Mahana

WARD VILLAGE

APPENDICES

LAND BLOCK 1, PROJECT 6

AMENDED HCDA PLANNED DEVELOPMENT PERMIT APPLICATION

(KAK 25-045)

DECEMBER 2025

WARD VILLAGE

Appendices

APPENDIX A	LEED CHECKLIST
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Appendix A

LEED CHECKLIST

LEED-NCv4 Checklist
Block N West
5/23/2025

Preliminary Checklist

Certified 40-49 points

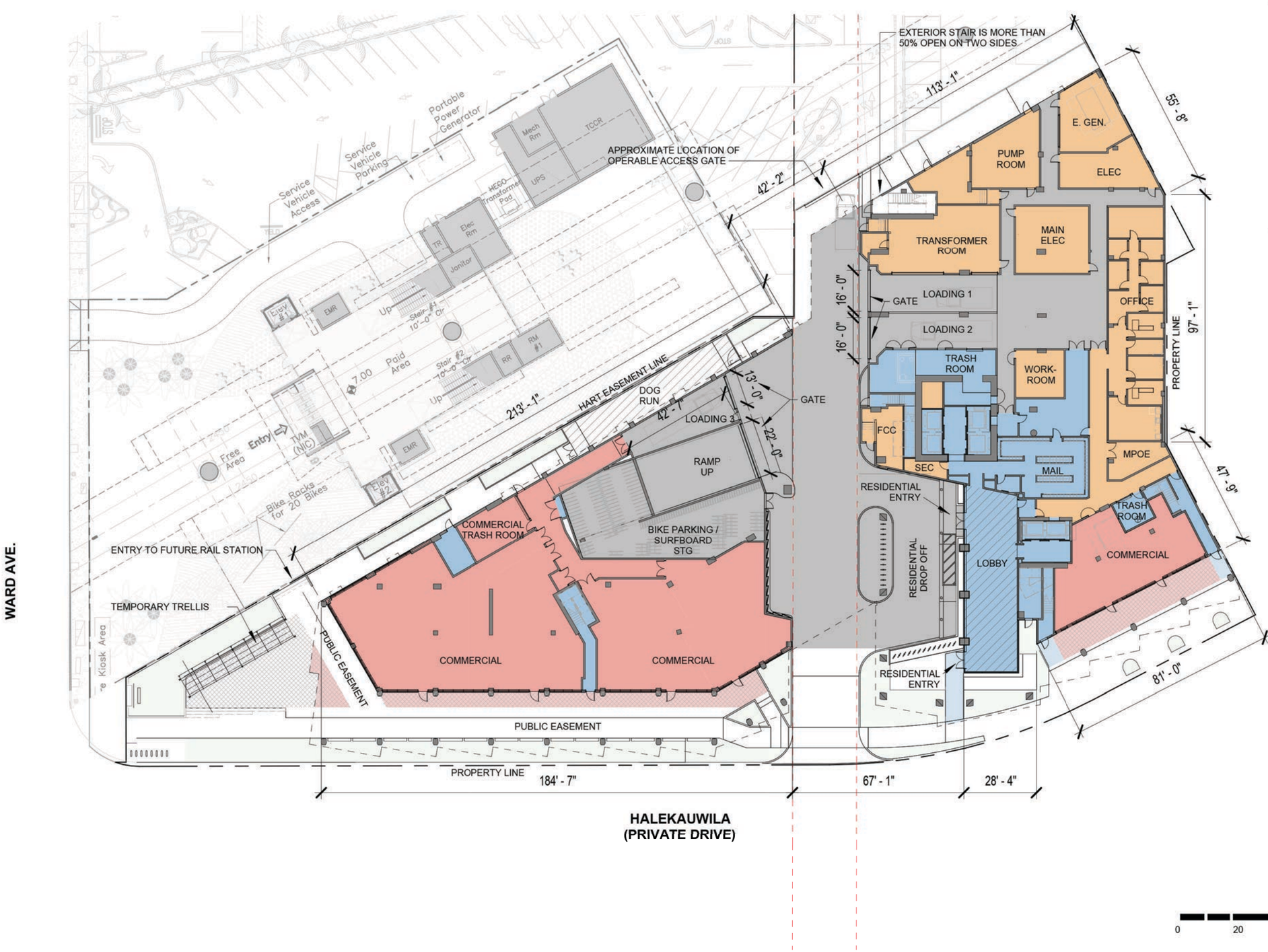
Platinum 80 points and above

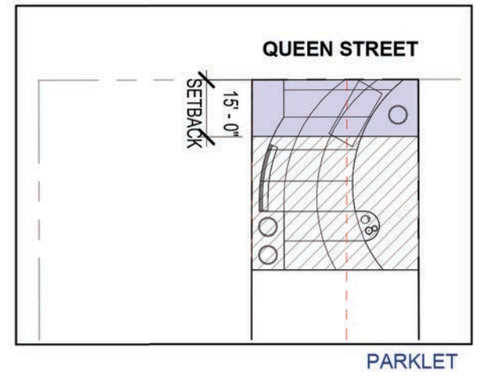
Summary	Yes	?	No
	62	28	20

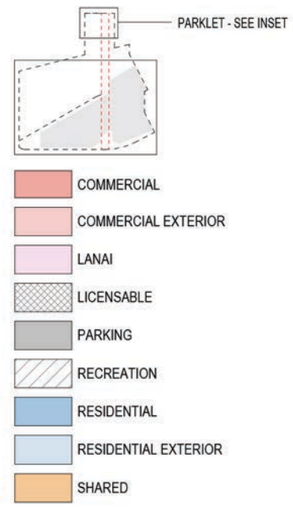
Category	Credit	Credit Name	Yes	?	No	Status	Responsibility
Location and Transportation	C	LEED-ND Location				Targeted	-
	~~C~~	~~Sensitive Land Protection~~			1	~~Not Attempted~~	~~SCB~~
	~~C~~	~~High Priority Site~~			2	~~Not Attempted~~	~~SCB~~
	~~C~~	~~Surrounding Density & Diverse Uses~~			5	~~Not Attempted~~	~~SCB~~
	~~C~~	~~Access to Quality Transit~~			5	~~Not Attempted~~	~~SCB~~
	~~C~~	~~Bicycle Facilities~~			1	~~Not Attempted~~	~~SCB/Owner~~
	~~C~~	~~Reduced Parking Footprint~~			1	~~Not Attempted~~	~~SCB/Owner~~
	~~C~~	~~Green Vehicles~~			1	~~Not Attempted~~	~~SCB/Owner~~
Sustainable Sites	P	Construction Activity Pollution Prevention				Required	Contractor
	C	Site Assessment				Targeted	SCB
	C	Site Development - Protect or Restore Habitat				Targeted	Landscape
	C	Open Space				Targeted	Landscape
	C	Rainwater Management				Targeted	Civil
	C	Heat Island Reduction				Targeted	SCB
	C	Light Pollution Reduction				Targeted	Lighting
Water Efficiency	P	Outdoor Water Use Reduction				Required	Landscape
	P	Indoor Water Use Reduction				Required	SCB/Owner
	P	Building-Level Water Metering				Required	MEP
	C	Outdoor Water Use Reduction			1	Targeted	Landscape
	C	Indoor Water Use Reduction			3	Targeted	SCB
	C	Cooling Tower Water Use			1	Targeted	MEP
	C	Water Metering				Targeted	MEP
Energy and Atmosphere	P	Fundamental Commissioning and Verification				Required	Cx
	P	Minimum Energy Performance				Required	MEP
	P	Building-Level Energy Metering				Required	MEP
	P	Fundamental Refrigerant Management				Required	MEP
	C	Enhanced Commissioning		3		Targeted	Cx
	C	Optimize Energy Performance		2	9	Targeted	MEP
	C	Advanced Energy Metering				Targeted	MEP
	C	Demand Response			2	Deferred	Owner
	C	Renewable Energy Production		3		Deferred	MEP
	C	Enhanced Refrigerant Management				Targeted	MEP
	C	Green Power and Carbon Offsets		2		Deferred	Owner
Materials and Resources	P	Storage and Collection of Recyclables				Required	SCB/Owner
	P	CDWM Planning				Required	Contractor
	C	Building Life-Cycle Impact Reduction			2	Deferred	Contractor
	C	BPDO - Environmental Product Declarations				Targeted	Contractor
	C	BPDO - Sourcing of Raw Materials				Targeted	Contractor
	C	BPDO - Material Ingredients				Targeted	Contractor
	C	C&D Waste Management			1	Targeted	Contractor
Indoor Environmental Quality	P	Minimum IAQ Performance				Required	MEP
	P	Environmental Tobacco Smoke Control				Required	Owner
	C	Enhanced IAQ Strategies		1		Targeted	MEP
	C	Low-Emitting Materials				Targeted	Contractor
	C	Construction IAQ Management Plan				Targeted	Contractor
	C	Indoor Air Quality Assessment		2		Targeted	Contractor
	C	Thermal Comfort				Targeted	MEP
	C	Interior Lighting		1		Targeted	Lighting
	C	Daylight		3		Deferred	SCB
	C	Quality Views				Targeted	SCB
	C	Acoustic Performance		1		Targeted	SCB
Innovation	C	Innovation in Design: UHI	1			Targeted	-
	C	Innovation in Design: Quality Views	1			Targeted	-
	C	Innovation in Design: Biophilic Design	1			Targeted	-
	C	Innovation in Design: Purchasing - lamps	1			Targeted	-
	C	Innovation in Design: Green Building Education	1			Targeted	-
	C	LEED Accredited Professional	1			Targeted	-
Regional Priority	C	C&D Waste Management		1		Targeted	-
	C	Indoor Water Use Reduction	1			Targeted	-
	C	Renewable Energy Production		1		Deferred	-
	C	Optimize Energy Performance		1		Targeted	-

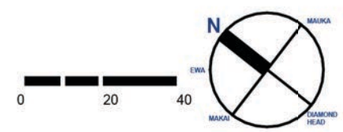
Appendix B

SITE PLAN AND ELEVATIONS WITH HART STATION









SCB
Architecture, Planning,
Interior and Urban Design

Architecture Planning Interior Design 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME:	MAHANA WARD VILLAGE	**DATE:**	
PROJECT NO:	2018028	**DTL./SHT. REF.:**	**REV.:**
DRAWING TITLE:	FLOOR PLAN - LEVEL 01	**SHEET**	of
DRAWING SCALE:	1" = 40'-0"		

C1.04

*HCDA RULE 15-22-62: MEASURED FROM THE STRUCTURAL SLAB, UTILITARIAN FEATURES INCLUDING STAIRWELLS MAY EXCEED THE HEIGHT LIMIT BY NOT MORE THAN 12'-0".

*HCDA RULE 15-22-77: NO BUILDING SHALL CONTAIN A REFLECTIVE SURFACE FOR MORE THAN 30% OF THAT WALL'S SURFACE AREA.

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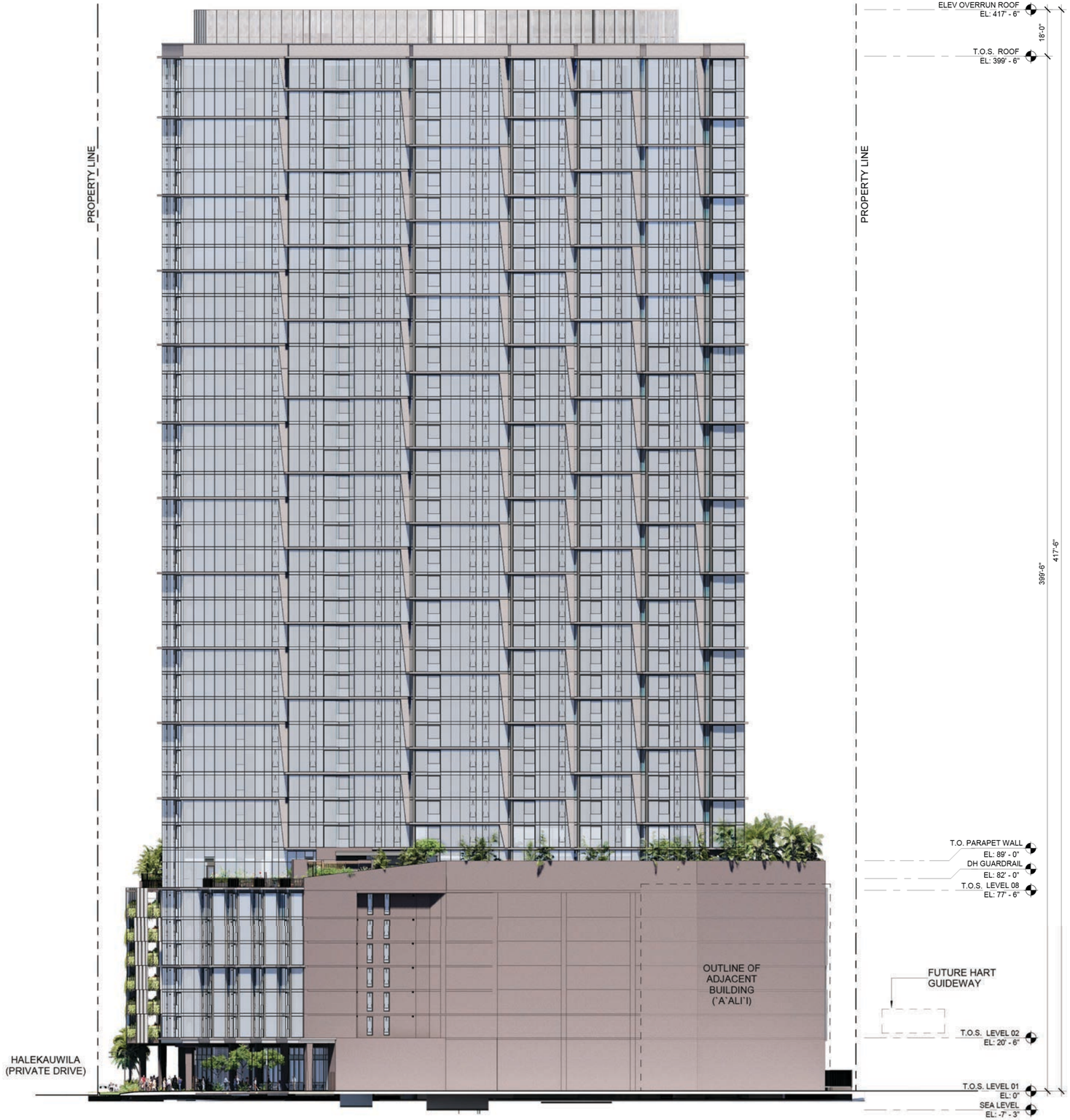
Architecture Planning Interior Design 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME:	MAHANA WARD VILLAGE	**DATE:**	
PROJECT NO:	2018028	**DTL./SHT. REF.:**	**REV.:**
DRAWING TITLE:	SOUTH ELEVATION	**SHEET**	of
DRAWING SCALE:	As indicated		

C1.15



*HCDA RULE 15-22-62: MEASURED FROM THE STRUCTURAL SLAB, UTILITARIAN FEATURES INCLUDING STAIRWELLS MAY EXCEED THE HEIGHT LIMIT BY NOT MORE THAN 12'-0".

*HCDA RULE 15-22-77: NO BUILDING SHALL CONTAIN A REFLECTIVE SURFACE FOR MORE THAN 30% OF THAT WALL'S SURFACE AREA.

SCB
Architecture, Planning, Interior and Urban Design

Architecture Planning Interior Design 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME:	MAHANA WARD VILLAGE	**DATE:**	
PROJECT NO:	2018028 **DTL/SHT. REF.:**	**REV.:**	
DRAWING TITLE:	EAST ELEVATION	**SHEET**	of
DRAWING SCALE:	As indicated		

C1.16

*HCDA RULE 15-22-62: MEASURED FROM THE STRUCTURAL SLAB, UTILITARIAN FEATURES INCLUDING STAIRWELLS MAY EXCEED THE HEIGHT LIMIT BY NOT MORE THAN 12'-0".

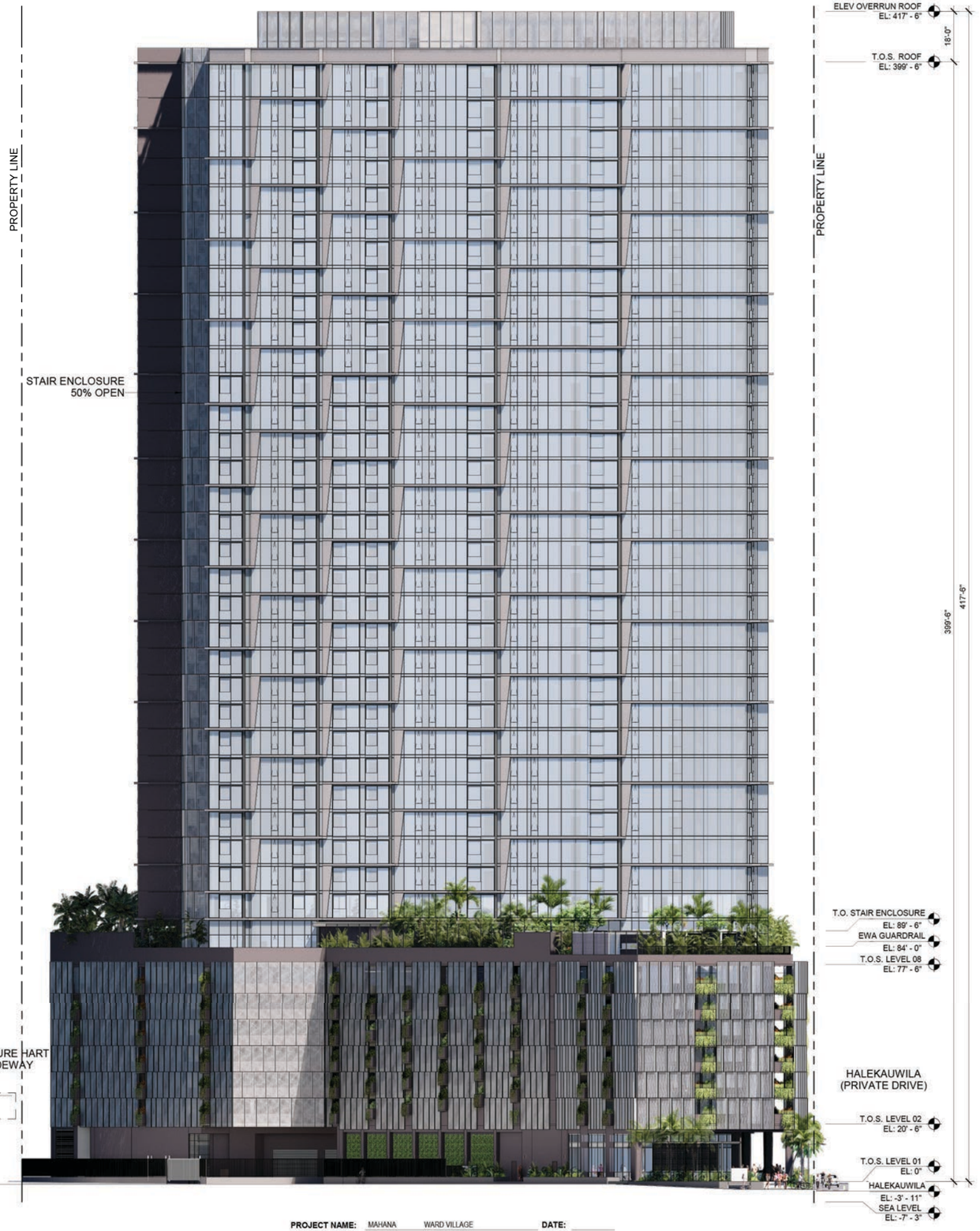
*HCDA RULE 15-22-77: NO BUILDING SHALL CONTAIN A REFLECTIVE SURFACE FOR MORE THAN 30% OF THAT WALL'S SURFACE AREA.

SCB
Architecture, Planning, Interior and Urban Design

Architecture Planning Interior Design 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME:	MAHANA WARD VILLAGE	**DATE:**	
PROJECT NO:	2018028	**DTL./SHT. REF.:**	**REV.:**
DRAWING TITLE:	NORTH ELEVATION	**SHEET**	of
DRAWING SCALE:	As indicated		

C1.17



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Architecture, Planning, Interior and Urban Design

Architecture Planning Interior Design 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME:	MAHANA WARD VILLAGE	**DATE:**	
PROJECT NO:	2018028 **DTL./SHT. REF.:**	**REV.:**	
DRAWING TITLE:	WEST ELEVATION	**SHEET**	of
DRAWING SCALE:	As indicated		

C1.18

Appendix C

SHPD LETTER

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

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

November 19, 2025

IN REPLY REFER TO:
Project No. 2019PR30462
Doc. No. 2511SCH04
Archaeology

Craig K. Nakamoto, Executive Director
Hawaiʻi Community Development Authority
547 Queen Street
Honolulu, Hawaiʻi 96817
craig.k.nakamoto@hawaii.gov

Ms. Dawn Takeuchi-Apuna, Director
Department of Planning and Permitting
City and County of Honolulu
Frank F. Fasi Municipal Building
650 S. King Street, 7th Floor
Honolulu, Hawaiʻi 96813
c/o Clint Young
clint.young@honolulu.gov

Dear Mr. Nakamoto and Ms. Dawn Takeuchi-Apuna:

SUBJECT: **Hawaii Revised Statutes (HRS) Chapter 6E-42 Historic Preservation Review**
Request to Support HCDA Proceeding with Permitting Process
Victoria Ward Limited (VWL) Block N West Makai Project
Honolulu Ahupuaʻa, Honolulu (Kona) District, Island of Oʻahu
TMK: (1) 2-3-002:116 por.

This letter provides the State Historic Preservation Division's (SHPD's) review regarding the Hawaii Community Development Authority's (HCDA's) planned development permitting process for the Victoria Ward, Ltd. (VWL) and The Howard Hughes Corporation (HHC) project titled Victoria Ward Limited (VWL) Block N West Makai Project. This private project is subject to permitting under HCDA's 2005 Mauka Area Rules and with permitting by the City and County of Honolulu, Department of Planning and Permitting (DPP).

Howard Hughes Corporation's (HHC) Block N West Makai/Mahana Project (HICRIS Project No. 2019PR30462) is a residential tower development on Ward Avenue, near its intersection with Halekauwila Street [TMK: (1) 2-3-002:116 por.]. On May 9, 2023, the SHPD issued a letter to the HCDA and DPP [Project No. 2019PR30462, Doc. No. 2305SCH05]. The letter lays out the stipulations that HHC has committed to for HCDA to proceed with the Planned Development Permit (PDP) project review process. After its project review, HCDA approved the project's PDP application with these stipulations.

SHPD is aware that subsequently, HHC entered into a transaction with HCDA, enabling project modifications, including increased platform height and unit counts. With these changes to the project design, HHC is now going through HCDA's review of a PDP Amendment of the project changes. The changes in the platform height and number of units of the project have not changed the commitments in SHPD's letter dated May 9, 2023 (Doc. No. 2305SCH05).

With HHC's renewed commitment to the stipulations specified in SHPD's May 9, 2023 letter, the SHPD has no objection with HCDA/DPP proceeding with the review and acceptance of the project's PDP Amendment based on the recent project changes.

SHPD hereby notifies DPP and HCDA that the permitting process may continue.

Please contact Samantha Hemenway, Oʻahu Lead Archaeologist, at Samantha.Hemenway@hawaii.gov, for any matters regarding archaeological resources or this letter.

Aloha,

Jessica L. Puff, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Kaʻiulani Sodaro (HHC), kaiulani.sodaro@howardhughes.com
Matt McDermott (CSH), mmcdermott@culturalsurveys.com

Appendix D

TRAFFIC IMPACT REPORT

Traffic Impact Report Update

Block N West

Prepared for:
Victoria Ward, Ltd.

Prepared by:
Wilson Okamoto Corporation

Updated May 2025

TRAFFIC IMPACT REPORT UPDATE

FOR

BLOCK N WEST

Prepared for:

Victoria Ward Limited
1240 Ala Moana Blvd., Suite 200
Honolulu, HI 96814

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #8206-81

Updated May 2025

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LIST OF FIGURES

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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 N West development of the Ward Village Master Plan in Kakaako on the island of Oahu. A previous assessment including the Block N West development was included in the "Transportation Master Plan and Assessment for the Ward Village Master Plan" (hereafter referred to as the "Ward Village TMP") originally dated October 2020 and updated in October 2022. In addition, a Traffic Impact Analysis Report (TIAR) for Block N-West (dated March 2023) was also previously prepared and accepted by the City and County of Honolulu Department of Planning and Permitting, Traffic Review Branch (TRB). Since the preparation of the 2023 TIAR, the development timeline for the project has changed along with slight changes to the development plan. As such, this report is an update to the 2023 TIAR to incorporate these changes. It should also be noted that since the preparation of the 2023 TIAR, the project name has been updated to the "Mahana" development, but for the purpose of this report, the project will continue to be referred to as the Block N-West development to be consistent with the 2023 TIAR and Ward Village TMP.

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. Superimposition of 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

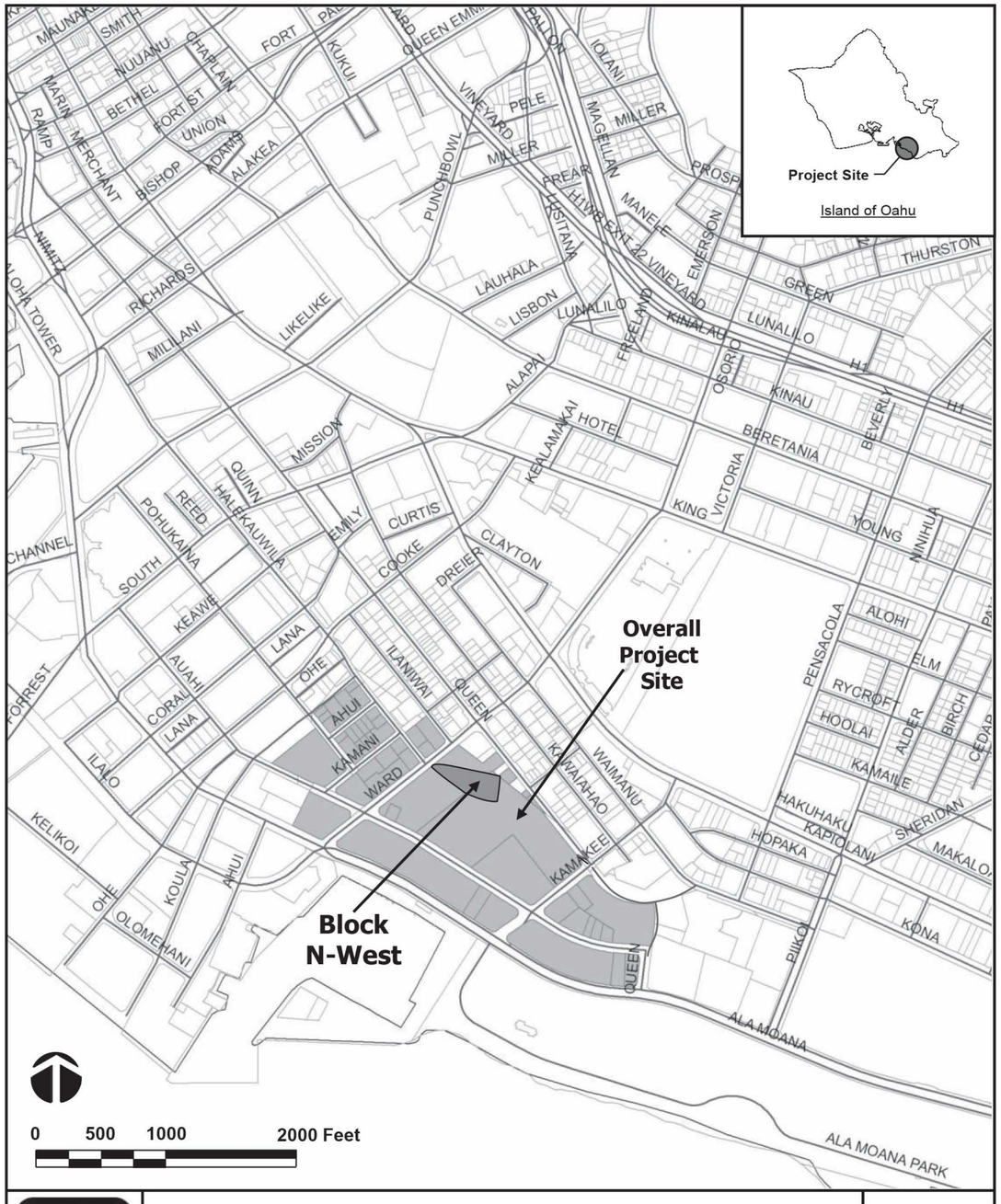
A. Location

The project site for the proposed Block N West development encompasses a portion of the former Ohana Hale Marketplace and will be located adjacent to the Halekauwila Extension in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Ward Avenue to the west, the Aalii development to the east, the future Kakaako Station site to the north and a private driveway to the south (referred to as the "Halekauwila Extension"). It is further identified as Tax Map Key (TMK): 2-3-002:116. Access to the proposed project is expected to be provided via a new two-way driveway off the Halekauwila Extension.

B. Project Characteristics

The overall Ward Village Master Plan entails the redevelopment of most of the existing commercial, office, and industrial spaces implemented in five (5) phases over a span of 10-15 years. Phase 1, which includes Blocks C (Waiea), K (Anaha), M (Aeo), and O (Kilohana) and Phase 2, which includes Blocks N-East (Aalii), I (Koula), and C West (Victoria Place), have been fully completed and occupied. Phase 3 projects, which include Blocks H (The Park Ward Village), F (Ulana), and B (Kalae), are currently under construction and are expected to be completed by Year 2027. The Phase 4 projects, which include Blocks A (The Launiu), D (Melia), and E (Ilima), have been accepted by the Hawaii Community Development Authority (HCDA), are under design and are expected to be completed by Year 2029.

Phase 5 of the master plan only includes Block N West as the Block P parcels previously planned for an 88,800 sq retail project has been sold to the HCDA and the retail project cancelled. The proposed project entails the development of approximately 465 residential units, 8,000 square feet (sf) of retail uses, and 4,000 sf of restaurant uses. It should be noted that these densities represent an increase in the residential units but a decrease in both commercial and restaurant uses from the 2023 TIAR. Access to the proposed project is expected to be provided via a new driveway off the Halekauwila Extension. As discussed in the Ward Village TMP, the existing private driveway that intersects Kamakee Street between Auahi and Queen Streets is expected to be extended westward to intersect with Ward Avenue forming a 4-way



WILSON OKAMOTO CORPORATION	**BLOCK N WEST** LOCATION AND VICINITY MAP	FIGURE 1

intersection with Halekauwila Street at an earlier phase (Phase 3) in conjunction with the development of the Park Ward Village. Parking for the residential uses is expected to be accommodated on site while parking for the commercial uses is expected to be accommodated within the commercial parking area in the Park Ward Village development. The Block N West is anticipated to be completed by Year 2030. See Figure 2 for the project site plan.

III. BASELINE 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 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.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

The 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 2018 and supplemented during 2019 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 Queen 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 Queen 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

Starting in 2020, the ongoing COVID-19 pandemic resulted in fluctuations in traffic volumes and shifts in travel patterns that limited the ability to collect updated traffic data. Since the end of 2021, traffic volumes and patterns have slowly been normalizing and as such, additional supplemental traffic data was collected in August 2022 at key intersection in the vicinity to incorporate these noted changes. The resulting baseline traffic volumes used for this study reflect the incorporation of these considerations and are considered to be representative of Year 2022 existing conditions. As previously noted, the developments associated with Phase 1 and Block N East of Phase 2 have been completed and occupied. As such, the trips associated with these blocks were assumed to be captured within the surveyed traffic volumes. In addition, during the supplemental counts, the sites for Blocks H, F, B, A, and N West had been cleared of their existing uses, while Block C West was still under construction. Appendix A includes the 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 and 2016 methodologies are 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.

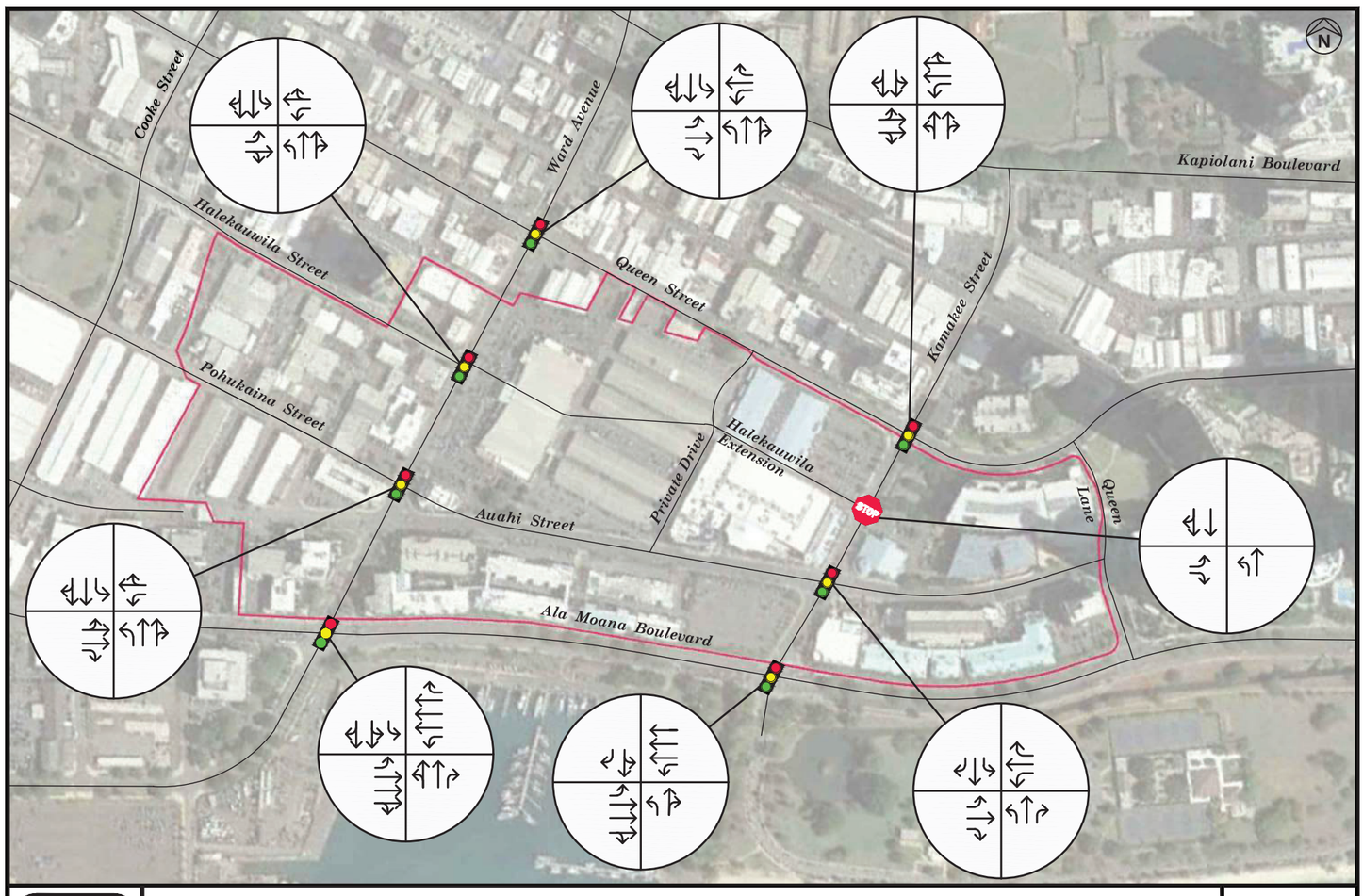
LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"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.

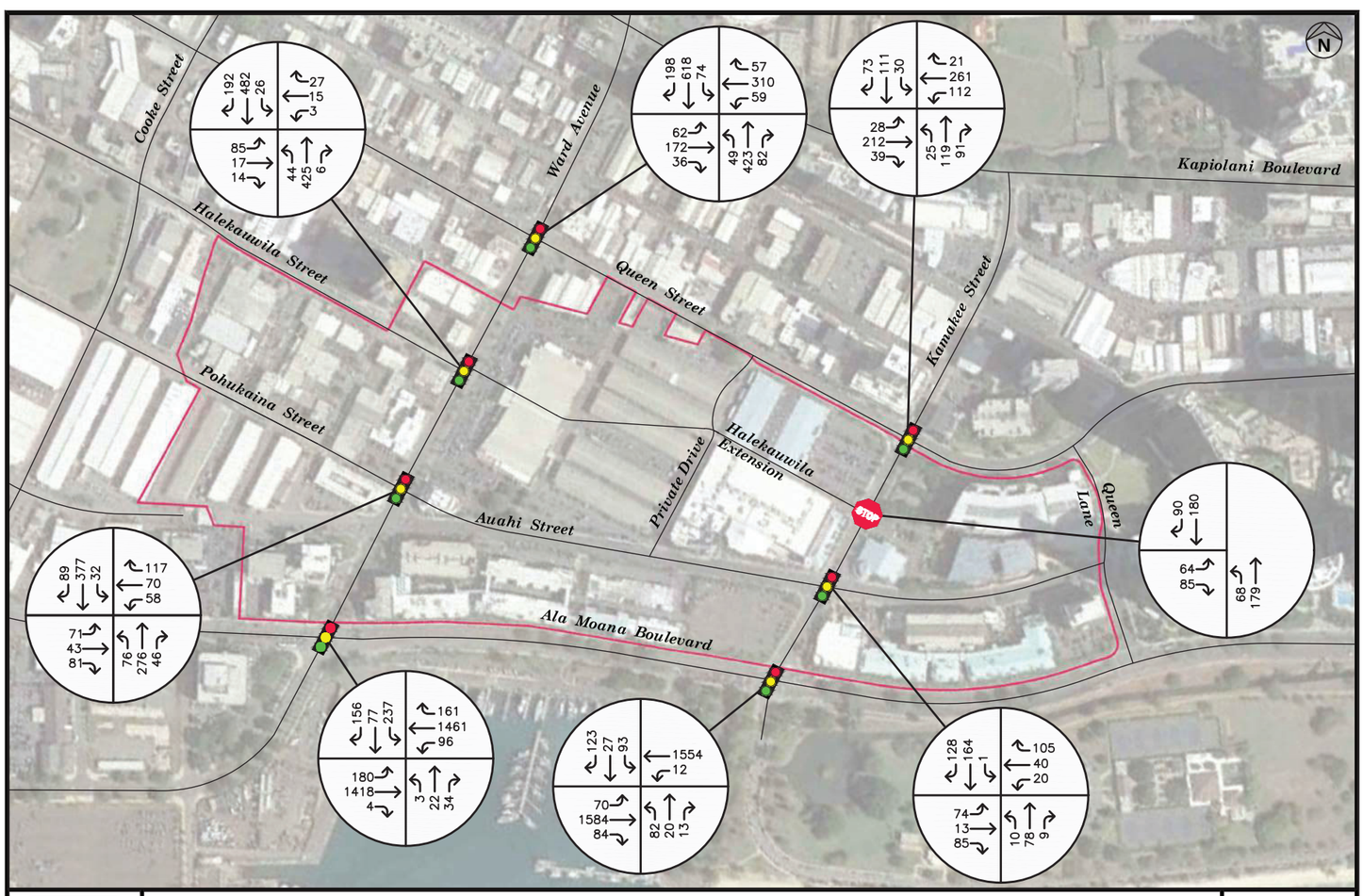
2. Baseline Peak Hour Traffic

a. General

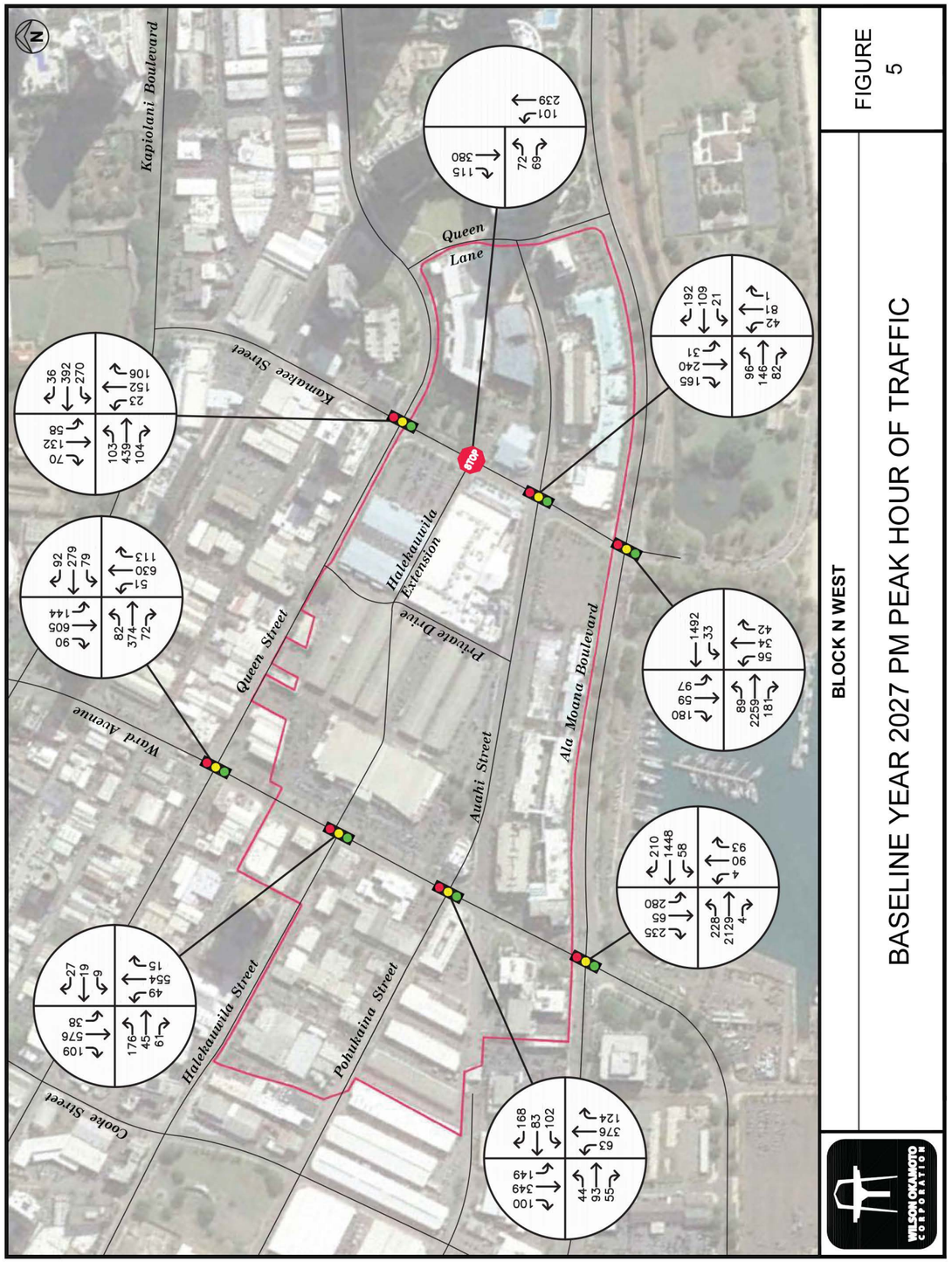
Figures 3-5 show the baseline Year 2027 lane configurations and AM and PM peak hour traffic volumes at key locations within the study area which includes the development of other projects in the vicinity, as well as Phases 1 to 4 of the Ward Village Master Plan which are expected to be completed prior to the proposed project. The baseline traffic conditions are based on the projected Year 2027 conditions included in the "Traffic Impact Report For Block D and Block E Developments" dated March 2023 (hereafter referred to as the "Block D and Block E TIAR"). The AM peak hour of traffic generally occurs between 7:30 AM and 8:30 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



WILSON OKAMOTO CORPORATION	BLOCK N WEST BASELINE LANE CONFIGURATIONS	FIGURE 3



WILSON OKAMOTO CORPORATION	BLOCK N WEST BASELINE YEAR 2027 AM PEAK HOUR OF TRAFFIC	FIGURE 4



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.

