.2 | | | 19.1 | |
| Effective Green, g (s) | | 13.5 | 13.5 | | | | 7.1 | 31.2 | | | 19.1 | |
| Actuated g/C Ratio | | 0.25 | 0.25 | | | | 0.13 | 0.57 | | | 0.35 | |
| Clearance Time (s) | | 5.0 | 5.0 | | | | 5.0 | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 387 | 369 | | | | 229 | 1035 | | | 571 | |
| v/s Ratio Prot | | | | | | | c0.06 | 0.07 | | | | |
| v/s Ratio Perm | | 0.10 | 0.02 | | | | | | | | c0.09 | |
| v/c Ratio | | 0.39 | 0.09 | | | | 0.47 | 0.12 | | | 0.26 | |
| Uniform Delay, d1 | | 17.2 | 15.9 | | | | 22.0 | 5.4 | | | 12.8 | |
| Progression Factor | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.6 | 0.1 | | | | 1.5 | 0.1 | | | 0.2 | |
| Delay (s) | | 17.8 | 16.0 | | | | 23.6 | 5.5 | | | 13.0 | |
| Level of Service | | B | B | | | | C | A | | | B | |
| Approach Delay (s) | | 16.9 | | | 0.0 | | | 13.8 | | | 13.0 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 54.7 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 56.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 245 | 1622 | 12 | 96 | 1721 | 180 | 2 | 40 | 43 | 176 | 114 | 194 |
| Future Volume (vph) | 245 | 1622 | 12 | 96 | 1721 | 180 | 2 | 40 | 43 | 176 | 114 | 194 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.97 | | 1.00 | 0.98 | 1.00 | 0.98 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.91 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3025 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 5078 | | 1770 | 5085 | 1530 | | 3531 | 1544 | 1610 | 3025 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 258 | 1707 | 13 | 101 | 1812 | 189 | 2 | 42 | 45 | 185 | 120 | 204 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 167 | 0 |
| Lane Group Flow (vph) | 258 | 1719 | 0 | 101 | 1812 | 109 | 0 | 44 | 45 | 166 | 176 | 0 |
| Confl. Peds. (#/hr) | | | 13 | | | 14 | | | 11 | | | 13 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 18.8 | 58.4 | | 9.4 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Effective Green, g (s) | 18.8 | 58.4 | | 9.4 | 49.0 | 49.0 | | 25.8 | 25.8 | 25.1 | 25.1 | |
| Actuated g/C Ratio | 0.14 | 0.42 | | 0.07 | 0.35 | 0.35 | | 0.19 | 0.19 | 0.18 | 0.18 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 239 | 2138 | | 119 | 1796 | 540 | | 656 | 287 | 291 | 547 | |
| v/s Ratio Prot | c0.15 | 0.34 | | 0.06 | c0.36 | | | 0.01 | | c0.10 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.07 | | | c0.03 | | | |
| v/c Ratio | 1.08 | 0.80 | | 0.85 | 1.01 | 0.20 | | 0.07 | 0.16 | 0.57 | 0.32 | |
| Uniform Delay, d1 | 59.9 | 35.1 | | 63.9 | 44.8 | 31.2 | | 46.5 | 47.3 | 51.9 | 49.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 81.0 | 2.3 | | 39.8 | 23.4 | 0.2 | | 0.0 | 0.3 | 2.7 | 0.3 | |
| Delay (s) | 140.9 | 37.4 | | 103.8 | 68.3 | 31.4 | | 46.6 | 47.6 | 54.6 | 49.7 | |
| Level of Service | F | D | | F | E | C | | D | D | D | D | |
| Approach Delay (s) | | 50.9 | | | 66.7 | | | 47.1 | | | 51.3 | |
| Approach LOS | | D | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 58.0 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 138.7 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 77.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 41: Ala Moana Blvd & Ward Ave

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 208 | 1976 | 2 | 51 | 1390 | 226 | 6 | 107 | 158 | 275 | 68 | 264 |
| Future Volume (vph) | 208 | 1976 | 2 | 51 | 1390 | 226 | 6 | 107 | 158 | 275 | 68 | 264 |
| 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 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | 1.00 | | 0.95 | 1.00 | 0.91 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.93 | | 1.00 | 0.94 | 1.00 | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.90 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (prot) | 1770 | 5084 | | 1770 | 5085 | 1466 | | 3530 | 1493 | 1610 | 2943 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.95 | 0.99 | |
| Satd. Flow (perm) | 1770 | 5084 | | 1770 | 5085 | 1466 | | 3530 | 1493 | 1610 | 2943 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 219 | 2080 | 2 | 54 | 1463 | 238 | 6 | 113 | 166 | 289 | 72 | 278 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 121 | 0 | 0 | 0 | 0 | 230 | 0 |
| Lane Group Flow (vph) | 219 | 2082 | 0 | 54 | 1463 | 117 | 0 | 119 | 166 | 223 | 186 | 0 |
| Confl. Peds. (#/hr) | | | 41 | | | 35 | | | 34 | | | 19 |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | Perm | Split | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 8 | 8 | | 4 | 4 | |
| Permitted Phases | | | | | | 6 | | | 8 | | | |
| Actuated Green, G (s) | 22.3 | 69.1 | | 6.0 | 52.8 | 52.8 | | 35.0 | 35.0 | 27.4 | 27.4 | |
| Effective Green, g (s) | 22.3 | 69.1 | | 6.0 | 52.8 | 52.8 | | 35.0 | 35.0 | 27.4 | 27.4 | |
| Actuated g/C Ratio | 0.14 | 0.44 | | 0.04 | 0.34 | 0.34 | | 0.22 | 0.22 | 0.17 | 0.17 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 250 | 2230 | | 67 | 1704 | 491 | | 784 | 331 | 280 | 511 | |
| v/s Ratio Prot | c0.12 | c0.41 | | 0.03 | 0.29 | | | 0.03 | | c0.14 | 0.06 | |
| v/s Ratio Perm | | | | | | 0.08 | | | c0.11 | | | |
| v/c Ratio | 0.88 | 0.93 | | 0.81 | 0.86 | 0.24 | | 0.15 | 0.50 | 0.80 | 0.36 | |
| Uniform Delay, d1 | 66.2 | 42.0 | | 75.2 | 48.9 | 37.8 | | 49.3 | 53.6 | 62.4 | 57.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 27.1 | 8.0 | | 48.7 | 4.5 | 0.3 | | 0.1 | 1.2 | 14.5 | 0.4 | |
| Delay (s) | 93.4 | 50.0 | | 123.9 | 53.4 | 38.1 | | 49.4 | 54.8 | 76.8 | 57.8 | |
| Level of Service | F | D | | F | D | D | | D | D | E | E | |
| Approach Delay (s) | | 54.1 | | | 53.5 | | | 52.5 | | | 64.5 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 55.1 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 157.5 | Sum of lost time (s) | 20.0 |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

## HCM Signalized Intersection Capacity Analysis
## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 1556 | 90 | 13 | 1848 | 103 | 88 | 22 | 14 | 121 | 29 | 109 |
| Future Volume (vph) | 84 | 1556 | 90 | 13 | 1848 | 103 | 88 | 22 | 14 | 121 | 29 | 109 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.97 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.94 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.96 | 1.00 |
| Satd. Flow (prot) | 1770 | 5027 | | 1770 | 5029 | | 1770 | 1707 | | | 1702 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.55 | 1.00 | | | 0.74 | 1.00 |
| Satd. Flow (perm) | 1770 | 5027 | | 1770 | 5029 | | 1026 | 1707 | | | 1314 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 87 | 1604 | 93 | 13 | 1905 | 106 | 91 | 23 | 14 | 125 | 30 | 112 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 11 | 0 | 0 | 0 | 88 |
| Lane Group Flow (vph) | 87 | 1693 | 0 | 13 | 2007 | 0 | 91 | 26 | 0 | 0 | 155 | 24 |
| Confl. Peds. (#/hr) | | | 18 | | | 27 | | | 55 | 55 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 11.9 | 84.5 | | 1.8 | 74.4 | | 27.7 | 27.7 | | | 27.7 | 27.7 |
| Effective Green, g (s) | 11.9 | 84.5 | | 1.8 | 74.4 | | 27.7 | 27.7 | | | 27.7 | 27.7 |
| Actuated g/C Ratio | 0.09 | 0.66 | | 0.01 | 0.58 | | 0.21 | 0.21 | | | 0.21 | 0.21 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 163 | 3292 | | 24 | 2900 | | 220 | 366 | | | 282 | 339 |
| v/s Ratio Prot | c0.05 | 0.34 | | 0.01 | c0.40 | | | 0.02 | | | | |
| v/s Ratio Perm | | | | | | | 0.09 | | | | c0.12 | 0.02 |
| v/c Ratio | 0.53 | 0.51 | | 0.54 | 0.69 | | 0.41 | 0.07 | | | 0.55 | 0.07 |
| Uniform Delay, d1 | 55.9 | 11.6 | | 63.2 | 19.2 | | 43.7 | 40.4 | | | 45.1 | 40.4 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.3 | 0.1 | | 22.7 | 0.7 | | 1.3 | 0.1 | | | 2.2 | 0.1 |
| Delay (s) | 59.2 | 11.7 | | 85.9 | 20.0 | | 44.9 | 40.5 | | | 47.3 | 40.5 |
| Level of Service | E | B | | F | B | | D | D | | | D | D |
| Approach Delay (s) | | 14.0 | | | 20.4 | | | 43.6 | | | 44.4 | |
| Approach LOS | | B | | | C | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 129.0 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 81.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



## HCM Signalized Intersection Capacity Analysis
## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

04/17/2019

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 62 | 2250 | 195 | 36 | 1566 | 164 | 60 | 20 | 45 | 114 | 55 | 147 |
| Future Volume (vph) | 62 | 2250 | 195 | 36 | 1566 | 164 | 60 | 20 | 45 | 114 | 55 | 147 |
| 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 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.93 | | | 1.00 | 1.00 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 0.95 | 1.00 |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 4984 | | 1770 | 4972 | | 1770 | 1557 | | | 1704 | 1583 |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.50 | 1.00 | | | 0.76 | 1.00 |
| Satd. Flow (perm) | 1770 | 4984 | | 1770 | 4972 | | 937 | 1557 | | | 1332 | 1583 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 64 | 2320 | 201 | 37 | 1614 | 169 | 62 | 21 | 46 | 118 | 57 | 152 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 7 | 0 | 0 | 36 | 0 | 0 | 0 | 90 |
| Lane Group Flow (vph) | 64 | 2515 | 0 | 37 | 1776 | 0 | 62 | 31 | 0 | 0 | 175 | 62 |
| Confl. Peds. (#/hr) | | | 33 | | | 35 | | | 65 | 65 | | |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.5 | 94.7 | | 6.5 | 92.7 | | 33.8 | 33.8 | | | 33.8 | 33.8 |
| Effective Green, g (s) | 8.5 | 94.7 | | 6.5 | 92.7 | | 33.8 | 33.8 | | | 33.8 | 33.8 |
| Actuated g/C Ratio | 0.06 | 0.63 | | 0.04 | 0.62 | | 0.23 | 0.23 | | | 0.23 | 0.23 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 100 | 3146 | | 76 | 3072 | | 211 | 350 | | | 300 | 356 |
| v/s Ratio Prot | c0.04 | c0.50 | | 0.02 | 0.36 | | | 0.02 | | | | |
| v/s Ratio Perm | | | | | | | 0.07 | | | | c0.13 | 0.04 |
| v/c Ratio | 0.64 | 0.80 | | 0.49 | 0.58 | | 0.29 | 0.09 | | | 0.58 | 0.17 |
| Uniform Delay, d1 | 69.3 | 20.6 | | 70.1 | 17.0 | | 48.2 | 45.9 | | | 51.8 | 46.9 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.1 | 1.5 | | 4.8 | 0.3 | | 0.8 | 0.1 | | | 2.9 | 0.2 |
| Delay (s) | 82.4 | 22.1 | | 75.0 | 17.3 | | 49.0 | 46.0 | | | 54.7 | 47.1 |
| Level of Service | F | C | | E | B | | D | D | | | D | D |
| Approach Delay (s) | | 23.6 | | | 18.5 | | | 47.5 | | | 51.2 | |
| Approach LOS | | C | | | B | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 85.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

**From:** Andrade, Kamakaokalani M [mailto:kandrade1@honolulu.gov]
**Sent:** Thursday, July 11, 2019 3:08 PM
**To:** Pete Pascua <ppascua@wilsonokamoto.com>; Watanabe, Lance K. <lkwatanabe@honolulu.gov>
**Cc:** Jennylyn Tapat <JTapat@wilsonokamoto.com>; Cathy Leong <cleong@wilsonokamoto.com>; Sugiura, Jean <jsugiura@honolulu.gov>; Wataru, Weston <wwataru@honolulu.gov>
**Subject:** Block C - West Traffic Impact Report (TIR)

Pete,

This email acknowledges the traffic analysis for the subject development is acceptable to the Traffic Review Branch (TRB). This acceptance is with the understanding that the site layout and recommendations in the TIAR may be revised based on further review of the project as the design progresses.

**Kamaka Andrade, P.E.**
City & County of Honolulu
Traffic Review Branch
(808) 768-8080

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# APPENDIX D

INFRASTRUCTURE AVAILABILITY REPORT

**Block C West**
**Infrastructure Availability Report**

**Honolulu, Oahu, Hawaii**
**Tax Map Key: 2-3-001:Por.131**

Prepared for
**The Howard Hughes Corporation**
1240 Ala Moana Boulevard, Suite 202
Honolulu, HI 96814

Prepared by
**Wilson Okamoto Corporation**
1907 South Beretania Street, Suite 400
Honolulu, HI 96826

June 2019



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APPENDIX A

- City and County of Honolulu - Department of Planning and Permitting, Wastewater Branch: Approved Sewer Connection Application
- Honolulu Board of Water Supply: Request Letter and Adequacy Letter
- City and County of Honolulu – Department of Planning and Permitting, Civil Engineering Branch: LID Correspondence with Keith Miyashiro
- Honolulu Fire Department: HFD Requirements
- Hawaiian Electric Company: Request Letter and Will Serve Letter
- Hawaiian Telcom: Request Letter and Assessment Letter
- Spectrum(Formerly Oceanic and Charter Communications): Utility Assessment Request Letter and Email Correspondence
- Hawaii Gas – Email Correspondence

# 1 INTRODUCTION

## 1.1 Purpose

The purpose of this report is to confirm the availability of infrastructure utilities to accommodate the demands proposed by the project. The utilities researched include water, sanitary sewer, drainage, electrical, communication, cable, and gas.

## 1.2 Proposed Project Location and Description

The Howard Hughes Corporation (HHC) proposes the development of a 360 unit high-rise condominium tower with mixed use commercial in Kakaako on the island of Oahu (see Figures 1-1 and 1-2). The project site is approximately 2.1 acres, generally located at TMK: 2-3-001:Por.131. The project site will be bounded by the Auahi Street to the north, existing pavement to the west, Block C to the east and Ala Moana Boulevard to the south.

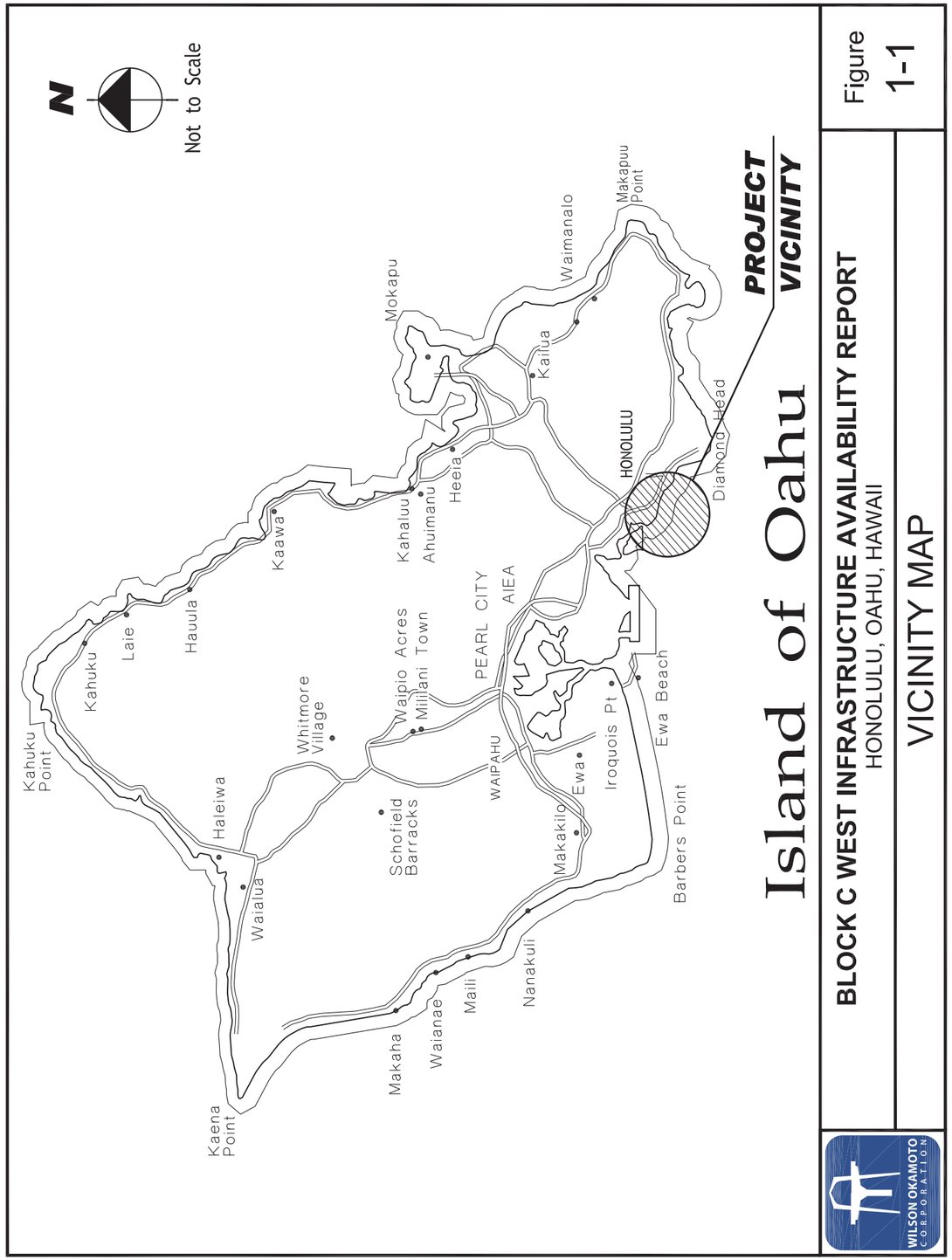
## 1.3 Existing Topography

The project site is currently an existing gravel mound, along with several A.C. pavement parking lots. Drain inlets are located in various locations along the gravel mound and the A.C. pavement parking lot to collect and convey storm water runoff. See Figures 1-3 for the topographic survey prepared October 2012 by Control Point Surveying Inc. See Figure 1-4 for ALTA survey prepared August 2011 by Engineers Surveyors Hawaii, Inc. The project site is currently occupied by parking lots and a gravel mound constructed under “Ward Village Gateway Demolition and Parking Improvements”. See Figure 1-3 for topographic survey prepared October 2012.

## 1.4 Flood Hazard

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel No: 15003C0362G dated January 19, 2011 shows that the project is located in Zone AE. Zone AE is characterized as a special flood hazard area, where the annual chance of flooding (100 year flood) is determined as 1%. The property’s Flood Base Elevations is at 9 feet (see Figure 1-4). The proposed finish floor elevation at Level 1 for the project is 9.25 feet.








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WARD VILLAGE BLOCK C WEST

HONOLULU, OAHU, HAWAII

LOCATION MAP

Figure

**1-2**

Not to Scale

**BLOCK C WEST INFRASTRUCTURE AVAILABILITY REPORT**
HONOLULU, OAHU, HAWAII

# TOPOGRAPHIC SURVEY MAP

Figure
1-3

## 2 UTILITIES

### 2.1 Sanitary Sewer System

Sanitary sewer system servicing the Kakaako Makai area and the project area is owned by the City and County of Honolulu (City) and maintained by its Department of Environmental Services (ENV). The project area is located within the Sand Island collection system where wastewater flow is discharged into the Ala Moana Wastewater Pump Station and conveyed to the City's Sand Island Wastewater Treatment Plant, which serves the Honolulu area from Kuliouou to Moanalua.

The project proposes connection to a proposed 18-inch sewer which is to be constructed within Auahi Street under the "Auahi Street 18-inch sewer line" project. A 12-inch lateral is anticipated for the project and will be confirmed during the final design phase. See Figure 2-1 which identifies the existing sewer system within the project vicinity and future 18-inch sewer improvements.

A sewer connection application was submitted on May 10, 2019 to the City Department of Planning and Permitting (DPP), Wastewater Branch (WWB) to confirm the existing sanitary sewer system can accommodate the project. An approved sewer connection application was received on May 29, 2019 confirming available capacity (see Appendix A).

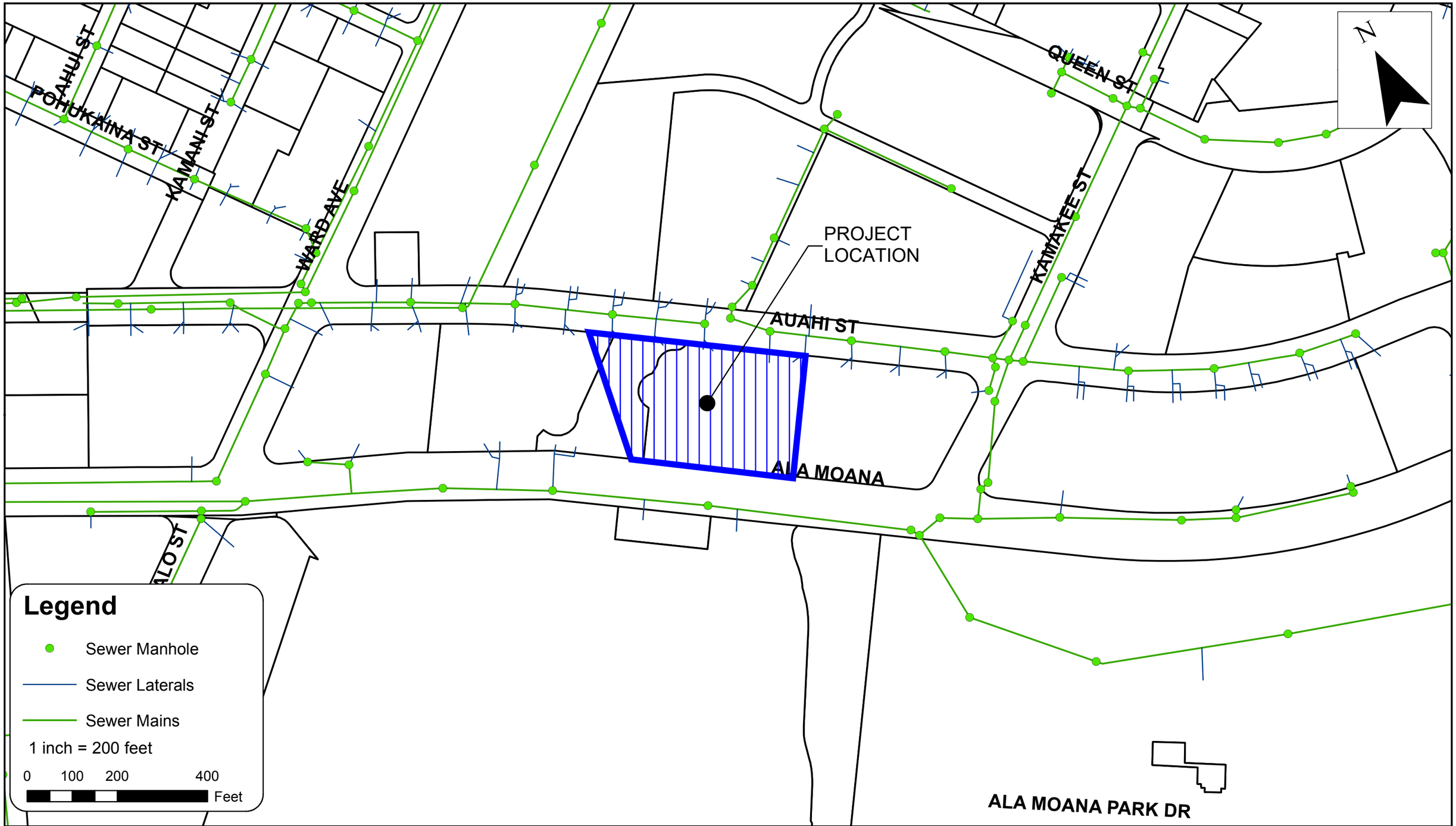



Figure 1-4

WARD VILLAGE BLOCK C WEST
HONOLULU, OAHU, HAWAII

FLOOD HAZARD

WILSON OKAMOTO CORPORATION




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# WARD VILLAGE BLOCK C WEST

HONOLULU, OAHU, HAWAII

## EXISTING SANITARY SEWER SYSTEM

Figure

**2-1**

## 2.2 Water System

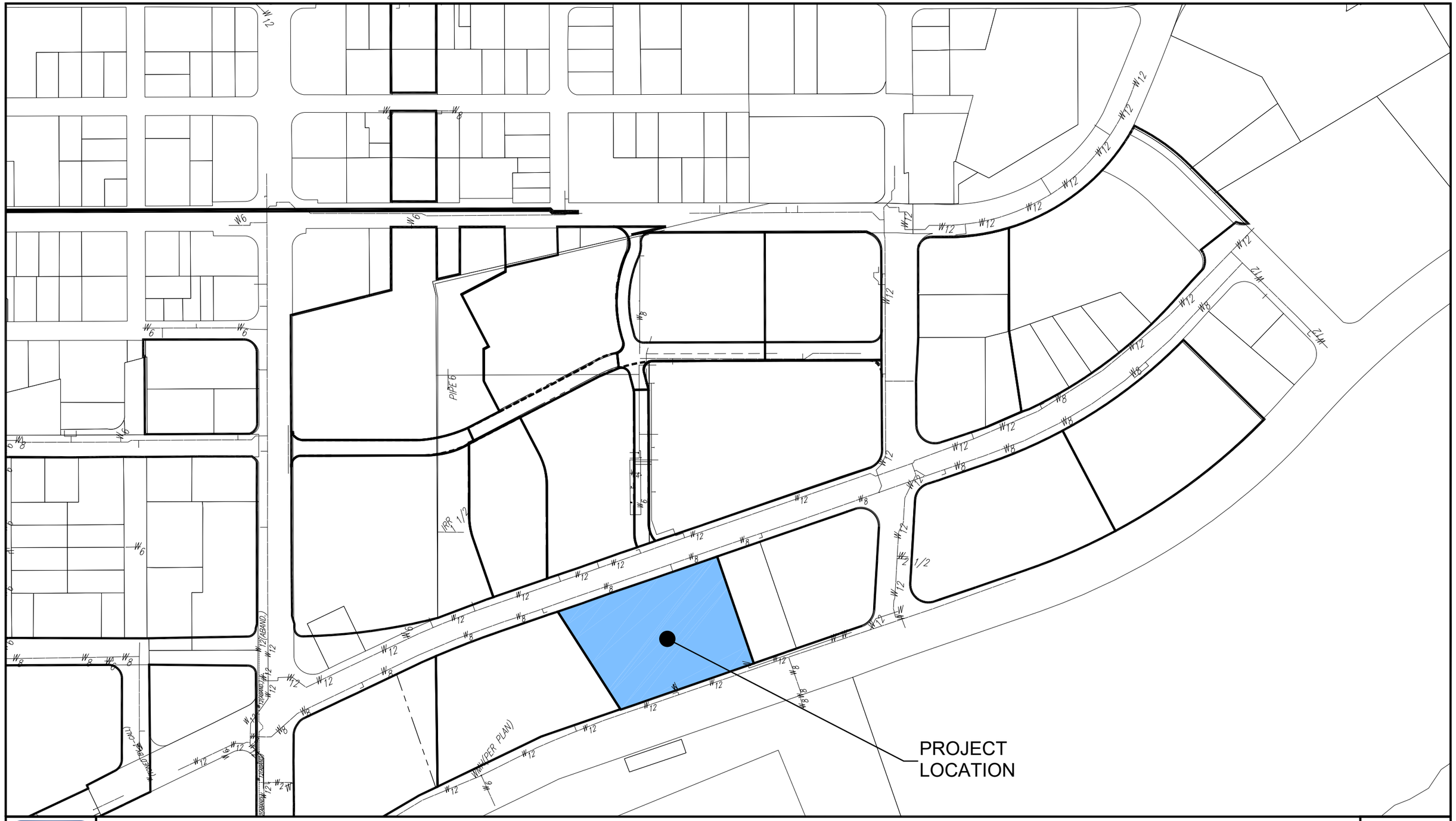
### 2.2.1 Potable Water

Potable water service for the project will be provided by the City and County of Honolulu's Board of Water Supply (BWS).The BWS's water system in the project area consists of a system of looped transmission mains, fire hydrants and water meters.