As previously discussed in the Ward Village TMP, improvements to the surrounding roadways are planned in conjunction with the overall Ward Village Master Plan. These improvements include the realignment of Auahi Street east of Ward Avenue that will connect Auahi Street to Pohukaina Street and the completion of the Halekauwila Extension from Robinson Lane to Ward Avenue. Both of these roadway projects are expected to be completed by Year 2026 and were included in the baseline conditions. The baseline conditions also included the following other considerations discussed in the Block D and Block E TIAR:

- Ala Moana Pedestrian Bridge
- Ala Moana Boulevard and Kamakee Street Lane Use Modifications
- Kakaako Mauka Master Plan (KKMP) Blocks I (Alia) and Block G (Kaliu) developments
- Right-Turn on Red Restrictions at Select Intersections along Ala Moana Boulevard

b. Ward Avenue and Queen Street

At the intersection with Queen Street, Ward Avenue carries 554 vehicles northbound and 890 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 794 vehicles traveling northbound and 839 vehicles traveling southbound. The northbound approach operates at LOS "B" and LOS "C" during the AM and PM peak hours of traffic, respectively, while the southbound approach of the intersection operates at LOS "B" during both peak hours of traffic.

The Queen Street approaches of the intersection carry 270 vehicles eastbound and 426 vehicles westbound during the AM peak

hour of traffic. During the PM peak period, traffic volumes are higher with 528 vehicles traveling eastbound and 450 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak hours of traffic, respectively, while the westbound approach of the intersection operates at LOS "C" during both AM and PM peak hours of traffic.

c. Queen Street and Kamakee Street

At the intersection with Kamakee Street, Queen Street carries 279 vehicles eastbound and 394 vehicles westbound during the AM peak hour of traffic. During the PM peak hour, traffic volumes are higher with 646 vehicles traveling eastbound and 698 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak hours of traffic, respectively, while the westbound approach operates at LOS "A" and LOS "B" during the AM and PM peak hours of traffic, respectively.

The Kamakee Street approaches carry 235 vehicles northbound and 214 vehicles southbound during the AM peak hour of traffic. During the PM peak hour, the overall traffic volume is similar with 281 vehicles traveling northbound and 260 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS "B" during the AM peak hour and LOS "C" during the PM peak hour.

d. Ward Avenue and Halekauwila Street

At the intersection with Halekauwila Street, Ward Avenue carries 475 vehicles northbound and 700 vehicles southbound during the AM peak hour of traffic. During the PM peak hour of traffic, traffic volumes are higher with 618 vehicles traveling northbound and 723 vehicles traveling southbound. Both approaches of Ward Avenue operate at LOS "A" during the AM peak hour and LOS "B" during the PM peak hour.

The Halekauwila Street approach of the intersection carries 116 vehicles eastbound and 45 vehicles westbound during the AM peak

hour. During the PM peak hour, traffic volumes are higher with 282 vehicles traveling eastbound and 55 vehicles traveling westbound. The eastbound approach operates at LOS "B" during both peak hours of traffic, while the westbound approach operates at LOS "B" and LOS "A" during the AM and PM peak hour, respectively.

e. Kamakee Street and Halekauwila Extension

At the intersection with Halekauwila Extension, Kamakee Street carries 247 vehicles northbound and 270 vehicles southbound during the AM peak hour. During the PM peak hour, the traffic volumes are higher with 340 vehicles traveling northbound and 495 vehicles traveling southbound. The northbound approach on Kamakee Street operate at LOS "A" during both peak hours.

Halekauwila Extension carries 149 vehicles eastbound during the AM peak hour. During the PM peak hour, traffic volume is lower with 141 vehicles traveling eastbound. The eastbound approach on Halekauwila Extension operates at LOS "B" and LOS "C" during the AM and PM peak hours, respectively.

f. Ward Avenue, Auahi Street, and Pohukaina Street

At the intersection with Auahi Street, Ward Avenue carries 398 vehicles northbound and 498 vehicles southbound during the AM peak hour. During the PM peak hour, traffic volumes are higher with 563 vehicles traveling northbound and 598 vehicles traveling southbound. During the AM peak hour, both approaches of Ward Avenue operate at LOS "A" while both approaches operate at LOS "B" during the PM peak hour.

The Auahi Street approach of the intersection carries 245 vehicles westbound during the AM peak hour and 353 vehicles during the PM peak hour. The Auahi Street approach operates at LOS "B" during both peak hours. The Pohukaina Street approach of the intersection carries 195 eastbound vehicles during the AM peak hour

and 192 vehicles during the PM peak hour. The Pohukaina Street approach operates at LOS "B" during both peak hours.

g. Kamakee Street and Auahi Street

At the intersection with Auahi Street, Kamakee Street carries 97 vehicles northbound and 293 vehicles southbound during the AM peak hour. During the PM peak hour, the traffic volumes are higher with 124 vehicles traveling northbound and 436 vehicles traveling southbound. Both approaches on Kamakee Street operate at LOS "B" during both peak hours.

Auahi Street carries 172 vehicles eastbound and 165 vehicles westbound during the AM peak hour. During the PM peak hour, traffic volumes are higher with 324 vehicles traveling eastbound and 322 vehicles traveling westbound. Both approaches on Auahi Street operate at LOS "B" during both peak hours.

h. Ala Moana Boulevard and Ward Avenue

At the intersection with Ward Avenue, Ala Moana Boulevard carries 1,602 vehicles eastbound and 1,718 vehicles westbound during the AM peak hour. During the PM peak hour, the overall traffic volume is similar with 2,361 vehicles traveling eastbound and 1,716 vehicles traveling westbound. Both approaches on Ala Moana Boulevard operate at LOS "D" and LOS "E" during the AM and PM peak hours, respectively. Traffic operations at this intersection are influenced by the high volume of conflicting traffic at this intersection and split phasing of the northbound and southbound approaches.

The Ward Avenue approaches of the intersection carry 59 vehicles northbound and 470 vehicles southbound during the AM peak hour. During the PM peak hour, traffic volumes are higher with 187 vehicles traveling northbound and 580 vehicles traveling southbound. The northbound approach operates at LOS "D" during both peak hours while the southbound approach operates at LOS "D" and LOS "E" during the AM and PM peak hours, respectively. As previously

discussed, the low levels of service are influenced by the high volume of conflicting traffic at this intersection.

i. Ala Moana Boulevard, Kamakee Street, and Ala Moana Park Drive

At the intersection with Kamakee Street, Ala Moana Boulevard carries 1,738 vehicles eastbound and 1,566 vehicles westbound during the AM peak hour of traffic. During the PM peak hour, the overall traffic volume is higher with 2,529 vehicles traveling eastbound and 1,525 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak hours, respectively, while the westbound approach operates at LOS "B" during both peak hours.

The Kamakee Street approach of the intersection carries 243 vehicles southbound during the AM peak hour and 336 vehicles during the PM peak hour. The Kamakee Street approach operates at LOS "C" and LOS "D" during the AM and PM hours, respectively. The northbound approach is comprised of Ala Moana Park Drive which carries 115 vehicles during the AM peak hour and 132 vehicles during the PM peak hour. The Ala Moana Park Drive operates at LOS "C" and LOS "D" during the AM and PM peak hours, respectively.

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 or 1,000 sf of development. It should be noted that a more recent edition of the Trip Generation was recently published at the end of 2021. Although average trip generation rates for some

residential land uses have remained generally similar, the retail land uses have been updated to provide additional land use types. However, trip generation data for some for some of these uses are still limited. As such, for the purpose of this assessment, the 2017 edition was used. Tables 1 summarize the proposed trip generation characteristics for the Block N West development.

Table 1: Proposed Peak Hour Trip Generation

MULTIFAMILY HOUSING (HIGH-RISE) INDEPENDENT VARIABLE: Dwelling Units = 465		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	35
	EXIT	109
	TOTAL	144
PM PEAK	ENTER	102
	EXIT	65
	TOTAL	167
RESTAURANT (HIGH-TURNOVER SIT-DOWN) INDEPENDENT VARIABLE: 1,000 sf of development =4.034		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	22
	EXIT	18
	TOTAL	40
PM PEAK	ENTER	24
	EXIT	15
	TOTAL	39
SHOPPING CENTER INDEPENDENT VARIABLE: 1,000 sf of development = 8.066		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	5
	EXIT	3
	TOTAL	8
PM PEAK	ENTER	15
	EXIT	16
	TOTAL	31

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

TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	62
	EXIT	130
	TOTAL	192
PM PEAK	ENTER	141
	EXIT	96
	TOTAL	237

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. The trip generation characteristics for the proposed project were adjusted to account for trips made using alternative modes of transportation. Table 2 summarizes the adjusted trip generation characteristics for the Block N West development. Appendix D includes a detailed trip generation worksheet for the Block N West development.

Table 2: Adjusted Peak Hour Trip Generation

TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	52
	EXIT	123
	TOTAL	175
PM PEAK	ENTER	121
	EXIT	79
	TOTAL	200

2. Trip Distribution and Through Traffic Forecasting Methodology

The directional distribution of site-generated trips was based on the relative distribution of traffic along the regional roadways in the vicinity of the project. These percentages are generally consistent with the regional forecasting model developed by the Oahu Metropolitan Planning Organization (OMPO) since the project is located within a developed, well-established area in Honolulu. The OMPO model provides a macro level forecast of the

anticipated overall travel demand for the island of Oahu utilizing Socio-Economic Data (SED) representing population distribution within a multitude of traffic analysis zones to forecast individual vehicle trips between destinations within the model. The model by OMPO provides a general framework of travel demand, however a more finite, micro-level approach was utilized to complete the specific distribution of site-generated trips at the study intersections based on their assumed origin/destination, allowed turning movements, and the relative convenience of the available routes. In addition, taking into the account the project's location within a well-developed area and anticipated development in the vicinity of the project, a growth rate of approximately 1.5% growth rate per year was assumed in the vicinity of the project. This is generally in line with OMPO's forecasting model which estimates population growth to be relatively linear to the Year 2035. As such, a growth factor was determined for Year 2030 and applied to the baseline through traffic demands along the regional roadways in the project vicinity. 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. The trips associated with the proposed project were distributed at the study intersections based on their assumed origin/destination, allowed turning movements, and the relative convenience of the available routes.

B. Other Considerations

1. Honolulu Rail Transit Project

The City and County of Honolulu is currently developing a fixed guideway transit system that is planned to extend from Kapolei to the central Honolulu area thereby providing an alternate mode of travel through the Kakaako area. The proposed Honolulu High-Capacity Transit Corridor Project is intended to increase east-west mobility on Oahu's most heavily congested corridor. In the vicinity of the Ward Village development, the guideway alignment is expected to run along Halekauwila Street, cross over to Queen Street, and then follow that roadway to Waimanu Street. However, on September 30, 2022, the Honolulu Authority for Rapid Transit (HART)

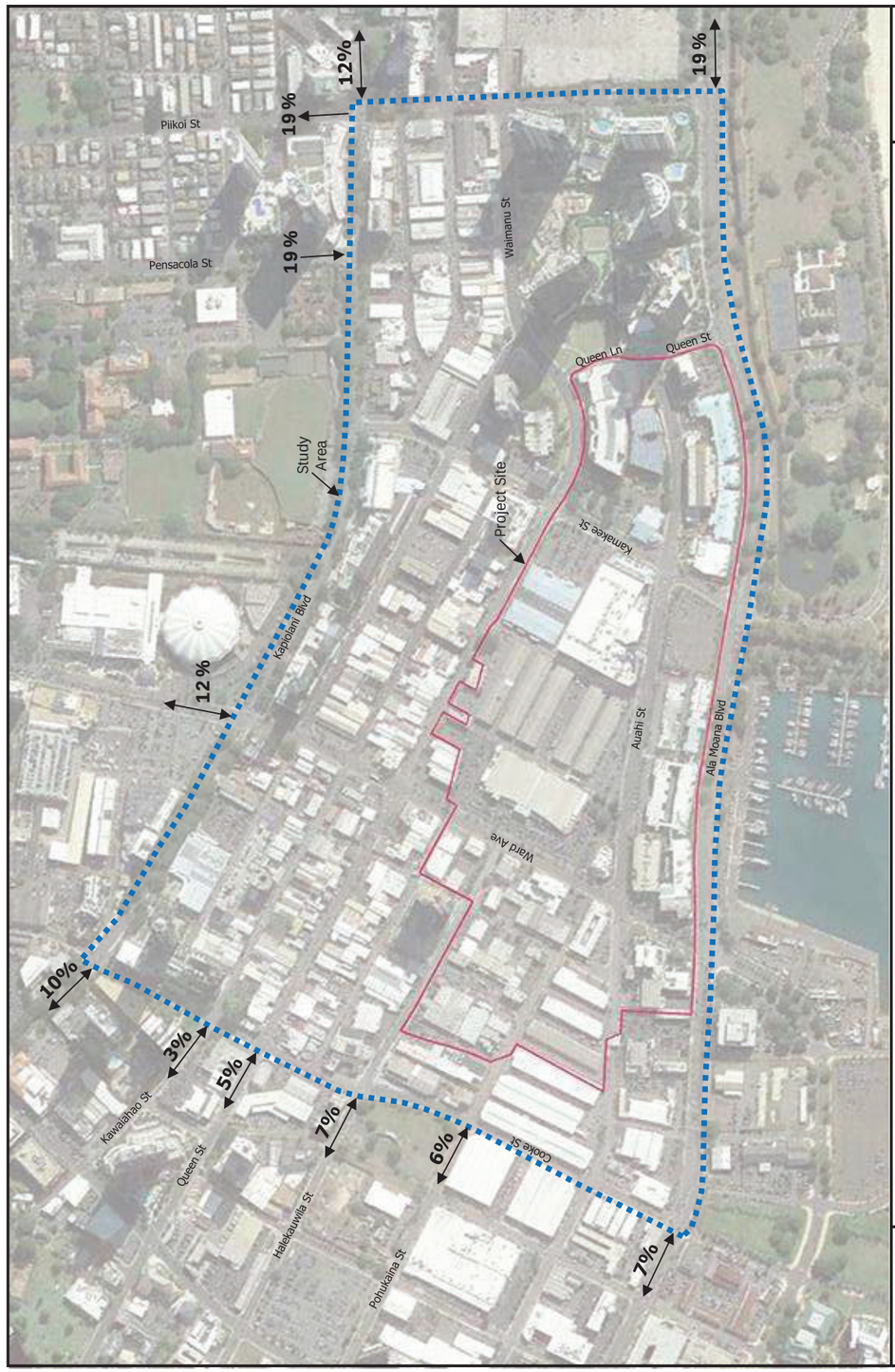


FIGURE 6

DISTRIBUTION OF EXTERNAL SITE-GENERATED TRIPS

BLOCK N WEST

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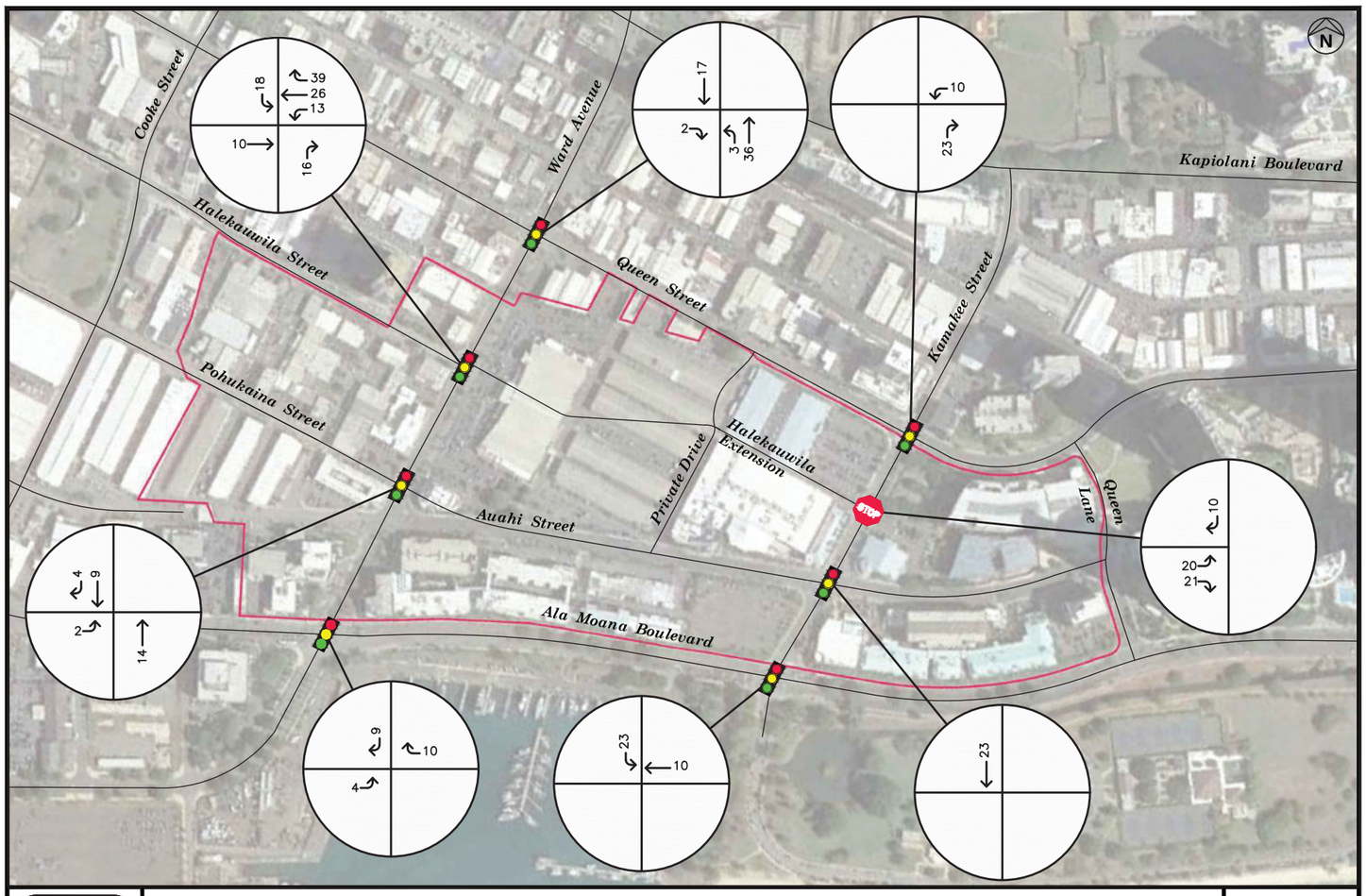
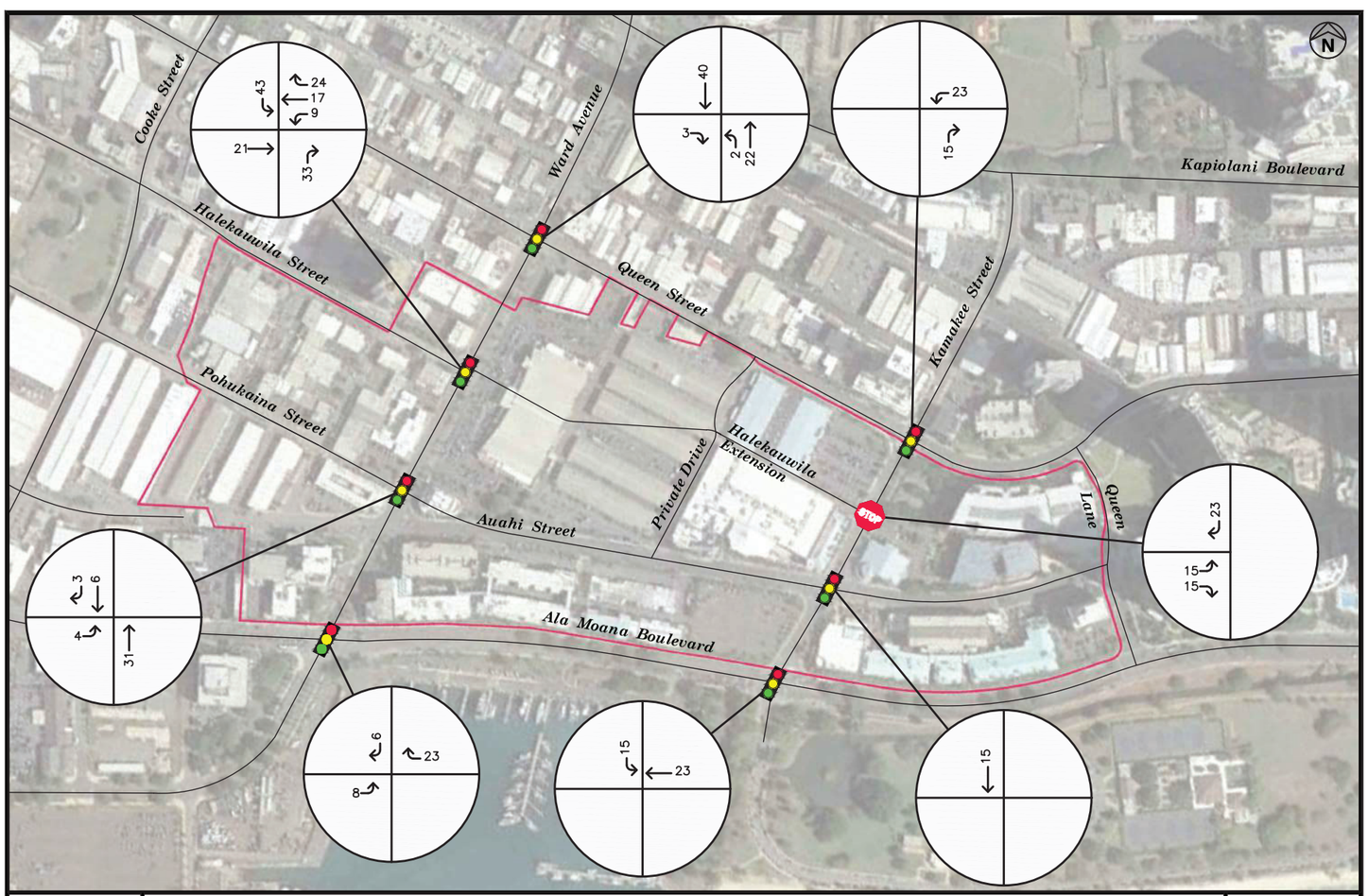


BLOCK N WEST

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

FIGURE 7



BLOCK N WEST

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

FIGURE 8

announced the Federal Transit Administration (FTA) approved HART's 2022 Recovery Plan, which proposed a truncated project scope with an interim terminus at the Civic Center, located at the intersection of Halekauwila Street and South Street. HART further announced that it remains committed to completing the full scope of the project to the Ala Moana Transit Center in a subsequent phase. Because the timing of the subsequent phase was not announced, the rail project was not incorporated into baseline or projected conditions.

2. KKMP Block D Development

As discussed in the Ward Village TMP, there is another planned development in the vicinity of the project. The KKMP Increment 2 is being planned by Kamehameha Schools and entails the replacement of existing commercial and light industrial uses within the Kakaako Mauka area with mixed-use developments. Blocks I and G of the KKMP were previously incorporated into baseline conditions. The Block D development is another development within the KKMP and entails development of approximately 1,034 residential units, 68,325 sf of commercial uses, and 2,679 sf of restaurant uses. Access to the project site is expected to be provided via driveways off Pohukaina Street and Auahi Street. Based on the Traffic Impact Report for the Kakaako Block D Development (dated August 2024), the proposed project is expected to be completed by Year 2029. As such, the trips associated with the proposed Block D development were incorporated into projected conditions.

3. KKMP Block C Development

Another KKMP development anticipated in the vicinity of the project is the Block C development. The project site for Block C is bounded by Pohukaina Street to the north, Auahi Street to the south, Coral Street to the west and Cooke Street to the east. This project is expected to be a mixed-use development with residential and commercial uses. Information regarding this project found in real estate websites previously anticipated the project to be completed by 2026, but more recent updates indicate that the project is

delayed. The Hawaii Community Development Authority (HCDA) website also has limited information on the status of this project. As such, the KKMP Block C development was not incorporated into projected conditions.

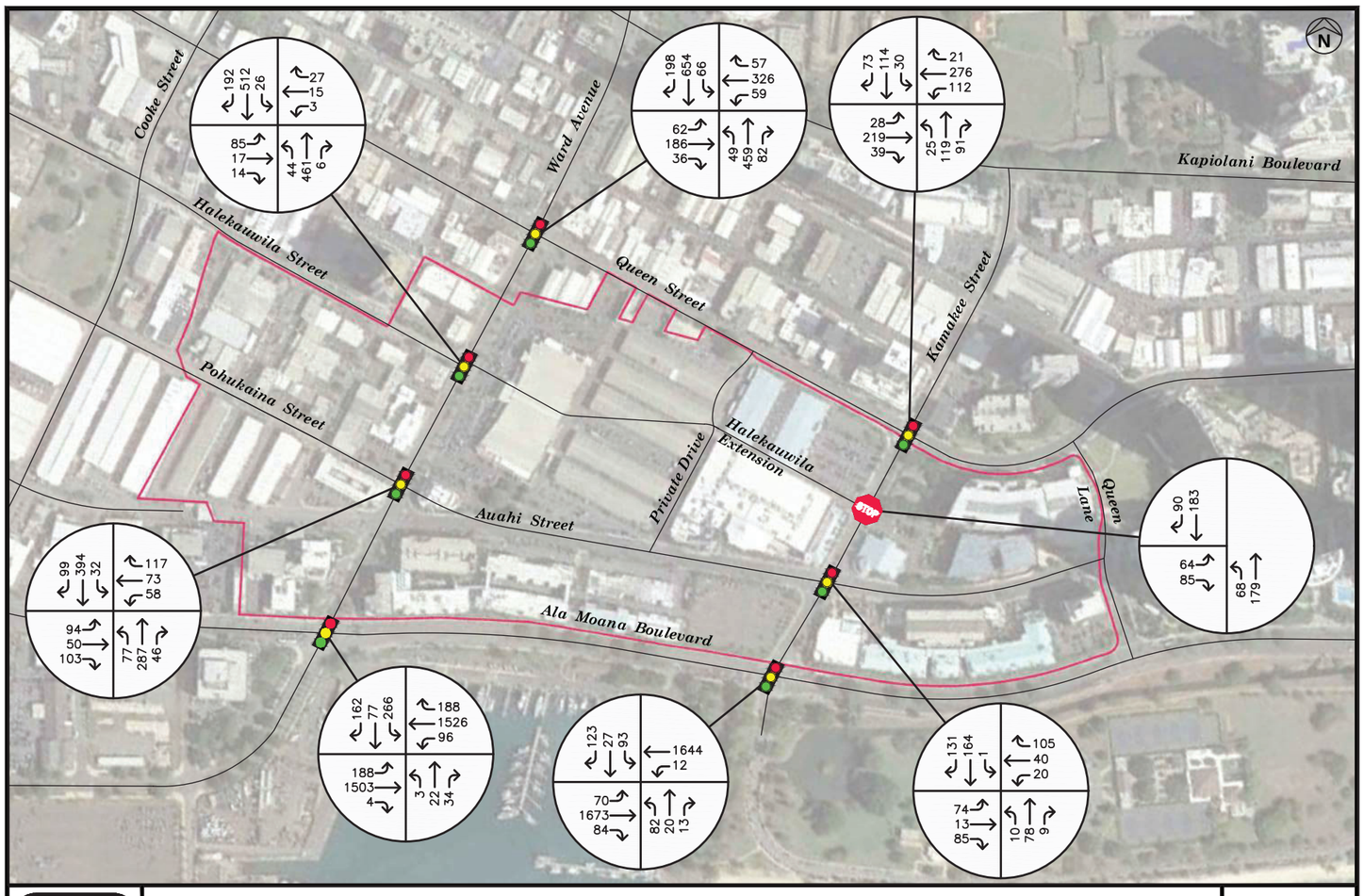
C. Total Traffic Volumes Without Project

The projected Year 2030 AM and PM peak period traffic volumes and operating conditions without the Block N West development are shown in Figures 9 and 10 and summarized in Table 3. The analysis incorporates the trips associated with the development of other projects in the area including Phases 1 to 4 of the Ward Villages Master Plan, Blocks I, G, and D of the KKMP, and the anticipated ambient growth in traffic in the vicinity. In addition, the analysis also incorporates the aforementioned roadway improvements along Auahi Street and Halekauwila Street. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 3: Baseline and Projected Year 2030 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Base-line*	Year 2030 w/out Proj	Base-line*	Year 2030 w/out Proj
Ward Ave/ Queen St	Eastbound	B	B	C	C
	Westbound	C	C	C	C
	Northbound	B	B	C	C
	Southbound	B	B	B	B
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	A	A	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Ward Ave/ Halekauwila St	Eastbound	B	B	B	B
	Westbound	B	B	A	A
	Northbound	A	A	B	B
	Southbound	A	A	B	B

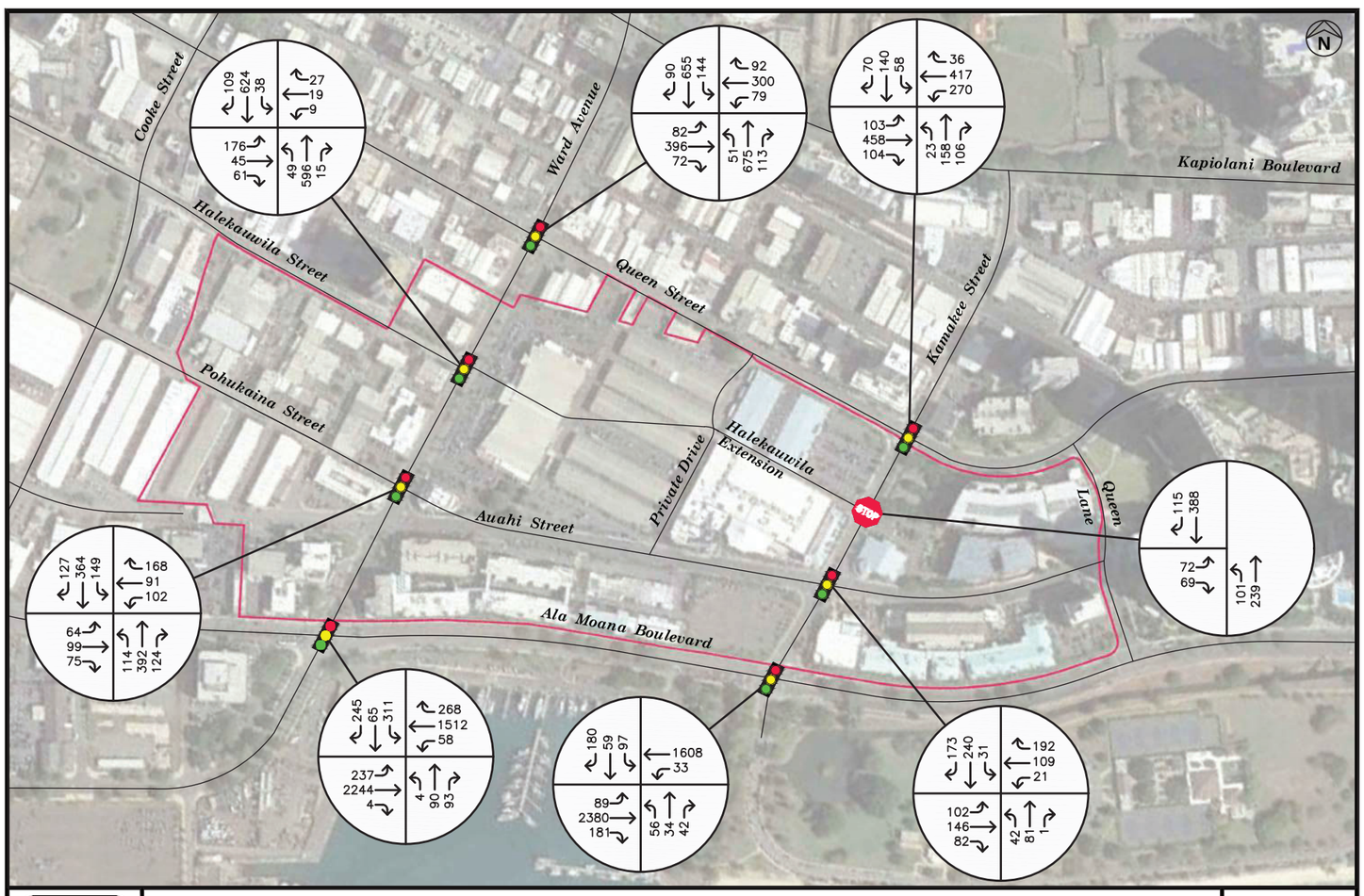
*Year 2027 conditions which incorporate the completion of Phases 1 to 4 of the Ward Villages Master Plan.



BLOCK N WEST

YEAR 2030 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 9



BLOCK N WEST

YEAR 2030 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 10

Table 3: Baseline and Projected Year 2030 (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Base-line*	Year 2030 w/out Proj	Base-line*	Year 2030 w/out Proj
Kamakee St/ Halekauwila Ext	Eastbound	B	B	C	C
Ward Ave/ Auahi St/ Pohukaina St	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	B	B	B	B
Ala Moana Blvd/ Ward Ave	Eastbound	D	D	E	E
	Westbound	D	D	E	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	C	C	D	D
	Southbound	C	C	D	D

*Year 2027 conditions which incorporate the completion of Phases 1 to 4 of the Ward Villages Master Plan.

Traffic operations under Year 2030 without project conditions are generally expected to remain similar to baseline conditions. Along Ward Avenue, traffic operations at Queen Street are expected to continue operating at LOS "C" or better during both peak periods, whereas those at Ala Moana Boulevard are expected to continue operating at LOS "D" and LOS "E" or better during the AM and PM peak hours, respectively. As previously discussed, the high volume of conflicting traffic and the split phasing of the northbound and southbound approaches influence the low levels of service at this intersection. Along Kamakee Street, the approaches at the intersection with Queen Street are anticipated to continue operating at LOS "B" and LOS "C" or better during the AM and PM peak periods, respectively, while those at Ala Moana Boulevard are expected to continue operating at LOS "C" or better and

LOS "D" or better during the AM and PM peak periods, respectively. The remaining study intersections are also expected to continue operating similar to baseline conditions.