The project proposes connection to an existing 12-inch water main located north of the project site within Auahi Street. An 8-inch lateral is anticipated and will extend upto the face of the building. The size and location of the lateral will be confirmed during the final design phase. See Figure 2-2 which identifies the existing water system within the project vicinity. A letter request to BWS dated April 17, 2019 to confirm that the existing water system can accommodate the project. An adequacy letter was received May 13, 2019 confirming available capacity (See Appendix A). It was stated in the letter the developer should proceed with the upgrade of the 6-inch water main located between Cummins and Kamakee Streets to a 12-inch water main as stated in the Victoria Ward , LTD Redevelopment Project and Master Plan but is not required as part of the Block C West (see Appendix A). It had been clarified by BWS that the upgrades shall be installed and placed in prior to Phase 3 of the masterplan. Block C West is a part of Phase 2.

### 2.2.2 Fire Protection

Fire protection will be provided by both public and private fire hydrants. Water supply from a public fire hydrant must be provided within 450 feet from the furthest point of the building to the fire access road, while water supply from a private hydrant must be provided within 450 feet from the furthest point of the building to the private fire hydrant. Additionally, a fire sprinkler system will be provided within the building. The sprinkler system will be supplied by an 8-inch fire line which comes off of the 12-inch main located within Auahi Street. The 8-inch fire line will run parallel to the 8-inch domestic water described in section 2.2.1. The Honolulu Fire Department (HFD) was consulted on May 21, 2019 to discuss the project and proposed fire protection methods.
A figure that was prepared as per the recommendations by HFD is provided on Appendix A. Recommendations provided by HFD will be maintained during the final design phase.




WILSON OKAMOTO CORPORATION

**BLOCK C WEST INFRASTRUCTURE AVAILABILITY REPORT**
HONOLULU, OAHU, HAWAII

EXISTING WATER SYSTEM

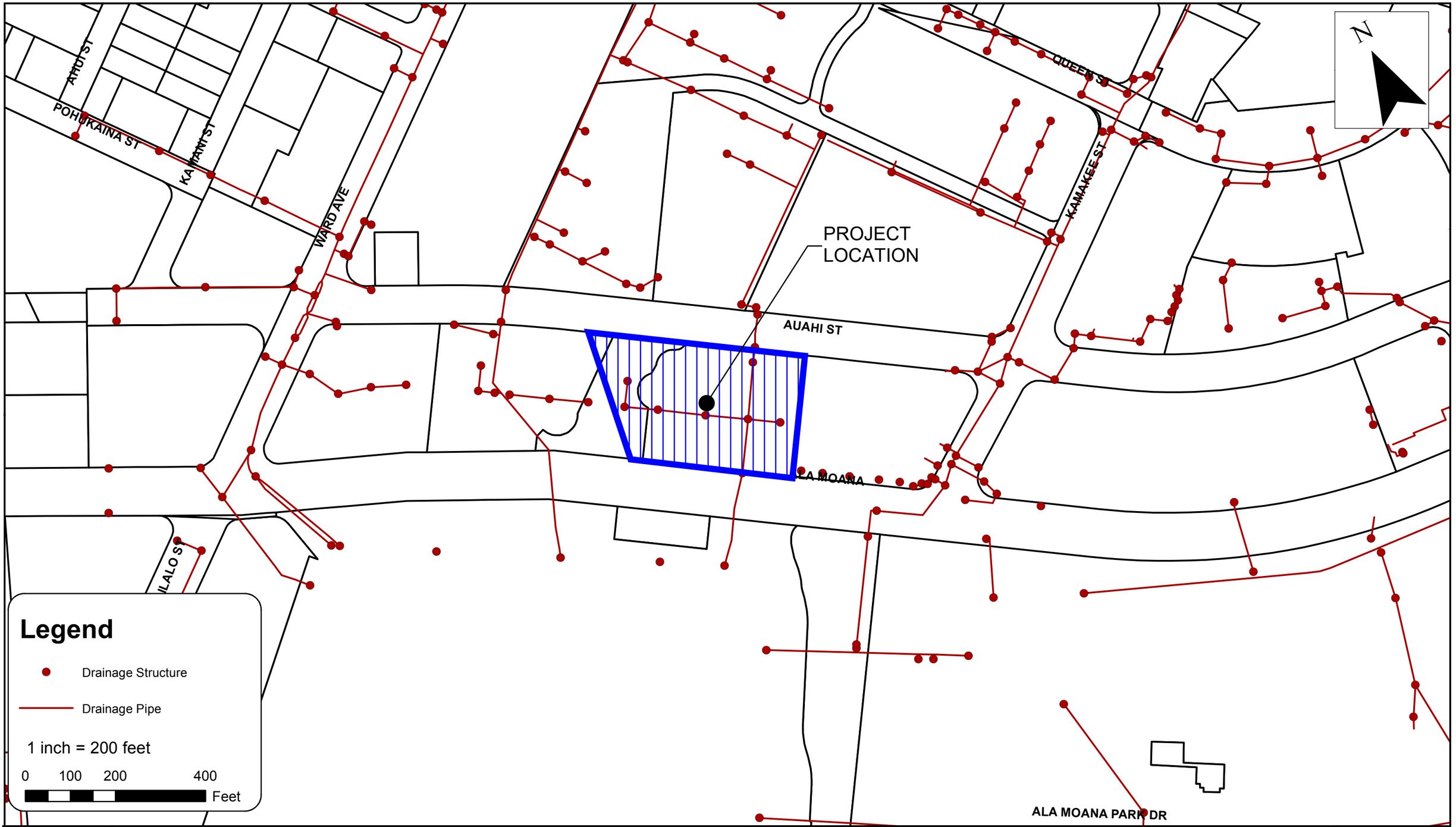
Figure
2-2

## 2.3 Site Drainage and Low Impact Development

The drainage system within the City right-of-way and City drainage easements servicing the Kakaako Mauka area is owned by the City and maintained by its Department of Facilities Maintenance (DFM). Drainage systems within private property are owned and maintained by the respective property owner.

The runoff from the project site will be collected within a private drainage system owned and maintained by HHC with a series of subsurface infiltration systems that will percolate onto the ground, any overflow will discharges into a City owned drainage system south of the project site. It is anticipated that the project site will maintain the drainage pattern and will not increase the peak flow rate and volume. For this reason, the project will not adversely impact the existing performance of the City system. See Figure 2-3 for the drainage system within the project site.

The project proposes to install subsurface infiltration systems ewa of the building. Two subsurface infiltration systems will be used to treat the overall storm water quality requirements for the project site. The systems will be located along the proposed Gateway Plaza adjacent to the Block C West building. Any overflow will connect to the 18-inch drain line along Ala Moana Boulevard. Email correspondence was received for the LID Site Design Strategies on Appendix A.




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# WARD VILLAGE BLOCK C WEST

HONOLULU, OAHU, HAWAII

## EXISTING DRAINAGE SYSTEM

Figure

**2-3**

### 2.4 Electrical Power Facilities

Hawaiian Electric Company (HECO) was consulted on March 14, 2017 by Ronald Ho and Associates to confirm the existing electrical system can accommodate the project (See Appendix A). A Will Serve letter was received on May 6, 2019 confirming proposed circuits will be installed along Auahi which will serve the Block C West project and the other Howard Hughes developments in the area.

### 2.5 Telephone System

Hawaiian Telcom Incorporated was consulted on January 22, 2019 to confirm the existing communication system can accommodate the project (see Appendix A). Email correspondence was received confirming available capacity for Block C West project.

### 2.6 Cable Television System

Spectrum (formerly Oceanic and Charter Communications) was consulted January 22, 2019 to confirm the existing cable system can accommodate the project (see Appendix A). Email correspondence was received confirming design parameters to use in development of the cable infrastructure for Block C West.

### 2.7 Gas System

Hawaii Gas was consulted on June 13, 2019 to confirm the existing gas system can accommodate the project. Email correspondence was received confirming available capacity for the Block C West project (see Appendix A).

## APPENDIX A

- City and County of Honolulu - Department of Planning and Permitting, Wastewater Branch: Approved Sewer Connection Application
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- Hawaii Gas: Email Correspondence

Infrastructure Availability Report Appendix A

**City and County of Honolulu - Department of Planning and Permitting**
**Wastewater Branch**

**Approved Sewer Connection Application**

DEPARTMENT OF PLANNING AND PERMITTING
**CITY AND COUNTY OF HONOLULU**
650 SOUTH KING STREET * HONOLULU, HAWAII 96813
Phone: (808) 768-8209 * Fax: (808) 768-4210

# SEWER CONNECTION APPLICATION

APPLICATION NO.: **2019/SCA-0671** STATUS: **Approved with conditions**

DATE RECEIVED: **05/10/2019** IWDP APP. NO.:

PROJECT NAME: **2019/SCA-0671 Victoria Ward: Block C West**

**$1,667,232.00**
Estimated Wastewater System Facility Charge*

LOCATION:

| Zone | Section | Plat | Parcel |
|---|---|---|---|
| 2 | 3 | 001 | 131 |

**77,686** Sq. Ft.

SPECIFIC LOCATION: **Auahi Street**

APPLICANT: **Wilson Okamoto Corporation**
**ATTN. Kevin Goto**
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

DEVELOPMENT TYPE: **Dwelling, Multi-family** SEWER CONNECTION WORK DESIRED:

OTHER USES:

NON-RESIDENTIAL AREA: s.f. APPROXIMATE DATE OF CONNECTION:

| PROPOSED UNITS | EXISTING UNITS | UNITS TO BE DEMOLISHED |
|---|---|---|
| No. of New Units: **360** | No. of Existing Units: **0** | No. of Units to be Demolished: **0** |
| Studios: **0** | Studios: | Studios: |
| 1-Bedroom: **137** | 1-Bedroom: | 1-Bedroom: |
| 2-Bedroom: **146** | 2-Bedroom: | 2-Bedroom: |
| 3-Bedroom: **77** | 3-Bedroom: | 3-Bedroom: |
| 4-Bedroom: | 4-Bedroom: | 4-Bedroom: |
| 5-Bedroom: | 5-Bedroom: | 5-Bedroom: |
| 6-Bedroom: | 6-Bedroom: | 6-Bedroom: |

REMARKS **Sewer improvements as proposed in the approved Victoria Ward Sewer Master Plan (April 2019) are reqiored. Submit construction plans for review and approval.**

APPROVAL DATE: **05/24/2019**

EXPIRATION DATE: **05/23/2021**

*Valid 2-years after approval date. Construction plans shall be completed and approved within this 2-year period. Construction shall commence within 1-year after approval of plans.*
** Applicable WSFC shall be collected at the prevailing rate in accordance with ROH 1990, Chapter 14, Sections 14-10.3, 14-10.4, 14-10.5 and Appendix 14-D.*

REVIEWED BY: ***Keith Miyashiro***

Site Development Division, Wastewater Branch

ExternalID: **072748479-001** JobId: **72748479**

Initial Print Date: Friday May 24, 2019 10:01 am



**Honolulu Board of Water Supply**

**Request Letter**
**Adequacy Letter**

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8206-51
April 17, 2019

City and County of Honolulu
Board of Water Supply
Customer Care Operating Unit
630 South Beretania Street
Honolulu, HI 96813

Attention: Mr. Robert Chun

Subject: Ward Village Block C West – BWS Water System Adequacy

Dear Mr. Chun:

Thank you again for your original response letter dated February 6, 2019 to our request for assistance to determine the Board of Water Supply system adequacy to support the proposed 1.8 acre Ward Village Block C West development at TMK: 2-3-001:131. The developer, the Howard Hughes Corporation, recently updated the programming as follows:

- Residential – 360 units
- Commercial – 0 sf

If possible, please confirm the system adequacy to support this updated programming in addition to providing the latest flow information, pressure information, record drawings and facility maps related to the property.

Feel free to call or email me at kgoto@wilsonokamoto.com should you have any questions or require additional information.