D. Total Traffic Volumes With Project

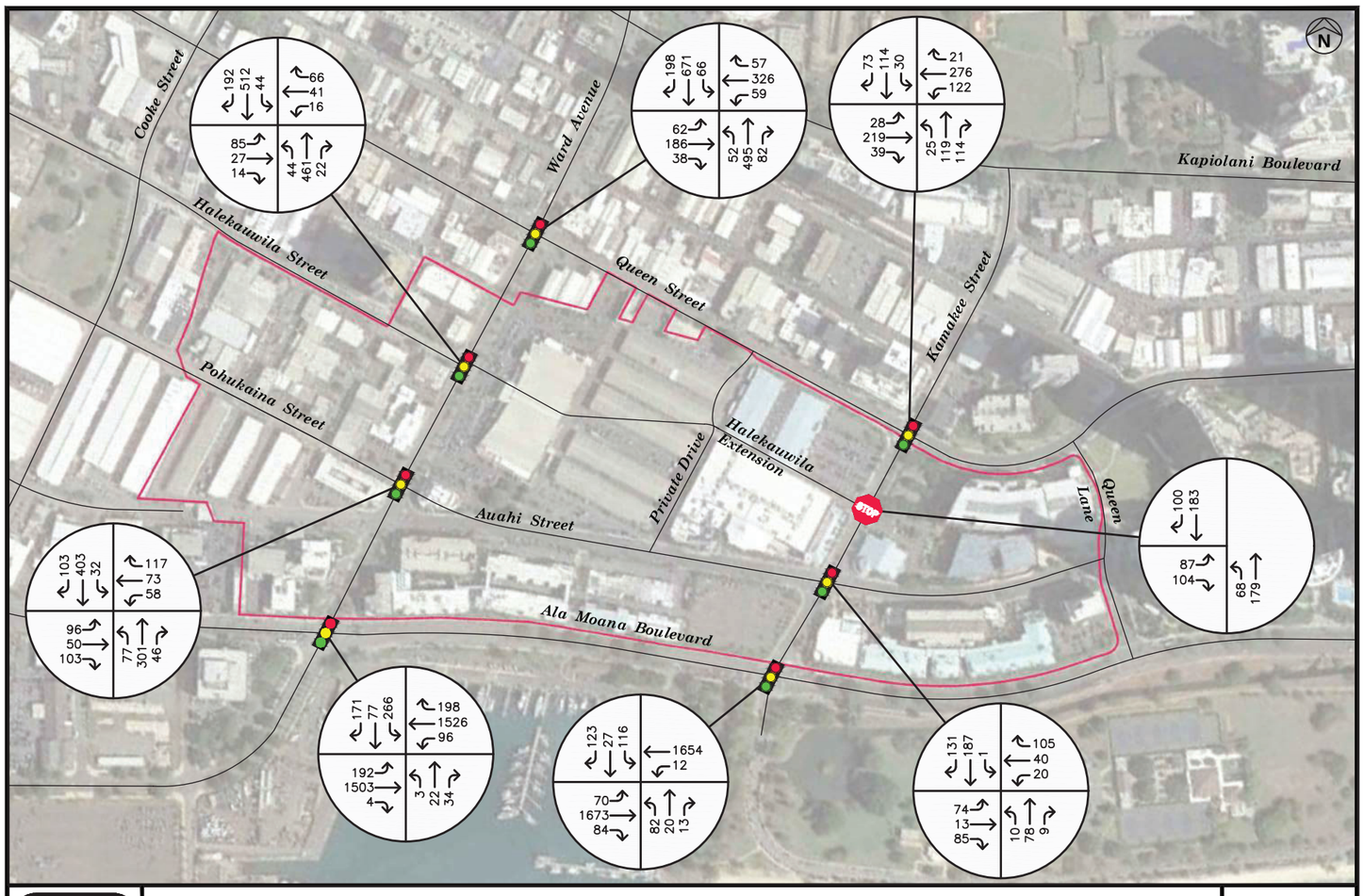
Figures 11 and 12 show the Year 2030 cumulative AM and PM peak hour traffic conditions resulting from the completion of the Block N West development. The cumulative volumes consist of site-generated traffic superimposed over Year 2030 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2030 cumulative AM and PM peak hour traffic conditions with the completion of the Block N West development are shown on Figures 11 and 12 and summarized in Table 4. The projected Year 2030 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 4: Projected Year 2030 (Without and With Project) LOS Traffic Operating Conditions

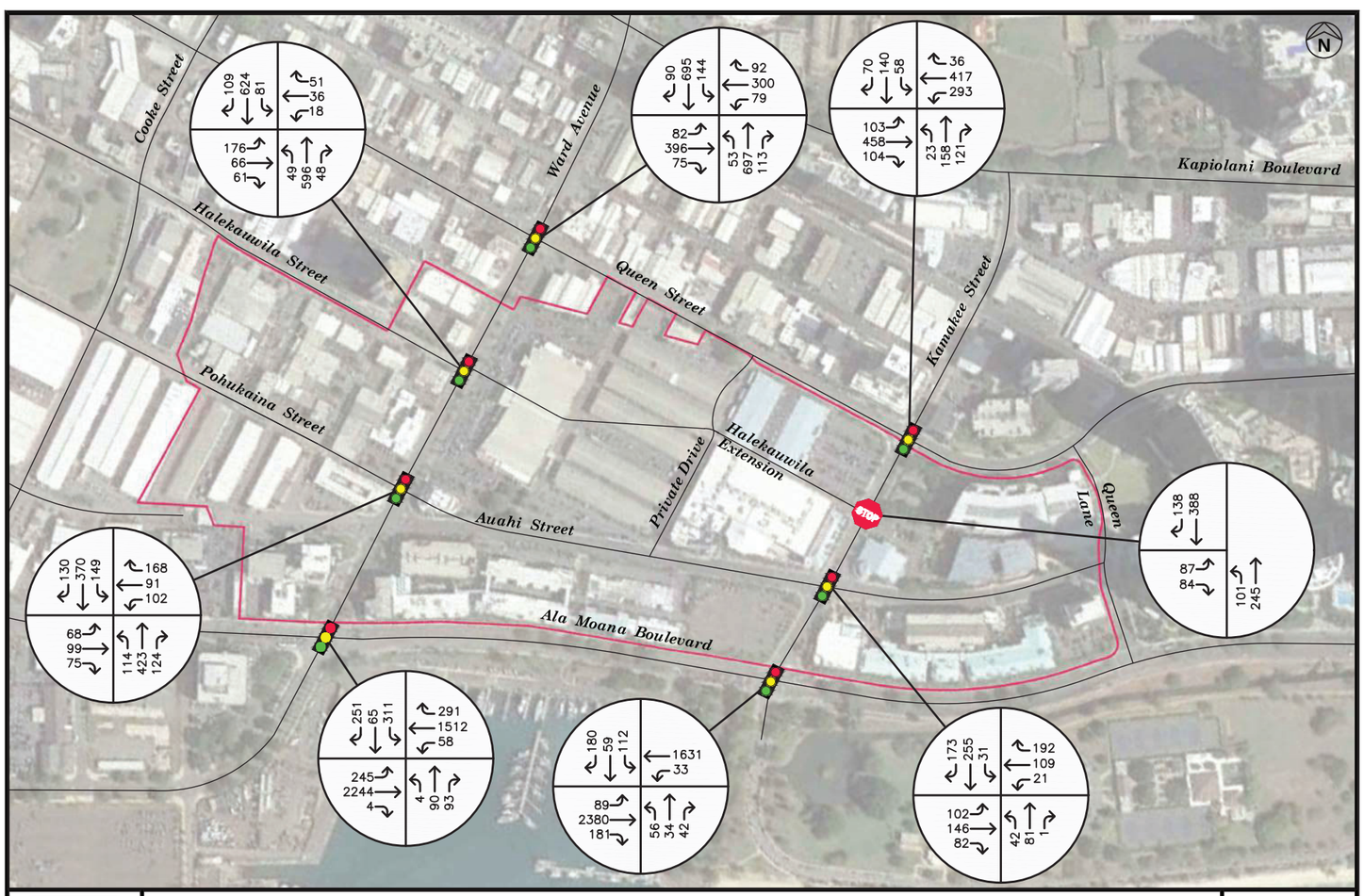
Intersection	Approach/ Critical Movement	AM		PM	
		Year 2030		Year 2030	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ward Ave/ Queen St	Eastbound	B	B	C	C
	Westbound	C	C	C	C
	Northbound	B	B	C	C
	Southbound	B	B	B	B
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	A	B	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Ward Ave/ Halekauwila St	Eastbound	B	B	B	B
	Westbound	B	B	A	A
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Halekauwila Ext	Eastbound	B	B	C	D



BLOCK N WEST

YEAR 2030 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 11



BLOCK N WEST

YEAR 2030 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 12

Table 4: Projected Year 2030 (Without and With Project)
LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2030		Year 2030	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ward Ave/ Auahi St/ Pohukaina St	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	B	B	B	B
Ala Moana Blvd/ Ward Ave	Eastbound	D	D	E	E
	Westbound	D	D	E	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	C	C	D	D
	Southbound	C	C	D	D

Traffic operations under Year 2030 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 intersection with Ward Avenue are expected to continue operating at LOS "C" or better during both peak periods, while those at the intersection with Kamakee Street are expected to continue operating at LOS "B" during the AM peak period and LOS "C" or better during the PM peak period. Along Auahi Street, traffic operations at the intersection with Ward Ave are expected to continue operating at LOS "B" during both peak periods, while those at the intersection with Kamakee Street are expected to continue operating at LOS "B" during the AM peak period and LOS "C" or better during the PM peak period. Traffic operations at the remaining study intersections are also anticipated to continue operating at levels of service similar to without project conditions.

VI. MULTIMODAL FACILITIES

A. Pedestrian Facilities

1. Existing Conditions

Improved pedestrian facilities such as sidewalks and crosswalks are currently provided along the roadways adjacent to the project site including Ward Avenue and Halekauwila Street, as well as further east and south along Kamakee Street and Auahi Street. It should be noted that a rectangular rapid flashing beacon (RRFB) was also previously installed at the intersection of Kamakee Street with the Halekauwila Extension to facilitate pedestrian crossings at this midblock location. Pedestrian facilities north of the project site along Queen Street are, however, currently limited with sidewalks only provided on the south side of the roadway east of Cummins Street. The shoulder areas west of Cummins Street are generally unimproved with pedestrians observed to occasionally utilize the vehicle travel way due to the presence of perpendicular on-street parking along this roadway.

2. Projected Conditions

Existing pedestrian facilities along the adjacent roadways are generally expected to be improved/maintained with the proposed project. The project frontage along the Halekauwila Extension is expected to incorporate sidewalks and landscaping treatments consistent with the already constructed segments of the Halekauwila Extension east of Ward Avenue. In addition, the proposed project is also located in close proximity to the Victoria Ward Mauka/Makai Parks, which will include a north-south pedestrian route extending from Halekauwila Street to Ala Moana Boulevard and the Ala Moana Pedestrian Bridge.

B. Bicycle Facilities

1. Existing Facilities

A number of bicycle parking areas are currently provided throughout Ward Village. In addition, the proposed Block N West development is located within close proximity to a number of BIKI bikeshare facilities, which are operated by Bikeshare Hawaii. The nearest BIKI station to the project site

is located the near the intersection of Ward Avenue and Halekauwila Street with additional bike share stations located near the intersections of Halekauwila Extension with Robinson Lane and Kamakee Street with Queen Street.

Bicycle facilities, which generally consist of shared-use paths, bike lanes, protected bike lanes, or shared roadways with pavement markings called sharrows, are also provided in the vicinity of the project. Existing bike facilities currently include designated bike lanes along Auahi Street between Ward Avenue and Queen Street (one lane on each side of the roadway), a bike route along Queen Street east of Kamakee Street, and buffered bike lanes along Ward Avenue between Ala Moana Boulevard and South King Street. It should be noted that since the preparation of the Ward Village TMP, additional bicycle facilities have been added to the roadways in the vicinity including the bike lanes along Cooke Street. Figure 13 depicts the existing bicycle facilities in the vicinity of the proposed project.

2. Bicycle Level of Traffic Stress

Bicycle Level of Traffic Stress (LTS) is a metric developed by the Mineta Transportation Institute used to classify a roadway segment or intersection. The LTS ranking system is based on the amount of traffic stress imposed on cyclists based on variables such as street width, prevailing vehicle speed, and average daily traffic volumes. The Level of Traffic Stress ranges from 1 to 4 and can be assessed for a given segment or intersection via six tables provided by the Mineta Transportation Institute. The general descriptions of the LTS levels are as follows:

- LTS 1: Characterized by strong separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
- LTS 2: Except in low speed/low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. There is a physical separation from higher speed and multilane traffic. Crossings are easy for an adult to navigate. This refers to a level of traffic stress that most adults can tolerate, particularly those sometimes classified as interested but concerned.

- LTS 3: Involves interaction with moderate speed or multilane traffic, or close proximity to higher speed traffic. Refers to a level of traffic stress acceptable to those classified as enthused and confident.
- LTS 4: Involves interaction with higher speed traffic or close proximity to high speed traffic. Refers to a level of stress acceptable only to those classified as strong and fearless.

It should be noted that current LTS methodology assumes no traffic stress is imposed on cyclists at signalized intersections. Guidance provided by the Mineta Transportation Institute includes categorizing signalized intersections as LTS 2. The LTS of the roadways in the vicinity of the proposed Block A development are depicted in Figure 14. As shown in Figure 14, Ward Avenue is rated at LTS 2 due to the provision of buffered bike lanes along this roadway while Auahi Street is currently rated LTS 3. As previously mentioned, designated bike lanes adjacent to the parking lanes were recently installed along Cooke Street. As such, this roadway is now rated as LTS 2.

3. Projected Conditions

The proposed project is expected to provide bicycle facilities on-site. These facilities are expected to include short- and long-term facilities for residents, guests, and employees to encourage the use of alternate modes of transportation. In addition, there are also future bike improvements planned as part of the overall Ward Village Master Plan to enhance bicycle connectivity within the area as well to the surrounding uses. In conjunction with the Auahi Street Promenade project, the roadway is expected to be converted to a 2-lane roadway to accommodate enhanced multimodal facilities with additional pavement striping installed to provide buffered bike lanes resulting in additional separation between bicyclists and vehicles. This project is expected to be completed by Year 2026.

There are also other bicycle improvements planned by the City and County of Honolulu Department Transportation Services (CCH-DTS) in the vicinity of the project as included in the Oahu Bike Plan (Updated 2019). These include the following:

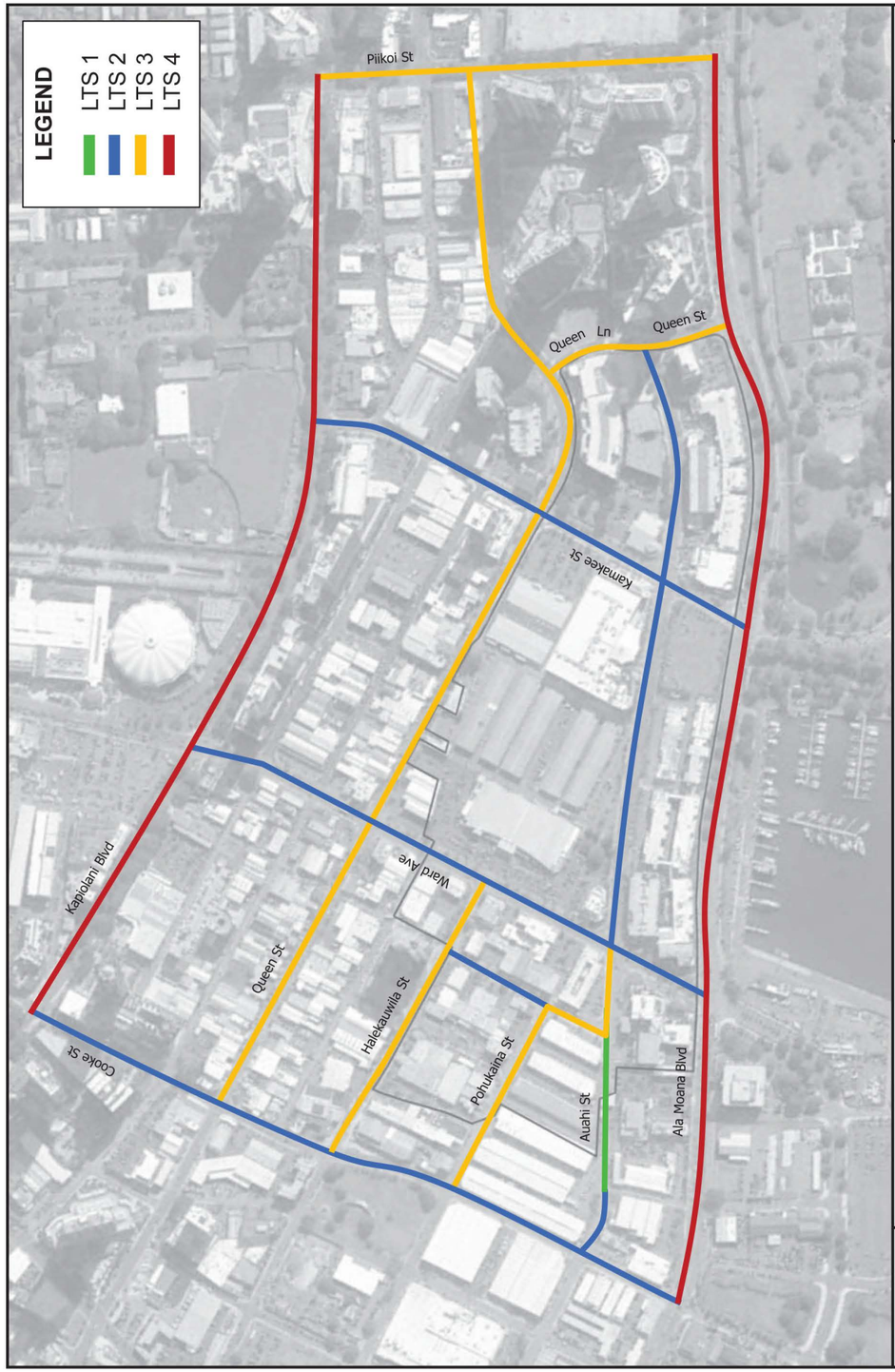


FIGURE 14

BLOCK N WEST

EXISTING BICYCLE LEVEL OF TRAFFIC STRESS

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- Bike lanes along Ala Moana Boulevard between Nimitz Highway and Kalakaua Avenue
- Protected bike lanes along Halekauwila Street between Ala Moana Boulevard and Ward Avenue

Figure 13 depicts the future bicycle facilities in the vicinity of the project. The addition of the aforementioned bicycle facilities are expected to improve the level of traffic stress along the roadways in the project vicinity and increase bicycle connectivity; however, the time for these improvements are not known at this time.

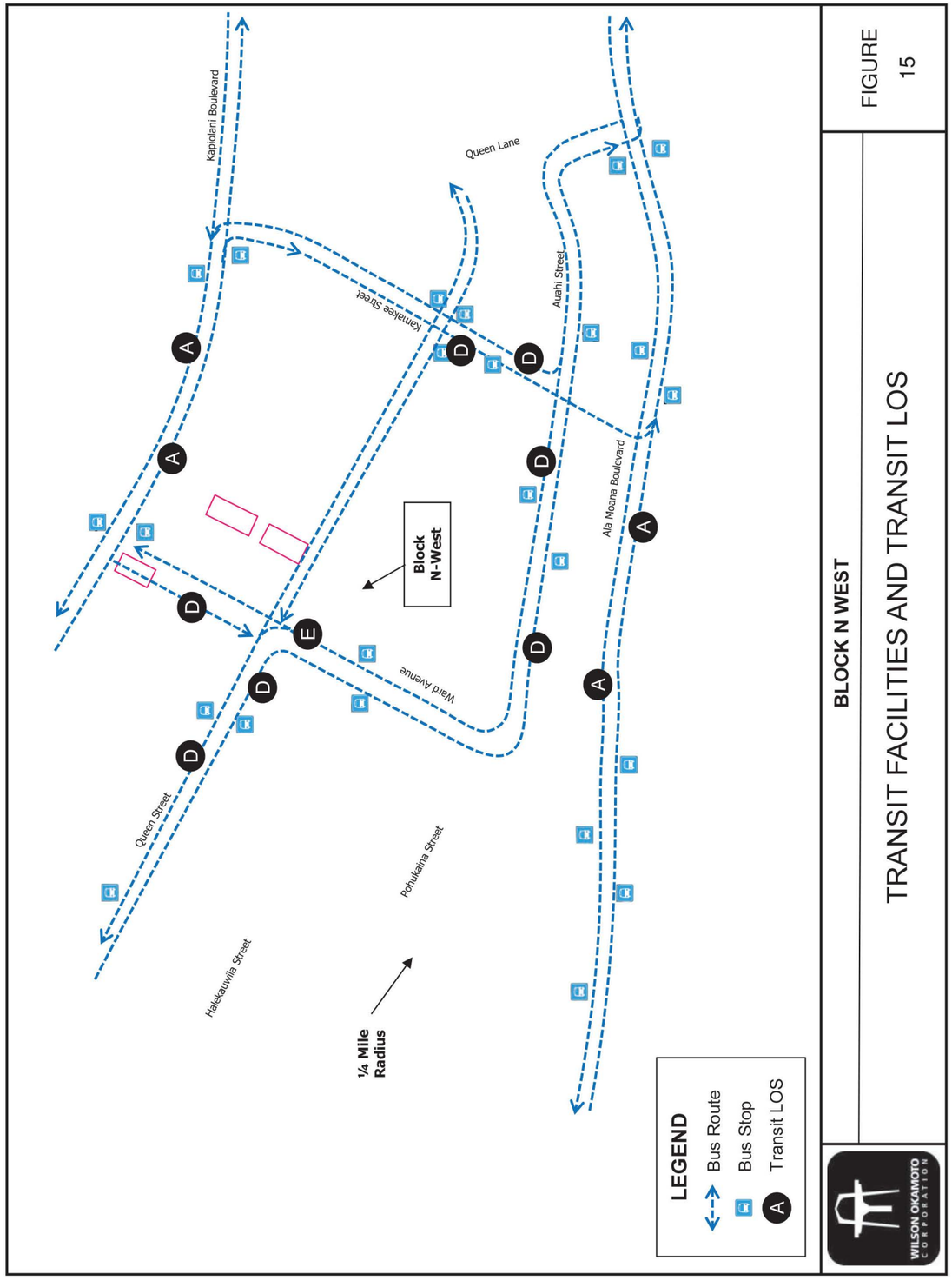
C. Transit Facilities

1. Existing Conditions

Public transportation services in the vicinity of the project are provided by the City and County of Honolulu. These services currently consist of fixed route bus services, as well as door-to-door services for people who have difficulty accessing the fixed route services (HandiVan). The fixed route bus services in the project vicinity consist of regional routes along Ala Moana Boulevard and Kapiolani Boulevard and supplemented by local routes along Auahi Street and Queen Street. There are approximately 11 transit stops that are served by 15 bus routes within a quarter mile radius of the proposed project (see Figure 15). In addition to fixed bus routes, the project vicinity is also served by a number of trolley companies including Waikiki Trolley.

2. Transit Capacity and Quality of Service Manual (TCQSM)

Transit Capacity and Quality of Service is a metric used to measure transit availability, comfort, and convenience from both the passenger and transit service provider's points of view. The framework for this metric is outlined in the Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual, 3rd Edition (TCQSM) published in 2013 which provides research-based guidance on public transit capacity and quality of service. The quality of service concepts and methods contained in the TCQSM address real-world transit operations, comprehensive planning, and design needs.



The research for and development of the TCQSM has also directly supported the development of the Multimodal Level of Service (LOS) analysis methodologies introduced in the Highway Capacity Manual (HCM) 2010 and subsequently refined in HCM 6. Multimodal LOS analyzes a roadway corridor comprised of street segments which are defined as a length of street between intersections where traffic may have to stop due to traffic control. Transit LOS can be directly compared to other transportation modes with LOS "A" representing the best quality of service and the letter "F" used to represent the worst quality of service. The assessment evaluates the quality of transit operations incorporating factors that bear all aspect of a transit trip including the pedestrian environment along the street, service frequency and reliability, and the availability of transit amenities at those stop locations.

3. Transit Level of Service

Figure 15 summarizes the existing transit LOS for the transit facilities within a quarter-mile radius of the project site. Transit LOS calculations are included in Appendix G. In general, there is good transit quality of service in the project vicinity. The project vicinity is served by a number of transit facilities that provide connections to local and regional bus routes with headways of 1 hour or less. Pedestrian facilities such as sidewalks and crosswalks facilitate access to and from these bus stop locations.

4. Projected Conditions

Modifications to the existing bus stops in the vicinity of Block N West are expected under projected conditions. In conjunction with the planned improvements along Auahi Street, the existing bus stops will be relocated to facilitate access to future planned developments within the Ward Village with additional bus stops provided to further enhance convenient access to transit. West of Kamakee Street, the existing bus stops north and south of the roadway near the Ward Entertainment Center are expected to be relocated further west near the Park Ward Village development and the Victoria Ward Mauka and Makai Parks. All bus and trolley stops along Auahi Street will be modified to include bus/trolley pull-in areas to facilitate through traffic along

the roadway. Along Ward Avenue, the existing bus stop at Halekauwila Street on the east side of the roadway is also expected to be relocated slightly south near the future the Park Ward Village development.

In addition, the City and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to the central Honolulu area thereby providing an alternate mode of travel through the Kakaako area. In the vicinity of the project, the guideway alignment was originally expected to run along Halekauwila Street, cross over to Queen Street, and then follow that roadway to Waimanu Street. However, based on recent discussions about the project, a truncated project scope is now expected with an interim terminus at the Civic Center west of the Ward Village development. It should be noted that HART remains committed to completing the full scope of the project to the Ala Moana Transit Center in a subsequent phase, but the timing of the subsequent phase is unknown at this time. As such, this project was not incorporated into projected conditions.

VII. 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. Provide sufficient sight distance for motorists to safely enter and exit the project driveway to ensure visibility between pedestrians, bicyclists, motorists, or other users at these conflict points. It should be noted that there is a planned pullout along the opposite side of Halekauwila Street offset from the proposed residential driveway for Block N West, as well as a marked pedestrian crossing slightly east of the project site.

2. Provide adequate on-site loading and off-loading service areas to accommodate all anticipated vehicle types and prohibit off-site loading operations.

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

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

5. If access at the entrances to the parking areas are controlled, provide sufficient storage for entering vehicles at the parking area access controls (i.e. automatic gate,

etc.) to ensure that queues do not extend onto the adjacent roadway. The layout and dimensions shall be determined during the design phase.

6. Provide bicycle facilities within the project boundaries including designated and secured bicycle parking to encourage the use of this alternative mode of transportation. Access to these facilities should be safe, convenient, and clearly delineated, especially within the designated parking areas where conflicts with vehicular traffic are expected.

7. Update the study should development phasing, land use intensity, or land use mix change.

8. 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 Village Master Plan," dated October 2022.

9. Coordinate the management of Block N West with those discussed in the Ward Village TMP including the overall Transportation Demand Management (TDM) Plan.

VIII. CONCLUSION

The overall Ward Village Master Plan is expected to be implemented in five (5) phases over a span of 10-15 years and entail the redevelopment of most of the existing commercial, office, and industrial spaces. Block N West is a part of Phase 5 of the master plan which is expected to include residential, retail, and restaurant uses. With the implementation of the aforementioned recommendations, traffic operations with the Block N West development are generally expected to remain similar to without project conditions. In addition, Victoria Ward Limited continues 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, GC
Counters: TU-0651, TU-1958
Weather: Clear

File Name : WarQue AM
Site Code : 00000002
Start Date : 8/30/2022
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
06:30 AM	14	111	20	3	148	1	12	5	4	22	9	25	4	4	42	8	7	7	13	35	247
06:45 AM	14	127	30	2	173	5	29	18	0	52	3	49	6	7	65	7	14	5	5	31	321
Total	28	238	50	5	321	6	41	23	4	74	12	74	10	11	107	15	21	12	18	66	568
07:00 AM	9	87	49	4	149	6	56	18	3	83	2	59	8	5	74	16	22	10	10	58	364
07:15 AM	10	112	48	6	176	9	60	15	0	84	5	78	3	11	97	15	23	6	8	52	409
07:30 AM	10	116	50	6	182	14	89	23	3	129	11	71	8	5	95	15	26	13	10	64	470
07:45 AM	17	124	61	2	204	9	60	7	2	78	6	68	13	5	92	22	46	5	9	82	456
Total	46	439	208	18	711	38	265	63	8	374	24	276	32	26	358	68	117	34	37	256	1699
08:00 AM	27	139	48	1	215	17	81	12	0	110	8	72	13	8	101	9	32	12	8	61	487
08:15 AM	16	144	39	5	204	10	50	17	2	79	11	69	8	5	93	16	40	1	8	65	441
Grand Total	117	960	345	29	1451	71	437	115	14	637	55	491	63	50	659	108	210	59	71	448	3195
Apprch %	8.1	66.2	23.8	2		11.1	68.6	18.1	2.2		8.3	74.5	9.6	7.6		24.1	46.9	13.2	15.8		
Total %	3.7	30	10.8	0.9	45.4	2.2	13.7	3.6	0.4	19.9	1.7	15.4	2	1.6	20.6	3.4	6.6	1.8	2.2	14	

	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 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	10	116	50	176	14	89	23	126	11	71	8	90	15	26	13	54	446
07:45 AM	17	124	61	202	9	60	7	76	6	68	13	87	22	46	5	73	438
08:00 AM	27	139	48	214	17	81	12	110	8	72	13	93	9	32	12	53	470
08:15 AM	16	144	39	199	10	50	17	77	11	69	8	88	16	40	1	57	421
Total Volume	70	523	198	791	50	280	59	389	36	280	42	358	62	144	31	237	1775
% App. Total	8.8	66.1	25		12.9	72	15.2		10.1	78.2	11.7		26.2	60.8	13.1		
PHF	.648	.908	.811	.924	.735	.787	.641	.772	.818	.972	.808	.962	.705	.783	.596	.812	.944

Wilson Okamoto Corporation

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

Counted By: LF, GC
Counters: TU-0651, TU-1958
Weather: Clear

File Name : WarQue PM
Site Code : 00000002
Start Date : 8/30/2022
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
04:00 PM	23	109	21	14	167	18	60	36	13	127	4	110	24	10	148	23	52	11	18	104	546
04:15 PM	34	129	22	5	190	25	79	28	2	134	7	129	18	10	164	19	77	12	12	120	608
04:30 PM	34	129	25	7	195	12	61	16	5	94	6	127	28	9	170	30	68	11	10	119	578
04:45 PM	35	102	20	7	164	15	70	24	6	115	8	102	23	14	147	17	72	15	11	115	541
Total	126	469	88	33	716	70	270	104	26	470	25	468	93	43	629	89	269	49	51	458	2273
05:00 PM	32	117	22	3	174	20	67	24	3	114	11	137	14	17	179	14	102	12	9	137	604
05:15 PM	37	111	23	13	184	15	61	36	12	124	14	149	25	16	204	21	90	20	28	159	671
05:30 PM	34	126	35	9	204	14	66	23	7	110	7	110	20	10	147	25	73	8	15	121	582
05:45 PM	30	127	16	5	178	15	61	29	5	110	5	92	17	8	122	17	67	16	10	110	520
Total	133	481	96	30	740	64	255	112	27	458	37	488	76	51	652	77	332	56	62	527	2377
Grand Total	259	950	184	63	1456	134	525	216	53	928	62	956	169	94	1281	166	601	105	113	985	4650
Apprch %	17.8	65.2	12.6	4.3		14.4	56.6	23.3	5.7		4.8	74.6	13.2	7.3		16.9	61	10.7	11.5		
Total %	5.6	20.4	4	1.4	31.3	2.9	11.3	4.6	1.1	20	1.3	20.6	3.6	2	27.5	3.6	12.9	2.3	2.4	21.2	

	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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	34	129	25	188	12	61	16	89	6	127	28	161	30	68	11	109	547
04:45 PM	35	102	20	157	15	70	24	109	8	102	23	133	17	72	15	104	503
05:00 PM	32	117	22	171	20	67	24	111	11	137	14	162	14	102	12	128	572
05:15 PM	37	111	23	171	15	61	36	112	14	149	25	188	21	90	20	131	602
Total Volume	138	459	90	687	62	259	100	421	39	515	90	644	82	332	58	472	2224
% App. Total	20.1	66.8	13.1		14.7	61.5	23.8		6.1	80	14		17.4	70.3	12.3		
PHF	.932	.890	.900	.914	.775	.925	.694	.940	.696	.864	.804	.856	.683	.814	.725	.901	.924

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: CD, SDR
Counters: TU-2050, TU-2840
Weather: Clear

File Name : WarAua AM
Site Code : 00000003
Start Date : 8/30/2022
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
06:30 AM	19	68	7	3	97	8	3	3	4	18	8	25	8	5	46	0	5	0	3	8	169
06:45 AM	18	67	4	4	93	2	1	8	10	21	12	32	19	5	68	1	3	3	3	10	192
Total	37	135	11	7	190	10	4	11	14	39	20	57	27	10	114	1	8	3	6	18	361
07:00 AM	10	56	5	2	73	10	8	4	2	24	9	39	15	1	64	2	8	4	7	21	182
07:15 AM	9	71	8	2	90	12	4	8	4	28	13	51	12	7	83	2	4	6	1	13	214
07:30 AM	7	78	10	4	99	4	8	4	3	19	12	55	12	3	82	0	2	9	4	15	215
07:45 AM	12	81	9	5	107	4	9	4	2	19	20	70	9	15	114	3	5	4	1	13	253
Total	38	286	32	13	369	30	29	20	11	90	54	215	48	26	343	7	19	23	13	62	864
08:00 AM	10	95	4	8	117	7	4	2	2	15	14	63	5	3	85	3	4	3	4	14	231
08:15 AM	17	91	9	2	119	9	7	5	5	26	6	53	9	1	69	2	6	2	2	12	226
Grand Total	102	607	56	30	795	56	44	38	32	170	94	388	89	40	611	13	37	31	25	106	1682
Apprch %	12.8	76.4	7	3.8		32.9	25.9	22.4	18.8		15.4	63.5	14.6	6.5		12.3	34.9	29.2	23.6		
Total %	6.1	36.1	3.3	1.8	47.3	3.3	2.6	2.3	1.9	10.1	5.6	23.1	5.3	2.4	36.3	0.8	2.2	1.8	1.5	6.3	

	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 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	7	78	10	95	4	8	4	16	12	55	12	79	0	2	9	11	201
07:45 AM	12	81	9	102	4	9	4	17	20	70	9	99	3	5	4	12	230
08:00 AM	10	95	4	109	7	4	2	13	14	63	5	82	3	4	3	10	214
08:15 AM	17	91	9	117	9	7	5	21	6	53	9	68	2	6	2	10	216
Total Volume	46	345	32	423	24	28	15	67	52	241	35	328	8	17	18	43	861
% App. Total	10.9	81.6	7.6		35.8	41.8	22.4		15.9	73.5	10.7		18.6	39.5	41.9		
PHF	.676	.908	.800	.904	.667	.778	.750	.798	.650	.861	.729	.828	.667	.708	.500	.896	.936

Wilson Okamoto Corporation

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

Counted By: CD, LP
Counters: TU-2050, TU-2840
Weather: Clear

File Name : WarAua PM
Site Code : 00000003
Start Date : 8/30/2022
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
04:00 PM	17	72	9	5	103	27	3	16	3	49	11	62	16	19	108	7	15	8	2	32	292
04:15 PM	34	94	9	5	142	16	7	20	3	46	12	97	9	2	120	6	10	2	1	19	327
04:30 PM	29	78	3	9	119	20	14	21	3	58	6	84	13	7	110	2	14	14	4	34	321
04:45 PM	33	61	6	11	111	21	9	28	6	64	8	79	15	9	111	4	18	11	3	36	322
Total	113	305	27	30	475	84	33	85	15	217	37	322	53	37	449	19	57	35	10	121	1262
05:00 PM	21	76	9	15	121	25	14	32	3	74	8	70	23	19	120	6	21	11	10	48	363
05:15 PM	31	73	6	5	115	22	7	23	1	53	8	87	16	4	115	3	14	5	7	29	312
05:30 PM	28	78	7	7	120	14	15	23	5	57	6	69	21	2	98	0	16	12	7	35	310
05:45 PM	33	87	7	10	137	12	10	9	3	34	8	59	16	1	84	3	10	10	22	45	300
Total	113	314	29	37	493	73	46	87	12	218	30	285	76	26	417	12	61	38	46	157	1285
Grand Total	226	619	56	67	968	157	79	172	27	435	67	607	129	63	866	31	118	73	56	278	2547
Apprch %	23.3	63.9	5.8	6.9		36.1	18.2	39.5	6.2		7.7	70.1	14.9	7.3		11.2	42.4	26.3	20.1		
Total %	8.9	24.3	2.2	2.6	38	6.2	3.1	6.8	1.1	17.1	2.6	23.8	5.1	2.5	34	1.2	4.6	2.9	2.2	10.9	

	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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	34	94	9	137	16	7	20	43	12	97	9	118	6	10	2	18	316
04:30 PM	29	78	3	110	20	14	21	55	6	84	13	103	2	14	14	30	298
04:45 PM	33	61	6	100	21	9	28	58	8	79	15	102	4	18	11	33	293
05:00 PM	21	76	9	106	25	14	32	71	8	70	23	101	6	21	11	38	316
Total Volume	117	309	27	453	82	44	101	227	34	330	60	424	18	63	38	119	1223
% App. Total	25.8	68.2	6		36.1	19.4	44.5		8	77.8	14.2		15.1	52.9	31.9		
PHF	.860	.822	.750	.827	.820	.786	.789	.799	.708	.851	.652	.898	.750	.750	.679	.783	.968

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: CD, MA
Counters: TU-2049, TU-2605
Weather: Clear

File Name : KamAua AM
Site Code : 00000005
Start Date : 8/31/2022
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
06:30 AM	3	20	7	12	42	0	3	1	11	15	3	11	5	9	28	2	8	4	9	23	108
06:45 AM	0	11	5	5	21	5	7	11	15	38	4	22	1	24	51	6	12	3	2	23	133
Total	3	31	12	17	63	5	10	12	26	53	7	33	6	33	79	8	20	7	11	46	241
07:00 AM	3	19	7	4	33	2	9	15	11	37	3	22	3	6	34	7	6	6	2	21	125
07:15 AM	4	28	7	20	59	7	4	19	17	47	1	17	7	4	29	2	7	0	1	10	145
07:30 AM	5	36	2	13	56	2	6	16	14	38	1	25	8	4	38	5	15	0	9	29	161
07:45 AM	4	34	7	7	52	6	7	14	13	40	0	22	5	16	43	6	16	3	17	42	177
Total	16	117	23	44	200	17	26	64	55	162	5	86	23	30	144	20	44	9	29	102	608
08:00 AM	6	30	6	4	46	7	6	11	23	47	1	30	10	9	50	2	19	3	15	39	182
08:15 AM	12	29	7	9	57	6	7	8	19	40	2	29	9	4	44	3	9	4	8	24	165
Grand Total	37	207	48	74	366	35	49	95	123	302	15	178	48	76	317	33	92	23	63	211	1196
Apprch %	10.1	56.6	13.1	20.2		11.6	16.2	31.5	40.7		4.7	56.2	15.1	24		15.6	43.6	10.9	29.9		
Total %	3.1	17.3	4	6.2	30.6	2.9	4.1	7.9	10.3	25.3	1.3	14.9	4	6.4	26.5	2.8	7.7	1.9	5.3	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 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	36	2	43	2	6	16	24	1	25	8	34	5	15	0	20	121
07:45 AM	4	34	7	45	6	7	14	27	0	22	5	27	6	16	3	25	124
08:00 AM	6	30	6	42	7	6	11	24	1	30	10	41	2	19	3	24	131
08:15 AM	12	29	7	48	6	7	8	21	2	29	9	40	3	9	4	16	125
Total Volume	27	129	22	178	21	26	49	96	4	106	32	142	16	59	10	85	501
% App. Total	15.2	72.5	12.4		21.9	27.1	51		2.8	74.6	22.5		18.8	69.4	11.8		
PHF	.563	.896	.786	.927	.750	.929	.766	.889	.500	.883	.800	.866	.667	.776	.625	.850	.956

Wilson Okamoto Corporation

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

Counted By: CD, LP
Counters: TU-2049, TU-2605
Weather: Clear

File Name : KamAua PM
Site Code : 00000005
Start Date : 8/31/2022
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
04:00 PM	13	58	14	26	111	4	14	16	16	50	3	24	18	21	66	8	22	1	18	49	276
04:15 PM	8	47	18	16	89	9	15	17	20	61	6	39	7	17	69	7	21	5	25	58	277
04:30 PM	17	59	19	18	113	5	20	18	17	60	6	32	8	10	56	7	37	4	20	68	297
04:45 PM	8	45	15	22	90	9	13	20	20	62	5	29	5	15	54	13	34	6	25	78	284
Total	46	209	66	82	403	27	62	71	73	233	20	124	38	63	245	35	114	16	88	253	1134
05:00 PM	16	64	13	11	104	4	19	14	29	66	9	42	14	25	90	20	40	6	17	83	343
05:15 PM	5	45	10	19	79	5	21	20	29	75	6	52	8	31	97	11	44	6	25	86	337
05:30 PM	16	56	15	24	111	6	16	22	26	70	6	45	17	21	89	17	30	10	32	89	359
05:45 PM	11	45	10	29	95	5	16	10	16	47	6	41	7	23	77	7	24	3	42	76	295
Total	48	210	48	83	389	20	72	66	100	258	27	180	46	100	353	55	138	25	116	334	1334
Grand Total	94	419	114	165	792	47	134	137	173	491	47	304	84	163	598	90	252	41	204	587	2468
Apprch %	11.9	52.9	14.4	20.8		9.6	27.3	27.9	35.2		7.9	50.8	14	27.3		15.3	42.9	7	34.8		
Total %	3.8	17	4.6	6.7	32.1	1.9	5.4	5.6	7	19.9	1.9	12.3	3.4	6.6	24.2	3.6	10.2	1.7	8.3	23.8	

	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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	45	15	68	9	13	20	42	5	29	5	39	13	34	6	53	202
05:00 PM	16	64	13	93	4	19	14	37	9	42	14	65	20	40	6	66	261
05:15 PM	5	45	10	60	5	21	20	46	6	52	8	66	11	44	6	61	233
05:30 PM	16	56	15	87	6	16	22	44	6	45	17	68	17	30	10	57	256
Total Volume	45	210	53	308	24	69	76	169	26	168	44	238	61	148	28	237	952
% App. Total	14.6	68.2	17.2		14.2	40.8	45		10.9	70.6	18.5		25.7	62.4	11.8		
PHF	.703	.820	.883	.828	.667	.821	.864	.918	.722	.808	.647	.875	.763	.841	.700	.898	.912

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: 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

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: GC, LF
Counters: TU-2606, TU-0654
Weather: Clear

File Name : KamQue AM
Site Code : 00000004
Start Date : 8/31/2022
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
06:30 AM	6	15	14	0	35	5	22	3	9	39	1	4	5	6	16	6	13	4	5	28	118
06:45 AM	5	13	17	2	37	8	24	6	4	42	2	23	7	5	37	6	20	2	12	40	156
Total	11	28	31	2	72	13	46	9	13	81	3	27	12	11	53	12	33	6	17	68	274
07:00 AM	7	18	16	3	44	8	34	6	12	60	4	16	18	13	51	4	19	2	13	38	193
07:15 AM	11	19	9	3	42	10	35	3	7	55	6	12	15	12	45	1	31	11	9	52	194
07:30 AM	7	18	21	7	53	15	53	7	5	80	5	19	16	12	52	4	31	11	26	72	257
07:45 AM	9	14	16	5	44	21	65	3	17	106	9	21	6	14	50	4	39	10	15	68	268
Total	34	69	62	18	183	54	187	19	41	301	24	68	55	51	198	13	120	34	63	230	912
08:00 AM	10	26	20	9	65	15	62	7	6	90	7	17	9	17	50	7	37	8	10	62	267
08:15 AM	8	16	13	9	46	24	57	5	10	96	4	16	9	14	43	7	44	6	41	98	283
Grand Total	63	139	126	38	366	106	352	40	70	568	38	128	85	93	344	39	234	54	131	458	1736
Apprch %	17.2	38	34.4	10.4		18.7	62	7	12.3		11	37.2	24.7	27		8.5	51.1	11.8	28.6		
Total %	3.6	8	7.3	2.2	21.1	6.1	20.3	2.3	4	32.7	2.2	7.4	4.9	5.4	19.8	2.2	13.5	3.1	7.5	26.4	

	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 06:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	7	18	21	46	15	53	7	75	5	19	16	40	4	31	11	46	207
07:45 AM	9	14	16	39	21	65	3	89	9	21	6	36	4	39	10	53	217
08:00 AM	10	26	20	56	15	62	7	84	7	17	9	33	7	37	8	52	225
08:15 AM	8	16	13	37	24	57	5	86	4	16	9	29	7	44	6	57	209
Total Volume	34	74	70	178	75	237	22	334	25	73	40	138	22	151	35	208	858
% App. Total	19.1	41.6	39.3		22.5	71	6.6		18.1	52.9	29		10.6	72.6	16.8		
PHF	.850	.712	.833	.795	.781	.912	.786	.938	.694	.869	.625	.863	.786	.858	.795	.912	.953

Wilson Okamoto Corporation

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

Counted By: GC, LF
Counters: TU-2606, TU-0654
Weather: Clear

File Name : KamQue PM
Site Code : 00000004
Start Date : 8/31/2022
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
04:00 PM	9	24	20	4	57	43	76	15	18	152	6	30	10	29	75	23	108	12	38	181	465
04:15 PM	16	26	10	0	52	25	76	13	8	122	3	35	19	12	69	16	68	15	23	122	365
04:30 PM	10	31	23	3	67	38	83	9	9	139	9	37	14	33	93	20	89	30	49	188	487
04:45 PM	19	24	14	6	63	35	93	11	12	151	8	29	16	38	91	25	115	15	35	190	495
Total	54	105	67	13	239	141	328	48	47	564	26	131	59	112	328	84	380	72	145	681	1812
05:00 PM	16	31	13	4	64	34	87	11	17	149	3	24	22	38	87	33	100	29	43	205	505
05:15 PM	18	26	14	12	70	49	85	10	10	154	3	32	19	35	89	19	84	13	32	148	461
05:30 PM	15	29	14	3	61	29	60	8	3	100	13	46	24	26	109	22	84	23	48	177	447
05:45 PM	9	21	21	4	55	29	64	11	11	115	2	23	7	32	64	17	88	19	48	172	406
Total	58	107	62	23	250	141	296	40	41	518	21	125	72	131	349	91	356	84	171	702	1819
Grand Total	112	212	129	36	489	282	624	88	88	1082	47	256	131	243	677	175	736	156	316	1383	3631
Apprch %	22.9	43.4	26.4	7.4		26.1	57.7	8.1	8.1		6.9	37.8	19.4	35.9		12.7	53.2	11.3	22.8		
Total %	3.1	5.8	3.6	1	13.5	7.8	17.2	2.4	2.4	29.8	1.3	7.1	3.6	6.7	18.6	4.8	20.3	4.3	8.7	38.1	

	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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	10	31	23	64	38	83	9	130	9	37	14	60	20	89	30	139	393
04:45 PM	19	24	14	57	35	93	11	139	8	29	16	53	25	115	15	155	404
05:00 PM	16	31	13	60	34	87	11	132	3	24	22	49	33	100	29	162	403
05:15 PM	18	26	14	58	49	85	10	144	3	32	19	54	19	84	13	116	372
Total Volume	63	112	64	239	156	348	41	545	23	122	71	216	97	388	87	572	1572
% App. Total	26.4	46.9	26.8		28.6	63.9	7.5		10.6	56.5	32.9		17	67.8	15.2		
PHF	.829	.903	.696	.934	.796	.935	.932	.946	.639	.824	.807	.900	.735	.843	.725	.883	.973

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

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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

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.