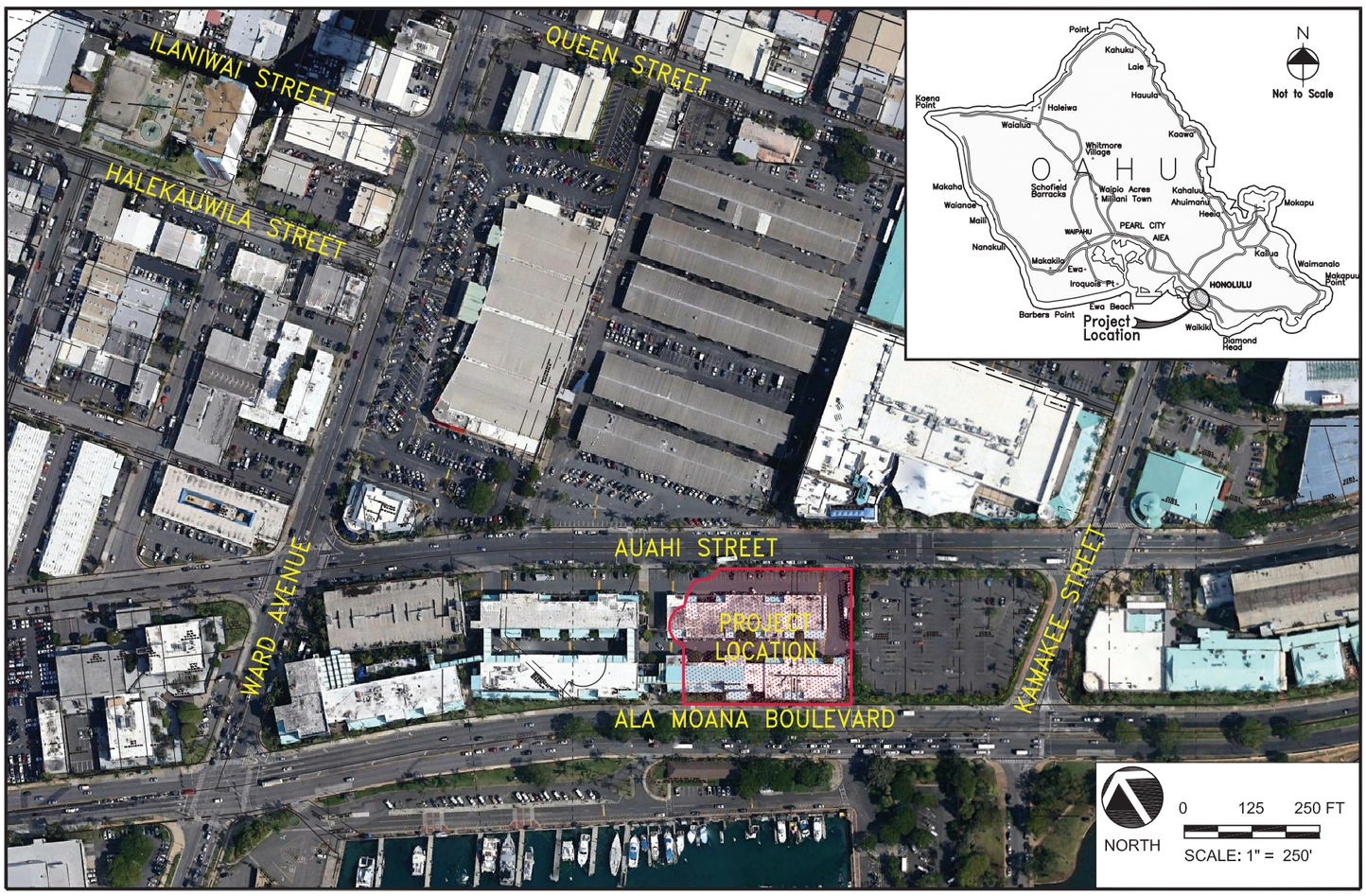
Sincerely,

Kevin Goto, PE, LEED AP
Project Manager

1907 S. Beretania Street, Suite 400 • Honolulu, Hawaii • 96826 • (808) 946-2277



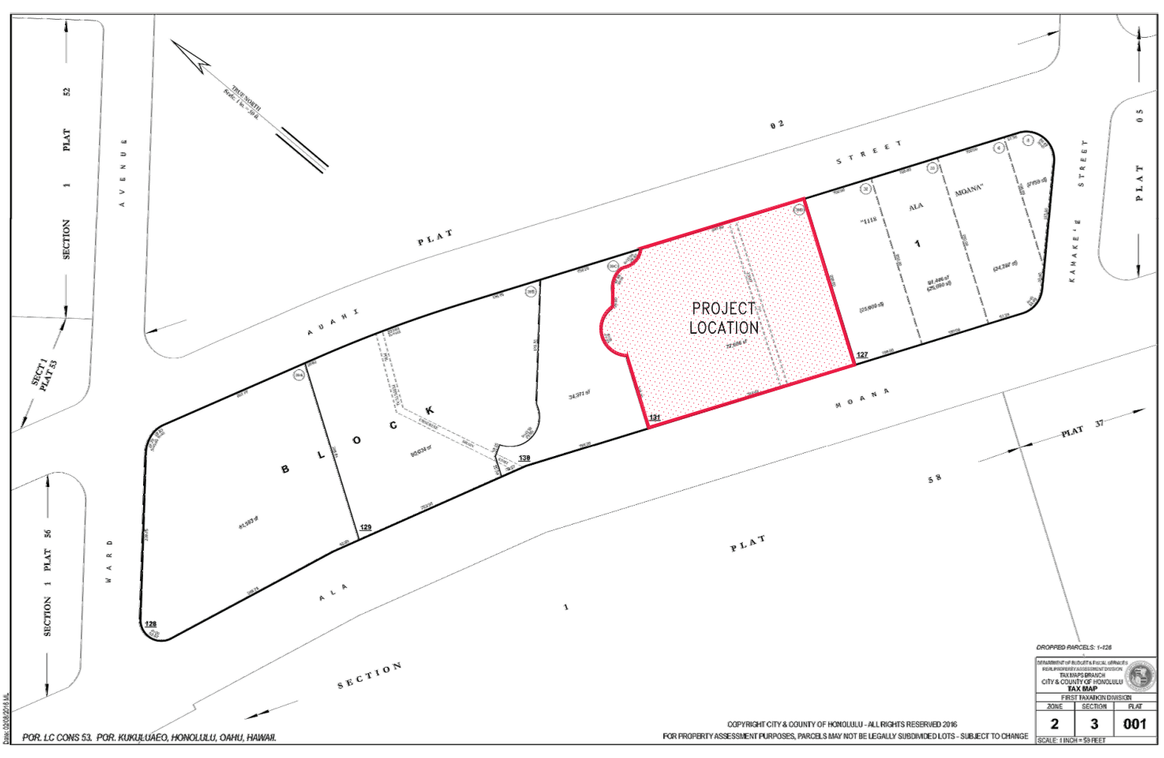
Enclosures: Project Vicinity and Location Map
Tax Map Key
Original BWS Response Letter dated February 6, 2019




WILSON OKAMOTO CORPORATION

# FIGURE 1
## PROJECT VICINITY AND LOCATION MAP

*WARD VILLAGE - BLOCK C WEST / HONOLULU, OAHU, HAWAII*




WILSON OKAMOTO CORPORATION

# FIGURE 2
## TMK MAP

*WARD VILLAGE - BLOCK C WEST / HONOLULU, OAHU, HAWAII*

**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

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JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

February 6, 2019

RECEIVED
FEB 08 2019
WILSON OKAMOTO CORPORATION

Mr. Kevin Goto
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Goto:

Subject: Your Letter Dated January 17, 2019 Regarding Availability of Water for Ward Village Block C West off Auahi Street, Tax Map Key: 2-3-001: 131

Thank you for your letter regarding the proposed 270-unit high-rise and 10,000 square foot commercial project.

The existing water system is adequate to accommodate the proposed mixed-use development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

The developer should proceed with the upgrade of the 6-inch water main on Queen Street from Cooke Street up to the existing 12-inch water main located between Cummins and Kamakee Streets to a 12-inch main, as indicated in our comments regarding the Victoria Ward Master Plan.

The construction drawings should be submitted for our approval, and the construction schedule should be coordinated to minimize impact to the water system.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

Proposed mixed use developments are required to install separate domestic water meters and laterals serving the residential and non-residential spaces.

Water conservation measures are recommended for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.



High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

The BWS has suspended fire flow tests on fire hydrants as a water conservation measure. However, you may use the following calculated flow data for Fire Hydrant No. M03199 and M06269:

| Fire Hydrant Number | Location | Static Pressure (psi) | Residual Pressure (psi) | Flow (gpm) |
|---|---|---|---|---|
| M03199 | Auahi Street | 77 | 56 | 2,000 |
| M06269 | Ala Moana Blvd. | 77 | 63 | 2,000 |

The data is based on the existing water system, and the static pressure represents the theoretical pressure at the point of calculation with the reservoir full and no demands on the water system. The static pressure is not indicative of the actual pressure in the field. Therefore, to determine the flows that are available to the site, you will have to determine the actual field pressure by taking on-site pressure readings at various times of the day and correlating that field data with the above hydraulic design data.

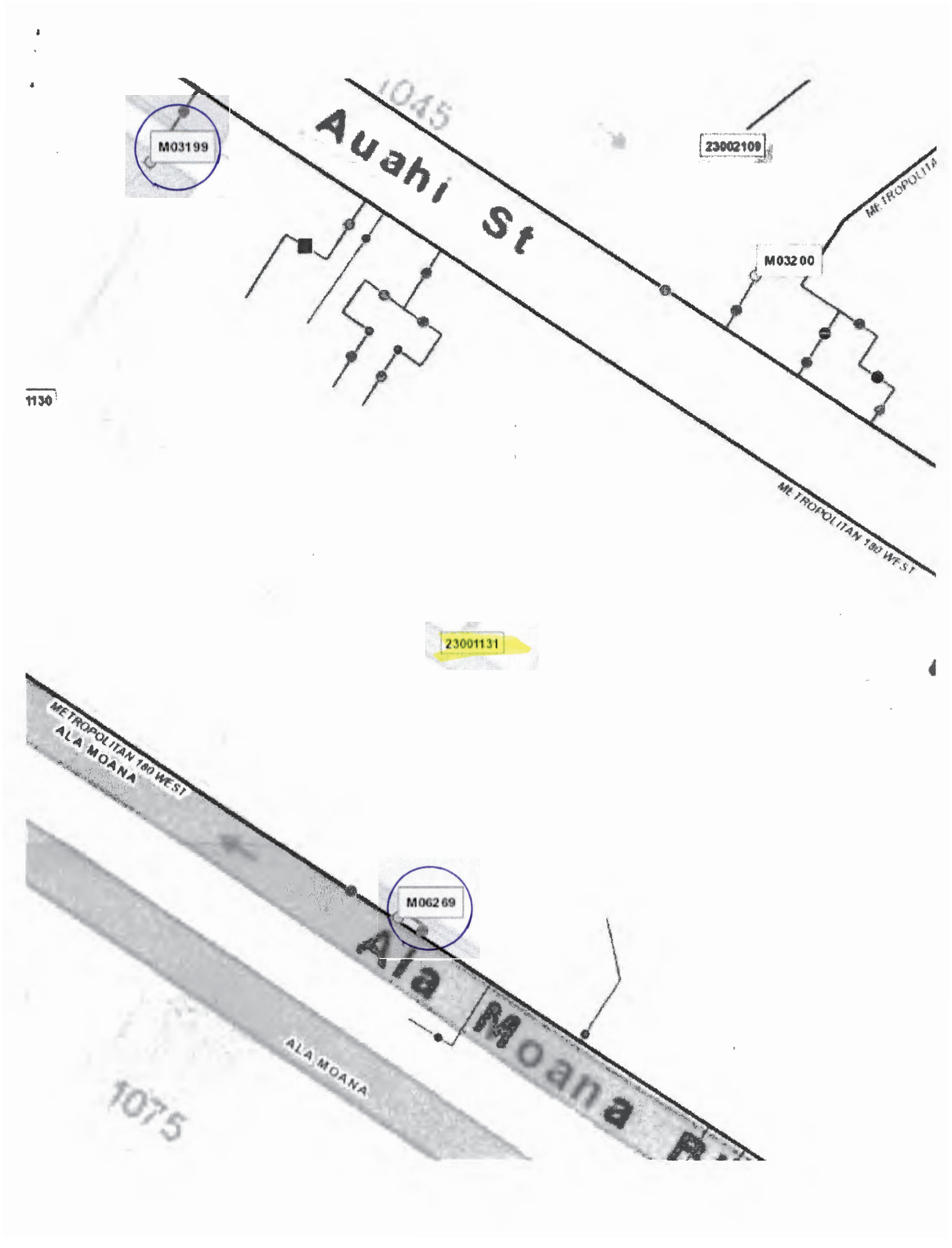
The map showing the location of the fire hydrants are attached.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachment




**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

May 10, 2019

KIRK CALDWELL, MAYOR

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MAX J. SWORD

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ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

RECEIVED
MAY 13 2019
WILSON OKAMOTO CORPORATION

Mr. Kevin Goto
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Goto:

Subject: Your Letter Dated April 17, 2019 Regarding Availability of Water for 360 Units at Ward Village Block C West off Auahi Street – Tax Map Key: 2-3-001: 131

Thank you for your letter regarding the proposed high-rise residential project.

The existing water system is adequate to accommodate the proposed development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply (BWS) reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

Water conservation measures are recommended for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

High-rise buildings with booster pumps will be required to install water hammer arrestors or expansion tanks to reduce pressure spikes and potential main breaks in our water system.

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The developer should proceed with the upgrade of the 6-inch water main along Queen Street, from Cooke Street up to the existing 12-inch water main located between Cummins and Kamakee Streets, to a 12-inch main as indicated in our comments regarding the Victoria Ward, LTD. Redevelopment Project and Master Plan.

The construction drawings should be submitted for our approval, and the construction schedule should be coordinated to minimize impact to the water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

The BWS has suspended fire flow tests on fire hydrants as a water conservation measure. However, you may use the following calculated flow data for Fire Hydrant No. M03199 and M06269:

| Fire Hydrant Number | Location | Static Pressure (psi) | Residual Pressure (psi) | Flow (gpm) |
|---|---|---|---|---|
| M03199 | Auahi Street | 77 | 56 | 2,000 |
| M06269 | Ala Moana Blvd. | 77 | 63 | 2,000 |

The data is based on the existing water system, and the static pressure represents the theoretical pressure at the point of calculation with the reservoir full and no demands on the water system. The static pressure is not indicative of the actual pressure in the field. Therefore, in order to determine the flows that are available to the site, you will have to determine the actual field pressure by taking on-site pressure readings at various times of the day and correlating that field data with the above hydraulic design data.

The map showing the location of the fire hydrants is attached.