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

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

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

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 02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	172	36	59	310	57	49	423	82	66	618	198
Future Volume (vph)	62	172	36	59	310	57	49	423	82	66	618	198
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.98	1.00	0.97		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.92	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1759	1863	1406	1630	1863	1548	1770	3356		1770	3368	
Flt Permitted	0.41	1.00	1.00	0.64	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	761	1863	1406	1095	1863	1548	1770	3356		1770	3368	
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)	65	181	38	62	326	60	52	445	86	69	651	208
RTOR Reduction (vph)	0	0	27	0	0	42	0	18	0	0	34	0
Lane Group Flow (vph)	65	181	11	62	326	18	52	513	0	69	825	0
Confl. Peds. (#/hr)	15		146	146		15			144			30
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	19.1	19.1	19.1	19.1	19.1	19.1	3.4	25.0		6.0	27.6	
Effective Green, g (s)	19.1	19.1	19.1	19.1	19.1	19.1	3.4	25.0		6.0	27.6	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.38		0.09	0.42	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	223	546	412	321	546	454	92	1288		163	1427	
v/s Ratio Prot		0.10			c0.18		0.03	0.15		c0.04	c0.24	
v/s Ratio Perm	0.09		0.01	0.06		0.01						
v/c Ratio	0.29	0.33	0.03	0.19	0.60	0.04	0.57	0.40		0.42	0.58	
Uniform Delay, d1	17.8	18.0	16.4	17.2	19.7	16.4	30.1	14.6		27.9	14.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4	0.0	0.3	1.8	0.0	7.7	0.2		1.8	0.6	
Delay (s)	18.5	18.4	16.4	17.5	21.5	16.5	37.9	14.8		29.7	14.9	
Level of Service	B	B	B	B	C	B	D	B		C	B	
Approach Delay (s)		18.1			20.3			16.8			16.0	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.1	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 Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	374	72	79	279	92	51	630	113	144	605	90
Future Volume (vph)	82	374	72	79	279	92	51	630	113	144	605	90
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.88	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.93	1.00	1.00	0.94	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1651	1863	1381	1672	1863	1389	1770	3252		1770	3432	
Flt Permitted	0.42	1.00	1.00	0.26	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	726	1863	1381	462	1863	1389	1770	3252		1770	3432	
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)	86	394	76	83	294	97	54	663	119	152	637	95
RTOR Reduction (vph)	0	0	55	0	0	70	0	15	0	0	12	0
Lane Group Flow (vph)	86	394	21	83	294	27	54	767	0	152	720	0
Confl. Peds. (#/hr)	136		142	142		136			294			52
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	21.4	21.4	21.4	21.4	21.4	21.4	3.7	29.7		11.6	37.6	
Effective Green, g (s)	21.4	21.4	21.4	21.4	21.4	21.4	3.7	29.7		11.6	37.6	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.05	0.38		0.15	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	199	513	380	127	513	382	84	1243		264	1660	
v/s Ratio Prot		c0.21			0.16		0.03	c0.24		c0.09	0.21	
v/s Ratio Perm	0.12		0.02	0.18		0.02						
v/c Ratio	0.43	0.77	0.06	0.65	0.57	0.07	0.64	0.62		0.58	0.43	
Uniform Delay, d1	23.2	25.9	20.7	24.9	24.2	20.8	36.4	19.4		30.8	13.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	6.8	0.1	11.5	1.6	0.1	15.6	0.9		3.0	0.2	
Delay (s)	24.7	32.7	20.8	36.3	25.8	20.9	52.0	20.3		33.8	13.3	
Level of Service	C	C	C	D	C	C	D	C		C	B	
Approach Delay (s)		29.8			26.6			22.4			16.8	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	212	39	112	261	21	25	119	91	30	111	73
Future Volume (vph)	28	212	39	112	261	21	25	119	91	30	111	73
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.99		1.00	1.00		1.00	0.99			1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00		0.96	1.00			1.00	1.00
Frt		0.98		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3417		1770	3494		1694	1730			1842	1483
Flt Permitted		0.90		0.95	1.00		0.66	1.00			0.89	1.00
Satd. Flow (perm)		3097		1770	3494		1183	1730			1662	1483
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)	29	221	41	117	272	22	26	124	95	31	116	76
RTOR Reduction (vph)	0	14	0	0	7	0	0	35	0	0	0	57
Lane Group Flow (vph)	0	277	0	117	287	0	26	184	0	0	147	19
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		16.0		7.1	28.1		12.4	12.4			12.4	12.4
Effective Green, g (s)		16.0		7.1	28.1		12.4	12.4			12.4	12.4
Actuated g/C Ratio		0.32		0.14	0.56		0.25	0.25			0.25	0.25
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)	981	248		1944	290		424				408	364
v/s Ratio Prot		c0.07		0.08			c0.11					
v/s Ratio Perm	c0.09				0.02						0.09	0.01
v/c Ratio	0.28	0.47		0.15	0.09		0.43				0.36	0.05
Uniform Delay, d1	12.9	20.0		5.4	14.7		16.1				15.8	14.6
Progression Factor	1.00	1.00		1.00	1.00		1.00				1.00	1.00
Incremental Delay, d2	0.2	1.4		0.0	0.1		0.7				0.5	0.1
Delay (s)	13.1	21.4		5.4	14.8		16.8				16.3	14.6
Level of Service	B	C		A	B		B				B	B
Approach Delay (s)	13.1			10.0			16.6				15.7	
Approach LOS	B			A			B				B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	439	104	270	392	36	23	152	106	58	132	70
Future Volume (vph)	103	439	104	270	392	36	23	152	106	58	132	70
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.96		1.00	1.00		1.00	0.97			1.00	0.63
Flpb, ped/bikes		1.00		1.00	1.00		0.74	1.00			0.99	1.00
Frt		0.98		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3289		1770	3482		1315	1703			1817	998
Flt Permitted		0.79		0.95	1.00		0.56	1.00			0.69	1.00
Satd. Flow (perm)		2610		1770	3482		782	1703			1277	998
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)	107	457	108	281	408	38	24	158	110	60	138	73
RTOR Reduction (vph)	0	18	0	0	8	0	0	28	0	0	0	55
Lane Group Flow (vph)	0	654	0	281	438	0	24	240	0	0	198	18
Confl. Peds. (#/hr)	25		190			25	179		48	48		179
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		25.4		16.6	47.0		18.8	18.8			18.8	18.8
Effective Green, g (s)		25.4		16.6	47.0		18.8	18.8			18.8	18.8
Actuated g/C Ratio		0.34		0.22	0.62		0.25	0.25			0.25	0.25
Clearance Time (s)		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
Lane Grp Cap (vph)		874		387	2159		193	422			316	247
v/s Ratio Prot				c0.16	0.13			0.14				
v/s Ratio Perm		c0.25					0.03				c0.16	0.02
v/c Ratio		0.75		0.73	0.20		0.12	0.57			0.63	0.07
Uniform Delay, d1		22.4		27.5	6.3		22.1	25.0			25.4	21.8
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		3.5		6.6	0.0		0.3	1.8			3.8	0.1
Delay (s)		25.9		34.1	6.3		22.4	26.7			29.2	22.0
Level of Service		C		C	A		C	C			C	C
Approach Delay (s)		25.9			17.1			26.4			27.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	17	14	3	15	27	44	428	6	26	482	192
Future Volume (vph)	85	17	14	3	15	27	44	428	6	26	482	192
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	0.98		1.00	0.96		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.96	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.90		1.00	1.00		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)	1770	1698		1770	1621		1701	3529		1770	3269	
Flt Permitted	0.73	1.00		0.74	1.00		0.37	1.00		0.49	1.00	
Satd. Flow (perm)	1358	1698		1372	1621		656	3529		919	3269	
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)	88	18	14	3	15	28	45	441	6	27	497	198
RTOR Reduction (vph)	0	10	0	0	20	0	0	1	0	0	48	0
Lane Group Flow (vph)	88	22	0	3	23	0	45	446	0	27	647	0
Confl. Peds. (#/hr)			78			47	85		47			85
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.9	14.9		14.9	14.9		24.6	24.6		24.6	24.6	
Effective Green, g (s)	14.9	14.9		14.9	14.9		24.6	24.6		24.6	24.6	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.50	0.50		0.50	0.50	
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)	408	511		412	487		326	1753		456	1624	
v/s Ratio Prot		0.01			0.01			0.13			c0.20	
v/s Ratio Perm	c0.06			0.00			0.07			0.03		
v/c Ratio	0.22	0.04		0.01	0.05		0.14	0.25		0.06	0.40	
Uniform Delay, d1	12.9	12.3		12.1	12.3		6.7	7.2		6.5	7.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.0	0.0		0.2	0.1		0.1	0.2	
Delay (s)	13.2	12.3		12.1	12.3		6.9	7.2		6.5	8.0	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.0			12.3			7.2			7.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	45	61	9	19	27	49	554	15	38	576	109
Future Volume (vph)	176	45	61	9	19	27	49	554	15	38	576	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	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93		1.00	0.93		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	0.90	1.00		0.90	1.00		0.93	1.00		0.93	1.00	
Frt	1.00	0.91		1.00	0.91		1.00	1.00		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)	1590	1579		1595	1582		1641	3509		1649	3327	
Flt Permitted	0.73	1.00		0.69	1.00		0.32	1.00		0.39	1.00	
Satd. Flow (perm)	1215	1579		1151	1582		553	3509		684	3327	
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)	183	47	64	9	20	28	51	577	16	40	600	114
RTOR Reduction (vph)	0	38	0	0	17	0	0	2	0	0	19	0
Lane Group Flow (vph)	183	73	0	9	31	0	51	591	0	40	695	0
Confl. Peds. (#/hr)	121		185	185		121	160		121	121		160
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	22.0		22.0	22.0		21.8	21.8		21.8	21.8	
Effective Green, g (s)	22.0	22.0		22.0	22.0		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.41	0.41		0.41	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	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	496	645		470	646		224	1421		277	1348	
v/s Ratio Prot		0.05			0.02			0.17			c0.21	
v/s Ratio Perm	c0.15			0.01			0.09			0.06		
v/c Ratio	0.37	0.11		0.02	0.05		0.23	0.42		0.14	0.52	
Uniform Delay, d1	11.1	9.9		9.5	9.6		10.5	11.4		10.1	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		0.0	0.0		0.5	0.2		0.2	0.3	
Delay (s)	11.5	9.9		9.5	9.6		11.0	11.6		10.3	12.4	
Level of Service	B	A		A	A		B	B		B	B	
Approach Delay (s)		10.9			9.6			11.6			12.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	43	81	58	70	117	76	276	46	32	377	89
Future Volume (vph)	71	43	81	58	70	117	76	276	46	32	377	89
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	0.97		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	0.98		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	1635		1724	1669		1720	3431		1718	3389	
Flt Permitted	0.64	1.00		0.67	1.00		0.48	1.00		0.55	1.00	
Satd. Flow (perm)	1177	1635		1224	1669		860	3431		993	3389	
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)	74	45	84	60	73	122	79	288	48	33	393	93
RTOR Reduction (vph)	0	57	0	0	76	0	0	16	0	0	25	0
Lane Group Flow (vph)	74	72	0	60	119	0	79	320	0	33	461	0
Confl. Peds. (#/hr)	14		67	67		14	75		63	63		75
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.1	13.1		13.1	13.1		18.2	18.2		18.2	18.2	
Effective Green, g (s)	13.1	13.1		13.1	13.1		18.2	18.2		18.2	18.2	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.44	0.44		0.44	0.44	
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)	373	518		388	529		378	1511		437	1493	
v/s Ratio Prot		0.04			c0.07			0.09			c0.14	
v/s Ratio Perm	0.06			0.05			0.09			0.03		
v/c Ratio	0.20	0.14		0.15	0.23		0.21	0.21		0.08	0.31	
Uniform Delay, d1	10.3	10.1		10.1	10.4		7.1	7.1		6.7	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.2	0.2		0.3	0.1		0.1	0.1	
Delay (s)	10.5	10.2		10.3	10.6		7.4	7.2		6.8	7.6	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		10.3			10.5			7.2			7.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	93	55	102	83	168	63	376	124	149	349	100
Future Volume (vph)	44	93	55	102	83	168	63	376	124	149	349	100
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	0.97		1.00	0.91		1.00	0.95		1.00	0.97	
Flpb, ped/bikes	0.92	1.00		0.94	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	0.94		1.00	0.90		1.00	0.96		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)	1631	1706		1668	1532		1709	3222		1606	3330	
Flt Permitted	0.56	1.00		0.65	1.00		0.46	1.00		0.42	1.00	
Satd. Flow (perm)	957	1706		1149	1532		823	3222		710	3330	
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)	48	102	60	112	91	185	69	413	136	164	384	110
RTOR Reduction (vph)	0	22	0	0	76	0	0	43	0	0	35	0
Lane Group Flow (vph)	48	140	0	112	200	0	69	506	0	164	459	0
Confl. Peds. (#/hr)	200		122	122		200	66		194	194		96
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.0	24.0		24.0	24.0		24.9	24.9		24.9	24.9	
Effective Green, g (s)	24.0	24.0		24.0	24.0		24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.42	0.42		0.42	0.42	
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)	389	695		468	624		347	1362		300	1407	
v/s Ratio Prot		0.08			c0.13			0.16			0.14	
v/s Ratio Perm	0.05			0.10			0.08			c0.23		
v/c Ratio	0.12	0.20		0.24	0.32		0.20	0.37		0.55	0.33	
Uniform Delay, d1	10.9	11.3		11.5	11.9		10.7	11.6		12.8	11.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.3	0.3		0.3	0.2		2.0	0.1	
Delay (s)	11.0	11.4		11.7	12.2		11.0	11.8		14.8	11.5	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.3			12.1			11.7			12.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	13	85	20	40	105	10	78	9	1	164	128
Future Volume (vph)	74	13	85	20	40	105	10	78	9	1	164	128
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1549		1770	1863	1506	1680	1863	1512	1729	1863	1452
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.65	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	1549		1770	1863	1506	1148	1863	1512	1282	1863	1452
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)	77	14	89	21	42	109	10	81	9	1	171	133
RTOR Reduction (vph)	0	61	0	0	0	82	0	0	5	0	0	81
Lane Group Flow (vph)	77	42	0	21	42	27	10	81	4	1	171	52
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	4.7	17.3		1.2	13.8	13.8	21.6	21.6	21.6	21.6	21.6	21.6
Effective Green, g (s)	4.7	17.3		1.2	13.8	13.8	21.6	21.6	21.6	21.6	21.6	21.6
Actuated g/C Ratio	0.09	0.31		0.02	0.25	0.25	0.39	0.39	0.39	0.39	0.39	0.39
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	486		38	466	377	450	730	592	502	730	569
v/s Ratio Prot	c0.04	c0.03		0.01	0.02			0.04			c0.09	
v/s Ratio Perm						0.02	0.01		0.00	0.00		0.04
v/c Ratio	0.51	0.09		0.55	0.09	0.07	0.02	0.11	0.01	0.00	0.23	0.09
Uniform Delay, d1	24.1	13.3		26.7	15.8	15.8	10.3	10.6	10.2	10.2	11.2	10.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1		16.2	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1
Delay (s)	27.1	13.4		42.9	15.9	15.8	10.3	10.7	10.2	10.2	11.4	10.6
Level of Service	C	B		D	B	B	B	B	B	B	B	B
Approach Delay (s)		19.2			19.2			10.6			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	111	82	21	94	207	57	66	1	31	240	165
Future Volume (vph)	96	111	82	21	94	207	57	66	1	31	240	165
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.93		1.00	1.00	0.82	1.00	1.00	0.78	1.00	1.00	0.71
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.82	1.00	1.00	0.81	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1626		1770	1863	1290	1447	1863	1228	1433	1863	1127
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.52	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	1770	1626		1770	1863	1290	797	1863	1228	1076	1863	1127
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)	98	113	84	21	96	211	58	67	1	32	245	168
RTOR Reduction (vph)	0	29	0	0	0	126	0	0	1	0	0	118
Lane Group Flow (vph)	98	168	0	21	96	85	58	67	0	32	245	50
Confl. Peds. (#/hr)	161		147	147		161	177		141	141		177
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	6.5	33.4		1.7	28.6	28.6	21.0	21.0	21.0	21.0	21.0	21.0
Effective Green, g (s)	6.5	33.4		1.7	28.6	28.6	21.0	21.0	21.0	21.0	21.0	21.0
Actuated g/C Ratio	0.09	0.47		0.02	0.40	0.40	0.30	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	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	161	763		42	749	518	235	550	362	317	550	332
v/s Ratio Prot	c0.06	c0.10		0.01	0.05			0.04			c0.13	
v/s Ratio Perm						0.07	0.07		0.00	0.03		0.04
v/c Ratio	0.61	0.22		0.50	0.13	0.16	0.25	0.12	0.00	0.10	0.45	0.15
Uniform Delay, d1	31.1	11.1		34.3	13.4	13.6	19.0	18.3	17.7	18.2	20.3	18.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.1		9.1	0.1	0.1	0.6	0.1	0.0	0.1	0.6	0.2
Delay (s)	37.5	11.3		43.3	13.5	13.7	19.6	18.4	17.7	18.3	20.9	18.7
Level of Service	D	B		D	B	B	B	B	B	B	C	B
Approach Delay (s)		20.0			15.6			18.9			19.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	1418	4	96	1461	161	3	22	34	237	77	156
Future Volume (vph)	180	1418	4	96	1461	161	3	22	34	237	77	156
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	0.84		1.00	0.93	1.00	0.95	
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	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1337		3519	1473	1610	2926	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1337		3519	1473	1610	2926	
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)	189	1493	4	101	1538	169	3	23	36	249	81	164
RTOR Reduction (vph)	0	0	0	0	0	85	0	0	0	0	0	0
Lane Group Flow (vph)	189	1497	0	101	1538	84	0	26	36	169	325	0
Confl. Peds. (#/hr)			13			94			51			73
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)	17.5	52.7		11.5	46.7	46.7		25.2	25.2	25.8	25.8	
Effective Green, g (s)	17.5	52.7		11.5	46.7	46.7		25.2	25.2	25.8	25.8	
Actuated g/C Ratio	0.13	0.39		0.09	0.35	0.35		0.19	0.19	0.19	0.19	
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)	229	1981		150	1756	461		655	274	307	558	
v/s Ratio Prot	c0.11	0.29		0.06	c0.30			0.01		0.10	c0.11	
v/s Ratio Perm						0.06			c0.02			
v/c Ratio	0.83	0.76		0.67	0.88	0.18		0.04	0.13	0.55	0.58	
Uniform Delay, d1	57.4	35.7		60.0	41.5	30.9		45.1	45.9	49.5	49.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.9	1.7		11.3	5.2	0.2		0.0	0.2	2.1	1.6	
Delay (s)	78.3	37.4		71.3	46.8	31.1		45.1	46.1	51.6	51.3	
Level of Service	E	D		E	D	C		D	D	D	D	
Approach Delay (s)		42.0			46.7			45.7			51.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	2129	4	58	1448	210	4	90	93	280	65	235
Future Volume (vph)	228	2129	4	58	1448	210	4	90	93	280	65	235
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	0.80		1.00	0.86	1.00	0.96	
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	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1262		3532	1367	1610	2930	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1262		3532	1367	1610	2930	
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)	240	2241	4	61	1524	221	4	95	98	295	68	247
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	0	0
Lane Group Flow (vph)	240	2245	0	61	1524	111	0	99	98	212	398	0
Confl. Peds. (#/hr)			41			107			94			31
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)	22.0	69.1		6.0	53.1	53.1		35.0	35.0	27.8	27.8	
Effective Green, g (s)	22.0	69.1		6.0	53.1	53.1		35.0	35.0	27.8	27.8	
Actuated g/C Ratio	0.14	0.44		0.04	0.34	0.34		0.22	0.22	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)	246	2224		67	1710	424		782	303	283	515	
v/s Ratio Prot	c0.14	c0.44		0.03	0.30			0.03		0.13	c0.14	
v/s Ratio Perm						0.09			c0.07			
v/c Ratio	0.98	1.01		0.91	0.89	0.26		0.13	0.32	0.75	0.97dr	
Uniform Delay, d1	67.7	44.4		75.7	49.7	38.2		49.2	51.5	61.7	62.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	50.1	21.4		79.0	6.3	0.3		0.1	0.6	10.4	7.1	
Delay (s)	117.8	65.8		154.7	56.0	38.5		49.3	52.1	72.1	69.1	
Level of Service	F	E		F	E	D		D	D	E	E	
Approach Delay (s)		70.8			57.2			50.7			70.2	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	65.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	157.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1584	84	12	1554	0	82	20	13	93	27	123
Future Volume (vph)	70	1584	84	12	1554	0	82	20	13	93	27	123
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	0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.96	1.00
Frt	1.00	0.99		1.00	1.00		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	5034		1770	5085		1770	1713			1724	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.66	1.00			0.75	1.00
Satd. Flow (perm)	1770	5034		1770	5085		1226	1713			1350	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)	72	1633	87	12	1602	0	85	21	13	96	28	127
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	72	1716	0	12	1602	0	85	34	0	0	124	127
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)	8.0	61.6		1.3	54.9		27.0	27.0			27.0	27.0
Effective Green, g (s)	8.0	61.6		1.3	54.9		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.08	0.59		0.01	0.52		0.26	0.26			0.26	0.26
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)	134	2956		21	2661		315	440			347	407
v/s Ratio Prot	c0.04	c0.34		0.01	0.32			0.02				
v/s Ratio Perm							0.07				c0.09	0.08
v/c Ratio	0.54	0.58		0.57	0.60		0.27	0.08			0.36	0.31
Uniform Delay, d1	46.7	13.6		51.5	17.4		31.1	29.5			31.9	31.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.1	0.3		32.5	0.4		0.5	0.1			0.6	0.4
Delay (s)	50.8	13.9		84.0	17.8		31.5	29.6			32.5	31.9
Level of Service	D	B		F	B		C	C			C	C
Approach Delay (s)		15.3			18.3			31.0			32.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.0%	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

02/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	2259	181	33	1492	0	56	34	42	97	59	180
Future Volume (vph)	89	2259	181	33	1492	0	56	34	42	97	59	180
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	1.00		1.00	0.95			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	1.00		1.00	0.92			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	4991		1770	5085		1770	1615			1717	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00			0.76	1.00
Satd. Flow (perm)	1770	4991		1770	5085		983	1615			1342	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)	92	2329	187	34	1538	0	58	35	43	100	61	186
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	92	2511	0	34	1538	0	58	78	0	0	161	186
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)	12.7	95.9		6.4	89.6		33.5	33.5			33.5	33.5
Effective Green, g (s)	12.7	95.9		6.4	89.6		33.5	33.5			33.5	33.5
Actuated g/C Ratio	0.08	0.64		0.04	0.59		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)	149	3173		75	3021		218	358			298	351
v/s Ratio Prot	c0.05	c0.50		0.02	0.30			0.05				
v/s Ratio Perm							0.06				c0.12	0.12
v/c Ratio	0.62	0.79		0.45	0.51		0.27	0.22			0.54	0.53
Uniform Delay, d1	66.7	20.1		70.5	17.8		48.5	47.9			51.8	51.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	7.4	1.4		4.3	0.1		0.7	0.3			2.0	1.4
Delay (s)	74.1	21.5		74.8	17.9		49.1	48.2			53.8	53.2
Level of Service	E	C		E	B		D	D			D	D
Approach Delay (s)		23.4			19.2			48.6			53.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
47: Kamakee St & Halekauwilia St

02/10/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	85	68	179	180	90
Future Volume (Veh/h)	64	85	68	179	180	90
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	89	72	188	189	95
Pedestrians	99			30	74	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	8			3	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				334	243	
pX, platoon unblocked						
vC, conflicting volume	742	271	383			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	271	383			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	83	88	93			
cM capacity (veh/h)	391	769	1075			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	156	72	188	126	158
Volume Left	67	72	0	0	0
Volume Right	89	0	0	0	95
cSH	911	1075	1700	1700	1700
Volume to Capacity	0.17	0.07	0.11	0.07	0.09
Queue Length 95th (ft)	15	5	0	0	0
Control Delay (s)	12.8	8.6	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.8	2.4		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	69	101	239	380	115
Future Volume (Veh/h)	72	69	101	239	380	115
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	79	76	111	263	418	126
Pedestrians	143			12	71	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	12			1	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				342	236	
pX, platoon unblocked						
vC, conflicting volume	1180	427	687			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1180	427	687			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	61	88	86			
cM capacity (veh/h)	201	618	795			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	155	111	263	279	265
Volume Left	79	111	0	0	0
Volume Right	76	0	0	0	126
cSH	394	795	1700	1700	1700
Volume to Capacity	0.39	0.14	0.15	0.16	0.16
Queue Length 95th (ft)	46	12	0	0	0
Control Delay (s)	23.1	10.3	0.0	0.0	0.0
Lane LOS	C	B			
Approach Delay (s)	23.1	3.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

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	AM PEAK Trip Rate per Unit	AM PEAK 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 N West - Phase 5																					
Proposed																					
465	units	222	High-Rise Apartment	4.45	2069	0.31	144	24	0.07	35	76	0.24	109	0.36	167	61	0.22	102	39	0.14	65
8.066	ksf	820	Shopping Center	37.75	304	0.94	8	62	0.58	5	38	0.36	3	3.81	31	48	1.83	15	52	1.98	16
4.034	ksf	932	High-Turnover (Sit-Down) Restaurant (formerly #83	112.18	453	9.94	40	55	5.47	22	45	4.47	18	9.77	39	62	6.06	24	38	3.71	15
	ksf	110	General Light Industrial	6.97	0	0.92	0	88	0.81	0	12	0.11	0	0.97	0	12	0.116	0	88	0.854	0
Block N West - Residential Alt Mode Trip Reduction					**-316**		**-31**			**-7**			**-24**		**-25**			**-16**			**-9**
Block N West Residential					**1753**		**113**			**28**			**85**		**142**			**86**			**56**
Retail SubTotal (no reductions)					757		48			27			21		70			39			31
Block N West - Trip Reduction					-410		-17			-10			-7		-37			-20			-17
Block N West -					-94		14			-3			17		-12			-4			-8
Block N West Retail (to Block H					**663**		**62**			**24**			**38**		**58**			**35**			**23**
Block N West Total					**2416**		**175**			**52**			**123**		**200**			**121**			**79**

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2030 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	186	36	59	326	57	49	459	82	66	654	198
Future Volume (vph)	62	186	36	59	326	57	49	459	82	66	654	198
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.98	1.00	0.97		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.92	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1759	1863	1404	1632	1863	1548	1770	3367		1770	3374	
Flt Permitted	0.39	1.00	1.00	0.61	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	717	1863	1404	1052	1863	1548	1770	3367		1770	3374	
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)	65	196	38	62	343	60	52	483	86	69	688	208
RTOR Reduction (vph)	0	0	27	0	0	42	0	17	0	0	32	0
Lane Group Flow (vph)	65	196	11	62	343	18	52	552	0	69	864	0
Confl. Peds. (#/hr)	15		146	146		15			144			30
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	19.7	19.7	19.7	19.7	19.7	19.7	3.4	25.5		6.0	28.1	
Effective Green, g (s)	19.7	19.7	19.7	19.7	19.7	19.7	3.4	25.5		6.0	28.1	
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.05	0.39		0.09	0.42	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213	554	417	313	554	460	90	1296		160	1432	
v/s Ratio Prot		0.11			c0.18		0.03	0.16		c0.04	c0.26	
v/s Ratio Perm	0.09		0.01	0.06		0.01						
v/c Ratio	0.31	0.35	0.03	0.20	0.62	0.04	0.58	0.43		0.43	0.60	
Uniform Delay, d1	18.0	18.3	16.5	17.4	20.0	16.5	30.7	15.0		28.5	14.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4	0.0	0.3	2.1	0.0	8.7	0.2		1.9	0.7	
Delay (s)	18.8	18.6	16.5	17.7	22.1	16.6	39.4	15.2		30.3	15.5	
Level of Service	B	B	B	B	C	B	D	B		C	B	
Approach Delay (s)		18.4			20.8			17.2			16.5	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.2	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 Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	219	39	112	276	21	25	119	91	30	111	73
Future Volume (vph)	28	219	39	112	276	21	25	119	91	30	111	73
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.99		1.00	1.00		1.00	0.99			1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00		0.96	1.00			1.00	1.00
Frt		0.98		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3420		1770	3496		1693	1730			1842	1482
Flt Permitted		0.90		0.95	1.00		0.66	1.00			0.89	1.00
Satd. Flow (perm)		3097		1770	3496		1183	1730			1662	1482
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)	29	228	41	117	288	22	26	124	95	31	116	76
RTOR Reduction (vph)	0	14	0	0	6	0	0	35	0	0	0	57
Lane Group Flow (vph)	0	284	0	117	304	0	26	184	0	0	147	19
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		16.1		7.1	28.2		12.4	12.4			12.4	12.4
Effective Green, g (s)		16.1		7.1	28.2		12.4	12.4			12.4	12.4
Actuated g/C Ratio		0.32		0.14	0.56		0.25	0.25			0.25	0.25
Clearance Time (s)		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
Lane Grp Cap (vph)		985		248	1948		289	423			407	363
v/s Ratio Prot				c0.07	0.09			c0.11				
v/s Ratio Perm		c0.09					0.02				0.09	0.01
v/c Ratio		0.29		0.47	0.16		0.09	0.43			0.36	0.05
Uniform Delay, d1		12.9		20.0	5.4		14.7	16.1			15.8	14.6
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		0.2		1.4	0.0		0.1	0.7			0.5	0.1
Delay (s)		13.1		21.4	5.5		14.9	16.9			16.4	14.7
Level of Service		B		C	A		B	B			B	B
Approach Delay (s)		13.1			9.8			16.6			15.8	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	17	14	3	15	27	44	461	6	26	512	192
Future Volume (vph)	85	17	14	3	15	27	44	461	6	26	512	192
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	0.98		1.00	0.96		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.96	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.90		1.00	1.00		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)	1770	1698		1770	1620		1704	3530		1770	3279	
Flt Permitted	0.73	1.00		0.74	1.00		0.35	1.00		0.48	1.00	
Satd. Flow (perm)	1358	1698		1372	1620		628	3530		889	3279	
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)	88	18	14	3	15	28	45	475	6	27	528	198
RTOR Reduction (vph)	0	10	0	0	20	0	0	1	0	0	45	0
Lane Group Flow (vph)	88	22	0	3	23	0	45	480	0	27	681	0
Confl. Peds. (#/hr)			78			47	85		47			85
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.9	14.9		14.9	14.9		25.4	25.4		25.4	25.4	
Effective Green, g (s)	14.9	14.9		14.9	14.9		25.4	25.4		25.4	25.4	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.50	0.50		0.50	0.50	
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)	402	502		406	479		317	1782		448	1655	
v/s Ratio Prot		0.01			0.01			0.14			c0.21	
v/s Ratio Perm	c0.06			0.00			0.07			0.03		
v/c Ratio	0.22	0.04		0.01	0.05		0.14	0.27		0.06	0.41	
Uniform Delay, d1	13.3	12.6		12.5	12.6		6.6	7.1		6.4	7.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.0	0.0		0.2	0.1		0.1	0.2	
Delay (s)	13.6	12.7		12.5	12.7		6.8	7.2		6.4	7.9	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.3			12.7			7.2			7.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	50	103	58	73	117	77	287	46	32	394	99
Future Volume (vph)	94	50	103	58	73	117	77	287	46	32	394	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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	0.98		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	1627		1726	1672		1721	3434		1719	3381	
Flt Permitted	0.63	1.00		0.66	1.00		0.46	1.00		0.54	1.00	
Satd. Flow (perm)	1174	1627		1192	1672		839	3434		983	3381	
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)	98	52	107	60	76	122	80	299	48	33	410	103
RTOR Reduction (vph)	0	77	0	0	78	0	0	14	0	0	25	0
Lane Group Flow (vph)	98	82	0	60	120	0	80	333	0	33	488	0
Confl. Peds. (#/hr)	14		67	67		14	75		63	63		75
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.7	11.7		11.7	11.7		19.7	19.7		19.7	19.7	
Effective Green, g (s)	11.7	11.7		11.7	11.7		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		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)	331	459		336	472		399	1634		467	1608	
v/s Ratio Prot		0.05			0.07			0.10			c0.14	
v/s Ratio Perm	c0.08			0.05			0.10			0.03		
v/c Ratio	0.30	0.18		0.18	0.25		0.20	0.20		0.07	0.30	
Uniform Delay, d1	11.6	11.2		11.2	11.5		6.3	6.3		5.9	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.3	0.3		0.2	0.1		0.1	0.1	
Delay (s)	12.1	11.4		11.5	11.8		6.5	6.4		5.9	6.8	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		11.7			11.7			6.4			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	13	85	20	40	105	10	78	9	1	164	131
Future Volume (vph)	74	13	85	20	40	105	10	78	9	1	164	131
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1549		1770	1863	1506	1680	1863	1512	1729	1863	1452
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.65	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	1549		1770	1863	1506	1148	1863	1512	1282	1863	1452
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)	77	14	89	21	42	109	10	81	9	1	171	136
RTOR Reduction (vph)	0	61	0	0	0	82	0	0	5	0	0	83
Lane Group Flow (vph)	77	42	0	21	42	27	10	81	4	1	171	53
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	4.7	17.3		1.2	13.8	13.8	21.6	21.6	21.6	21.6	21.6	21.6
Effective Green, g (s)	4.7	17.3		1.2	13.8	13.8	21.6	21.6	21.6	21.6	21.6	21.6
Actuated g/C Ratio	0.09	0.31		0.02	0.25	0.25	0.39	0.39	0.39	0.39	0.39	0.39
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	486		38	466	377	450	730	592	502	730	569
v/s Ratio Prot	c0.04	c0.03		0.01	0.02			0.04			c0.09	
v/s Ratio Perm						0.02	0.01		0.00	0.00		0.04
v/c Ratio	0.51	0.09		0.55	0.09	0.07	0.02	0.11	0.01	0.00	0.23	0.09
Uniform Delay, d1	24.1	13.3		26.7	15.8	15.8	10.3	10.6	10.2	10.2	11.2	10.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1		16.2	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1
Delay (s)	27.1	13.4		42.9	15.9	15.8	10.3	10.7	10.2	10.2	11.4	10.6
Level of Service	C	B		D	B	B	B	B	B	B	B	B
Approach Delay (s)		19.2			19.2			10.6			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	1503	4	96	1526	188	3	22	34	266	77	162
Future Volume (vph)	188	1503	4	96	1526	188	3	22	34	266	77	162
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	0.84		1.00	0.93	1.00	0.95	
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	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1335		3519	1466	1610	2933	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1335		3519	1466	1610	2933	
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)	198	1582	4	101	1606	198	3	23	36	280	81	171
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	0	0	0	0
Lane Group Flow (vph)	198	1586	0	101	1606	103	0	26	36	182	350	0
Confl. Peds. (#/hr)			13			94			51			73
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)	17.8	54.8		11.3	48.3	48.3		24.2	24.2	26.0	26.0	
Effective Green, g (s)	17.8	54.8		11.3	48.3	48.3		24.2	24.2	26.0	26.0	
Actuated g/C Ratio	0.13	0.40		0.08	0.35	0.35		0.18	0.18	0.19	0.19	
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)	231	2043		146	1801	473		624	260	307	559	
v/s Ratio Prot	c0.11	0.31		0.06	c0.32			0.01		0.11	c0.12	
v/s Ratio Perm						0.08			c0.02			
v/c Ratio	0.86	0.78		0.69	0.89	0.22		0.04	0.14	0.59	0.63	
Uniform Delay, d1	58.0	35.4		60.8	41.5	30.8		46.4	47.3	50.3	50.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	25.5	1.9		13.2	6.0	0.2		0.0	0.2	3.1	2.2	
Delay (s)	83.5	37.3		74.0	47.6	31.0		46.5	47.5	53.4	52.9	
Level of Service	F	D		E	D	C		D	D	D	D	
Approach Delay (s)		42.5			47.3			47.1			53.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	136.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1673	84	12	1644	0	82	20	13	93	27	123
Future Volume (vph)	70	1673	84	12	1644	0	82	20	13	93	27	123
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			0.96	1.00
Frt	1.00	0.99		1.00	1.00		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	5036		1770	5085		1770	1712			1721	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.65	1.00			0.75	1.00
Satd. Flow (perm)	1770	5036		1770	5085		1210	1712			1344	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)	72	1725	87	12	1695	0	85	21	13	96	28	127
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	72	1809	0	12	1695	0	85	34	0	0	124	127
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)	8.2	65.2		2.3	59.3		27.0	27.0			27.0	27.0
Effective Green, g (s)	8.2	65.2		2.3	59.3		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.07	0.60		0.02	0.54		0.25	0.25			0.25	0.25
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	2998		37	2753		298	422			331	390
v/s Ratio Prot	c0.04	c0.36		0.01	0.33			0.02				
v/s Ratio Perm							0.07				c0.09	0.08
v/c Ratio	0.55	0.60		0.32	0.62		0.29	0.08			0.37	0.33
Uniform Delay, d1	48.9	14.0		52.8	17.3		33.4	31.7			34.2	33.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.5	0.3		5.1	0.4		0.5	0.1			0.7	0.5
Delay (s)	53.4	14.3		57.9	17.7		34.0	31.8			35.0	34.3
Level of Service	D	B		E	B		C	C			C	C
Approach Delay (s)		15.8			18.0			33.3			34.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
47: Kamakee St & Halekauwilia St