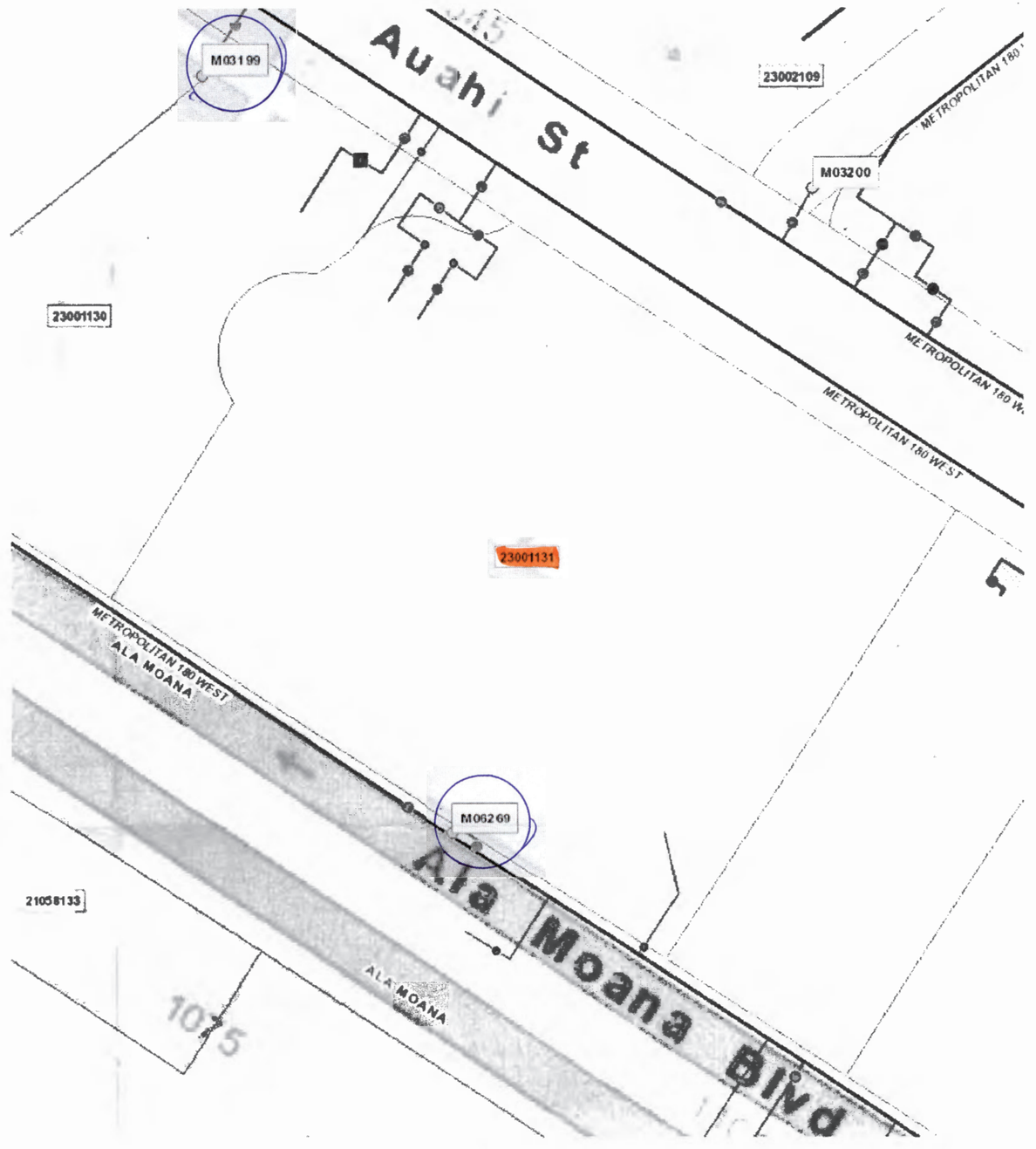
To obtain record drawings and facility maps related to the property you may contact the Support Branch of our Capital Projects Division at 748-5740.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachment



**City and County of Honolulu - Department of Planning and Permitting**
**Civil Engineering Branch**

**LID Correspondence with Keith Miyashiro**

---

**From:** Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
**Sent:** Saturday, June 29, 2019 8:57 AM
**To:** Cara Itai
**Cc:** Kevin Goto; Dayson Watanabe
**Subject:** RE: Ward Village Block C-West - LID Conceptual Design

Hi Cara,

As a recap on our phone conversation earlier, LID Site Design Strategies mainly include the incorporation of features that maintain the hydrological cycle on-site. A great example of this would be landscaping, self-mitigating, and self-retaining areas. Based on the mentioned inclusion of landscaping, this project will have included LID strategies. Keep in mind that this is conceptual and actual determination will be made at the time of the plan review and storm water quality report.

Hope this helps.

***Keith K. Miyashiro***
Civil Engineer
City and County of Honolulu
Department of Planning and Permitting
Civil Engineering Branch
650 S. King Street, Honolulu, HI 96813
**Email**: kmiyashiro1@honolulu.gov
**Phone**: 808-768-8106

---

**From:** Cara Itai [mailto:CItai@wilsonokamoto.com]
**Sent:** Friday, June 28, 2019 11:50 AM
**To:** Miyashiro, Keith K
**Cc:** Kevin Goto; Dayson Watanabe
**Subject:** Ward Village Block C-West - LID Conceptual Design

Hi Keith:

Howard Hughes is in conceptual design of a new tower project at Ward Village. We'd like to present the project's conceptual LID design for your review and comments. Please see the attached for reference.

Since there is limited space on the site, the intent is to allow stormwater to sheet flow to the Future Plaza, that will be constructed concurrently as Block C-West, into subsurface infiltration systems with an overflow connection into the existing drain system in Ala Moana Boulevard.

We understand that official review will be done during permitting, but would it be possible to comment and confirm if the conceptual design generally conforms to LID standards?

Please let us know if you have any comments or questions.

Thanks,

**Cara Itai**
Civil Engineer

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

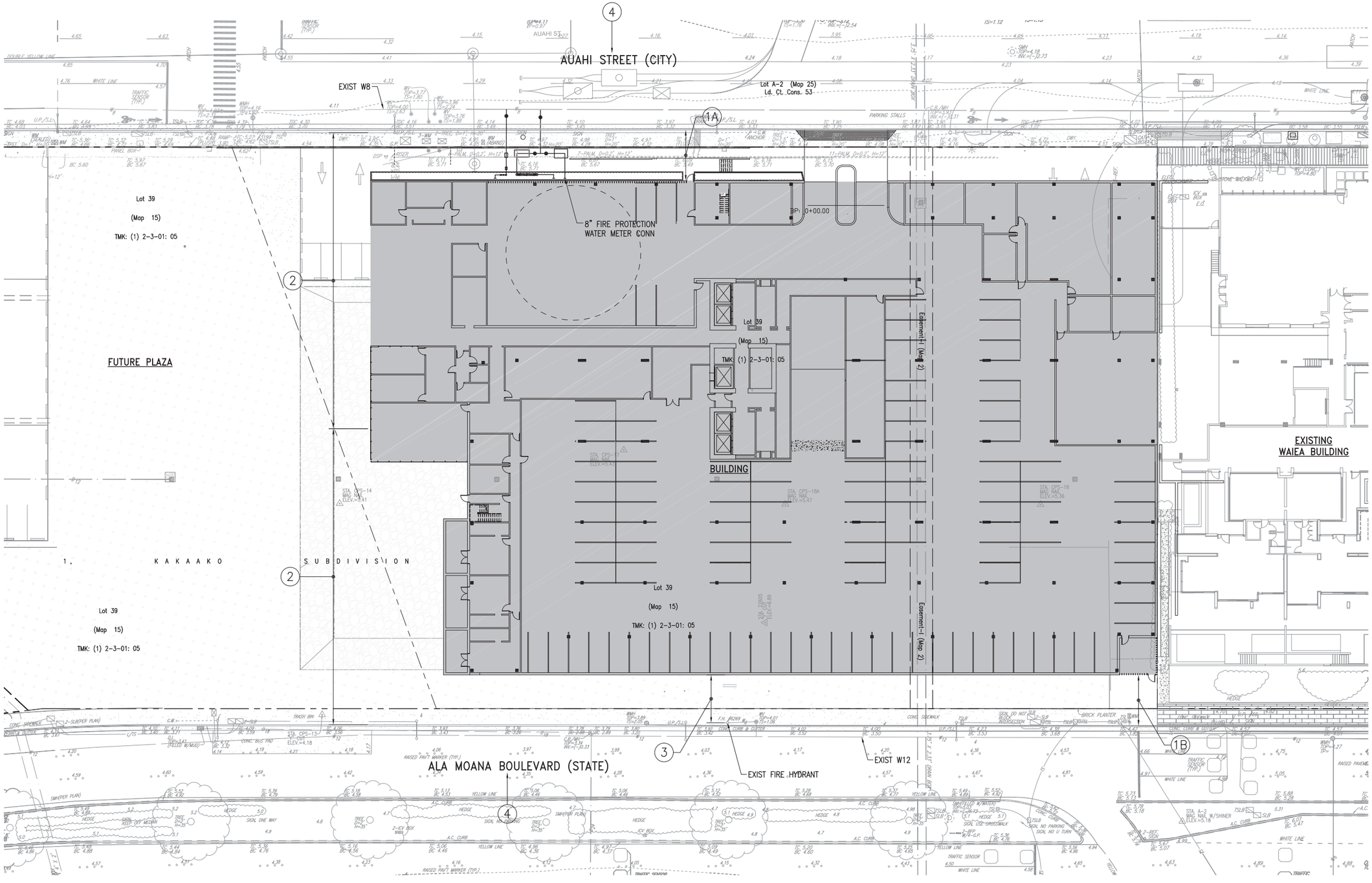
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
T (808) 946-2277 F (808) 946-2253
W http://www.wilsonokamoto.com

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**Honolulu Fire Department**

**HFD REQUIREMENTS**




1A REQUIREMENT = A DOORWAY IS WITHIN 100' OR LESS FROM A FIRE ACCESS ROAD
PROPOSED = 22.61'

1B REQUIREMENT = A DOORWAY IS WITHIN 100' OR LESS FROM A FIRE ACCESS ROAD
PROPOSED = 22.59'

2 REQUIREMENT = FURTHEST POINT ON THE BUILDING TO A FIRE ACCESS ROAD SHALL BE WITHIN 450'
PROPOSED = 132'

3 REQUIREMENT = CLOSEST POINT FROM THE BUILDING TO A FIRE HYDRANT SHALL BE WITHIN 400'
PROPOSED = 21.32'

4 FIRE ACCESS ROAD

LEGEND

PROPOSED BUILDING

FIGURE 1
HFD REQUIREMENTS

**Hawaiian Electric Company**

**Request Letter and Will Serve Letter**

Ronald N.S. Ho & Associates, Inc.
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22 January 2019

Hawaiian Electric Co.
820 Ward Avenue
Honolulu, HI 96840

Attention: Eric Shimono, P.E.

Project: Ward Village Block C West Utility Assessment

Enclosures: (a) Block C West Concept Site Plan
(b) TMK No. 2-3-001:131

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block C West development (TMK No. 2-3-001:131). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 270 dwelling units and a 10,000 square foot restaurant space. Based on a diversified per unit demand load of 5 kVA, a pro-rated common area demand load of 3VA per residential unit and a demand load of 11 VA per square foot for the restaurant space, the preliminary peak demand load would be 2,270 kVA. This peak demand load is for planning purposes and it should be noted that the building load, when calculated based on the currently enforced edition of the National Electrical Code, will be higher than this calculation. Please advise on the following:

1. HECO's preferred service connection point for this development. Also please verify that HECO's distribution system in the area has sufficient capacity to provide service to this development. If off-site improvements are required to provide service to this site, please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

2. If we may obtain the existing HECO distribution plans for any existing overhead and underground facilities within or adjacent to the site and, if possible, a color G-net map of the project area. These will assist with the development of the utility assessment.

2153 North King Street, Suite 201 | Honolulu, Hawaii 96819 | Tel (808) 941-0577 | Fax (808) 945-2646 | postmaster@rnsha.com | www.rnsha.com

Hawaiian Electric Co.
Project: Ward Village Block C West Utility Assessment
Page – 2

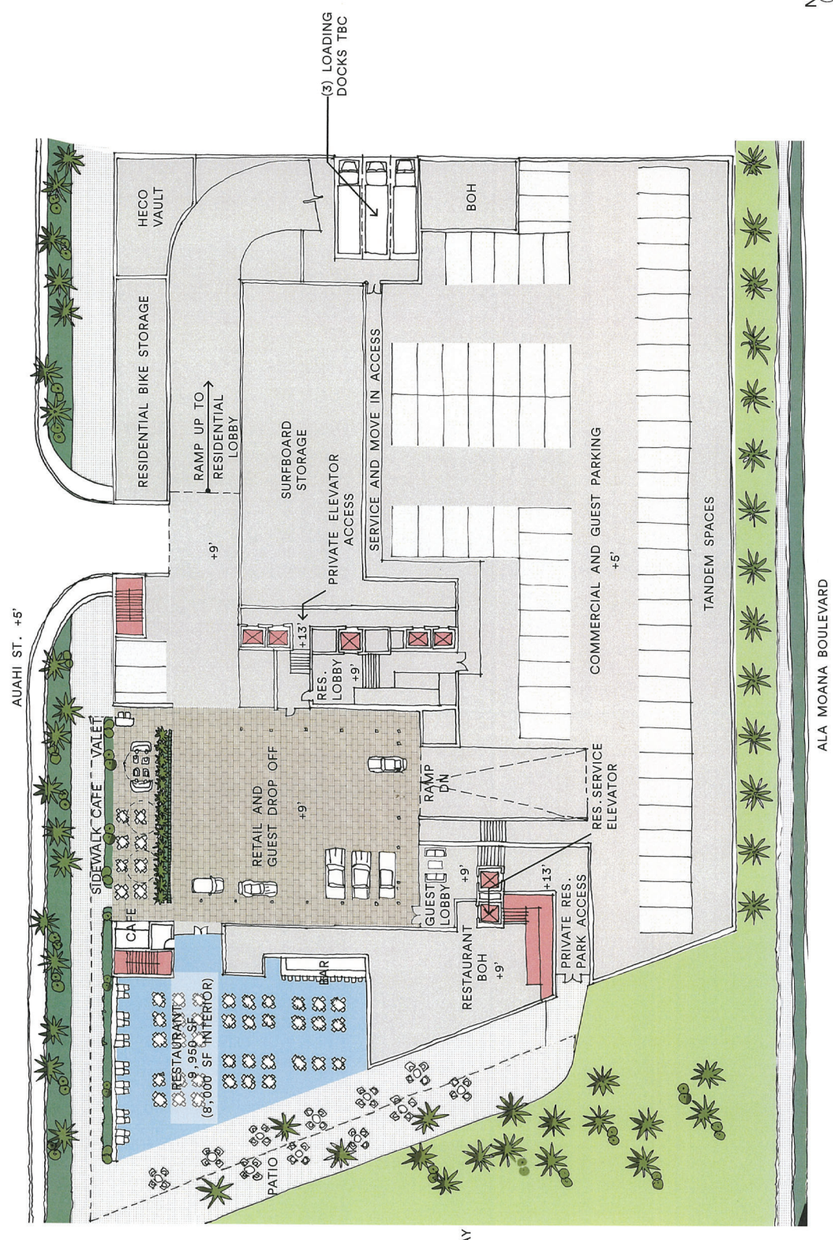
3. HECO would provide a "will serve" letter for this project which will be included in the project's application for approval by the Hawaii Community Development Authority.

We are trying to complete the draft utility assessment report as quickly as feasible and would appreciate any information you can furnish within the next three weeks. Your assistance in expediting this matter is greatly appreciated. Should you have any questions, please call.

Very truly yours,

Steven Sakai

cc: Gary Fukumoto, HECO
Kevin Goto, WOC




FLOOR PLANS | GROUND FLOOR

100% CONCEPT DESIGN | BLOCK CW | WARD VILLAGE | 2018027 | 12-07-2018 | 27

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May 6, 2019

Mr. Steve Sakai
Ronald N.S. Ho & Associates
2153 N. King Street #201
Honolulu, HI. 96819

Dear Mr. Sakai:

Re: Ward Village – Block C West

This is in response to your request for a "Will Serve" letter for the subject project.