04/23/2025

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	85	68	179	183	90
Future Volume (Veh/h)	64	85	68	179	183	90
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	89	72	188	193	95
Pedestrians	99			30	74	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	8			3	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				334	243	
pX, platoon unblocked						
vC, conflicting volume	746	273	387			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746	273	387			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	83	88	93			
cM capacity (veh/h)	389	767	1072			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	156	72	188	129	159
Volume Left	67	72	0	0	0
Volume Right	89	0	0	0	95
cSH	906	1072	1700	1700	1700
Volume to Capacity	0.17	0.07	0.11	0.08	0.09
Queue Length 95th (ft)	15	5	0	0	0
Control Delay (s)	12.8	8.6	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.8	2.4		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	396	72	79	300	92	51	675	113	144	655	90
Future Volume (vph)	82	396	72	79	300	92	51	675	113	144	655	90
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.88	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.94	1.00	1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1655	1863	1378	1676	1863	1386	1770	3265		1770	3438	
Flt Permitted	0.39	1.00	1.00	0.24	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	682	1863	1378	427	1863	1386	1770	3265		1770	3438	
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)	86	417	76	83	316	97	54	711	119	152	689	95
RTOR Reduction (vph)	0	0	54	0	0	69	0	14	0	0	11	0
Lane Group Flow (vph)	86	417	22	83	316	28	54	816	0	152	773	0
Confl. Peds. (#/hr)	136		142	142		136			294			52
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	22.5	22.5	22.5	22.5	22.5	22.5	3.7	30.0		11.4	37.7	
Effective Green, g (s)	22.5	22.5	22.5	22.5	22.5	22.5	3.7	30.0		11.4	37.7	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.38		0.14	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	531	392	121	531	395	83	1241		255	1642	
v/s Ratio Prot		c0.22			0.17		0.03	c0.25		c0.09	0.22	
v/s Ratio Perm	0.13		0.02	0.19		0.02						
v/c Ratio	0.44	0.79	0.06	0.69	0.60	0.07	0.65	0.66		0.60	0.47	
Uniform Delay, d1	23.1	26.0	20.5	25.1	24.3	20.6	37.0	20.2		31.6	13.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	7.5	0.1	14.9	1.8	0.1	16.8	1.3		3.7	0.2	
Delay (s)	24.7	33.5	20.5	40.0	26.1	20.6	53.7	21.5		35.3	14.1	
Level of Service	C	C	C	D	C	C	D	C		D	B	
Approach Delay (s)		30.5			27.3			23.4			17.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	458	104	270	417	36	23	158	106	58	140	70
Future Volume (vph)	103	458	104	270	417	36	23	158	106	58	140	70
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.96		1.00	1.00		1.00	0.97			1.00	0.62
Flpb, ped/bikes		1.00		1.00	1.00		0.75	1.00			0.99	1.00
Frt		0.98		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3294		1770	3485		1319	1706			1819	988
Flt Permitted		0.78		0.95	1.00		0.55	1.00			0.67	1.00
Satd. Flow (perm)		2602		1770	3485		758	1706			1245	988
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)	107	477	108	281	434	38	24	165	110	60	146	73
RTOR Reduction (vph)	0	18	0	0	8	0	0	26	0	0	0	55
Lane Group Flow (vph)	0	674	0	281	464	0	24	249	0	0	206	18
Confl. Peds. (#/hr)	25		190			25	179		48	48		179
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		26.5		16.6	48.1		19.0	19.0			19.0	19.0
Effective Green, g (s)		26.5		16.6	48.1		19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.34	0.22	0.62	0.25	0.25						0.25	0.25
Clearance Time (s)	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
Lane Grp Cap (vph)	894	381	2174	186	420						306	243
v/s Ratio Prot		c0.16	0.13		0.15							
v/s Ratio Perm	c0.26			0.03							c0.17	0.02
v/c Ratio	0.75	0.74	0.21	0.13	0.59						0.67	0.07
Uniform Delay, d1	22.4	28.2	6.3	22.6	25.6						26.2	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2	3.6	7.3	0.0	0.3	2.2						5.7	0.1
Delay (s)	26.1	35.5	6.3	22.9	27.9						32.0	22.4
Level of Service	C	D	A	C	C						C	C
Approach Delay (s)	26.1		17.2		27.5						29.5	
Approach LOS	C		B		C						C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	77.1	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			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	45	61	9	19	27	49	596	15	38	624	109
Future Volume (vph)	176	45	61	9	19	27	49	596	15	38	624	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	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93		1.00	0.93		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	0.90	1.00		0.90	1.00		0.93	1.00		0.94	1.00	
Frt	1.00	0.91		1.00	0.91		1.00	1.00		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)	1587	1578		1593	1581		1650	3511		1656	3339	
Flt Permitted	0.73	1.00		0.69	1.00		0.29	1.00		0.37	1.00	
Satd. Flow (perm)	1212	1578		1149	1581		512	3511		641	3339	
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)	183	47	64	9	20	28	51	621	16	40	650	114
RTOR Reduction (vph)	0	38	0	0	17	0	0	2	0	0	18	0
Lane Group Flow (vph)	183	73	0	9	31	0	51	635	0	40	746	0
Confl. Peds. (#/hr)	121		185	185		121	160		121	121		160
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.0	22.0		22.0	22.0		22.7	22.7		22.7	22.7	
Effective Green, g (s)	22.0	22.0		22.0	22.0		22.7	22.7		22.7	22.7	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		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	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	487	634		462	635		212	1457		266	1385	
v/s Ratio Prot		0.05			0.02			0.18			c0.22	
v/s Ratio Perm	c0.15			0.01			0.10			0.06		
v/c Ratio	0.38	0.11		0.02	0.05		0.24	0.44		0.15	0.54	
Uniform Delay, d1	11.5	10.2		9.9	10.0		10.4	11.4		10.0	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		0.0	0.0		0.6	0.2		0.3	0.4	
Delay (s)	12.0	10.3		9.9	10.0		11.0	11.6		10.2	12.5	
Level of Service	B	B		A	B		B	B		B	B	
Approach Delay (s)		11.4			10.0			11.6			12.4	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	54.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	99	75	102	91	168	114	392	124	149	364	127
Future Volume (vph)	44	99	75	102	91	168	114	392	124	149	364	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	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	0.96		1.00	0.92		1.00	0.95		1.00	0.97	
Flpb, ped/bikes	0.92	1.00		0.94	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	0.94		1.00	0.90		1.00	0.96		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)	1633	1681		1672	1542		1713	3231		1610	3296	
Flt Permitted	0.55	1.00		0.64	1.00		0.43	1.00		0.41	1.00	
Satd. Flow (perm)	938	1681		1122	1542		768	3231		692	3296	
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)	48	109	82	112	100	185	125	431	136	164	400	140
RTOR Reduction (vph)	0	28	0	0	68	0	0	41	0	0	48	0
Lane Group Flow (vph)	48	163	0	112	217	0	125	526	0	164	492	0
Confl. Peds. (#/hr)	200		122	122		200	66		194	194		96
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.0	24.0		24.0	24.0		25.1	25.1		25.1	25.1	
Effective Green, g (s)	24.0	24.0		24.0	24.0		25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.42	0.42		0.42	0.42	
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)	380	682		455	626		326	1372		293	1399	
v/s Ratio Prot		0.10			c0.14			0.16			0.15	
v/s Ratio Perm	0.05			0.10			0.16			c0.24		
v/c Ratio	0.13	0.24		0.25	0.35		0.38	0.38		0.56	0.35	
Uniform Delay, d1	11.0	11.5		11.6	12.1		11.7	11.7		12.8	11.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.3		0.8	0.2		2.3	0.2	
Delay (s)	11.1	11.7		11.9	12.5		12.4	11.9		15.1	11.7	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.6			12.3			12.0			12.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	146	82	21	109	192	42	81	1	31	240	173
Future Volume (vph)	102	146	82	21	109	192	42	81	1	31	240	173
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.81	1.00	1.00	0.77	1.00	1.00	0.71
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.81	1.00	1.00	0.81	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1863	1285	1435	1863	1220	1433	1863	1118
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.55	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1863	1285	834	1863	1220	1060	1863	1118
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)	104	149	84	21	111	196	43	83	1	32	245	177
RTOR Reduction (vph)	0	25	0	0	0	130	0	0	1	0	0	114
Lane Group Flow (vph)	104	208	0	21	111	66	43	83	0	32	245	63
Confl. Peds. (#/hr)	161		147	147		161	177		141	141		177
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	7.1	30.0		1.7	24.6	24.6	26.0	26.0	26.0	26.0	26.0	26.0
Effective Green, g (s)	7.1	30.0		1.7	24.6	24.6	26.0	26.0	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.10	0.41		0.02	0.34	0.34	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	684		41	630	434	298	666	436	379	666	399
v/s Ratio Prot	c0.06	c0.13		0.01	0.06			0.04			c0.13	
v/s Ratio Perm						0.05	0.05		0.00	0.03		0.06
v/c Ratio	0.60	0.30		0.51	0.18	0.15	0.14	0.12	0.00	0.08	0.37	0.16
Uniform Delay, d1	31.5	14.3		35.1	16.9	16.8	15.8	15.7	15.0	15.5	17.3	15.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	0.3		10.4	0.1	0.2	0.2	0.1	0.0	0.1	0.3	0.2
Delay (s)	37.3	14.6		45.5	17.1	16.9	16.0	15.8	15.0	15.6	17.6	16.1
Level of Service	D	B		D	B	B	B	B	B	B	B	B
Approach Delay (s)		21.6			18.8			15.9			16.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	72.7	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 Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	237	2244	4	58	1512	268	4	90	93	311	65	245
Future Volume (vph)	237	2244	4	58	1512	268	4	90	93	311	65	245
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	0.80		1.00	0.86	1.00	0.96	
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	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1261		3532	1355	1610	2936	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1261		3532	1355	1610	2936	
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)	249	2362	4	61	1592	282	4	95	98	327	68	258
RTOR Reduction (vph)	0	0	0	0	0	134	0	0	0	0	0	0
Lane Group Flow (vph)	249	2366	0	61	1592	148	0	99	98	226	427	0
Confl. Peds. (#/hr)			41			107			94			31
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)	23.0	71.0		6.0	54.0	54.0		33.0	33.0	28.1	28.1	
Effective Green, g (s)	23.0	71.0		6.0	54.0	54.0		33.0	33.0	28.1	28.1	
Actuated g/C Ratio	0.15	0.45		0.04	0.34	0.34		0.21	0.21	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)	257	2282		67	1736	430		737	282	286	521	
v/s Ratio Prot	c0.14	c0.47		0.03	0.31			0.03		0.14	c0.15	
v/s Ratio Perm						0.12			c0.07			
v/c Ratio	0.97	1.04		0.91	0.92	0.34		0.13	0.35	0.79	1.00dr	
Uniform Delay, d1	67.2	43.5		75.8	49.9	38.8		50.9	53.4	62.2	62.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	46.9	29.2		79.0	8.1	0.5		0.1	0.7	13.8	9.8	
Delay (s)	114.1	72.7		154.8	58.0	39.3		51.0	54.1	76.0	72.3	
Level of Service	F	E		F	E	D		D	D	E	E	
Approach Delay (s)		76.7			58.3			52.6			73.6	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	68.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	158.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	2380	181	33	1608	0	56	34	42	97	59	180
Future Volume (vph)	89	2380	181	33	1608	0	56	34	42	97	59	180
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	1.00		1.00	0.94			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	1.00		1.00	0.92			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	4995		1770	5085		1770	1614			1716	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00			0.76	1.00
Satd. Flow (perm)	1770	4995		1770	5085		974	1614			1337	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)	92	2454	187	34	1658	0	58	35	43	100	61	186
RTOR Reduction (vph)	0	5	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	92	2636	0	34	1658	0	58	50	0	0	161	186
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)	12.5	98.3		6.0	91.8		33.3	33.3			33.3	33.3
Effective Green, g (s)	12.5	98.3		6.0	91.8		33.3	33.3			33.3	33.3
Actuated g/C Ratio	0.08	0.64		0.04	0.60		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)	144	3217		69	3058		212	352			291	345
v/s Ratio Prot	c0.05	c0.53		0.02	0.33			0.03				
v/s Ratio Perm							0.06				c0.12	0.12
v/c Ratio	0.64	0.82		0.49	0.54		0.27	0.14			0.55	0.54
Uniform Delay, d1	67.9	20.5		71.8	18.0		49.6	48.1			53.0	52.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.0	1.7		5.4	0.2		0.7	0.2			2.3	1.6
Delay (s)	76.8	22.2		77.3	18.2		50.3	48.3			55.3	54.5
Level of Service	E	C		E	B		D	D			E	D
Approach Delay (s)		24.0			19.4			49.2			54.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	152.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
47: Kamakee St & Halekauwilia St

04/23/2025

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	69	101	239	388	115
Future Volume (Veh/h)	72	69	101	239	388	115
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	79	76	111	263	426	126
Pedestrians	143			12	71	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	12			1	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				342	236	
pX, platoon unblocked						
vC, conflicting volume	1188	431	695			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1188	431	695			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	60	88	86			
cM capacity (veh/h)	199	615	790			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	155	111	263	284	268
Volume Left	79	111	0	0	0
Volume Right	76	0	0	0	126
cSH	390	790	1700	1700	1700
Volume to Capacity	0.40	0.14	0.15	0.17	0.16
Queue Length 95th (ft)	47	12	0	0	0
Control Delay (s)	23.4	10.3	0.0	0.0	0.0
Lane LOS	C	B			
Approach Delay (s)	23.4	3.1		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2030 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	186	38	59	326	57	52	495	82	66	671	198
Future Volume (vph)	62	186	38	59	326	57	52	495	82	66	671	198
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.98	1.00	0.97		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.92	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1759	1863	1403	1631	1863	1548	1770	3377		1770	3377	
Flt Permitted	0.39	1.00	1.00	0.61	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	715	1863	1403	1050	1863	1548	1770	3377		1770	3377	
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)	65	196	40	62	343	60	55	521	86	69	706	208
RTOR Reduction (vph)	0	0	28	0	0	42	0	15	0	0	30	0
Lane Group Flow (vph)	65	196	12	62	343	18	55	592	0	69	884	0
Confl. Peds. (#/hr)	15		146	146		15			144			30
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8	19.8	3.4	25.8		6.0	28.4	
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8	19.8	3.4	25.8		6.0	28.4	
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.05	0.39		0.09	0.43	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	553	417	312	553	460	90	1308		159	1440	
v/s Ratio Prot		0.11			c0.18		0.03	0.18		c0.04	c0.26	
v/s Ratio Perm	0.09		0.01	0.06		0.01						
v/c Ratio	0.31	0.35	0.03	0.20	0.62	0.04	0.61	0.45		0.43	0.61	
Uniform Delay, d1	18.1	18.4	16.6	17.5	20.2	16.6	31.0	15.2		28.7	14.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4	0.0	0.3	2.2	0.0	11.7	0.2		1.9	0.8	
Delay (s)	18.9	18.8	16.6	17.8	22.3	16.7	42.6	15.4		30.6	15.6	
Level of Service	B	B	B	B	C	B	D	B		C	B	
Approach Delay (s)		18.5			21.0			17.7			16.7	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.6	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			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	219	39	122	276	21	25	119	114	30	111	73
Future Volume (vph)	28	219	39	122	276	21	25	119	114	30	111	73
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.99		1.00	1.00		1.00	0.99			1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00		0.96	1.00			1.00	1.00
Frt		0.98		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3420		1770	3496		1693	1713			1842	1482
Flt Permitted		0.90		0.95	1.00		0.66	1.00			0.90	1.00
Satd. Flow (perm)		3076		1770	3496		1183	1713			1673	1482
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)	29	228	41	127	288	22	26	124	119	31	116	76
RTOR Reduction (vph)	0	16	0	0	7	0	0	40	0	0	0	53
Lane Group Flow (vph)	0	282	0	127	303	0	26	203	0	0	147	23
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		12.6		7.6	25.2		15.5	15.5			15.5	15.5
Effective Green, g (s)		12.6		7.6	25.2		15.5	15.5			15.5	15.5
Actuated g/C Ratio	0.25		0.15	0.50		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
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)	764		265	1737		361	523				511	453
v/s Ratio Prot			c0.07	0.09			c0.12					
v/s Ratio Perm	c0.09					0.02					0.09	0.02
v/c Ratio	0.37		0.48	0.17		0.07	0.39				0.29	0.05
Uniform Delay, d1	15.8		19.7	7.0		12.5	13.9				13.4	12.4
Progression Factor	1.00		1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2	0.3		1.4	0.0		0.1	0.5				0.3	0.0
Delay (s)	16.1		21.1	7.1		12.6	14.3				13.7	12.5
Level of Service	B		C	A		B	B				B	B
Approach Delay (s)	16.1			11.1			14.2				13.3	
Approach LOS	B			B			B				B	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	50.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	17	14	16	41	66	44	461	22	44	512	192
Future Volume (vph)	85	17	14	16	41	66	44	461	22	44	512	192
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	0.98		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		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)	1770	1702		1770	1638		1711	3504		1770	3292	
Flt Permitted	0.69	1.00		0.74	1.00		0.36	1.00		0.47	1.00	
Satd. Flow (perm)	1278	1702		1372	1638		654	3504		875	3292	
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)	88	18	14	16	42	68	45	475	23	45	528	198
RTOR Reduction (vph)	0	10	0	0	50	0	0	4	0	0	44	0
Lane Group Flow (vph)	88	22	0	16	60	0	45	494	0	45	682	0
Confl. Peds. (#/hr)			78			47	85		47			85
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.3	11.3		11.3	11.3		22.3	22.3		22.3	22.3	
Effective Green, g (s)	11.3	11.3		11.3	11.3		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.51	0.51		0.51	0.51	
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)	331	441		355	424		334	1792		447	1683	
v/s Ratio Prot		0.01			0.04			0.14			c0.21	
v/s Ratio Perm	c0.07			0.01			0.07			0.05		
v/c Ratio	0.27	0.05		0.05	0.14		0.13	0.28		0.10	0.41	
Uniform Delay, d1	12.8	12.1		12.1	12.4		5.6	6.1		5.5	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.0		0.1	0.2		0.2	0.1		0.1	0.2	
Delay (s)	13.3	12.2		12.2	12.6		5.8	6.1		5.6	6.7	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.0			12.5			6.1			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Pohukaina St/Auahi St 04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	50	103	58	73	117	77	301	46	32	403	103
Future Volume (vph)	96	50	103	58	73	117	77	301	46	32	403	103
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	0.97		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	0.98		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	1627		1726	1671		1722	3439		1720	3380	
Flt Permitted	0.63	1.00		0.66	1.00		0.46	1.00		0.54	1.00	
Satd. Flow (perm)	1174	1627		1192	1671		828	3439		970	3380	
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)	100	52	107	60	76	122	80	314	48	33	420	107
RTOR Reduction (vph)	0	77	0	0	78	0	0	14	0	0	25	0
Lane Group Flow (vph)	100	82	0	60	120	0	80	348	0	33	502	0
Confl. Peds. (#/hr)	14		67	67		14	75		63	63		75
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.7	11.7		11.7	11.7		19.8	19.8		19.8	19.8	
Effective Green, g (s)	11.7	11.7		11.7	11.7		19.8	19.8		19.8	19.8	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		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)	330	458		336	471		395	1640		462	1612	
v/s Ratio Prot		0.05			0.07			0.10			c0.15	
v/s Ratio Perm	c0.09			0.05			0.10			0.03		
v/c Ratio	0.30	0.18		0.18	0.25		0.20	0.21		0.07	0.31	
Uniform Delay, d1	11.7	11.3		11.3	11.5		6.3	6.3		5.9	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.3	0.3		0.3	0.1		0.1	0.1	
Delay (s)	12.2	11.5		11.5	11.8		6.5	6.4		5.9	6.8	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		11.8			11.7			6.4			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	41.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St 04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	13	85	20	40	105	10	78	9	1	187	131
Future Volume (vph)	74	13	85	20	40	105	10	78	9	1	187	131
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1549		1770	1863	1506	1683	1863	1512	1729	1863	1452
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.64	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	1549		1770	1863	1506	1125	1863	1512	1282	1863	1452
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)	77	14	89	21	42	109	10	81	9	1	195	136
RTOR Reduction (vph)	0	61	0	0	0	82	0	0	5	0	0	82
Lane Group Flow (vph)	77	42	0	21	42	27	10	81	4	1	195	54
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	4.6	17.1		1.2	13.7	13.7	21.9	21.9	21.9	21.9	21.9	21.9
Effective Green, g (s)	4.6	17.1		1.2	13.7	13.7	21.9	21.9	21.9	21.9	21.9	21.9
Actuated g/C Ratio	0.08	0.31		0.02	0.25	0.25	0.40	0.40	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	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	147	479		38	462	373	446	739	599	508	739	576
v/s Ratio Prot	c0.04	c0.03		0.01	0.02			0.04			c0.10	
v/s Ratio Perm						0.02	0.01		0.00	0.00		0.04
v/c Ratio	0.52	0.09		0.55	0.09	0.07	0.02	0.11	0.01	0.00	0.26	0.09
Uniform Delay, d1	24.3	13.5		26.7	16.0	15.9	10.1	10.5	10.1	10.1	11.2	10.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.1		16.2	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1
Delay (s)	27.6	13.6		43.0	16.0	16.0	10.2	10.6	10.1	10.1	11.4	10.5
Level of Service	C	B		D	B	B	B	B	B	B	B	B
Approach Delay (s)		19.6			19.3			10.5			11.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	1503	4	96	1526	198	3	22	34	266	77	171
Future Volume (vph)	192	1503	4	96	1526	198	3	22	34	266	77	171
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	0.84		1.00	0.93	1.00	0.94	
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	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1335		3519	1466	1610	2918	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1335		3519	1466	1610	2918	
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)	202	1582	4	101	1606	208	3	23	36	280	81	180
RTOR Reduction (vph)	0	0	0	0	0	100	0	0	0	0	0	0
Lane Group Flow (vph)	202	1586	0	101	1606	108	0	26	36	188	353	0
Confl. Peds. (#/hr)			13			94			51			73
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)	17.8	54.8		11.3	48.3	48.3		24.2	24.2	26.0	26.0	
Effective Green, g (s)	17.8	54.8		11.3	48.3	48.3		24.2	24.2	26.0	26.0	
Actuated g/C Ratio	0.13	0.40		0.08	0.35	0.35		0.18	0.18	0.19	0.19	
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)	231	2043		146	1801	473		624	260	307	556	
v/s Ratio Prot	c0.11	0.31		0.06	c0.32			0.01		0.12	c0.12	
v/s Ratio Perm						0.08			c0.02			
v/c Ratio	0.87	0.78		0.69	0.89	0.23		0.04	0.14	0.61	0.63	
Uniform Delay, d1	58.2	35.4		60.8	41.5	30.9		46.4	47.3	50.5	50.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.6	1.9		13.2	6.0	0.2		0.0	0.2	3.6	2.4	
Delay (s)	86.7	37.3		74.0	47.6	31.2		46.5	47.5	54.1	53.2	
Level of Service	F	D		E	D	C		D	D	D	D	
Approach Delay (s)		42.9			47.2			47.1			53.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	136.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	1673	84	12	1654	0	82	20	13	116	27	123
Future Volume (vph)	70	1673	84	12	1654	0	82	20	13	116	27	123
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			0.96	1.00
Frt	1.00	0.99		1.00	1.00		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	5036		1770	5085		1770	1712			1714	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.61	1.00			0.74	1.00
Satd. Flow (perm)	1770	5036		1770	5085		1128	1712			1326	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)	72	1725	87	12	1705	0	85	21	13	120	28	127
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	72	1809	0	12	1705	0	85	34	0	0	148	127
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)	8.2	65.0		2.3	59.1		27.4	27.4			27.4	27.4
Effective Green, g (s)	8.2	65.0		2.3	59.1		27.4	27.4			27.4	27.4
Actuated g/C Ratio	0.07	0.59		0.02	0.54		0.25	0.25			0.25	0.25
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	2983		37	2739		281	427			331	395
v/s Ratio Prot	c0.04	c0.36		0.01	0.34			0.02				
v/s Ratio Perm							0.08				c0.11	0.08
v/c Ratio	0.55	0.61		0.32	0.62		0.30	0.08			0.45	0.32
Uniform Delay, d1	49.0	14.2		52.9	17.6		33.4	31.5			34.8	33.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.5	0.4		5.1	0.4		0.6	0.1			1.0	0.5
Delay (s)	53.5	14.6		58.0	18.0		34.0	31.6			35.7	34.0
Level of Service	D	B		E	B		C	C			D	C
Approach Delay (s)		16.1			18.3			33.3			34.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
47: Kamakee St & Halekauwilia St

04/23/2025

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	104	68	179	183	100
Future Volume (Veh/h)	87	104	68	179	183	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	92	109	72	188	193	105
Pedestrians	99			30	74	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	8			3	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				334	243	
pX, platoon unblocked						
vC, conflicting volume	750	278	397			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750	278	397			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	76	86	93			
cM capacity (veh/h)	387	763	1063			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	201	72	188	129	169
Volume Left	92	72	0	0	0
Volume Right	109	0	0	0	105
cSH	845	1063	1700	1700	1700
Volume to Capacity	0.24	0.07	0.11	0.08	0.10
Queue Length 95th (ft)	23	5	0	0	0
Control Delay (s)	13.6	8.6	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.6	2.4		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	37.2%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	396	75	79	300	92	53	697	113	144	695	90
Future Volume (vph)	82	396	75	79	300	92	53	697	113	144	695	90
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	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.88	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.94	1.00	1.00	0.95	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1655	1863	1378	1676	1863	1385	1770	3272		1770	3443	
Flt Permitted	0.39	1.00	1.00	0.24	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	682	1863	1378	427	1863	1385	1770	3272		1770	3443	
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)	86	417	79	83	316	97	56	734	119	152	732	95
RTOR Reduction (vph)	0	0	56	0	0	69	0	14	0	0	10	0
Lane Group Flow (vph)	86	417	23	83	316	28	56	839	0	152	817	0
Confl. Peds. (#/hr)	136		142	142		136			294			52
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	22.6	22.6	22.6	22.6	22.6	22.6	3.7	30.1		11.4	37.8	
Effective Green, g (s)	22.6	22.6	22.6	22.6	22.6	22.6	3.7	30.1		11.4	37.8	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.38		0.14	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	532	393	122	532	395	82	1245		255	1645	
v/s Ratio Prot		c0.22			0.17		0.03	c0.26		c0.09	0.24	
v/s Ratio Perm	0.13		0.02	0.19		0.02						
v/c Ratio	0.44	0.78	0.06	0.68	0.59	0.07	0.68	0.67		0.60	0.50	
Uniform Delay, d1	23.1	26.0	20.5	25.0	24.3	20.6	37.1	20.4		31.7	14.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	7.4	0.1	14.5	1.8	0.1	20.9	1.5		3.7	0.2	
Delay (s)	24.7	33.4	20.6	39.5	26.1	20.7	58.1	21.9		35.4	14.4	
Level of Service	C	C	C	D	C	C	E	C		D	B	
Approach Delay (s)		30.4			27.3			24.1			17.6	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	79.1	Sum of lost time (s)		15.0
Intersection Capacity Utilization	77.4%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	458	104	293	417	36	23	158	121	58	140	70
Future Volume (vph)	103	458	104	293	417	36	23	158	121	58	140	70
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
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frpb, ped/bikes		0.96		1.00	1.00		1.00	0.97			1.00	0.62
Flpb, ped/bikes		1.00		1.00	1.00		0.74	1.00			0.99	1.00
Frt		0.98		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)		3292		1770	3485		1312	1693			1820	978
Flt Permitted		0.78		0.95	1.00		0.54	1.00			0.64	1.00
Satd. Flow (perm)		2597		1770	3485		749	1693			1173	978
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)	107	477	108	305	434	38	24	165	126	60	146	73
RTOR Reduction (vph)	0	17	0	0	7	0	0	30	0	0	0	55
Lane Group Flow (vph)	0	675	0	305	465	0	24	261	0	0	206	18
Confl. Peds. (#/hr)	25		190			25	179		48	48		179
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		4
Actuated Green, G (s)		26.4		17.8	49.2		19.3	19.3			19.3	19.3
Effective Green, g (s)		26.4		17.8	49.2		19.3	19.3			19.3	19.3
Actuated g/C Ratio		0.34		0.23	0.63		0.25	0.25			0.25	0.25
Clearance Time (s)		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
Lane Grp Cap (vph)		873		401	2184		184	416			288	240
v/s Ratio Prot				c0.17	0.13			0.15				
v/s Ratio Perm		c0.26					0.03				c0.18	0.02
v/c Ratio		0.77		0.76	0.21		0.13	0.63			0.72	0.07
Uniform Delay, d1		23.4		28.4	6.3		23.1	26.4			27.1	22.7
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		4.3		8.3	0.0		0.3	2.9			8.2	0.1
Delay (s)		27.7		36.6	6.4		23.4	29.3			35.3	22.9
Level of Service		C		D	A		C	C			D	C
Approach Delay (s)		27.7			18.2			28.9			32.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	45	61	18	36	51	49	596	48	81	624	109
Future Volume (vph)	176	45	61	18	36	51	49	596	48	81	624	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	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93		1.00	0.93		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.90	1.00		0.90	1.00		0.93	1.00		0.94	1.00	
Frt	1.00	0.91		1.00	0.91		1.00	0.99		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)	1599	1579		1594	1582		1651	3457		1663	3340	
Flt Permitted	0.70	1.00		0.69	1.00		0.29	1.00		0.35	1.00	
Satd. Flow (perm)	1175	1579		1150	1582		511	3457		608	3340	
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)	183	47	64	19	38	53	51	621	50	84	650	114
RTOR Reduction (vph)	0	38	0	0	32	0	0	8	0	0	18	0
Lane Group Flow (vph)	183	73	0	19	59	0	51	663	0	84	746	0
Confl. Peds. (#/hr)	121		185	185		121	160		121	121		160
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.9	21.9		21.9	21.9		22.3	22.3		22.3	22.3	
Effective Green, g (s)	21.9	21.9		21.9	21.9		22.3	22.3		22.3	22.3	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		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	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	474	638		464	639		210	1422		250	1374	
v/s Ratio Prot		0.05			0.04			0.19			c0.22	
v/s Ratio Perm	c0.16			0.02			0.10			0.14		
v/c Ratio	0.39	0.11		0.04	0.09		0.24	0.47		0.34	0.54	
Uniform Delay, d1	11.4	10.1		9.8	10.0		10.4	11.6		10.9	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		0.0	0.1		0.6	0.2		0.8	0.4	
Delay (s)	11.9	10.2		9.8	10.1		11.0	11.9		11.7	12.5	
Level of Service	B	B		A	B		B	B		B	B	
Approach Delay (s)		11.3			10.0			11.8			12.4	
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	0.46		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	99	75	102	91	168	114	423	124	149	370	130
Future Volume (vph)	48	99	75	102	91	168	114	423	124	149	370	130
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	0.96		1.00	0.92		1.00	0.95		1.00	0.97	
Flpb, ped/bikes	0.92	1.00		0.94	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	0.94		1.00	0.90		1.00	0.97		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)	1631	1680		1670	1540		1713	3246		1617	3295	
Flt Permitted	0.54	1.00		0.64	1.00		0.42	1.00		0.39	1.00	
Satd. Flow (perm)	932	1680		1121	1540		757	3246		659	3295	
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)	53	109	82	112	100	185	125	465	136	164	407	143
RTOR Reduction (vph)	0	28	0	0	69	0	0	37	0	0	48	0
Lane Group Flow (vph)	53	163	0	112	216	0	125	564	0	164	502	0
Confl. Peds. (#/hr)	200		122	122		200	66		194	194		96
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.1	24.1		24.1	24.1		25.8	25.8		25.8	25.8	
Effective Green, g (s)	24.1	24.1		24.1	24.1		25.8	25.8		25.8	25.8	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.43	0.43		0.43	0.43	
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)	374	675		451	619		326	1398		283	1419	
v/s Ratio Prot		0.10			c0.14			0.17			0.15	
v/s Ratio Perm	0.06			0.10			0.17			c0.25		
v/c Ratio	0.14	0.24		0.25	0.35		0.38	0.40		0.58	0.35	
Uniform Delay, d1	11.3	11.8		11.9	12.4		11.6	11.7		12.9	11.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.3		0.8	0.2		2.9	0.2	
Delay (s)	11.5	12.0		12.2	12.8		12.4	11.9		15.8	11.6	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.9			12.6			12.0			12.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

04/23/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	146	82	21	109	192	42	81	1	31	255	173
Future Volume (vph)	102	146	82	21	109	192	42	81	1	31	255	173
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.81	1.00	1.00	0.77	1.00	1.00	0.71
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.82	1.00	1.00	0.81	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1659		1770	1863	1284	1445	1863	1219	1432	1863	1116
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.53	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	1659		1770	1863	1284	809	1863	1219	1060	1863	1116
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)	104	149	84	21	111	196	43	83	1	32	260	177
RTOR Reduction (vph)	0	25	0	0	0	130	0	0	1	0	0	114
Lane Group Flow (vph)	104	208	0	21	111	66	43	83	0	32	260	63
Confl. Peds. (#/hr)	161		147	147		161	177		141	141		177
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		6
Actuated Green, G (s)	7.1	30.1		1.7	24.7	24.7	26.1	26.1	26.1	26.1	26.1	26.1
Effective Green, g (s)	7.1	30.1		1.7	24.7	24.7	26.1	26.1	26.1	26.1	26.1	26.1
Actuated g/C Ratio	0.10	0.41		0.02	0.34	0.34	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	684		41	631	435	289	667	436	379	667	399
v/s Ratio Prot	c0.06	c0.13		0.01	0.06			0.04			c0.14	
v/s Ratio Perm						0.05	0.05		0.00	0.03		0.06
v/c Ratio	0.60	0.30		0.51	0.18	0.15	0.15	0.12	0.00	0.08	0.39	0.16
Uniform Delay, d1	31.6	14.4		35.2	16.9	16.8	15.9	15.7	15.0	15.5	17.5	15.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	0.3		10.4	0.1	0.2	0.2	0.1	0.0	0.1	0.4	0.2
Delay (s)	37.4	14.6		45.6	17.1	17.0	16.1	15.8	15.0	15.6	17.8	16.1
Level of Service	D	B		D	B	B	B	B	B	B	B	B
Approach Delay (s)		21.7			18.8			15.9			17.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	72.9	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			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	2244	4	58	1512	291	4	90	93	311	65	251
Future Volume (vph)	245	2244	4	58	1512	291	4	90	93	311	65	251
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	0.80		1.00	0.86	1.00	0.96	
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	0.99	
Satd. Flow (prot)	1770	5083		1770	5085	1261		3532	1355	1610	2931	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5083		1770	5085	1261		3532	1355	1610	2931	
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	2362	4	61	1592	306	4	95	98	327	68	264
RTOR Reduction (vph)	0	0	0	0	0	146	0	0	0	0	0	0
Lane Group Flow (vph)	258	2366	0	61	1592	160	0	99	98	229	430	0
Confl. Peds. (#/hr)			41			107			94			31
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)	24.0	71.0		6.0	53.0	53.0		33.0	33.0	28.1	28.1	
Effective Green, g (s)	24.0	71.0		6.0	53.0	53.0		33.0	33.0	28.1	28.1	
Actuated g/C Ratio	0.15	0.45		0.04	0.34	0.34		0.21	0.21	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)	268	2282		67	1704	422		737	282	286	520	
v/s Ratio Prot	c0.15	c0.47		0.03	0.31			0.03		0.14	c0.15	
v/s Ratio Perm						0.13			c0.07			
v/c Ratio	0.96	1.04		0.91	0.93	0.38		0.13	0.35	0.80	1.03dr	
Uniform Delay, d1	66.6	43.5		75.8	50.9	40.0		50.9	53.4	62.3	62.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	44.5	29.2		79.0	10.0	0.6		0.1	0.7	14.8	10.4	
Delay (s)	111.1	72.7		154.8	60.8	40.6		51.0	54.1	77.1	73.0	
Level of Service	F	E		F	E	D		D	D	E	E	
Approach Delay (s)		76.5			60.6			52.6			74.4	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	69.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	158.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	2380	181	33	1631	0	56	34	42	112	59	180
Future Volume (vph)	89	2380	181	33	1631	0	56	34	42	112	59	180
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	1.00		1.00	0.94			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	1.00		1.00	0.92			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	4995		1770	5085		1770	1615			1709	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.75	1.00
Satd. Flow (perm)	1770	4995		1770	5085		927	1615			1321	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)	92	2454	187	34	1681	0	58	35	43	115	61	186
RTOR Reduction (vph)	0	5	0	0	0	0	0	29	0	0	0	0
Lane Group Flow (vph)	92	2636	0	34	1681	0	58	49	0	0	176	186
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)	12.4	96.8		6.1	90.5		33.8	33.8			33.8	33.8
Effective Green, g (s)	12.4	96.8		6.1	90.5		33.8	33.8			33.8	33.8
Actuated g/C Ratio	0.08	0.64		0.04	0.60		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)	144	3187		71	3033		206	359			294	352
v/s Ratio Prot	c0.05	c0.53		0.02	0.33			0.03				
v/s Ratio Perm							0.06				c0.13	0.12
v/c Ratio	0.64	0.83		0.48	0.55		0.28	0.14			0.60	0.53
Uniform Delay, d1	67.5	21.0		71.2	18.4		48.9	47.3			52.9	51.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.0	1.9		5.0	0.2		0.8	0.2			3.3	1.4
Delay (s)	76.5	22.9		76.3	18.7		49.6	47.4			56.1	53.4
Level of Service	E	C		E	B		D	D			E	D
Approach Delay (s)		24.7			19.8			48.4			54.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	151.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	84	101	239	388	138
Future Volume (Veh/h)	87	84	101	239	388	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	96	92	111	263	426	152
Pedestrians	143			12	71	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	12			1	6	
Right turn flare (veh)		3				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				342	236	
pX, platoon unblocked						
vC, conflicting volume	1201	444	721			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1201	444	721			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	*3.0	*3.0	2.2			
p0 queue free %	51	85	86			
cM capacity (veh/h)	195	605	772			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	188	111	263	284	294
Volume Left	96	111	0	0	0
Volume Right	92	0	0	0	152
cSH	381	772	1700	1700	1700
Volume to Capacity	0.49	0.14	0.15	0.17	0.17
Queue Length 95th (ft)	66	13	0	0	0
Control Delay (s)	26.4	10.4	0.0	0.0	0.0
Lane LOS	D	B			
Approach Delay (s)	26.4	3.1		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

APPENDIX G

TRANSIT LOS CALCULATIONS

Multimodal Transit LOS Calculation															
	From	Ala Moana Blvd EB	Ala Moana Blvd WB	Kapiolani Blvd EB	Kapiolani Blvd WB	Kapiolani Blvd EB	Kapiolani Blvd WB	Auahi St EB	Auahi St WB	Ward Ave NB	Ward Ave SB	Queen St EB	Queen St WB	Kamakee St NB	Kamakee St SB
	To	Ward Ave	Queen St	Ward Ave	Kamakee St	Kamakee St	Piikoi St	Ward Ave	Kamakee St	Halekauwila St	Kapiolani Blvd	Cooke St	Kamani St	Kapiolani Blvd	Auahi St
Inputs		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
	TRANSIT OPERATIONS INFORMATION														
	Number of local buses on street segment per hour (bus/h)	28	24	32	32	12	16	2	2	2	2	2	4	2	2
	Number of express buses stopping in segment per hour (bus/h)	2	1	8	8	0	8	0	0	0	0	0	0	0	0
t_{ex}	Average excess wait time (min)	4.5	2.4	4.9	3.0	3.3	3.4	3.0	4.2	3.6	3.3	3.5	3.3	3.5	3.5
L_f	Average passenger load factor (p/seat)	0.5	0.5	0.6	0.6	0.7	0.5	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4
S	Average transit travel speed (mi/h)	14.2	10.9	12.2	13.0	12.6	10.5	11.4	20.0	7.9	11.5	13.3	7.9	12.0	12.0
l_{pt}	Average passenger trip length (mi)	7.0	7.2	4.1	4.2	2.2	3.8	1.7	2.0	2.0	1.7	1.7	2.0	4.6	4.6
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	TRANSIT AMENITY DATA														
p_{sh}	Percent stops in segment with a shelter	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%
	PEDESTRIAN ENVIRONMENT DATA														
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	8.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0	7.0	7.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
	Is the street divided?	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	Are parking spaces striped?	No	No	No	No	No	No	No	No	No	No	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	7.0	7.0	0.0	0.0	0.0	0.0
W_{sh}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.0	0.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	10.0	10.0	10.0	10.0	12.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
v_{m}	Outside lane demand flow rate at midsegment (veh/h)	600	600	400	400	400	400	150	150	300	300	400	400	200	200
S_R	Average vehicle running speed, including intersection delay (mi/h)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Calculations															
f	Transit frequency (bus/h)	30	25	40	40	12	24	2	2	2	2	2	4	2	2
f_h	Headway factor	3.81	3.78	3.86	3.86	3.55	3.77	1.95	1.95	1.95	1.95	1.95	2.80	1.95	1.95
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
T_{pt}	Perceived amenity time rate (min/mi)	0.2	0.2	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	0.6	0.3	1.2	0.7	1.5	0.9	1.8	2.1	1.8	1.9	2.1	1.7	0.8	0.8
T_{ptt}	Perceived travel time rate (min/mi)	5.3	6.0	6.9	5.7	7.7	7.5	8.7	7.1	11.1	9.0	8.5	10.8	6.5	6.5
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.89	0.85	0.81	0.87	0.78	0.78	0.74	0.80	0.68	0.73	0.75	0.69	0.83	0.83
s_{w-r}	Transit wait-ride score	3.41	3.23	3.11	3.36	2.76	2.96	1.45	1.56	1.34	1.43	1.46	1.93	1.61	1.61
f_s	Motorized vehicle speed adjustment factor	0.49	0.49	0.49	0.49	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
f_v	Motorized vehicle volume adjustment factor	1.37	1.37	0.91	0.91	0.91	0.91	0.34	0.34	0.68	0.68	0.91	0.91	0.46	0.46
W_{aA}	Adjusted available sidewalk width (ft)	8.0	8.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
f_{sw}	Sidewalk width coefficient	3.60	3.60	3.30	3.30	3.30	3.30	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
f_b	Buffer area coefficient	1.00	1.00	5.37	5.37	5.37	5.37	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	10.0	10.0	10.0	10.0	12.0	10.0	15.0	15.0	17.0	17.0	10.0	10.0	10.0	10.0
W_v	Effective total width as a function of traffic volume (ft)	10.0	10.0	10.0	10.0	12.0	10.0	18.8	18.8	17.0	17.0	10.0	10.0	10.0	10.0
W_{t1}	Effective width of combined bike lane and shoulder (ft)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	7.0	7.0	10.0	10.0	0.0	0.0
f_w	Cross-section adjustment factor	-4.49	-4.49	-5.34	-5.34	-5.37	-5.34	-4.80	-4.80	-4.79	-4.79	-5.57	-5.57	-4.49	-4.49
I_p	Pedestrian environment score	3.41	3.41	2.11	2.11	2.08	2.11	1.83	1.83	2.19	2.19	1.63	1.63	2.26	2.26
	Pedestrian LOS	C	C	B	B	B	B	A	A	B	B	A	A	B	B
I_t	Transit LOS score	1.40	1.67	1.65	1.28	2.18	1.88	4.10	3.94	4.33	4.18	4.05	3.35	3.92	3.92
Output															
	Transit LOS	***A***	***A***	***A***	***A***	***B***	***A***	***D***	***D***	***E***	***D***	***D***	***C***	***D***	***D***

From: Pascua, Kailiv A
To: Jennylyn Tapat Morrill
Cc: Andrade, Kamakaokalani M
Subject: Ward Village Block N-West TIAR Update
Date: Wednesday, July 23, 2025 9:09:52 AM

Hi Jenny,

The TIAR has been accepted.