We have reviewed our existing 25kv circuits in the area and have determined that they will not be able to serve the proposed Block C West loads. However, as a regulated utility, Hawaiian Electric Company (HECO) is obligated to serve all customers submitting a valid service request. Therefore, in order to provide service to this project, HECO is working with Howard Hughes Corporation to design and construct the required infrastructure upgrades to allow for the extension of additional 25kv circuits from our existing Kewalo Substation.

We request that you keep us informed on the status of your project and look forward to working with you on your design as they are being developed. As soon as you have detailed plans, please create a Service Request with us, and be sure to allow sufficient time for us to work on the project.

Please let us know if we can be of assistance in any other way. Should you have any questions, please call me at 543-7590.

Sincerely,

Eric Shimono
Sr. Engineer
Planning & Design Division
Customer Installation Dept.

ES:ks

**Hawaiian Telcom**

**Request Letter and Email Correspondence**

Ronald N.S. Ho & Associates, Inc.
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22 January 2019

Hawaiian Telecom Inc.
1177 Bishop Street, 10th Floor
Honolulu, HI 96813

Attention: Ms. Cassandra Yamamoto

Project: Ward Village Block C West Utility Assessment

Enclosures: (a) Block C West Concept Site Plan
(b) TMK No. 2-3-001:131

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block C West development (TMK No. 2-3-001:131). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 270 dwelling units and a 10,000 square foot restaurant space. Based on these figures and assuming conventional telecommunications provisioning, it appears that, for planning purposes, approximately 415 telephone pairs would be required. Please advise on the following:

1. HTCO's preferred service connection point for this development. Also please verify that HTCO's distribution system in the area has sufficient capacity to provide service to this development. If off-site improvements are required to provide service to this site, please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

2. If we may obtain the existing HTCO distribution maps for any existing overhead and underground facilities within or adjacent to the site. These will assist with the development of the utility assessment.

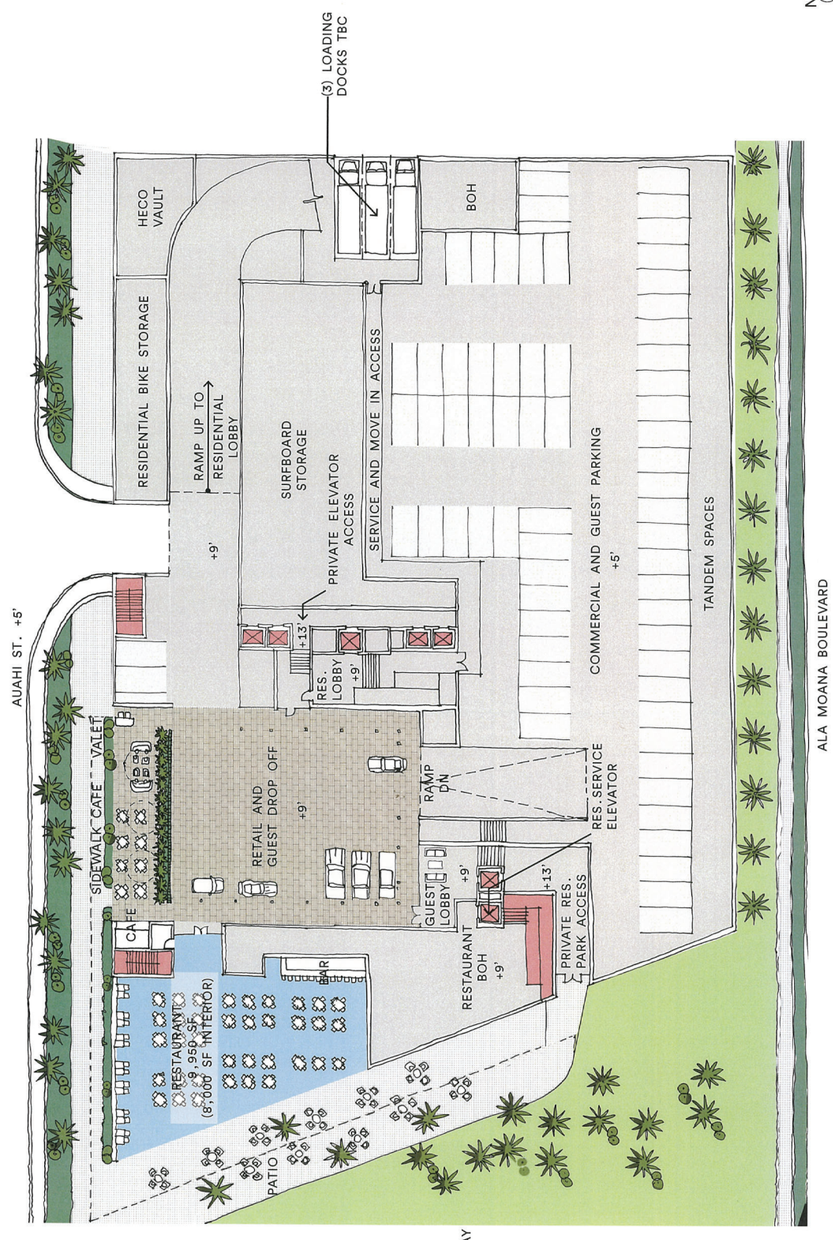
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We are trying to complete the draft utility assessment report as quickly as feasible and would appreciate any information you can furnish within the next three weeks. Your assistance in expediting this matter is greatly appreciated. Should you have any questions, please call.

Very truly yours,

Steven Sakai

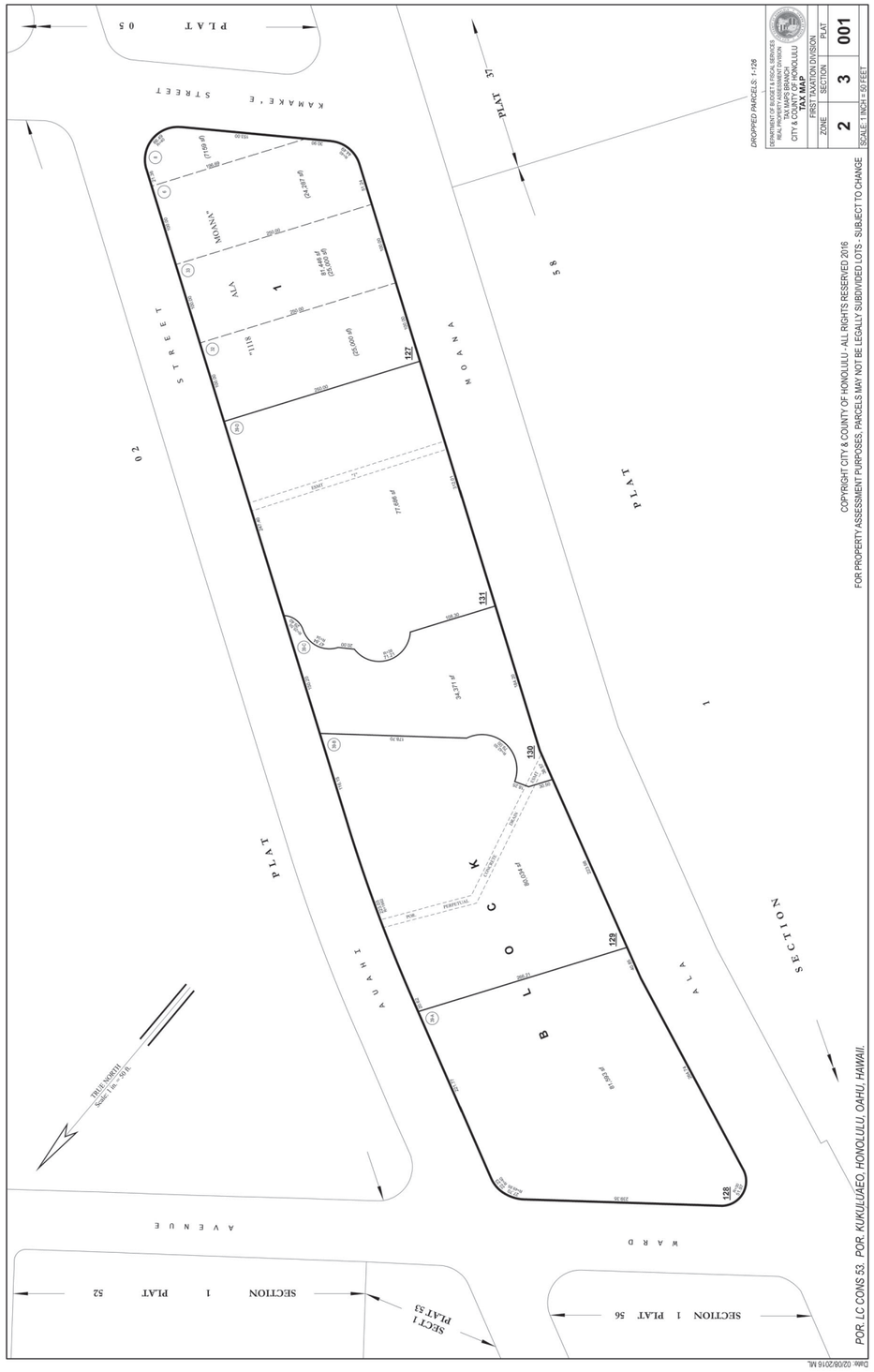
cc: Tracy Hiyane, HTCO
Kevin Goto, WOC




**FLOOR PLANS** | GROUND FLOOR



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**ssakai@rnsha.com**

**From:** Jolette Aldrich <Jolette.Aldrich@hawaiiantel.com>
**Sent:** Monday, April 22, 2019 9:27 AM
**To:** 'Steve Sakai'
**Cc:** mfujita@wilsonokamoto.com; 'Lee Cranmer'
**Subject:** RE: Ward Village Block C

Steve,

Yes, we have fiber along Kamakee that could feed Auahi through the underground duct system.

Mahalo!

Jolette Aldrich
Network Engineer
Hawaiian Telcom
Office: 808.546.3153
jolette.aldrich@hawaiiantel.com

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**From:** Steve Sakai <SSakai@rnsha.com>
**Sent:** Thursday, April 18, 2019 8:34 AM
**To:** Jolette Aldrich <Jolette.Aldrich@hawaiiantel.com>; Tracy Hiyane <Tracy.Hiyane@hawaiiantel.com>
**Cc:** mfujita@wilsonokamoto.com; 'Lee Cranmer' <Lee.Cranmer@howardhughes.com>
**Subject:** FW: Ward Village Block C

To: Jolette Aldrich, HTCO; Tracy Hiyane, HTCO
From: Steve Sakai, RHA

Thank you for responding. Is it also feasible for HTCO to extend service to Block C West from the duct system in Auahi Street that is providing service to the Waiea condominium i.e. from the underground duct system on Kamakee Street?

**From:** Jolette Aldrich <Jolette.Aldrich@hawaiiantel.com>
**Sent:** Wednesday, April 17, 2019 12:04 PM
**To:** Debbie Farr <dtfarr@rnsha.com>
**Cc:** Stacy Shishido <Stacy.Shishido@hawaiiantel.com>; Jaydence Goya <Jaydence.Goya@hawaiiantel.com>
**Subject:** RE: Ward Village Block C

Ms. Farr,

Here is the information Steve Sakai requested.

HTCO's preferred service connection point for this development will be along Auahi St more likely via fiber (aerial). We do have existing infrastructure and aerial cable along Auahi St from Ward Ave to Kamakee St.

Mahalo!

Jolette Aldrich
Network Engineer
Hawaiian Telcom
Office: 808.546.3153
jolette.aldrich@hawaiiantel.com

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**From:** Debbie Farr <dtfarr@rnsha.com>
**Sent:** Tuesday, January 22, 2019 2:54 PM
**To:** Cassandra Yamamoto <Cassandra.Yamamoto@hawaiiantel.com>
**Cc:** Tracy Hiyane <Tracy.Hiyane@hawaiiantel.com>
**Subject:** Ward Village Block C

Ms. Yamamoto,

Please find inquiry for Ward Village Block C.

Thank you.

Debbie Farr | Receptionist
Ronald N.S. Ho & Associates, Inc.
T: (808) 941-0577
dtfarr@rnsha.com | www.rnsha.com

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**Charter Communications aka Spectrum**

**Utility Assessment Request Letter and Email Correspondence**

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22 January 2019

Charter Communications
200 Akamainui Street
Mililani, HI 96789

Attention: Mr. Derek Kato

Project: Ward Village Block C West Utility Assessment

Enclosures: (a) Block C West Concept Site Plan
(b) TMK No. 2-3-001:131

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block C West development (TMK No. 2-3-001:131). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 270 dwelling units and a 10,000 square foot restaurant space. Please advise on the following:

1. Charter's preferred service connection point for this development. Also, please verify that Charter's distribution system in the area has sufficient capacity to provide service to this development. If off-site improvements are required to provide service to this site, please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

2. If we may obtain the existing Charter distribution maps for any existing overhead and underground facilities within or adjacent to the site. These will assist with the development of the utility assessment.

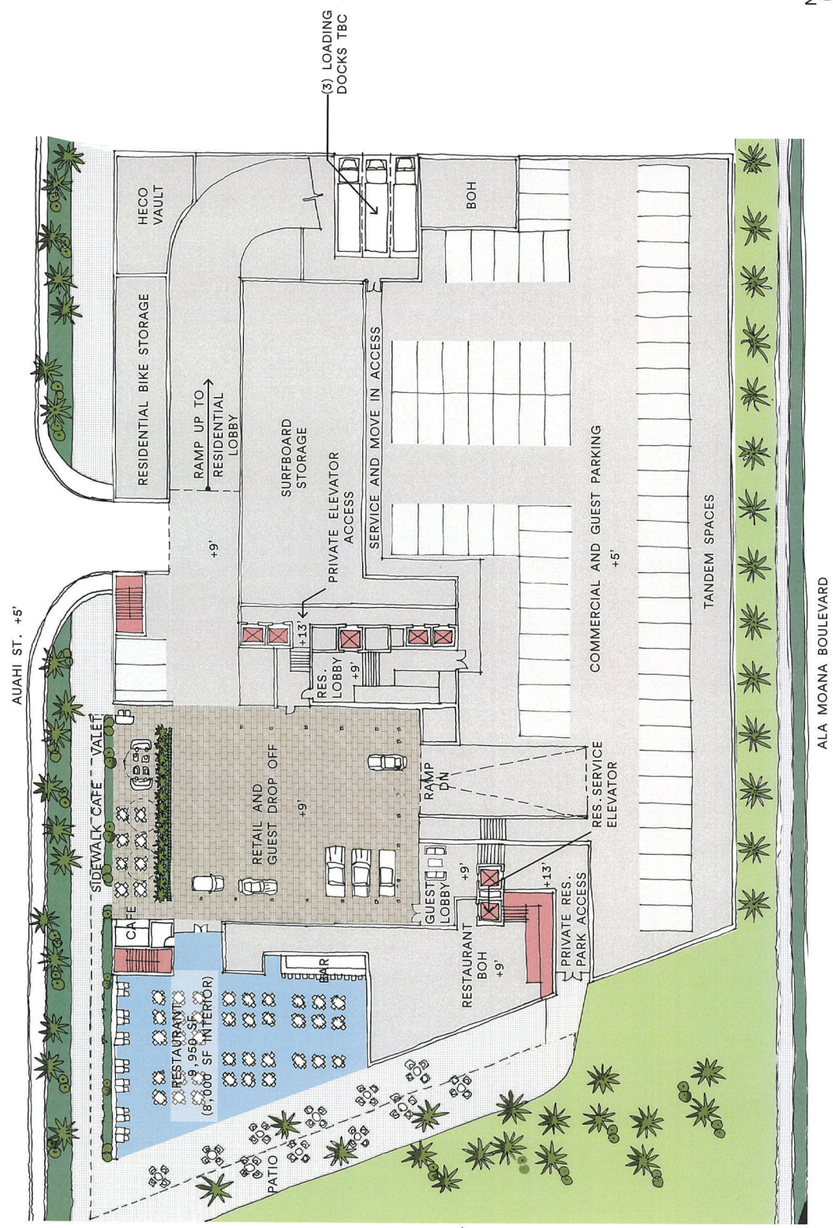
We are trying to complete the draft utility assessment report as quickly as feasible and would appreciate any information you can furnish within the next three weeks. Your assistance in expediting this matter is greatly appreciated. Should you have any questions, please call

Very truly yours,

Steven Sakai

cc: Randy Makizuru, Charter
Kevin Goto, WOC

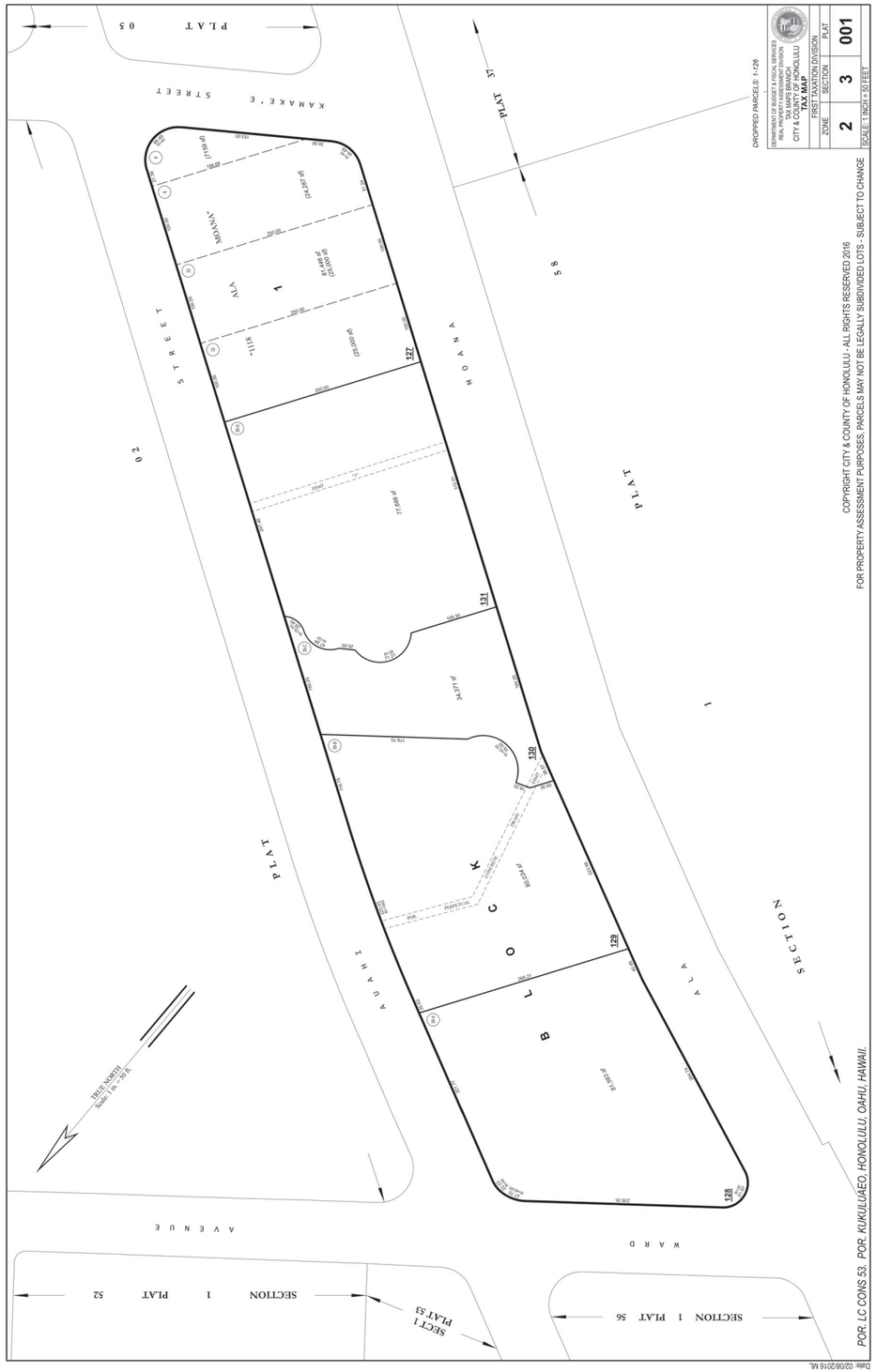
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## Steve Sakai

**From:** Debbie Farr <dtfarr@rnsha.com>
**Sent:** Thursday, January 24, 2019 11:04 AM
**To:** Steve Sakai
**Subject:** FW: Ward Village Block C West Utility Assessment
**Attachments:** HHC Block C West.pdf

Hi Steve,

Forwarding email from Randy Makizuru.

Debbie Farr | Receptionist
Ronald N.S. Ho & Associates, Inc.
T: (808) 941-0577
dtfarr@rnsha.com | www.rnsha.com

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**From:** Makizuru, Randy T <Randy.Makizuru@charter.com>
**Sent:** Thursday, January 24, 2019 10:51 AM
**To:** Debbie Farr <dtfarr@rnsha.com>; Kato, Derek M <Derek.Kato@charter.com>
**Subject:** RE: Ward Village Block C West Utility Assessment

Hello Ms. Farr,

Please see attached drawing indicating Spectrum's underground infrastructure along Auahi ST and Kamakee ST. Spectrum currently has facilities to service the proposed Block C West property. Services include but not limited to CATV, Telephone and Data.
Should you have any questions or need anything clarified, please let me know.

Thank you,
Randy Makizuru
Charter Communications / Spectrum
Engineering
#625-8346

**From:** Debbie Farr [mailto:dtfarr@rnsha.com]
**Sent:** Tuesday, January 22, 2019 3:02 PM
**To:** Kato, Derek M <Derek.Kato@charter.com>
**Cc:** Makizuru, Randy T <Randy.Makizuru@charter.com>
**Subject:** Ward Village Block C West Utility Assessment

Mr. Kato,

Please find inquiry for Ward Village Block C.

Thank you.

**Hawaii Gas**

**Email Correspondence**

---

**From:** Yamamoto, Keith <kkyamamo@hawaiigas.com>
**Sent:** Friday, June 14, 2019 8:33 AM
**To:** Cara Itai
**Cc:** Kevin Goto
**Subject:** RE: Ward Village Block C-West - Gas Availability
**Attachments:** Ward Village Block C-West.pdf

Cara,

There is 2" main on Auahi Street and a 1-1/4" main on Ala Moana Blvd. which may serve the project. Attached is a gas map for your info.

Please let me know if you have any questions.

Thanks.

--
**Keith K. Yamamoto - Manager, Engineering**
Phone: 808-594-5574 | Mobile: 808-351-9746
515 Kamake'e Street | Honolulu, Hawai'i 96814
http://www.hawaiigas.com

HAWAI'I GAS
THE CLEAN ENERGY COMPANY

---

**From:** Cara Itai [mailto:CItai@wilsonokamoto.com]
**Sent:** Thursday, June 13, 2019 11:08 AM
**To:** Yamamoto, Keith <kkyamamo@hawaiigas.com>
**Cc:** Kevin Goto <kgoto@wilsonokamoto.com>
**Subject:** Ward Village Block C-West - Gas Availability

Hi Keith,

Howard Hughes is proposing a new tower project, Block C-West, located ewa of Block C (Waiae). See the attached figure for the location. The proposed unit count is 360 (137 *1-bed*, 146 *2-bed*, and 77 *3-bed*). We do not have any gas loads at this time.

The project is in concept design and we are currently confirming infrastructure availability for the project. Would you be able to confirm gas availability for the project?

Please let us know if you have any questions.

Thanks,

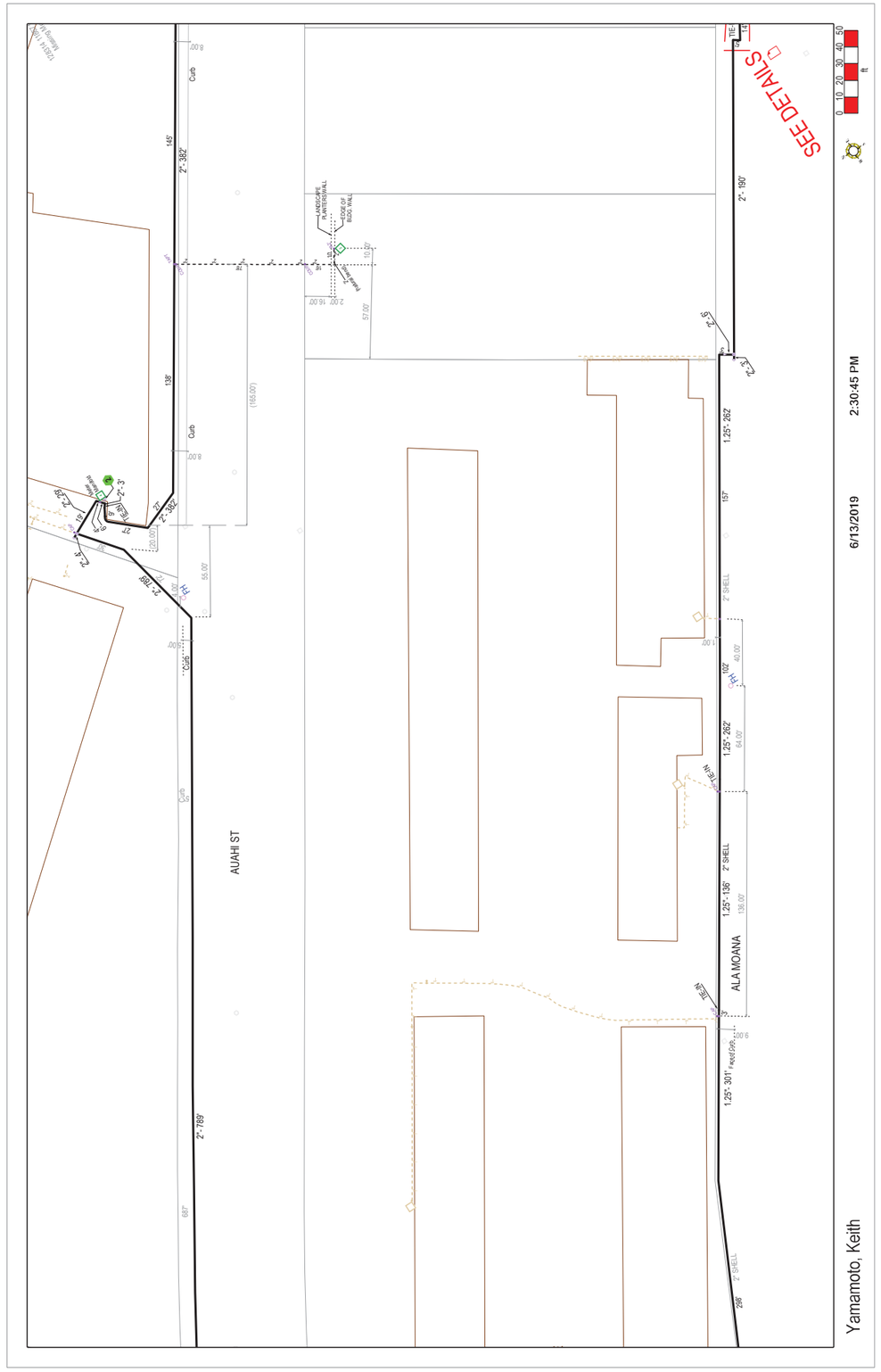
**Cara Itai**
Civil Engineer

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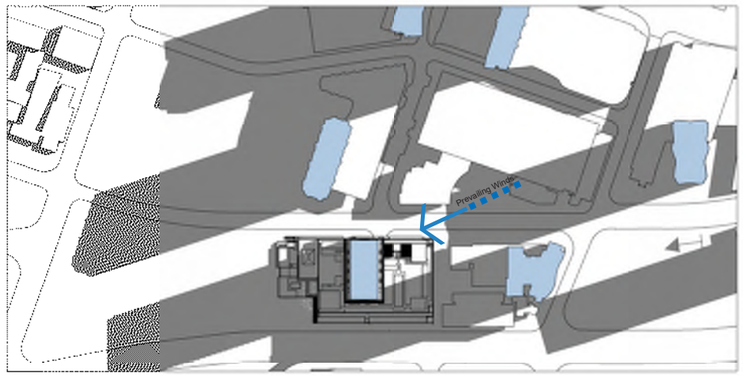