Kaily Pascua
City and County of Honolulu
Traffic Review Branch
(808)768-8077

Appendix E

INFRASTRUCTURE AVAILABILITY REPORT

Block N West
Infrastructure Availability Report

Honolulu, Oahu, Hawaii
Tax Map Key: 2-3-002:116

Prepared for
Victoria Ward, Ltd.
1240 Ala Moana Boulevard, Suite 200
Honolulu, HI 96814

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

Revised September 2025
May 2023

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LIST OF FIGURES

LIST OF APPENDICES

APPENDIX A

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. After a revision to the proposed programming of the building in 2025, the report was revised to include the updated feedback from infrastructure companies. The utilities researched include water, sanitary sewer, drainage, electrical, communication, cable, and gas.

1.2 Proposed Project Location and Description

Victoria Ward Limited VWL proposes the development of a 465-unit high-rise condominium tower and commercial building on the island of Oahu see Figures 1-1 and 1-2). The project site is approximately 1.69 acres, generally located at TMK: 2-3-002:116. The project site will be bounded by Ward Avenue to the west, proposed Halekauwila Street to the south and A'ali'i to the east.

1.3 Existing Topography

The project site is currently occupied by an AC parking lot and demolished commercial/retail building. Sewer manholes are located in a Private Drive Private Drive 2), and along the sewer easement that runs within the property. Drain inlets, trench drain, and catch basin are observed within the property. See Figure 1-3 for topographic survey prepared June 29, 2020 by Control Point Surveying Inc.

1.4 Flood Hazard

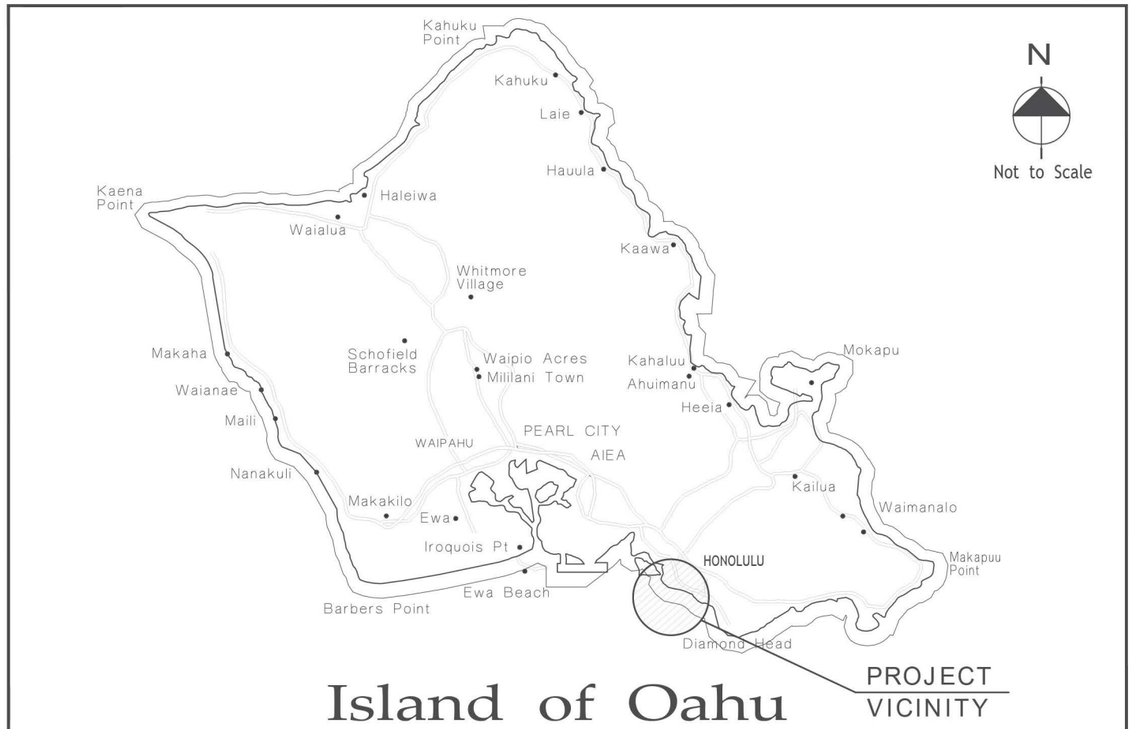
The Federal Emergency Management Agency FEMA) Flood Insurance Rate Map FIRM Community Panel No: 15003C0362G dated January 19, 2011 shows that the project is located in Zone AE 6 feet), Zone AE 7 feet) and Zone X see Figure 1-4 . Zone AE is characterized as a special flood hazard area, where the annual chance of flooding 100-year flood) is determined as 1%. Zone X is characterized as areas determined to be outside the 0.2% annual chance floodplain. The proposed finish floor elevation at Level 1 for the project is 7.25 feet.

1.5 Sea Level Rise

The Pacific Islands Ocean Observing System PacIOOS) Hawai'i Sea Level Rise Viewer shows that a small portion of the project site is shown within the 3.2-ft sea level rise by the year 2100 due to combined passive flooding and annual high wave flooding see Figure 1-5). The portions that are shown within the area of sea level rise are at the eastern sides of the project area see Figure 1-5 . With the project proposing to raise the grades in those areas by about 3 feet and the proposed finish floor of the building residing above the Base Flood Elevation - which is higher than the projected sea level rise - the project site considers and will not be impacted by the 3.2-ft sea level rise.

1.6 Climate Resilient Development

The project considers the impacts of climate change and climate-resilient development in its design. The building will utilize design solutions and best practices to weather-proof utility elements, while also employing low impact development strategies within the site drainage design see Section 2.3). Furthermore, the condominium is targeting LEED certification in an effort to reduce the development's impact on the environment and its resources, thereby bolstering the focus on sustainability efforts throughout Ward Village as a whole.



WILSON OKAMOTO CORPORATION

WARD VILLAGE BLOCK N WEST
HONOLULU, OAHU, HAWAII

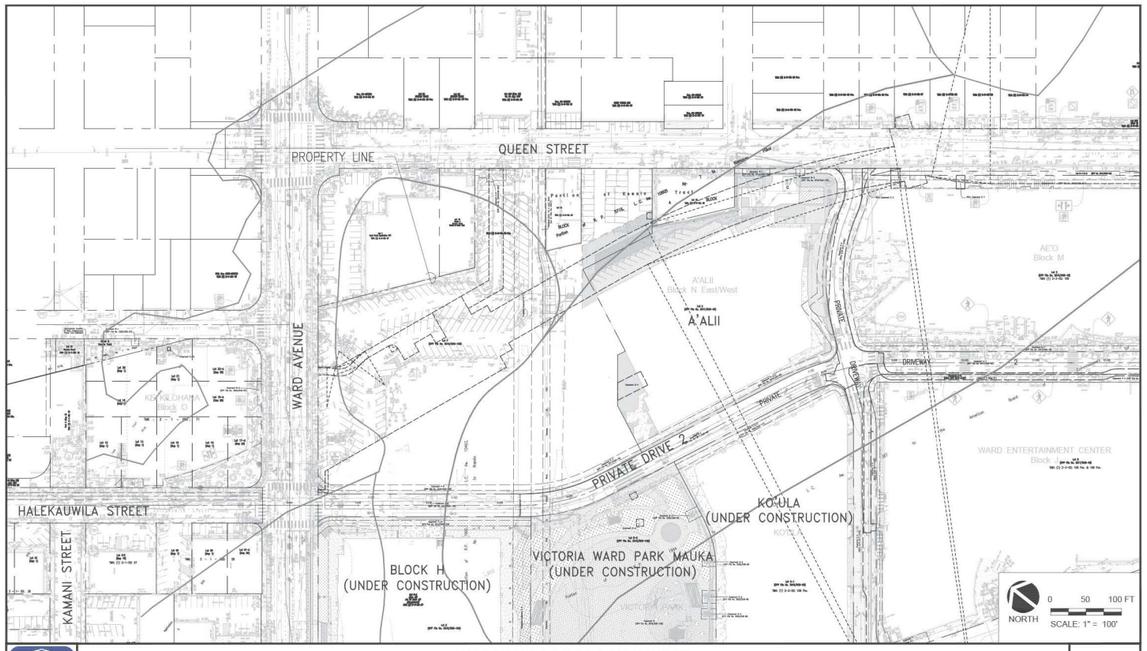
VICINITY MAP

Figure 1-1

WARD VILLAGE BLOCK N WEST
HONOLULU, OAHU, HAWAII

LOCATION MAP

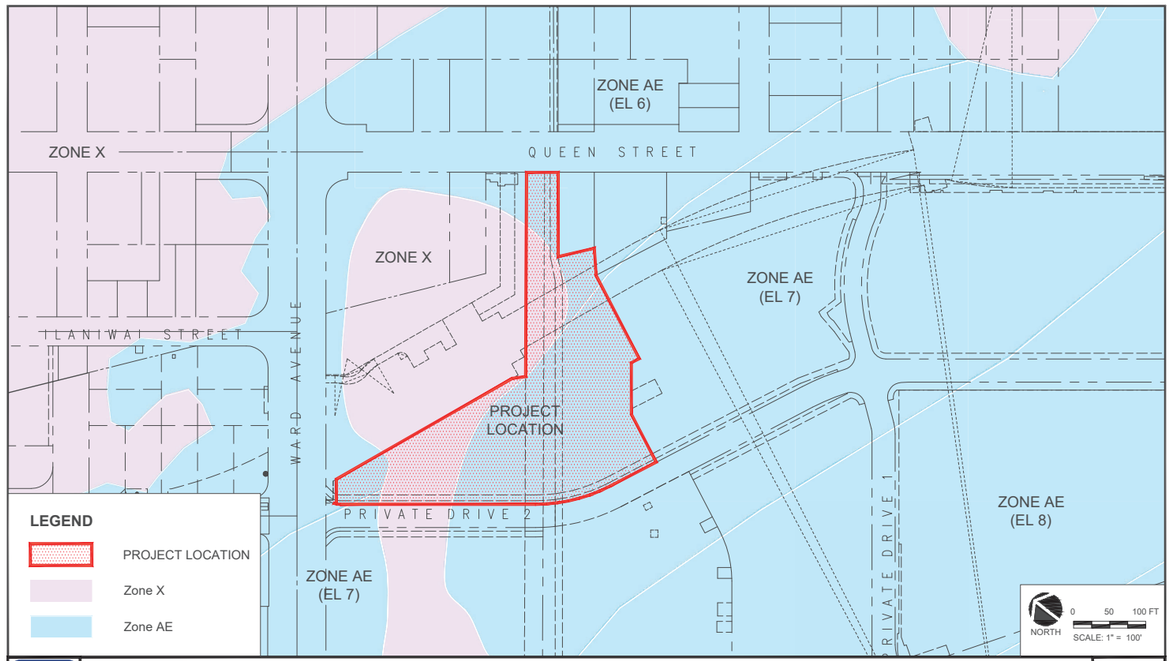
Figure 1-2



WARD VILLAGE BLOCK N WEST
HONOLULU, OAHU, HAWAII

TOPOGRAPHIC SURVEY MAP

Figure 1-3



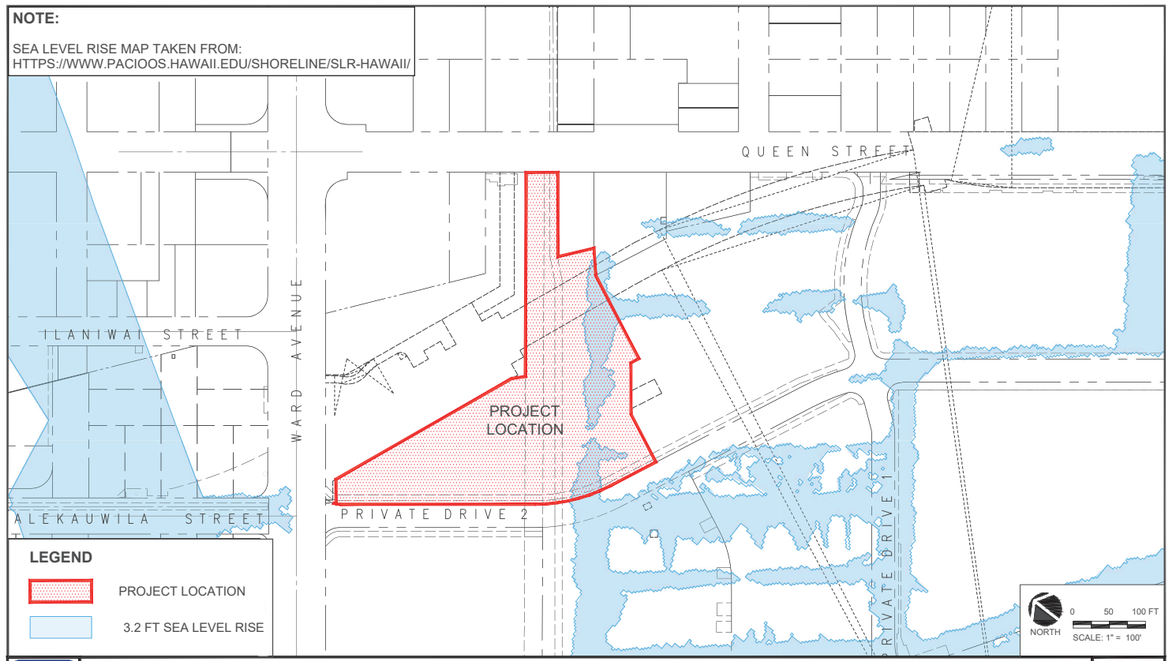
WARD VILLAGE BLOCK N WEST
HONOLULU, OAHU, HAWAII

FLOOD HAZARD MAP

Figure 1-4

NOTE:

SEA LEVEL RISE MAP TAKEN FROM:
HTTPS://WWW.PACIOOS.HAWAII.EDU/SHORELINE/SLR-HAWAII/



WARD VILLAGE BLOCK N WEST
HONOLULU, OAHU, HAWAII

SEA LEVEL RISE

Figure 1-5

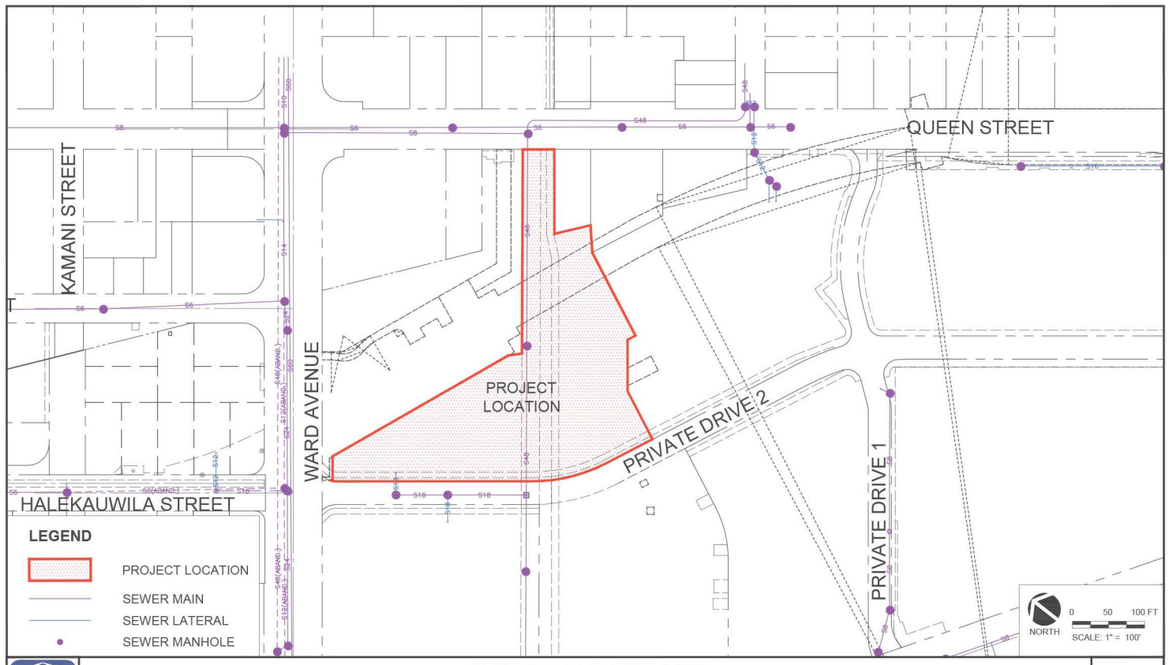
2 UTILITIES

2.1 Sanitary Sewer System

The sanitary sewer system servicing the Kaka`ako 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 wastewater flow from the project area is discharged into the Ala Moana Wastewater Pump Station and is then conveyed to the City's Sand Island Wastewater Treatment Plant, which serves the Honolulu area from Kuliouou to Moanalua.

The project proposes to connect to the existing 18" sewer main within Private Drive 2 that connected to the existing 48" East End Relief sewer. See Figure 2-1 which identifies the existing sewer system within the project vicinity.

An updated sewer connection application with the revised programming was submitted on April 10, 2025 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 dated September 19, 2025 was received confirming available capacity (see Appendix A).



2.2 Water System

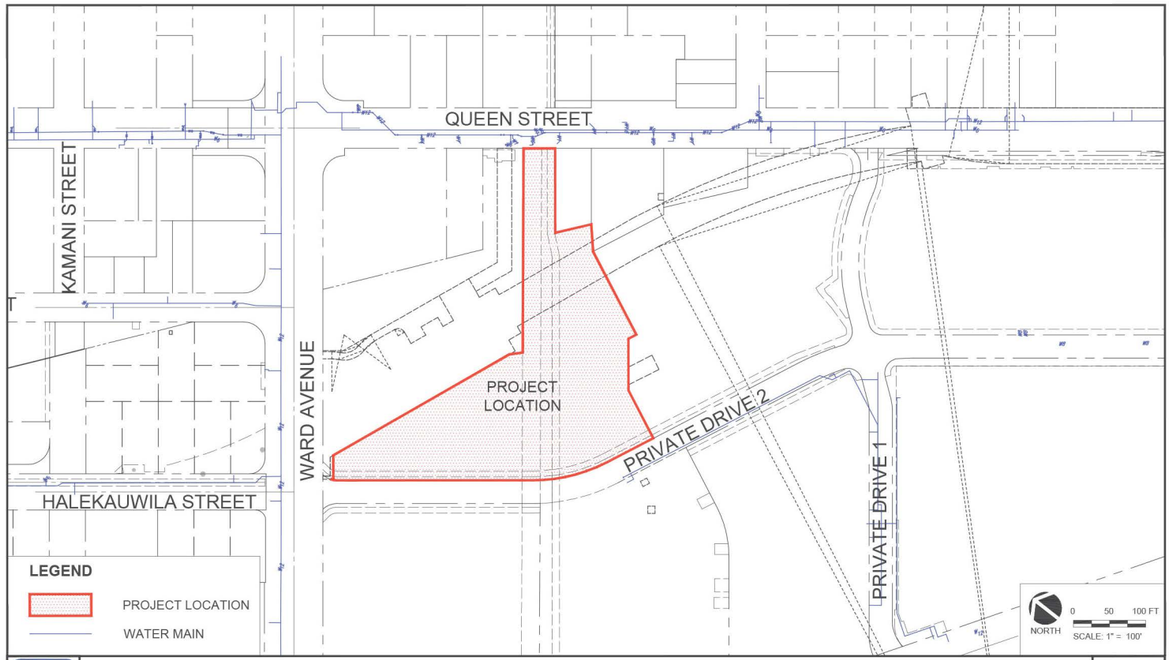
2.2.1 Potable Water

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 in Queen Street to accommodate both the residential tower and the commercial space. The size and location of the laterals will be confirmed during the final design phase. See Figure 2-2 which identifies the existing water system within the project vicinity. An updated letter request to BWS dated April 10, 2025 was sent to confirm that the existing water system can accommodate the project. An adequacy letter dated April 23, 2025 was received confirming available capacity (see Appendix A).

2.2.2 Fire Protection

Fire protection will be provided by private fire hydrants. Water supply from a private fire hydrant must be within 400 feet to the closest point from the building. A fire sprinkler system will be provided for the project. The size and location of the fire line that will supply for the sprinkler system will be confirmed during the final design phase. The Honolulu Fire Department (HFD) was consulted on April 28, 2025 to discuss the project and proposed fire protection methods. A figure was prepared as per the recommendations by HFD (see Appendix A). Recommendations provided by HFD will be maintained during the final design phase.

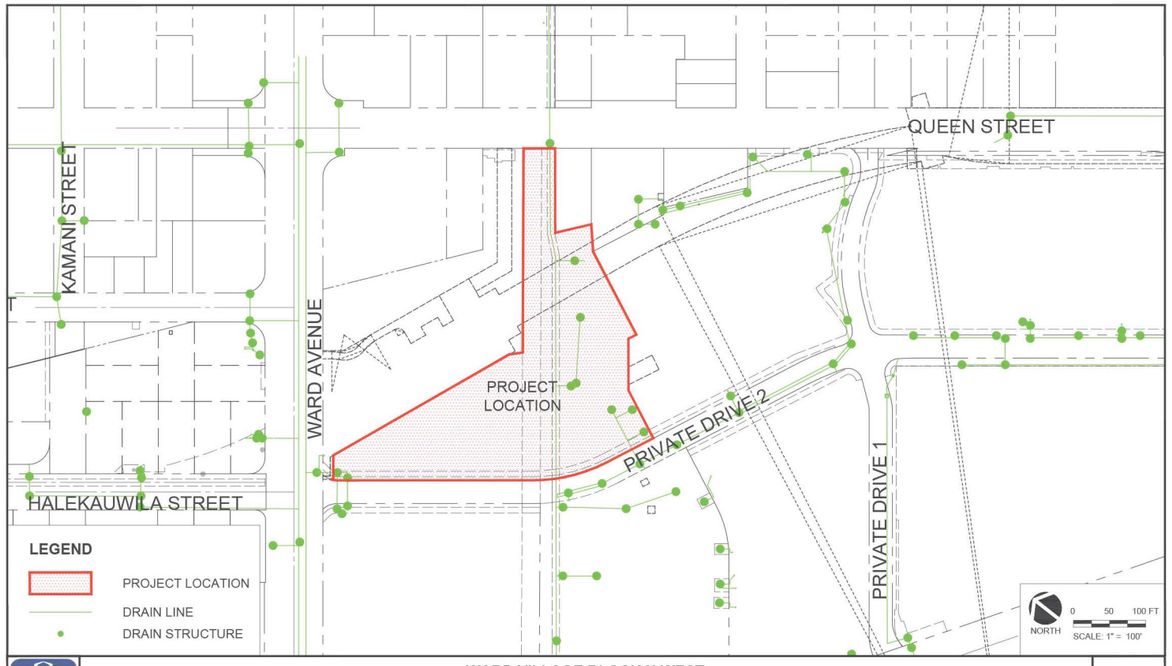


2.3 Site Drainage and Low Impact Development

The drainage system within the City right-of-way and City drainage easements servicing the Kaka`ako Makai area and the project area is owned 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 VWL with a series of trench drains, drain inlets and catch basins. It is anticipated that the drainage pattern of the project site will be maintained and the peak flow rate and volume will not increase. For this reason, the project will not adversely impact the existing performance of the City system. See Figure 2-3 for the existing drainage system within the project site.

The project proposes to treat the overall storm water quality for the site with manufactured treatment device and green roof. Storm water will be collected by the drain inlets and will be directed to the existing catch basin located at Ward Avenue (City) and Private Drive (Private Drive 2) where it will be discharged into the City Drainage System. Email correspondence for the LID Site Design Strategies is attached in Appendix A.



2.4 Electrical Power Facilities

The Hawaiian Electric Company HECo was consulted again on April 14, 2025 by Ronald N. S. Ho Associates, Inc. to confirm that the existing electrical system can accommodate the project's updated programming. An acknowledgement letter dated June 24, 2025 was received from HECo, confirming HECo's intent to provide service to the Block N West project (see Appendix A).

2.5 Telephone System

The Hawaiian Telecom Inc. was consulted on April 14, 2025 by Ronald N. S. Ho Associates, Inc. to confirm that the existing communication system can accommodate the project. An assessment letter dated May 30, 2025 was received confirming available service connection for the Block N West project (see Appendix A).

2.6 Cable Television System

The Spectrum formerly Oceanic and Charter Communications) was consulted on April 14, 2025 by Ronald N. S. Ho Associates, Inc. to confirm that the existing cable system can accommodate the project. An assessment letter dated April 25, 2025 was received confirming available service connection for the Block N West project see Appendix A).

2.7 Gas System

Hawaii Gas was consulted on April 10, 2025 to confirm that the existing gas system can accommodate the project. Email correspondence received on April 10, 2025 confirmed service availability for the Block N West project (see Appendix A .

3 TRAFFIC

3.1 Traffic Impact Analysis Report

An updated Traffic Impact Analysis Report TIAR was submitted on May 16, 2025 to the City Department of Planning and Permitting DPP), Traffic Review Branch TRB to identify and assess the potential traffic impacts resulting from the Block N West development. An email correspondence was received on July 23, 2025 confirming that the findings in the report are acceptable (see Appendix A).

APPENDIX A

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

Infrastructure Availability Report Appendix A

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

Sewer Connection Application Letter
Approved Sewer Connection Application

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PLANNING & PERMITTING
650 South King Street, Honolulu, Hawaii 96813

SITE DEVELOPMENT DIVISION MASTER APPLICATION FORM

All required documents and fees must accompany this application form. Please visit www.honoluludpp.org for applicable procedures and fees under the menu heading Application & Forms, Site Engineering and Subdivision Permits. Electronic submittal of permit applications and other permit-related documents constitutes agreement by the applicant or authorized representative to transact business electronically with this department, in accordance with HRS Chapter 489E.

I. PERMIT

Check one or more as appropriate:

		VARIANCE	APPROVAL
☐ Grading	☑ Sewer Connection	☐ Flood Hazard Variance	☐ Subdivision, Easement Consolidation
☐ Grubbing		☐ Flood Determination	☐ Park Dedication
☐ Stockpiling		☐ Floodway Permit	☐ Lot Determination
☐ Trenching		☐ Flood Map Revision	☐ Ag. Site Development

Complete Sections I, II, III and all other sections as possible

II. LOT AND LAND USE INFORMATION

TAX MAP KEY(S) 2-3-002:116 Lot Area: 80,091 (sq.ft)/ac.

Zoning District: Kakaako Dev Development Plan Designation: HCDA Kakaako Dev District Mauka Area State Land Use District: Urban

Street Address/Location of Property: 423 Ward Avenue, Honolulu, HI 96814

Present Use of Property/Building:

Project Name (if any): Mahana Ward Village

Request/Proposal (describe the nature of the request, proposed activity or project): The project proposes 465 residential units, 8,066 sf of retail/office space, and 4,034 sf of restaurant space

III. APPLICANT INFORMATION

	Owner/Developer	**Engineer**/Architect	**Contractor** (or **Agent for Subdivision apps only**)
Name (& title)	Victoria Ward, Ltd.	Brennan Nacario	
Mailing Address	1240 Ala Moana Blvd., Suite 200	1907 S. Beretania Street, Suite 400	
	Honolulu HI 96814	Honolulu HI 96826	
	City State Zip	City State Zip	City State Zip
Phone Number(s)	(808) 591-8411	(808) 946-2277	
Email Address		bnacario@wilsonokamoto.com	

APPLICANT Brennan Nacario (Print NAME of applicant) Project Manager (Print TITLE of applicant) Brennan Nacario **Signature of applicant**

IV. FOR GRADING/GRUBBING/STOCKPILING INFORMATION ONLY

Estimated Dates: Start: Completion: Borrow Material:

Area of work (sf or acres): Borrow Site:

Disturbed area (sf or acres): Disposal Material:

Estimated Quantity (cy): Cut: Fill: Disposal Site:

V. AUTHORIZED AGENT

This statement of authorization is used in reference to the information provided for in sections I, II and III above.

I/We, _____ (Print NAME and TITLE of person **giving authority**), hereby authorize _____ (Print NAME of person **receiving authority (Authorized Agent)**)

to act in my/our behalf in obtaining/closing the Grading/Grubbing/Stockpiling/Trenching permit for the project.

Signature of Owner/Developer giving authority **Date**

FOR DIVISION USE ONLY:

Grading Permit No.: Application No.:

Trenching Permit No.: Date of Application:

Received By:

SEE REVERSE FOR APPLICATIONS FOR TRENCHING AND SEWER CONNECTION

rev. 07/2020

SITE DEVELOPMENT DIVISION MASTER APPLICATION FORM

(REVERSE SIDE)

VI. FOR TRENCHING INFORMATION ONLY

Tax Map Key(s): 2-3-002:116

Work to be performed for: Work to be done: ☐ Service Connection ☐ Repair ☐ Borings

Estimated Dates: Start: Completion: Other:

Estimated Value of work: $ Dimensions: ft/in (length) ft/in (width) ft/in (depth)

in the city right - of - way

AGENCY CLEARANCES	SIGNATURE	DATE	ADDRESS	PHONE NO.
DPP, Wastewater Branch			650 So. King St., FMB, 1st Flr.	768-8210
DTS, Traffic Signal			650 So. King St., FMB, 2nd Flr.	768-8388
DDC, Street Lightning			650 So. King St., FMB, 11th Flr.	768-8431
BWS, Customer Care			630 So. Beretania St., 1st Flr.	748-5460
Hawaiian Electric Co., Inc., Construction Installation			820 Ward Avenue, 4th Flr. bryan.yonaha@hawaiianelectric.com	543-5654
Hawaiian Telcom, Excavation			1177 Bishop St., Lobby	546-7746
Gasco., Inc., Maps & Records			515 Kamakee St., 1st Flr.	594-5575
Spectrum, Engineering & Construction			200 Akamainui St. haw.engineering.research@charter.com	625-8443
DFM, Division of Road Maintenance (if trenching 200 linear feet or more)			99-999 Iwaena Street, #214	484-7695

DPP: Dept. of Planning and Permitting DTS: Dept. of Transportation Services DDC: Dept. of Design and Construction BWS: Board of Water Supply DFM: Dept. of Facility Maintenance

Note to agencies providing clearances: Signature on this form may be reproduced (scanned and emailed) and submitted electronically for permiting purposes in accordance with HRS Chapter 489E. Original wet Signatures may be retained by the applicant(s).

Note to the applicants receiving clearances: The utilities listed above may not represent all underground utilities located within City rights-of-ways, nor do their utility clearances relieve the permittee from complying with all other applicable codes, rules, regulations, and/or permit procedures including, but not limited to, additional clearances and requirements for other utilities (i.e. irrigation, data transmission, etc.) located within City rights-of-ways. Pursuant to ROH 1990, Section 14-17.6, the permittee shall indemnify and save harmless the city for any injuries or damages to any person or property received or sustained by any person as a consequence of any act or acts of the permitee on work done under the trenching permit.

VII. FOR SEWER CONNECTION INFORMATION ONLY

To receive a response via e-mail,provide email address below and check box here: ☑ bnacario@wilsonokamoto.com

☑ Residential: No. of Proposed Units 465 (Provide breakdown below)

82 Studios 158 1 Bedroom 155 2 Bedrooms 70 3 Bedrooms ____ 4 Bedrooms ____ Other

☑ Non-Residential: (See attached sewer table for required category and quantity and provide any additional information in the remarks)

CATEGORY(IES)	QUANTITY(IES)	NEW WATER METER SIZE(S)
Restaurant	4,034 sf (1,815 seats per day)	2" for commercial
Retail	8,066 sf	

Date of Connection: 2028 (approximate)

Connection Work Desired: ☐ Use Existing Lateral ☐ Other

Dimensions: 37 ft. (length) 18 in. (size) 4 ft. (depth)

Existing Structures/Dwellings on Property: (Provide breakdown below)

TYPE (i.e. Single Family)	QUANTITY(IES)	REMAIN	DEMOLISH
Commercial	80, 684 sf	0 sf	80, 684 sf

Remarks: (Provide any additional information on the lines provided) *To receive a response via e-mail,provide email address below and check box here:* ☑

This application seeks to renew/extend previously approved 2023/SCA-0509

FOR DIVISION USE ONLY:

Date of Application: Received By: Application No.:

rev. 07/2020

CITY AND COUNTY OF HONOLULU

Home

Search Permits, Parcels, Address, etc..

Log in

Application
2025/SCA-0425

New Note

Phase	Status	Type	Decision Date	Applicant
Completed	Approved	WWB Review		

Completed

Details

Information

Number 2025/SCA-0425	Account Brennan A. Nacario
Phase Completed	Status Approved
Type WWB Review	Completion Date 9/19/2025
Applicant	Expiration Date 9/19/2027

Scope

Project

Address

Parcel
23002116

Description

Job Description
2025/SCA-0425 Mahana Ward Village - 465 Units, 8066 sf of retail/office space, and 4034 sf of restaurant space

Honolulu Board of Water Supply

Request Letter
Adequacy Letter

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8206-77
April 10, 2025

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

Attention: Mr. Ernest Lau – Manager and Chief Engineer BWS

Subject: Mahana (Block N West) – BWS Water System Adequacy

Dear Mr. Lau:

We are requesting Board of Water Supply assistance to determine adequacy of the existing source, storage, and water distribution systems in Queen Street for the residential and commercial development of the Ward Village Mahana Condominium (Block N West) located at TMK: 2-3-002-116.

The development will include the following programming:

- Residential Units – 465 Units
  - Studio – 82 Units
  - 1 Bedroom – 158 Units
  - 2 Bedroom – 155 Units
  - 3 Bedroom – 70 Units
- Restaurant – 4,034 sf
- Commercial – 8,066 sf

In addition to your review of the existing water system, we would like to obtain pressure and flow information for any existing fire hydrants located adjacent the project site.

Please call or email me at bnacario@wilsonokamoto.com should you have any questions or require further information.