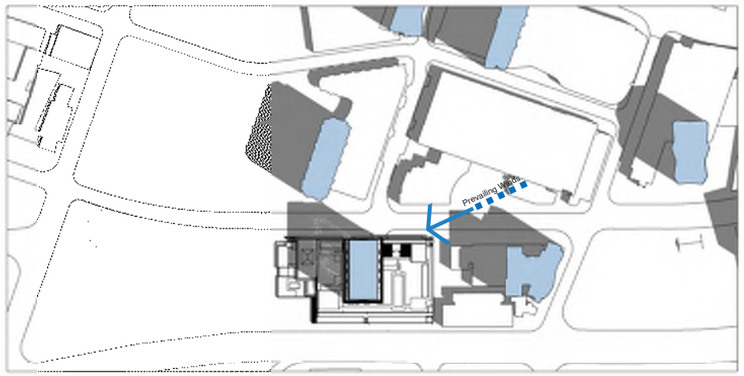
# APPENDIX E

SHADOW & WIND STUDIES

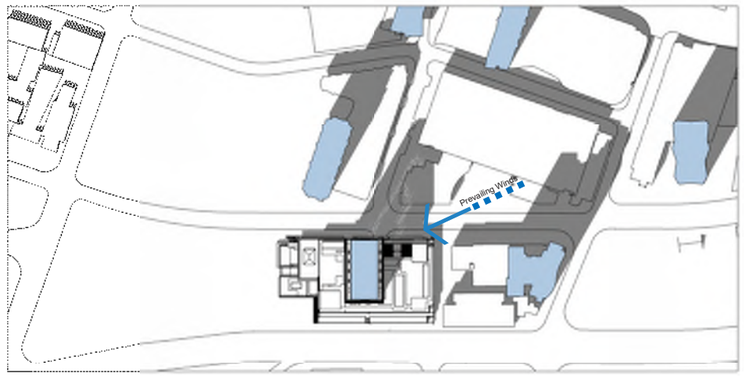
**MARCH 21, 9 AM**



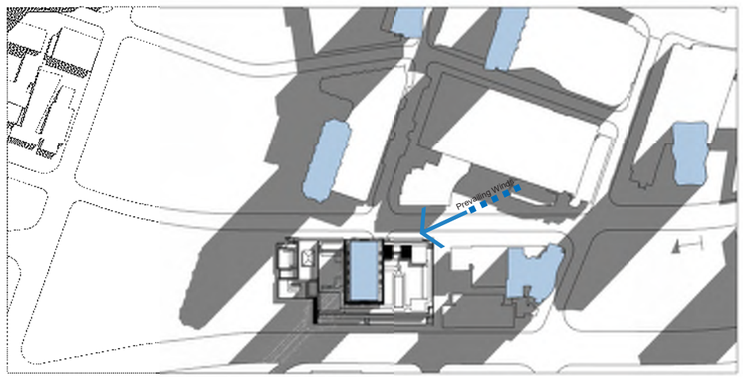

**MARCH 21, 12 PM**



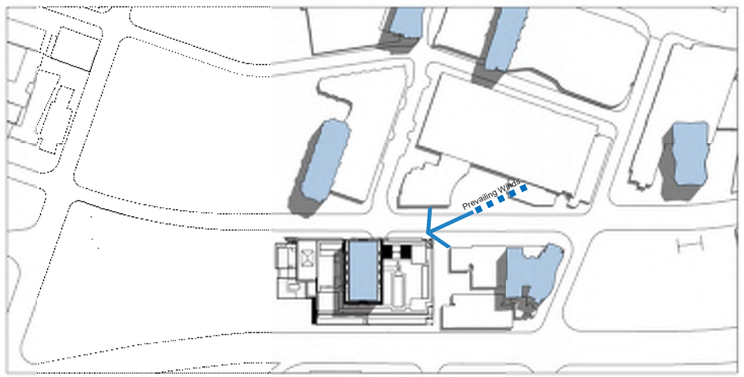

**MARCH 21, 3 PM**



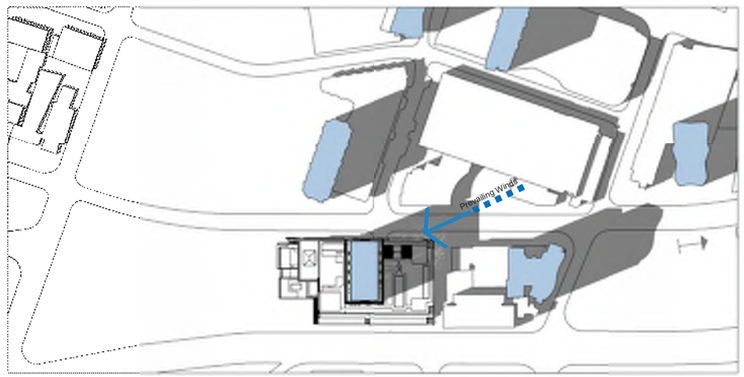

**JUNE 21, 9 AM**



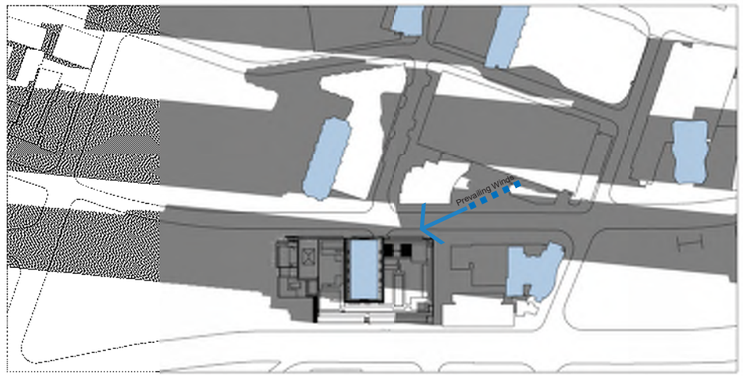

**JUNE 21, 12 PM**



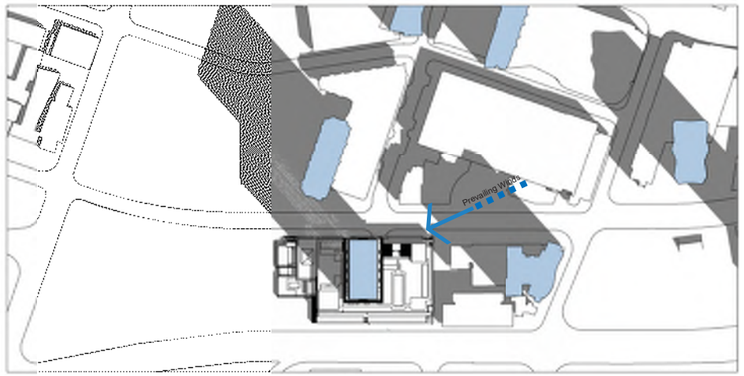

**JUNE 21, 3 PM**



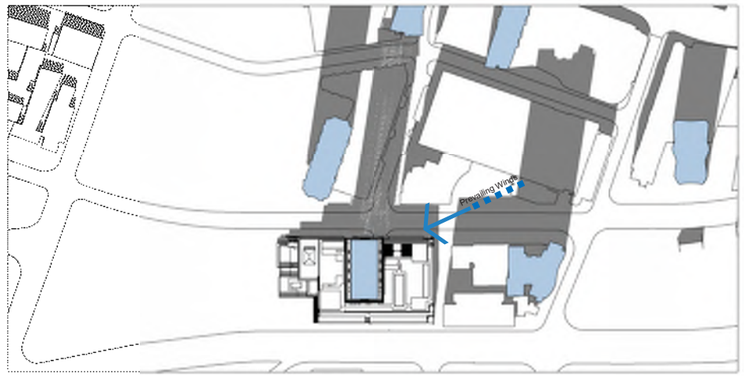

**DECEMBER 21, 9 AM**




**DECEMBER 21, 12 PM**




**DECEMBER 21, 3 PM**







©

# APPENDIX F

WIND CONSULTANT LETTER

600 Southgate Drive
Guelph, ON N1G 4P6
Canada

Tel: +1.519.823.1311
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June 28, 2019

Cord Anderson
Director, Development
THE HOWARD HUGHES CORPORATION
1240 Ala Moana Boulevard, Suite 200
Honolulu, HI 96814
Cord.Anderson@howardhughes.com

Re: Pedestrian Wind Conditions
Ward Village Block C-West
Honolulu, Hawaii
RWDI Reference No. 1900702

Dear Mr. Anderson,

Rowan Williams Davies & Irwin Inc. (RWDI) has been requested by The Howard Hughes Corporation to conduct wind tunnel studies for the pedestrian wind conditions on and around the proposed Ward Village Block C-West development in Honolulu, Hawaii.

The proposed development includes a 40-story residential tower with a 5-story podium, bounded by Auahi Street, Block C (Waiea), Ala Moana Boulevard, and future parklands. Winds around the proposed development will be simulated in one of RWDI's boundary-layer wind tunnels for the existing and proposed building configurations by using a scale model of the study building and its surroundings. The wind study will focus on frequently used pedestrian areas such as main entrances, sidewalks and outdoor seating areas at both the grade and podium levels. Wind tunnel measurements for 36 wind directions will be taken at key pedestrian areas, and will be combined with the long-term weather data collected from the nearby Honolulu International Airport to predict the wind speeds and frequencies in full scale. These data will then be compared with the RWDI wind comfort and safety criteria to determine if they are appropriate for the intended usage of the pedestrian areas on and around the development.

Immediately following the wind tunnel tests, a report will be issued to summarize our main findings through tables and figures. Wind mitigation measures will be provided for areas where higher-than-desired wind speeds are detected.

If you have any questions, please do not hesitate to contact us.

Respectfully submitted by:

Analene Belanger

Analene Belanger, P.Eng., PMP
Principal / Senior Project Manager
RWDI



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# APPENDIX G

ACOUSTICAL CONSULTANT LETTER

CENSEO
AV+Acoustics

KAILUA | DENVER | SEATTLE

Sound Advice in a World Full of Noise

June 6, 2019, *Revised June 17, 2019, Revised July 2, 2019*

Ms. Emily Kuo
Solomon Cordwell Buenz
255 California Street, 3rd Floor
San Francisco, CA 94111

**Re: Ward Village – Block C-West (#19001A)**
**Report #1: HCDA Noise Impact Summary**

Dear Ms. Kuo,

Block C-West of Ward Village is a proposed high-rise condominium project located on Auahi Street west of the Waiea high-rise condominium. The project includes a parking structure, residential units and residential amenities. Some building noise sources may concern neighboring properties like construction noise, parking structure noise, and noise from the amenity spaces. Some building and environmental noise sources may affect residents. These sources include traffic, future rail construction and operations, mechanical noise, parking structure noise, noise from the amenity spaces, and noise from adjacent commercial and residential units. The noise concerns will be evaluated during the design process.

## Project Description

This 40-story high rise housing development includes 35 floors of residential units, 1 floor of tenant amenities, and 4 floors of parking garage.

## Potential Noise Sources

### Vehicular Traffic and Rail Transit Noise

This building will be subject to vehicular traffic noise on neighboring streets, including the busy Ala Moana Boulevard. Although the lower levels of the building are closer to the street (and to vehicular noise sources), the upper floors have a direct line-of-sight to more streets. The net effect is often a somewhat consistent noise level due to vehicular traffic noise for the full height of the building façade, depending on the sound barrier effects provided by the neighboring buildings. Existing ambient noise level measurements are currently planned (at the project site) to document the approximate noise impact of the existing vehicular traffic noise on the project site.





The rail alignment of the future Honolulu Authority of Rapid Transit (HART) system is expected to be over 400 feet away from the Block C-West residential tower. Existing and future buildings provide a partial sound barrier effect to the Block C-West project site. Rail noise is expected to be minimal at the Block C-West project, however, this noise will be further evaluated and considered with the building shell design.

**Anticipated Transit Noise Mitigation Recommendations:**
The sound isolation performance of the building shell will be evaluated during the design phase to determine the most effective exterior shell assemblies for noise mitigation of vehicular traffic noise and rail transit noise. Since the exterior glazing is often the weakest link for noise transmission, we will evaluate an effective STC rating for the exterior glazing.

### Construction Noise

Construction noise may be a concern to nearby residential areas during the construction period. The surrounding area currently experiences somewhat high levels of vehicular traffic noise throughout the day so ambient noise levels may be higher than for other typical residential areas. The Contractor should take care to limit construction noise, where possible. The Contractor is required to submit for a Noise Permit with the Hawaii Department of Health (DOH), which limits noisy construction activities to the hours of 7:00am to 6:00pm (Mon-Fri) and 9:00am to 6:00 pm (Sat). Noisy construction activities are prohibited during Sundays and Holidays. [See Hawaii Administrative Rules, Title 11 Department of Health, Chapter 46 Community Noise Control]

### Building Operational and Mechanical Noise

Mechanical noise is a concern throughout the building, including mechanical noise impact by the Project to the Project and by the Project to the adjacent properties. On the ground floor, there is a HECO vault housing large transformers. Elevators are adjacent all types of spaces included residential units. Partitions between mechanical noise sources and sensitive areas (such as the residential units) will be evaluated during the design of the project. Much of the mechanical equipment is located on the roof. Radiated and ceiling-transmitted noise from the rooftop equipment is a concern for units on the top floor. HVAC noise will be carefully evaluated in the residential units, as well as other noise sensitive spaces in the project. All stationary mechanical equipment must comply with the State Noise Limits at the property lines.

**Anticipated Building and Mechanical Noise Mitigation Recommendations:**
Vibration mounts, resilient connections for rotating equipment, airborne noise mitigation techniques for sound absorption will all be considered and incorporated into the project design, where applicable. For an emergency generator, duct silencers and acoustical louvers at the room air inlet and discharge openings would likely be included. An engine exhaust muffler/silencer would also be included.

**Parking Structure and Loading Area**

The project includes a parking structure for residents. Parking level demising walls and parking structure ceiling assembly design will need to reduce noise build-up within the parking structure and limit noise "bleeding" into nearby residential units or to the adjacent buildings. Of particular concern are parking levels under and adjacent to amenity-level spaces. We will also review the potential noise impact of the Loading Area to the building and adjacent buildings.

**Anticipated Parking Structure and Loading Area Noise Mitigation Recommendations:**
The demising wall partitions and floor/ceiling assemblies between the parking or loading areas and the new residential units will be closely evaluated for adequate sound isolation of the noisy areas. Additionally, the use of a "rough wear surface" will be considered for the parking structure driving surface and ramps to minimize tire "squeal". If needed, weather-resistant acoustical panels or spray-on treatments can also be added to the parking structure ceilings and in the Loading Area for sound absorption.

**Amenity Level Noise**

Noise on the amenity level is a concern especially for the residential units located above the amenity level, or for residential units overlooking the outdoor amenity areas. The floor/ceiling assemblies directly above and below the amenity spaces will be carefully evaluated during the design to limit noise transmission from the amenities level. Limiting heavy amenity use during nighttime hours may be recommended.

## Project Design Intent for Noise Mitigation

Noise mitigation recommendations will be made throughout the design phases, as well as during the construction phase, where applicable. The purpose of these recommendations is to minimize the number of noise related complaints from the future residents of Block C-West as well as from the neighboring buildings.

Please let me know if you have any questions regarding this report.

Best Regards,

Christopher Ono, PE
Project Engineer
CENSEO AV+Acoustics LLC