Sincerely,

Brennan Nacario

Enclosure: Project Vicinity and Location Map

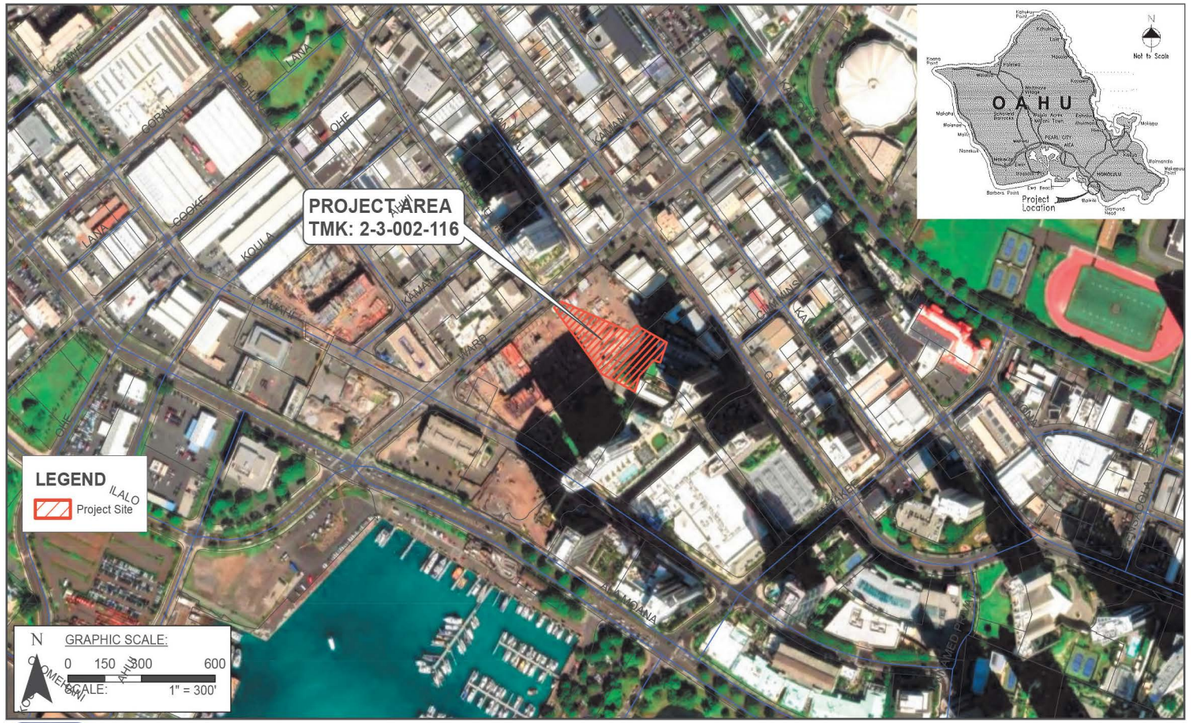


FIGURE A
PROJECT LOCATION AND VICINITY MAP
MAHANA - DEMOLITION & MASS GRADING / HONOLULU, OAHU, HAWAII

BOARD OF WATER SUPPLY
KA 'OIHANA WAI
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET • HONOLULU, HAWAI'I 96843
Phone: (808) 748-5000 • www.boardofwatersupply.com

RICK BLANGIARDI
MAYOR
MEIA

ERNEST Y. W. LAU, P.E.
MANAGER AND CHIEF ENGINEER
MANAKIA A ME KAHU WILIKĪ

ERWIN KAWATA
DEPUTY MANAGER
HOPE MANAKIA

NĀ'ĀLEHU ANTHONY, Chair
JONATHAN KANESHIRO, Vice Chair
BRYAN P. ANDAYA
LANCE WILHELM
KĒHAULANI PU'U
EDWIN H. SNIFFEN, Ex-Officio
GENE C. ALBANO, P.E., Ex-Officio

April 23, 2025

Mr. Brennan Nacario
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawai'i 96826

Dear Mr. Nacario:

Subject: Your Letter Dated April 10, 2025 Regarding Availability of Water for the Ward Village Mahana Block N West Condominium off Ward Avenue, Tax Map Key: 2-3-002:116

Thank you for your letter regarding the proposed 465-unit, 4,034-square foot restaurant space, and 8,066-square foot commercial space mixed-use project.

The existing water system is currently adequate to accommodate the proposed development. However, please be advised that the existing Honolulu water system capacity has been reduced due to the shut-down of the Hālawa Shaft pumping station as a proactive measure to prevent fuel contamination from the Navy's Red Hill Bulk Storage Tank fuel releases. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval, pending evaluation of the water system conditions at that time on a first-come, first-served basis. 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.

We continue to request 10% voluntary water conservation of all customers until new sources are completed and require water conservation measures in all new developments. If water consumption significantly increases, progressively restrictive conservation measures may be required to avoid low water pressures and disruptions of water service.

Presently, there is no moratorium on the issuance of new and additional water services. Water distributed via the BWS water systems remains safe for consumption. The BWS is closely monitoring water usage and will keep the public informed with the latest findings. Please visit our website at www.boardofwatersupply.com and www.protectoahuwater.org for the latest updates and water conservation tips.

The applicant will be required to obtain a water allocation letter from Victoria Ward Limited for Water System Facilities Charge (WSFC) transmission credits and submit it to the BWS for our review and recording purposes.

When water is made available, the applicant will be required to pay our WSFC for resource development, the remaining balance for transmission impact fees, and daily storage.

Water conservation measures are required 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. Prior to BWS approval of water availability, the developer is required to submit a Water Conservation and Reuse Plan for our review and approval.

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

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

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. 99 and M00144:

Fire Hydrant Number	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)
99	Queen Street	72	58	4,000
M00144	Ward Avenue	72	61	4,000

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 is attached.

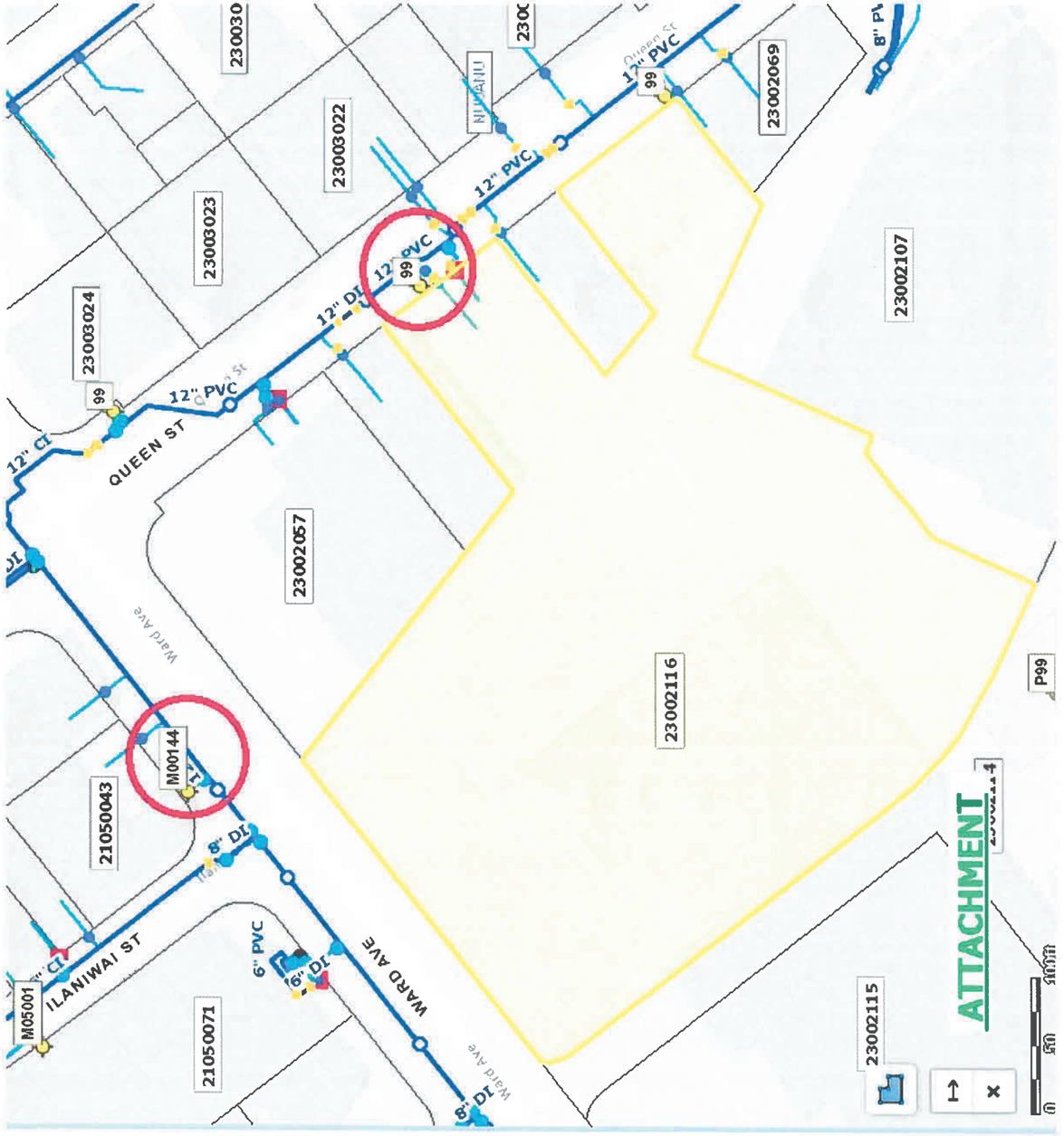
The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Barry Usagawa, Program Administrator of our Water Resources Division, at (808) 748-5900.

Very truly yours,

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

Attachment



Honolulu Fire Department

HFD Email Correspondence

From: Kassidy Mashiyama
Sent: Monday, April 28, 2025 1:19 PM
To: Zapata, Ricardo A
Subject: RE: Ward Village Block N West - HFD - ActionItem:00036:RXw40

Categories: Filed by Newforma

Hi Ricardo,

Thanks for confirming.

Kassidy Mashiyama
Civil Engineer

WILSON OKAMOTO CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

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

From: Zapata, Ricardo A <rzapata@honolulu.gov>
Sent: Monday, April 28, 2025 1:14 PM
To: Kassidy Mashiyama <kmashiyama@wilsonokamoto.com>
Subject: RE: Ward Village Block N West - HFD - ActionItem:00036:RXw40

Kassidy,
It looks good from a fire code perspective.
Ricardo

From: Kassidy Mashiyama <kmashiyama@wilsonokamoto.com>
Sent: Monday, April 28, 2025 10:38 AM
To: Zapata, Ricardo A <rzapata@honolulu.gov>
Cc: Brennan Nacario <BNacario@wilsonokamoto.com>
Subject: RE: Ward Village Block N West - HFD - ActionItem:00036:RXw40

Hi Ricardo,

The programming of Block N West (Mahana) has recently changed, so we wanted to re-confirm our conformance to HFD site access and water supply requirements.

The proposed programming has been adjusted to the following:

- Residential Units – 465 units
- Restaurant – 4,034 sf
- Commercial – 8,066 sf

Although the site layout of the condo has remained similar to the layout before the programming change, there are a few minor changes. Please see the attached PDF for our updated Fire Code Figure. Feel free to let us know if you have any questions or comments.

Thanks,

Kassidy Mashiyama
Civil Engineer

WILSON OKAMOTO CORPORATION
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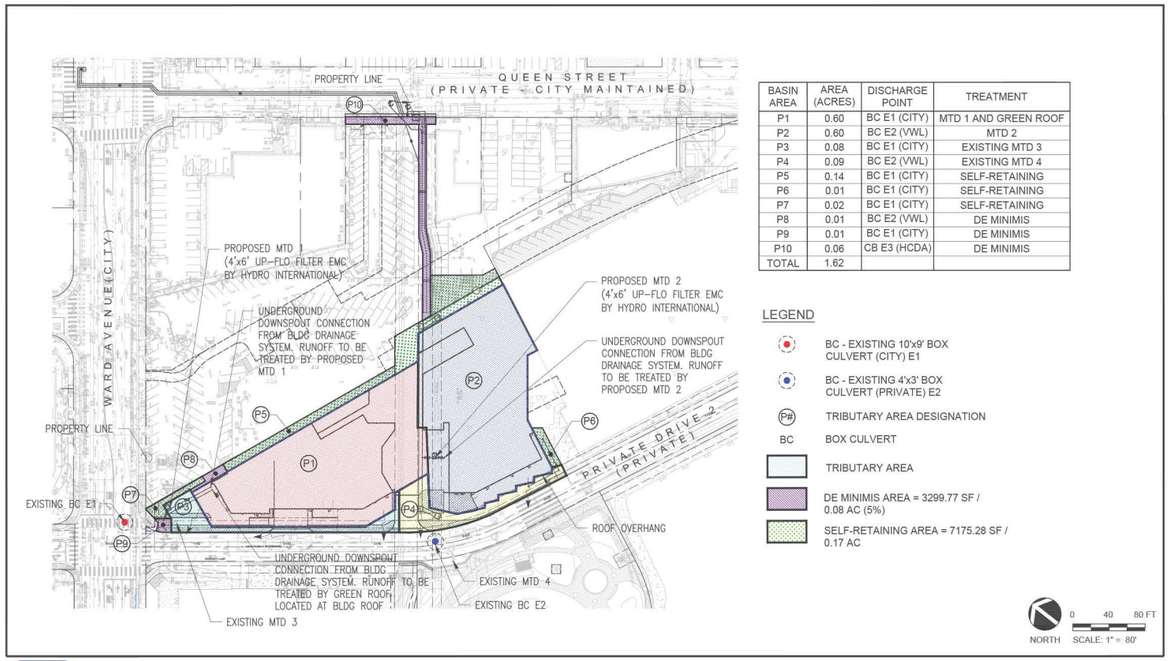
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
T (808) 946-2277
W http://www.wilsonokamoto.com

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

LID Correspondence



BASIN AREA	AREA (ACRES)	DISCHARGE POINT	TREATMENT
P1	0.60	BC E1 (CITY)	MTD 1 AND GREEN ROOF
P2	0.60	BC E2 (VWL)	MTD 2
P3	0.08	BC E1 (CITY)	EXISTING MTD 3
P4	0.09	BC E2 (VWL)	EXISTING MTD 4
P5	0.14	BC E1 (CITY)	SELF-RETAINING
P6	0.01	BC E1 (CITY)	SELF-RETAINING
P7	0.02	BC E1 (CITY)	SELF-RETAINING
P8	0.01	BC E2 (VWL)	DE MINIMIS
P9	0.01	BC E1 (CITY)	DE MINIMIS
P10	0.06	CB E3 (HCDA)	DE MINIMIS
TOTAL	1.62		

FIGURE D1
STORM WATER QUALITY ANALYSIS

WARD VILLAGE - BLOCK N-WEST/ HONOLULU, OAHU, HAWAII

From: Miyashiro, Keith K
To: John Kim
Subject: RE: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40
Date: Thursday, April 13, 2023 9:10:30 AM

Hi John,

Based on the information the SWQ concept appears to be ok however actual confirmation of the concept and compliance with the Water quality Rules will be made at the time of formal plan review.

Thanks,

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: John Kim <jkim@wilsonokamoto.com>
Sent: Thursday, April 13, 2023 9:01 AM
To: Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
Subject: RE: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40

Hi Keith,

Following up with the email below. Please let me know after you get a chance to review.

Thanks,
John S. H. Kim
T (808) 946-2277

From: John Kim <jkim@wilsonokamoto.com>
Sent: Monday, April 3, 2023 1:01 PM
To: Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
Subject: RE: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40

Hi Keith,

I've confirmed with the design team that the green roof will be utilized to the maximum extent

practicable. We're anticipating +-10,000 sf of the green roof, but that number will continue to be refined as we proceed into the design and before submitting it for formal permit review. The proposed area between P9 and P10 is just utility AC trench restoration for the Water line and Gas line service off Queen St. Please see attached for the revised figure. Please let me know if the project's swq strategy generally conforms with the WQ standards, understanding that formal approval shall come during permitting.

Thanks,
John S. H. Kim
T (808) 946-2277

From: Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
Sent: Wednesday, January 18, 2023 8:09 AM
To: John Kim <jkim@wilsonokamoto.com>
Subject: RE: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40

Hi John,

Sorry for the late response on this. CEB can confirm retention infeasibility via GWT elevation upon review of the grading plans and SWQR (grade elevations, soils report, etc.). For biofiltration is there a particular reason as to why a green roof is not incorporated into this project? I noticed that some of the other buildings utilized a green roof. No roof deck proposed for this project? Alternative compliance appears to be ok however landscaping should be incorporated to the MEP where applicable. Also what is being proposed for the area between P9 and P10?

Thanks,

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: John Kim <jkim@wilsonokamoto.com>
Sent: Tuesday, January 17, 2023 4:32 PM
To: Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
Subject: FW: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40

Hi Keith,

Following up with the request below. Please let me know after you get a chance to review.

Thanks,
John S. H. Kim
T (808) 946-2277

From: John Kim <jkim@wilsonokamoto.com>
Sent: Friday, December 23, 2022 8:40 AM
To: Keith Miyashiro (kmiyashiro1@honolulu.gov) <kmiyashiro1@honolulu.gov>
Subject: Ward Village Block N West - SWQ Strategy - ActionItem:00037:RXw40

Hi Keith,

Victoria Ward Ltd. is proceeding with another high-rise residential condominium tentatively named Block N West. See attached for the location map.

Would it be possible to confirm if alternative compliance treatment via a manufactured treatment device could be used for this project, given the site constraints listed below, which makes infiltration and biofiltration BMPs infeasible for treatment to most of the site?

1. The ground water table is at +3.00 (with a 3' buffer up to +6.00).
2. The finish floor of the proposed building will be +7.25.
3. The proposed building covers most of the project site.
4. The existing grades around the site are low at around +4.00 to +6.50.
5. The BMP inverts would be within 3' of the GWT.
6. Minimum underground drainage system depths.

Feel free to contact me should you like to discuss further.

Thanks,
John S. H. Kim, PE
Associate Project Manager

WILSON OKAMOTO CORPORATION 75

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

Hawaiian Electric Company

Will Serve Letter

June 24, 2025

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

Dear Mr. Mochizuki:

Re: Ward Village – Mahana

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

We have existing distribution circuits along Robinson that could potentially be used to serve the proposed development. Please keep in mind that these circuits may need to be upgraded depending on the ultimate size of this project’s load. At this time we do not have sufficient information and detailed plans to make this determination.

We request that you keep us informed on the status of your project. 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 543-7017.

Sincerely,

Reid-Prieto, Alistair

Digitally signed by Reid-Prieto, Alistair
DN: CN="Reid-Prieto, Alistair", OU=Users, OU=HECO, DC=hawaiianelectric, DC=net
Reason: I am the author of this document
Date: 2025.06.24 07:31:28-10'00'

Alistair Reid-Prieto
Supervisor
Customer Engineering Department

Hawaiian Telcom

Will Serve Letter

Hawaiian Telcom

May 27, 2025

Scott Shiraishi
Ronald N.S. Ho Associates

Subject: Will Serve Letter – Ward Village Block N-West Utility Assessment TMK as Follows: 2-3-002:116

Thank you for sharing information on your proposed Ward Village Block N-West Development. TMK listed above with the anticipated units listed as the following: 465 dwelling units. We are excited to be a part of the development and would gladly provide access to Hawaiian Telcom's services to this new development.

If you have any questions, please do not hesitate to contact me at (951) 203-2174 or email Braycen.lorenzo@hawaiiantel.com.

Sincerely,

Braycen Lorenzo

Braycen Lorenzo
OSP Network Engineer
Hawaiian Telcom

PO Box 2200, Honolulu, HI 96841 hawaiiantel.com

Charter Communications aka Spectrum

Will Serve Letter

Spectrum COMMUNITY SOLUTIONS

April 22, 2025

The Howard Hughes Corporation
1240 Ala Moana Blvd. Suite 200
Honolulu, HI 96814

Re: Will Serve Letter for Block N-West Development

Dear Howard Hughes Corporation:

Spectrum Oceanic LLC ("Spectrum"), directly or through its parent or affiliate companies, is an innovative provider of cable television, video, data, voice and other services (collectively, the "Services"). Howard Hughes Corporation ("Developer") is the developer of a proposed project located at Block N-West development with the TMK No. 2-3-002:116, consisting of 465 residential units. Spectrum's understanding is that the Developer wishes to make the Services available to residents and/or commercial tenants at the Project.

This is confirm that Spectrum is willing and able to provide the Services to the Project subject to all of the terms and conditions of its applicable franchise agreement with the State of Hawaii, all applicable federal, state and county laws, rules and regulations, and all other terms and conditions stated in this letter. Developer and/or its successors in interest will enter into a mutually agreeable services agreement with Spectrum, which shall specify the provision of equipment and facilities for the provision of the Services, the specific type(s) of Services provided, and other terms and conditions (which may include terms relating to the provision of easements, conduits, and accommodations for equipment).

The issuance of this letter by Spectrum, inclusive of the foregoing terms and conditions, is based upon the representations of the Developer to Spectrum with respect to the location and scope of the Project as of the date of this letter. Please contact us should you have any questions regarding the foregoing.

Jaycie Abe-Cameron

JaycieAnn Abe-Cameron
200 Akamainui St. | Mililani, HI | 96789
Director, Spectrum Community Solutions
Cell: 808.445.7239

Hawaii Gas

Email Correspondence

From: Kassidy Mashiyama
Sent: Thursday, April 10, 2025 10:22 AM
To: Keith Yamamoto
Subject: RE: Ward Village Mahana (Block N West) - Gas Availability

Hi Keith,

Thank you for the confirmation.

Thanks,
Kassidy

From: Keith Yamamoto <kkyamamo@hawaiigas.com>
Sent: Thursday, April 10, 2025 10:20 AM
To: Kassidy Mashiyama <kmashiyama@wilsonokamoto.com>
Cc: Brennan Nacario <BNacario@wilsonokamoto.com>
Subject: RE: Ward Village Mahana (Block N West) - Gas Availability

Kassidy,

Con irming the new 2” line from the intersection o Ward Ave and Queen St is su icient or the project. The alignment is also acceptable.

Thanks,
Keith

From: Kassidy Mashiyama <kmashiyama@wilsonokamoto.com>
Sent: Thursday, April 10, 2025 9:26 AM
To: Keith Yamamoto <kkyamamo@hawaiigas.com>
Cc: Brennan Nacario <BNacario@wilsonokamoto.com>
Subject: [EXTERNAL EMAIL] RE: Ward Village Mahana (Block N West) - Gas Availability

---

Hi Keith,

The programming of the Ward Village Mahana condominium has changed since WOC last coordinated with HiGas. In 2023, it was determined that a new line connecting to the existing 3” main at the intersection of Ward Avenue and Queen Street would be required to serve the project. We’d like to confirm that this requirement still stands with the revised programming:

82	Studio
158	1 BR
155	2 BR
70	3 BR

465	TOTAL
4,034 SF	Restaurant
8,066 SF	Retail
12,100 SF	TOTAL

If the requirement remains, please confirm that the size and schematic routing on the PDF are acceptable.

Thanks,

Kassidy Mashiyama
Civil Engineer

WILSON OKAMOTO CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

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

Traffic Review Branch

Email Correspondence

From: Pascua, Kaily A <kaily.pascua@honolulu.gov>
Sent: Wednesday, July 23, 2025 9:10 AM
To: Jennylyn Tapat Morrill
Cc: Andrade, Kamakaokalani M
Subject: Ward Village Block N-West TIAR Update

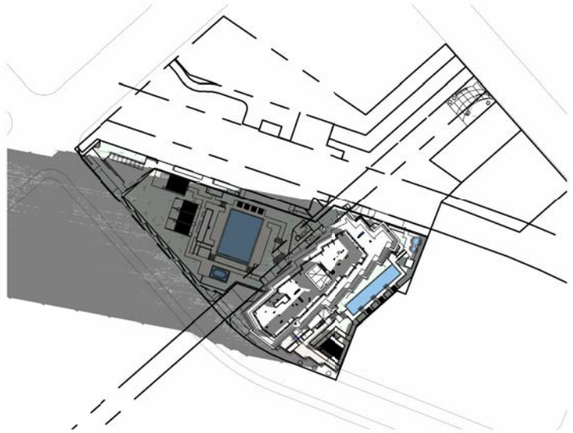
Hi Jenny,

The TIAR has been accepted.

Kaily Pascua
City and County of Honolulu
Traffic Review Branch
(808)768-8077

Appendix F

SHADE/SHADOW STUDY



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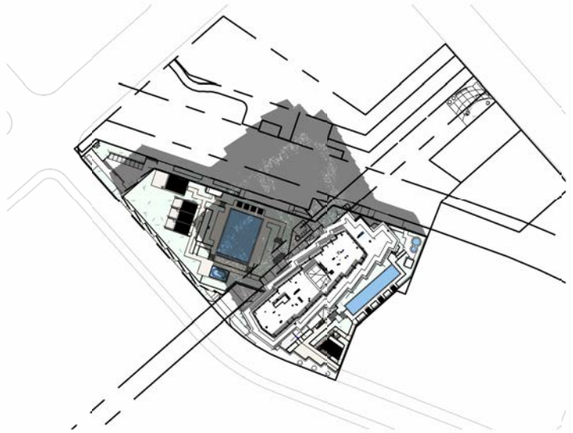

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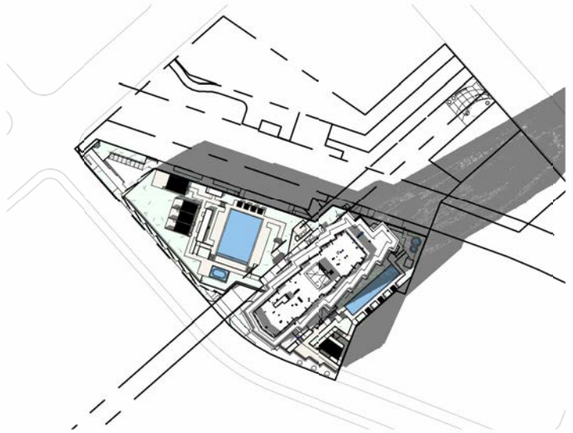

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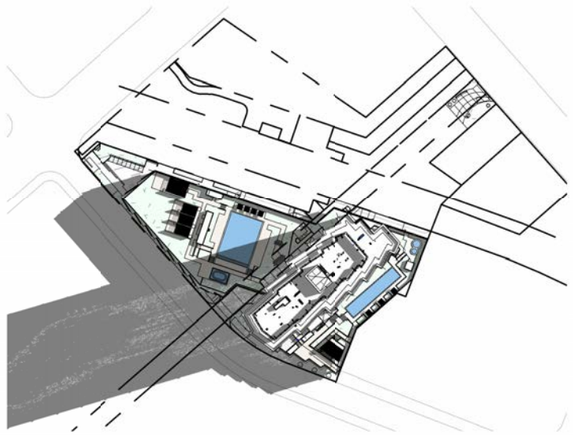

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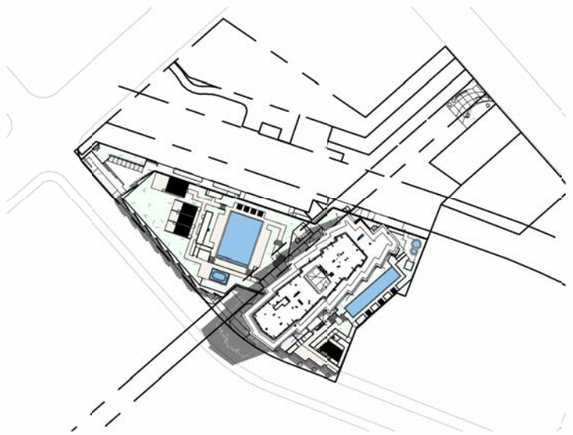

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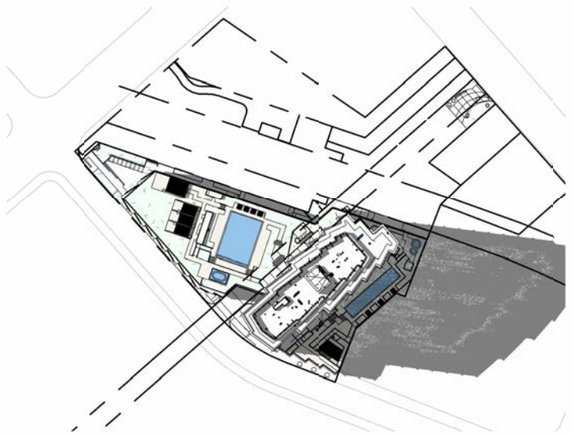

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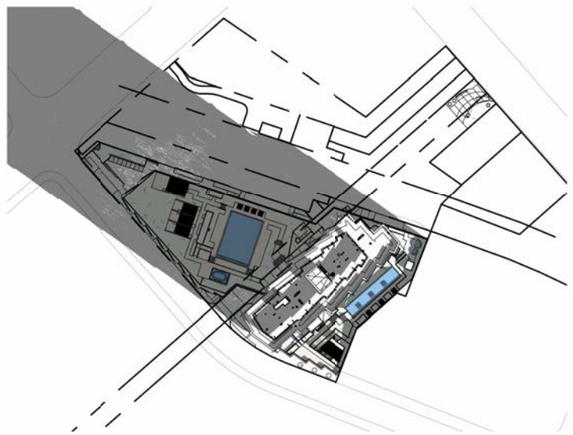

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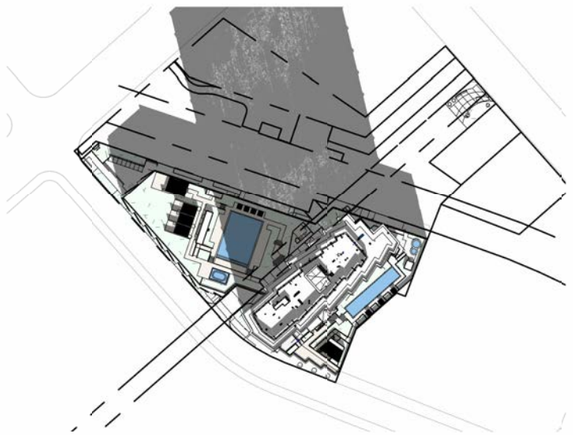

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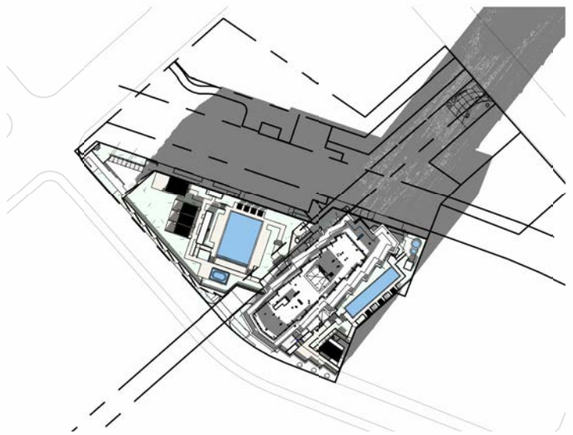

DECEMBER 22 3:00PM

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SCB
Architecture, Planning,
Interior and Urban Design

Architecture Planning Interior Des 255 California Street 3rd Floor San Francisco, CA 94111 T 415.216.2450 F 415.216.2451

PROJECT NAME: MAHANA WARD VILLAGE **DATE:**

PROJECT NO: 2018028 **REV.:**

DRAWING TITLE: SHADOW STUDY **SHEET** of

DRAWING SCALE: 1" = 200'-0"

Appendix G

PEDESTRIAN WIND STUDY

REPORT

WARD VILLAGE BLOCK N-WEST - MAHANA

HONOLULU, HAWAII

PEDESTRIAN WIND STUDY
RWDI # 2302847
May 15, 2025

SUBMITTED TO

Steven Lee
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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed Ward Village Block N-West in Honolulu, Hawaii (Image 1). Wind-tunnel testing was conducted in January 2024 for a previous design of the proposed development under the Existing, Proposed and Future configurations of the site and surroundings. The results for the Existing configuration of the site and surroundings are included in Appendix A.

RWDI received updated 3D model and architectural drawings of the proposed project in March 2025. This report summarizes the results from the second round of wind-tunnel testing conducted for the proposed development under the Proposed and Future configurations of the site and surroundings (Image 2). The results were analysed using the regional wind climate records (Image 3) and evaluated against the RWDI Pedestrian Wind Criteria for pedestrian comfort (pertaining to common wind speeds conducive to different levels of human activity) and pedestrian safety (pertaining to infrequent but strong gusts that could affect a person's footing). The predicted wind conditions are presented in Figures 1A through 2B and Table 1. Note that references to the orientation of streets and built features are based on Project North which is approximately aligned with Ward Avenue. Key findings are summarized as follows:

- The pedestrian wind safety criterion is predicted to be met at all assessed areas for all configurations studied.
- In the Proposed configuration, wind conditions at most areas assessed, including sidewalks/walkways, main entrances, and the pocket park, are predicted to be comfortable for the intended use year-round. Higher wind speeds and uncomfortable wind conditions are predicted near the intersection of Halekauwila Street and Ward Avenue on the west side of the podium, more notably during the summer months.
- Wind speeds at most areas on the Level 8 amenity deck are expected to be suitable for their intended use. Windier conditions are predicted around the family pool to the west of the tower, as well as to the east and northeast of the tower in both seasons.
- The addition of the future developments is predicted to reduce wind speeds near the intersection of Halekauwila Street and Ward Avenue. The future developments are not expected to impact the wind conditions in the designated pocket park to the north or on the Level 8 amenity deck.

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LIST OF APPENDICES

PEDESTRIAN WIND STUDY
WARD VILLAGE BLOCK N-WEST - MAHANA
RWDI #2302847
May 15, 2025

1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed Ward Village Block N-West – Mahana in Honolulu, Hawaii. This report presents the project objectives, approach and the main results from RWDI's assessment and provides conceptual wind control measures, where necessary. Our Statement of Limitations as it pertains to this study can be found in Section 4 of this report.

1.1 Project Description

The project site is located at the northeast corner of the intersection of Ward Avenue and Halekauwila Street, and it is an addition to Block N-East (Image 1). The proposed building consists of a 33-story (approximately 365 ft) residential tower with a 7-story podium structure and accessible rooftop. As part of the development plan, there is a small area designated as a "Pocket Park" to the north of the project site on the south of Queen Street.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to RWDI criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including building entrances, nearby walkways, pocket park and Level 8 amenity area.

Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1:300 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

A - Proposed: Proposed project with existing surroundings (Image 2A), and,

B - Future: Proposed project with existing and future surroundings (Image 2B).

The wind tunnel model included all relevant surrounding buildings and topography within an approximate 1200 ft radius around the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 89 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately ft above local grade in pedestrian areas throughout the study site. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site, and reviewed by The Howard Hughes Corporation. Wind speeds were measured for 36 directions in 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model.

PEDESTRIAN WIND STUDY
WARD VILLAGE BLOCK N-WEST - MAHANA
RWDI #2302847
May 15, 2025

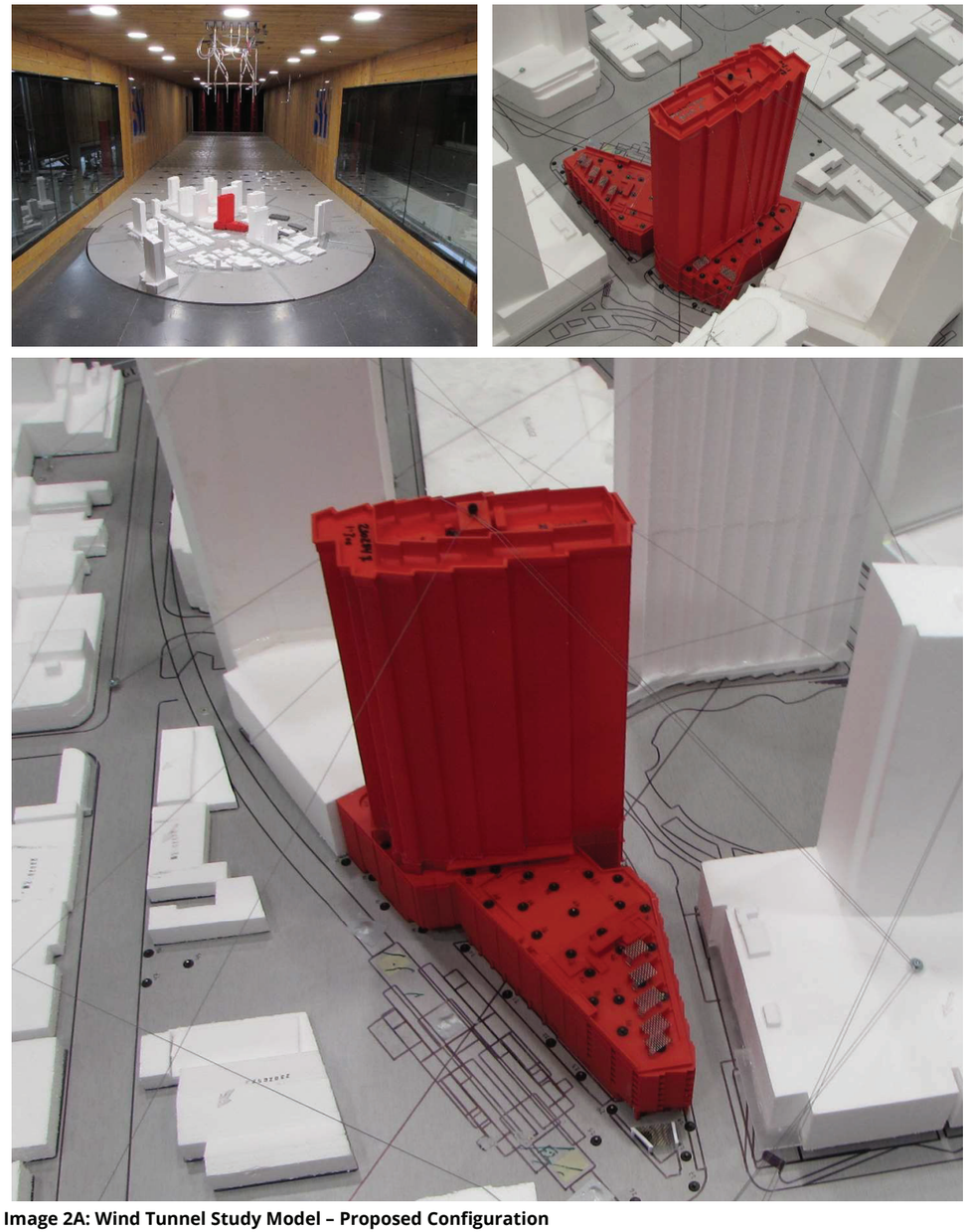


Image 2A: Wind Tunnel Study Model – Proposed Configuration

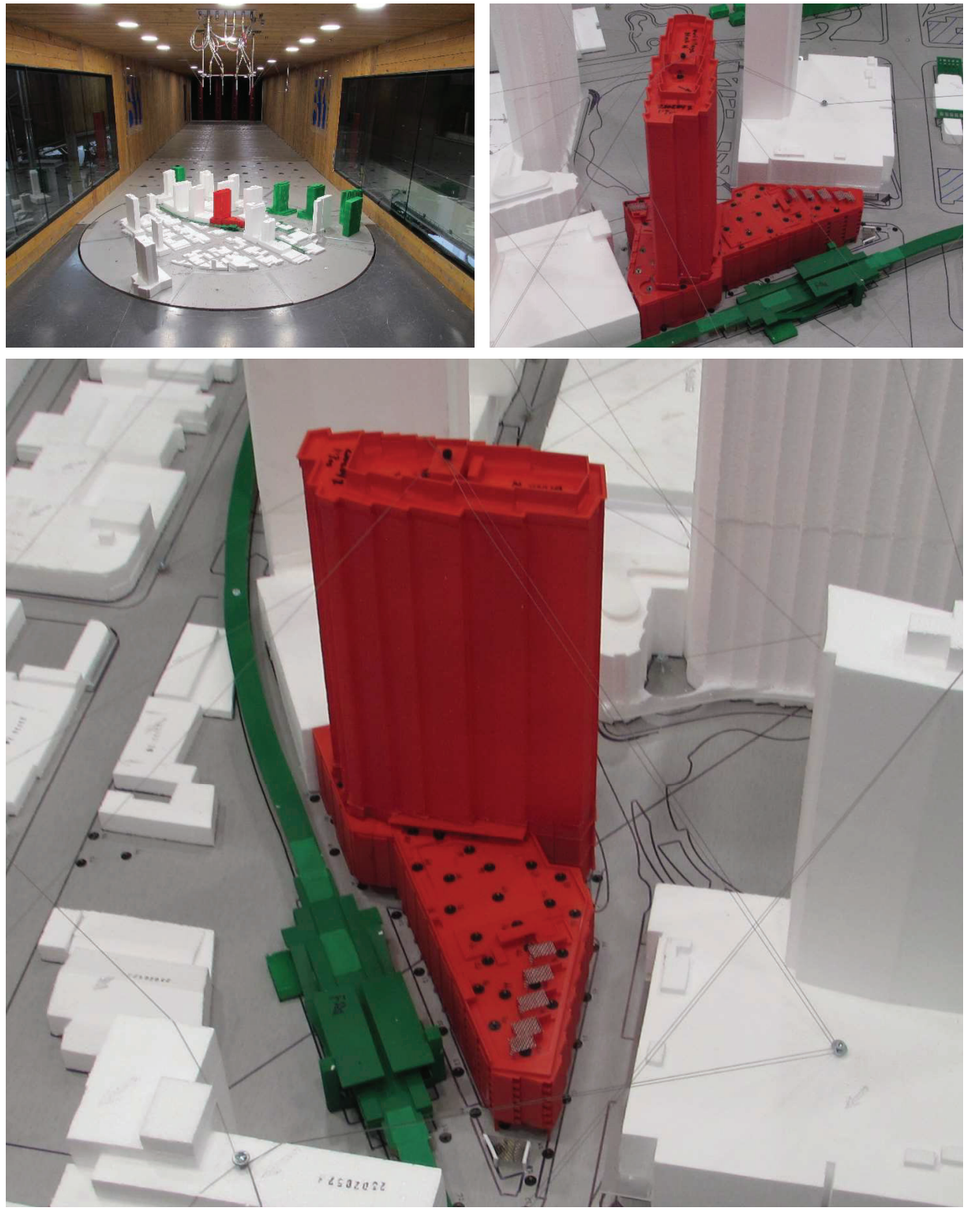
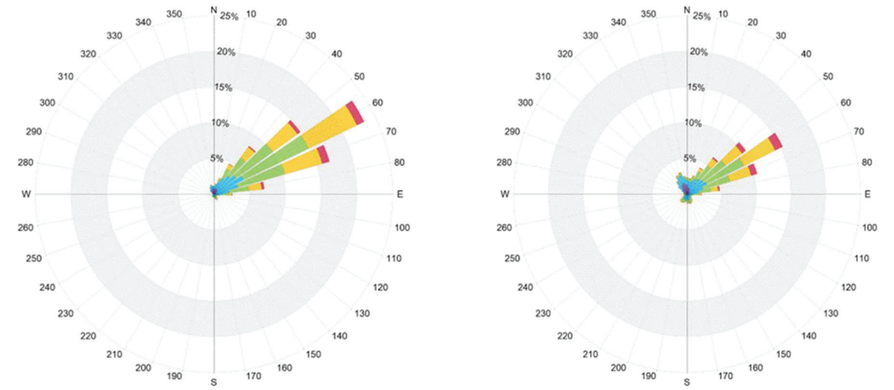


Image 2B: Wind Tunnel Study Model – Future Configuration

2.2 Wind Climate Data

Wind statistics recorded at Honolulu International Airport between 1993 and 2023, inclusive, were analyzed for the Summer (May through October) and Winter (November through April) seasons. Image 3 graphically depicts the directional distributions of wind frequencies and speeds for these two seasons. Winds from the northeast and east-northeast directions are predominant throughout the year, as indicated by the wind roses. Strong winds of a mean speed greater than 15 mph measured at the airport (at an anemometer height of 30 ft) occur for 25.8% and 19.6% of the time during the summer and winter seasons, respectively.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the wind criteria for pedestrian comfort and safety.



Summer (May – October) Winter (November – April)

Wind Speed (mph)	Probability (%) Summer	Winter
Calm	3.9	7.5
1-5	9.8	15.5
6-10	25.4	29.6
11-15	35.2	27.7
16-20	22.6	16.1
>20	3.2	3.5

Image 3: Directional Distribution of Winds Approaching Honolulu International Airport between 1993 and 2023

2.3 RWDI Pedestrian Wind Criteria

The RWDI pedestrian wind criteria, which have been developed by RWDI through research and consulting practice since 1974, are used in the current study. These criteria have been widely accepted by municipal authorities as well as by the building design and city planning community. Regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can affect a person's perception of the wind climate. Therefore, comparisons of wind speeds for the existing and proposed building configurations are the most objective way in assessing local pedestrian wind conditions. In general, the combined effect of mean and gust speeds on pedestrian comfort can be quantified by a Gust Equivalent Mean (GEM).

Comfort Category	GEM Speed (mph)	Description
Sitting	≤ 6	Calm or light breezes desired for outdoor restaurants and seating areas where one can read a paper without having it blown away
Standing	≤ 8	Gentle breezes suitable for main building entrances, bus stops, and other places where pedestrians may linger
Strolling	≤ 10	Moderate winds that would be appropriate for window shopping and strolling along a downtown street, plaza or park
Walking	≤ 12	Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering
Uncomfortable	> 12	Strong winds of this magnitude are considered a nuisance for all pedestrian activities, and wind mitigation is typically recommended

Notes:
(1) GEM Speed = max (Mean Speed, Gust Speed/1.85) and *Gust Speed = Mean Speed + 3*RMS Speed*.
(2) A wind comfort category is applicable if the predicted GEM speeds are within the respective threshold for at least 80% of the time in the season assessed.
(3) The comfort assessment was conducted for two seasonal periods, summer (May to October) and winter (November to April).
(4) The assessment considers winds occurring between 6 AM and midnight. Limited usage of outdoor spaces is anticipated in the excluded period.

Safety Criterion	Gust Speed (mph)	Description
Exceeded	> 56	Excessive gust speeds can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.

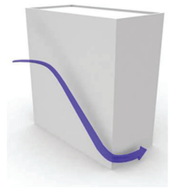
Notes:
(1) Based on an annual exceedance of 9 hours or 0.1% of the time for 24 hours a day; and,
(2) Only gust speeds need to be considered in the wind safety criterion. These are usually rare events but deserve special attention in city planning and building design due to their potential safety impact on pedestrians.

2.4 General Wind Flow Mechanisms

In the discussion of wind conditions, reference is made to the following wind flow mechanisms (Image 4):

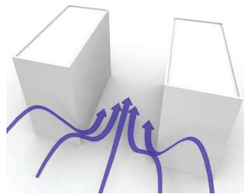
DOWNWASHING

Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. This is often the main cause for wind accelerations around large buildings at the pedestrian level.



CORNER ACCELERATION

When wind moves around the buildings a localized increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level. The effect is intensified when the wind approaches an oblique angle to a tall façade and are deflected down and around the exposed corners.



CHANNELING EFFECT

Wind flow tends to accelerate through the space between buildings, under bridges or in passages through buildings due to channelling effect caused by the narrow gap. The effect is intensified if the channel is aligned with the predominant wind direction.

Image 4: General Wind Flow Mechanisms

If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity. Design details such as setting back a tall tower from the edges of a podium, deep canopies close to ground level, wind screens, tall trees with dense landscaping, etc. can help reduce wind speeds. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1A through 2B located in the "Figures" section of this report and the associated wind speeds are presented in Table 1, located in the "Tables" section of this report. The existing configuration results from the previous wind tunnel test are presented in Appendix A.

Generally, wind conditions that are comfortable for walking or strolling are appropriate for sidewalks and walkways, as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds, conducive to standing or sitting, are preferred at main entrances where pedestrians are apt to linger. Wind conditions that are comfortable for sitting are desired for outdoor amenities and seating areas. However, considering the tropical or warm climate of the area, slightly higher wind speeds comfortable for standing might be acceptable. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

Wind conditions that meet the safety criterion are predicted at all assessed locations in all configurations.

3.1 Existing Configuration

Wind speeds throughout the year around the project site are mostly comfortable for standing or strolling, as shown in Appendix A. Similar wind conditions are expected in the pocket park area. Wind speeds during the summer are slightly higher than in the winter due to seasonal variations (Figures A1 and A2). The highest wind speeds around the project site are expected to occur at the northeast of the site, induced by the existing Block N-East. These wind speeds are comfortable for walking.

3.2 Proposed Configuration

3.2.1 Grade-Level (Locations 1 through 47)

As shown in Figures 1A and 2A, wind speeds at the main entrances (Locations 1 and 8) of the proposed building are expected to be comfortable for sitting year-round, making them suitable for their intended passive use. Wind conditions at the assessed locations in the pocket park (Locations 45-47) are predicted to be comfortable for standing or strolling year-round, which is similar to those in the Existing configuration.

Wind conditions at most assessed areas, including sidewalks and walkways, are predicted to be comfortable for walking or better in both winter and summer, generally suitable for their intended use. However, higher wind speeds and uncomfortable wind conditions are predicted on the west side of the podium, particularly during the summer months (Locations 26, 27, 30, and 31 in Figure 1A). Winds improve slightly during the winter months (Locations 26 and 31 in Figure 2A). These wind speeds are further reduced to more comfortable levels in the Future configuration – see Figures 1B and 2B and Section 3.3. If reduced wind speeds are desired in the interim, wind control strategies, such as wind screens and landscaping, are recommended along the sidewalks, as shown in Image 6.

Image 5: Example of mitigation measures on sidewalks and walkways

3.2.2 Above Grade (Locations 48 through 89)

Wind speeds at the assessed locations in the lounging area on the west and south portions of the podium are expected to be comfortable for standing or sitting, making them suitable for passive use throughout the year (Figures 1A and 2A). The wind conditions near the pool are anticipated to be comfortable for walking or strolling year-round. Higher wind speeds are expected near the east and northeast of the tower, with uncomfortable wind conditions anticipated in the summer (Locations 49, 50, and 53 in Figure 1A) and in the winter (Location 53 in Figure 2A). Wind control measures, including trellises, landscaping, and tall railings (at least 6 ft in height), are recommended, as shown in Image 7.

3.3 Future Configuration

As illustrated in Figures 1B and 2B, the addition of future developments is predicted to reduce wind speeds near the intersection of Halekauwila Street and Ward Avenue. Wind speeds at all assessed grade-level locations are expected to be comfortable for walking. The future developments are not anticipated to affect wind conditions in the designated pocket park to the north. Additionally, wind conditions on the Level 8 amenity deck are projected to remain comparable to those in the Proposed configuration.

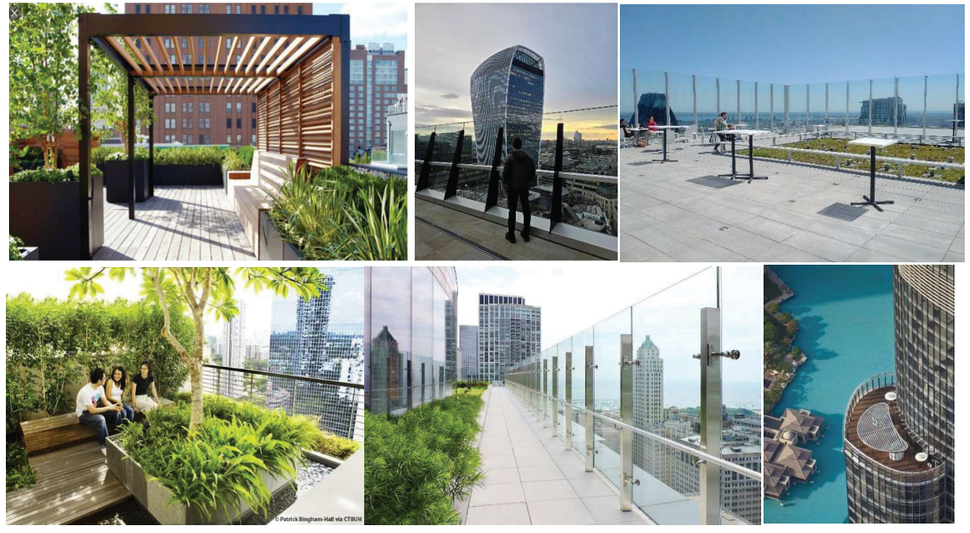


Image 6 Example of mitigation measures on outdoor amenity terraces

4 STATEMENT OF LIMITATIONS

Limitations

This report was prepared by Rowan Williams Davies & Irwin, Inc. ("RWDI") for Howard Hughes Corporation ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

Design Assumptions

RWDI confirms that the pedestrian wind assessment (the "**Assessment**") discussed herein was performed by RWDI in accordance with generally accepted professional standards at the time when the Assessment was performed and in the location of the Project. No other representations, warranties, or guarantees are made with respect to the accuracy or completeness of the information, findings, recommendations, or conclusions contained in this Report. This report is not a legal opinion regarding compliance with applicable laws.

The findings and recommendations set out in this report are based on the following information disclosed to RWDI. Drawings and information listed below were received from the project team and used to construct the scale model of the proposed Ward Village Block N-West **("Project Data**").

File Name	File Type	Date Received (dd/mm/yyyy)
2025-0228_Mahana_Architecture	PDF	05/03/2025
SCB_Mahana_Main	Revit	05/03/2025
SCB_Mahana_Skin	Revit	05/03/2025

The recommendations and conclusions are based on the assumption that the Project Data and Climate Data are accurate and complete. RWDI assumes no responsibility for any inaccuracy or deficiency in information it has received from others. In addition, the recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome.

The opinions in this report can only be relied upon to the extent that the Project Data and Project Specific Conditions have not changed. Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report. Therefore, it is incumbent upon the Client and/or any other third party reviewing the recommendations and conclusions in this report to contact RWDI in the event of any change in the Project Data and Project Specific Conditions in order to determine whether any such change(s) may impact the assumptions upon which the recommendations and conclusions were made.

5 REFERENCES

1. ASCE Task Committee on Outdoor Human Comfort (2004). *Outdoor Human Comfort and Its Assessment*, 68 pages, American Society of Civil Engineers, Reston, Virginia, USA.

2. Williams, C.J., Hunter, M.A. and Waechter, W.F. (1990). "Criteria for Assessing the Pedestrian Wind Environment," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.36, pp.811-815.

3. Williams, C.J., Soligo M.J. and Cote, J. (1992). "A Discussion of the Components for a Comprehensive Pedestrian Level Comfort Criteria," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.41-44, pp.2389-2390.

4. Soligo, M.J., Irwin, P.A., and Williams, C.J. (1993). "Pedestrian Comfort Including Wind and Thermal Effects," *Third Asia-Pacific Symposium on Wind Engineering*, Hong Kong.

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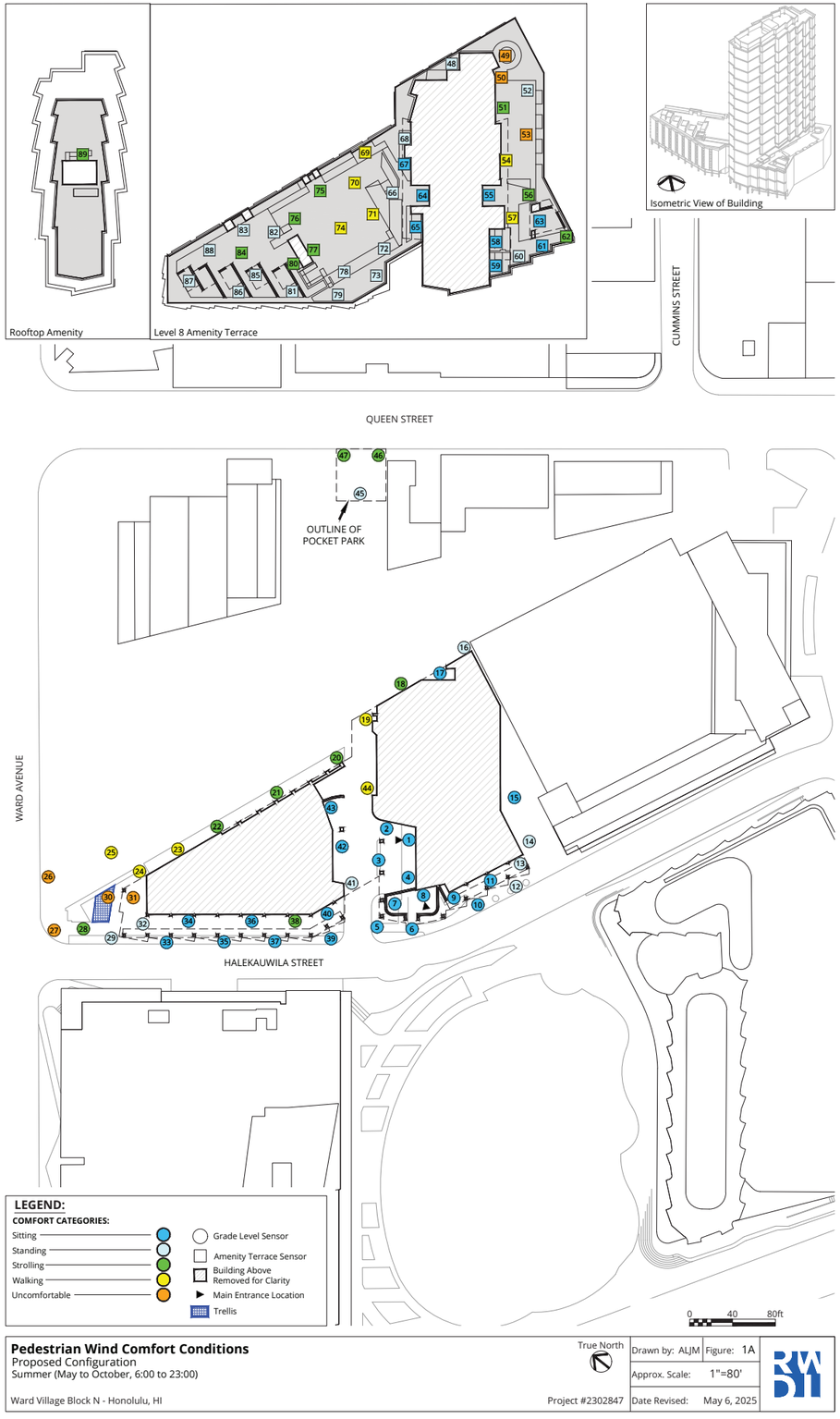
7. Lawson, T.V. (1973). "Wind Environment of Buildings: A Logical Approach to the Establishment of Criteria", *Report No. TVL 7321*, Department of Aeronautic Engineering, University of Bristol, Bristol, England.

8. Durgin, F. H. (1997). "Pedestr ian Level Wind Criteria Using the Equivalent average", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 66, pp.215-226.

9. Wu, H. and Kriksic, F. (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.104-106, pp.397-407.

10. Wu, H., Williams, C.J., Baker, H.A. and Waechter, W.F. (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", *ASCE Structure Congress 2004,* Nashville, Tennessee.

FIGURES

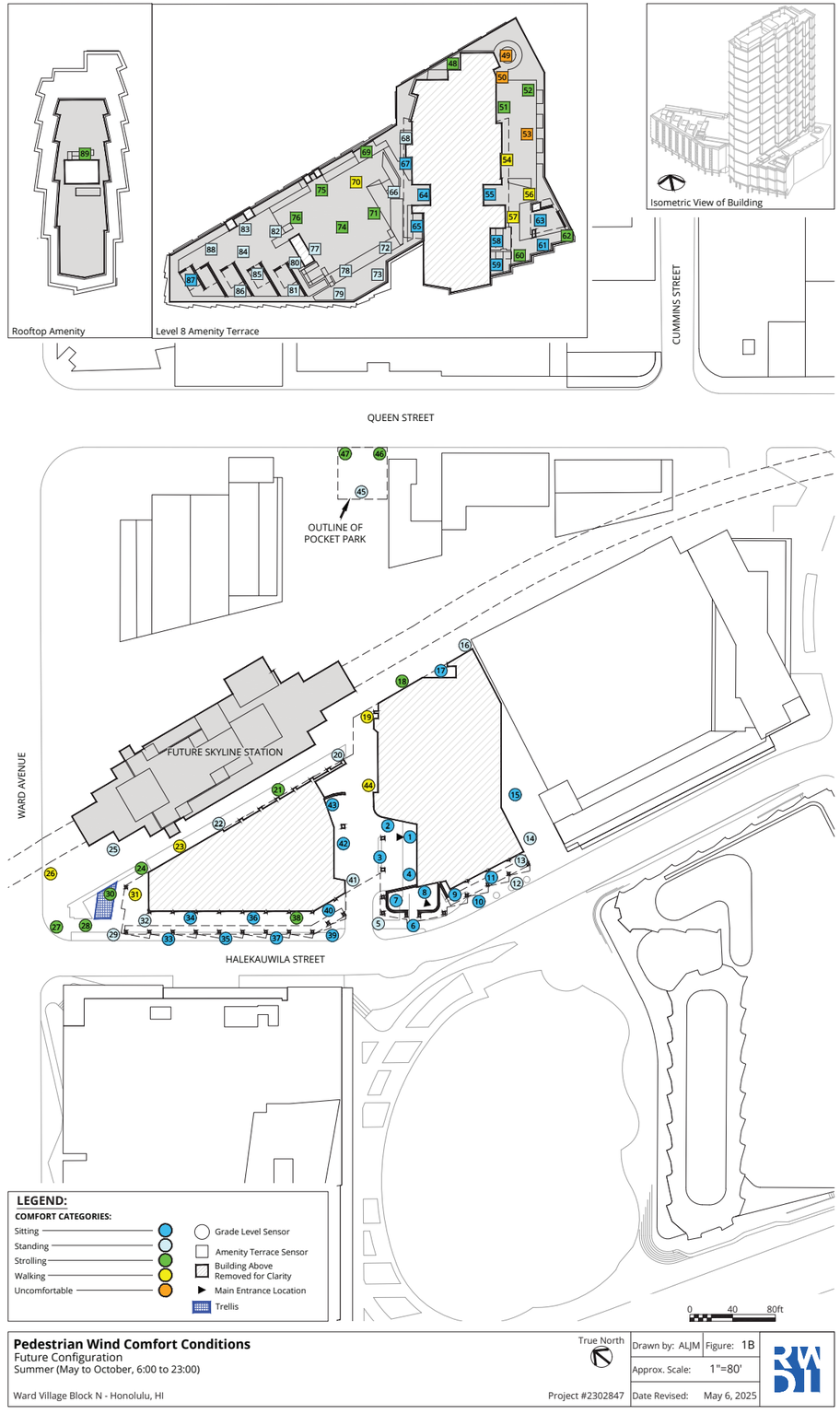


Pedestrian Wind Comfort Conditions
Proposed Configuration
Summer (May to October, 6:00 to 23:00)

True North

Drawn by: ALJM	Figure: 1A
Approx. Scale:	1"=80'
Date Revised:	May 6, 2025

Ward Village Block N - Honolulu, HI
Project #2302847

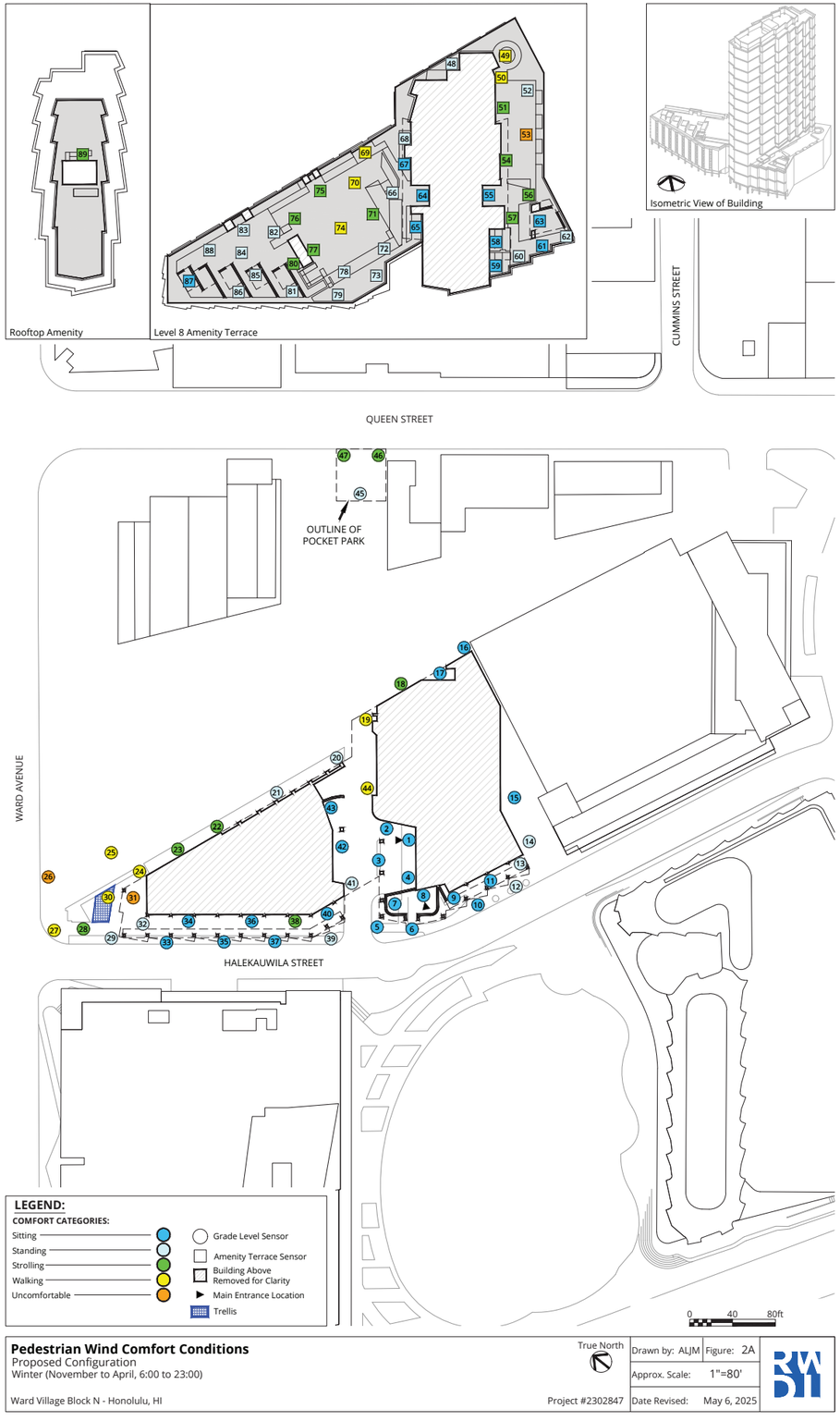


Pedestrian Wind Comfort Conditions
Future Configuration
Summer (May to October, 6:00 to 23:00)

True North

Drawn by: ALJM	Figure: 1B
Approx. Scale:	1"=80'
Date Revised:	May 6, 2025

Ward Village Block N - Honolulu, HI
Project #2302847



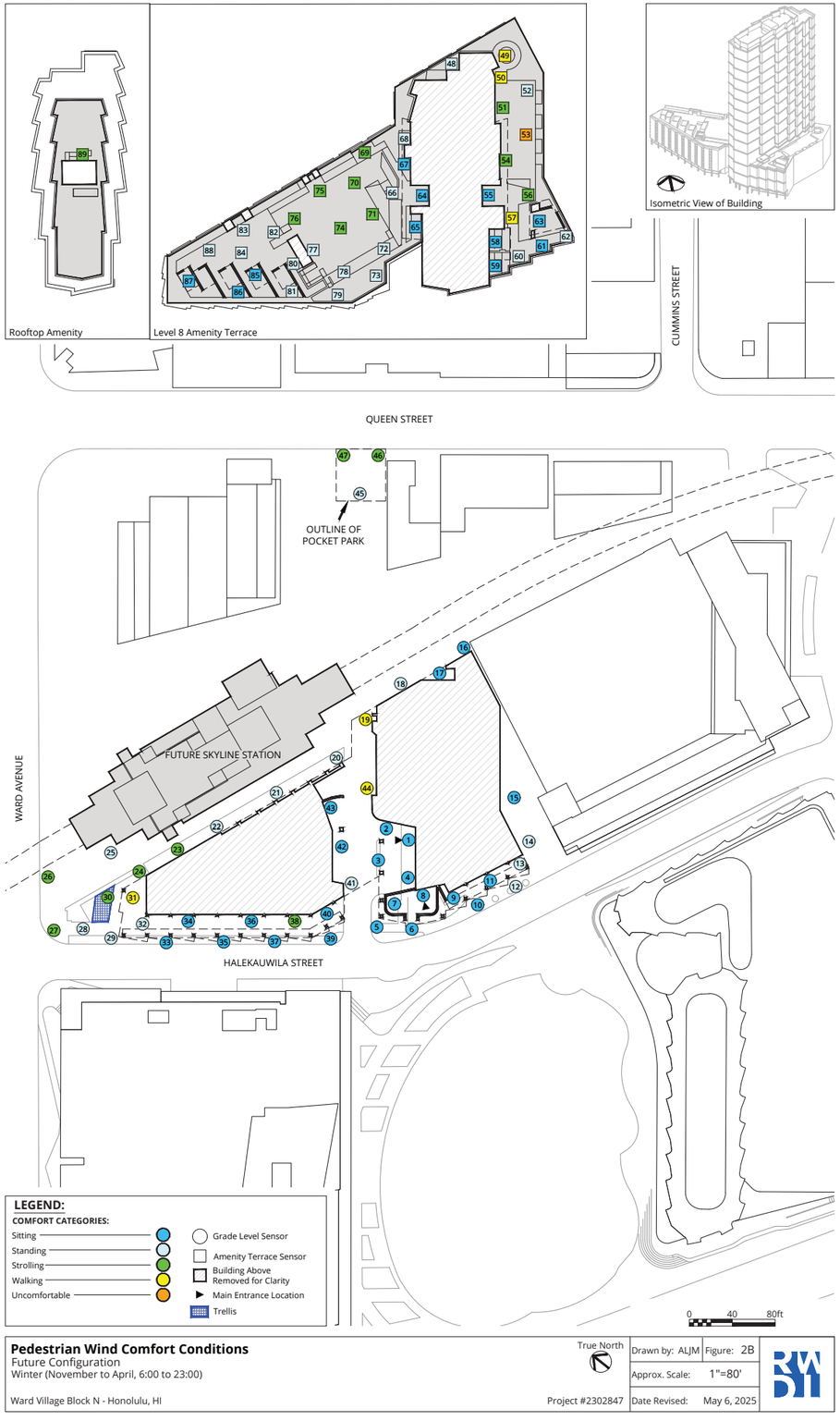
Pedestrian Wind Comfort Conditions
Proposed Configuration
Winter (November to April, 6:00 to 23:00)

Ward Village Block N - Honolulu, HI

Project #2302847

True North

Drawn by: ALJM	Figure: 2A		
Approx. Scale:	1"=80'		
Date Revised:	May 6, 2025		



Pedestrian Wind Comfort Conditions
Future Configuration
Winter (November to April, 6:00 to 23:00)

Ward Village Block N - Honolulu, HI

Project #2302847

True North

Drawn by: ALJM	Figure: 2B		
Approx. Scale:	1"=80'		
Date Revised:	May 6, 2025		

TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
1	Proposed	2	Sitting	3	Sitting	10	Pass
	Future	2	Sitting	2	Sitting	10	Pass
2	Proposed	3	Sitting	3	Sitting	12	Pass
	Future	2	Sitting	3	Sitting	12	Pass
3	Proposed	6	Sitting	6	Sitting	22	Pass
	Future	6	Sitting	6	Sitting	21	Pass
4	Proposed	4	Sitting	4	Sitting	18	Pass
	Future	4	Sitting	4	Sitting	18	Pass
5	Proposed	6	Sitting	6	Sitting	26	Pass
	Future	7	Standing	6	Sitting	22	Pass
6	Proposed	5	Sitting	5	Sitting	26	Pass
	Future	5	Sitting	5	Sitting	22	Pass
7	Proposed	3	Sitting	3	Sitting	16	Pass
	Future	3	Sitting	3	Sitting	16	Pass
8	Proposed	3	Sitting	3	Sitting	16	Pass
	Future	3	Sitting	3	Sitting	15	Pass
9	Proposed	5	Sitting	5	Sitting	20	Pass
	Future	4	Sitting	5	Sitting	19	Pass
10	Proposed	6	Sitting	6	Sitting	22	Pass
	Future	5	Sitting	6	Sitting	22	Pass
11	Proposed	5	Sitting	6	Sitting	22	Pass
	Future	5	Sitting	6	Sitting	20	Pass
12	Proposed	8	Standing	8	Standing	27	Pass
	Future	8	Standing	7	Standing	25	Pass
13	Proposed	7	Standing	7	Standing	28	Pass
	Future	7	Standing	7	Standing	25	Pass
14	Proposed	7	Standing	7	Standing	26	Pass
	Future	7	Standing	7	Standing	26	Pass
15	Proposed	5	Sitting	5	Sitting	21	Pass
	Future	5	Sitting	5	Sitting	19	Pass
16	Proposed	7	Standing	6	Sitting	21	Pass
	Future	7	Standing	6	Sitting	21	Pass
17	Proposed	5	Sitting	5	Sitting	16	Pass
	Future	5	Sitting	5	Sitting	17	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
18	Proposed	9	Strolling	9	Strolling	30	Pass
	Future	9	Strolling	8	Standing	28	Pass
19	Proposed	12	Walking	12	Walking	40	Pass
	Future	12	Walking	11	Walking	38	Pass
20	Proposed	9	Strolling	8	Standing	25	Pass
	Future	8	Standing	7	Standing	23	Pass
21	Proposed	9	Strolling	8	Standing	30	Pass
	Future	9	Strolling	8	Standing	28	Pass
22	Proposed	10	Strolling	10	Strolling	33	Pass
	Future	8	Standing	7	Standing	25	Pass
23	Proposed	11	Walking	10	Strolling	34	Pass
	Future	11	Walking	10	Strolling	34	Pass
24	Proposed	12	Walking	11	Walking	37	Pass
	Future	10	Strolling	9	Strolling	31	Pass
25	Proposed	12	Walking	11	Walking	36	Pass
	Future	8	Standing	8	Standing	26	Pass
26	Proposed	13	Uncomfortable	13	Uncomfortable	36	Pass
	Future	11	Walking	10	Strolling	33	Pass
27	Proposed	13	Uncomfortable	12	Walking	35	Pass
	Future	10	Strolling	9	Strolling	29	Pass
28	Proposed	10	Strolling	10	Strolling	31	Pass
	Future	9	Strolling	8	Standing	26	Pass
29	Proposed	8	Standing	8	Standing	26	Pass
	Future	7	Standing	7	Standing	23	Pass
30	Proposed	13	Uncomfortable	12	Walking	38	Pass
	Future	10	Strolling	9	Strolling	30	Pass
31	Proposed	14	Uncomfortable	13	Uncomfortable	41	Pass
	Future	12	Walking	11	Walking	35	Pass
32	Proposed	8	Standing	8	Standing	31	Pass
	Future	8	Standing	7	Standing	27	Pass
33	Proposed	5	Sitting	5	Sitting	23	Pass
	Future	4	Sitting	5	Sitting	23	Pass
34	Proposed	4	Sitting	5	Sitting	17	Pass
	Future	4	Sitting	4	Sitting	16	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
35	Proposed	5	Sitting	5	Sitting	26	Pass
	Future	4	Sitting	5	Sitting	26	Pass
36	Proposed	3	Sitting	4	Sitting	18	Pass
	Future	3	Sitting	3	Sitting	17	Pass
37	Proposed	6	Sitting	6	Sitting	27	Pass
	Future	5	Sitting	6	Sitting	27	Pass
38	Proposed	9	Strolling	9	Strolling	26	Pass
	Future	9	Strolling	9	Strolling	25	Pass
39	Proposed	6	Sitting	7	Standing	26	Pass
	Future	6	Sitting	6	Sitting	26	Pass
40	Proposed	4	Sitting	5	Sitting	27	Pass
	Future	4	Sitting	5	Sitting	25	Pass
41	Proposed	7	Standing	7	Standing	26	Pass
	Future	7	Standing	7	Standing	25	Pass
42	Proposed	6	Sitting	6	Sitting	21	Pass
	Future	6	Sitting	6	Sitting	20	Pass
43	Proposed	3	Sitting	3	Sitting	13	Pass
	Future	3	Sitting	3	Sitting	13	Pass
44	Proposed	12	Walking	12	Walking	36	Pass
	Future	12	Walking	12	Walking	34	Pass
45	Proposed	7	Standing	7	Standing	24	Pass
	Future	7	Standing	7	Standing	24	Pass
46	Proposed	10	Strolling	10	Strolling	33	Pass
	Future	10	Strolling	9	Strolling	32	Pass
47	Proposed	10	Strolling	9	Strolling	30	Pass
	Future	10	Strolling	9	Strolling	30	Pass
48	Proposed	8	Standing	7	Standing	27	Pass
	Future	9	Strolling	8	Standing	30	Pass
49	Proposed	13	Uncomfortable	12	Walking	41	Pass
	Future	13	Uncomfortable	11	Walking	40	Pass
50	Proposed	13	Uncomfortable	12	Walking	41	Pass
	Future	14	Uncomfortable	12	Walking	42	Pass
51	Proposed	10	Strolling	9	Strolling	31	Pass
	Future	10	Strolling	10	Strolling	32	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
52	Proposed	8	Standing	8	Standing	25	Pass
	Future	9	Strolling	8	Standing	25	Pass
53	Proposed	14	Uncomfortable	13	Uncomfortable	44	Pass
	Future	14	Uncomfortable	13	Uncomfortable	45	Pass
54	Proposed	11	Walking	10	Strolling	39	Pass
	Future	12	Walking	10	Strolling	40	Pass
55	Proposed	2	Sitting	2	Sitting	7	Pass
	Future	2	Sitting	2	Sitting	7	Pass
56	Proposed	10	Strolling	9	Strolling	35	Pass
	Future	11	Walking	10	Strolling	36	Pass
57	Proposed	12	Walking	10	Strolling	41	Pass
	Future	12	Walking	11	Walking	42	Pass
58	Proposed	3	Sitting	3	Sitting	14	Pass
	Future	4	Sitting	4	Sitting	13	Pass
59	Proposed	4	Sitting	4	Sitting	16	Pass
	Future	4	Sitting	4	Sitting	16	Pass
60	Proposed	8	Standing	8	Standing	28	Pass
	Future	9	Strolling	8	Standing	28	Pass
61	Proposed	6	Sitting	6	Sitting	20	Pass
	Future	6	Sitting	6	Sitting	20	Pass
62	Proposed	9	Strolling	8	Standing	30	Pass
	Future	9	Strolling	8	Standing	31	Pass
63	Proposed	5	Sitting	5	Sitting	27	Pass
	Future	5	Sitting	5	Sitting	20	Pass
64	Proposed	2	Sitting	2	Sitting	7	Pass
	Future	2	Sitting	2	Sitting	6	Pass
65	Proposed	4	Sitting	4	Sitting	17	Pass
	Future	4	Sitting	4	Sitting	15	Pass
66	Proposed	8	Standing	8	Standing	28	Pass
	Future	7	Standing	7	Standing	26	Pass
67	Proposed	6	Sitting	6	Sitting	18	Pass
	Future	5	Sitting	5	Sitting	18	Pass
68	Proposed	8	Standing	7	Standing	25	Pass
	Future	8	Standing	7	Standing	24	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
69	Proposed	12	Walking	11	Walking	44	Pass
	Future	10	Strolling	10	Strolling	41	Pass
70	Proposed	12	Walking	11	Walking	39	Pass
	Future	11	Walking	10	Strolling	36	Pass
71	Proposed	11	Walking	10	Strolling	36	Pass
	Future	10	Strolling	10	Strolling	34	Pass
72	Proposed	7	Standing	7	Standing	30	Pass
	Future	7	Standing	7	Standing	27	Pass
73	Proposed	7	Standing	7	Standing	27	Pass
	Future	7	Standing	7	Standing	26	Pass
74	Proposed	11	Walking	11	Walking	35	Pass
	Future	10	Strolling	10	Strolling	33	Pass
75	Proposed	10	Strolling	10	Strolling	33	Pass
	Future	9	Strolling	9	Strolling	31	Pass
76	Proposed	10	Strolling	9	Strolling	31	Pass
	Future	9	Strolling	9	Strolling	29	Pass
77	Proposed	9	Strolling	9	Strolling	29	Pass
	Future	8	Standing	8	Standing	28	Pass
78	Proposed	8	Standing	8	Standing	26	Pass
	Future	7	Standing	7	Standing	25	Pass
79	Proposed	8	Standing	8	Standing	26	Pass
	Future	7	Standing	7	Standing	25	Pass
80	Proposed	9	Strolling	9	Strolling	28	Pass
	Future	8	Standing	8	Standing	26	Pass
81	Proposed	7	Standing	7	Standing	28	Pass
	Future	7	Standing	7	Standing	27	Pass
82	Proposed	8	Standing	8	Standing	27	Pass
	Future	8	Standing	7	Standing	26	Pass
83	Proposed	8	Standing	7	Standing	24	Pass
	Future	8	Standing	7	Standing	24	Pass
84	Proposed	9	Strolling	8	Standing	27	Pass
	Future	8	Standing	8	Standing	26	Pass
85	Proposed	7	Standing	7	Standing	24	Pass
	Future	7	Standing	6	Sitting	23	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

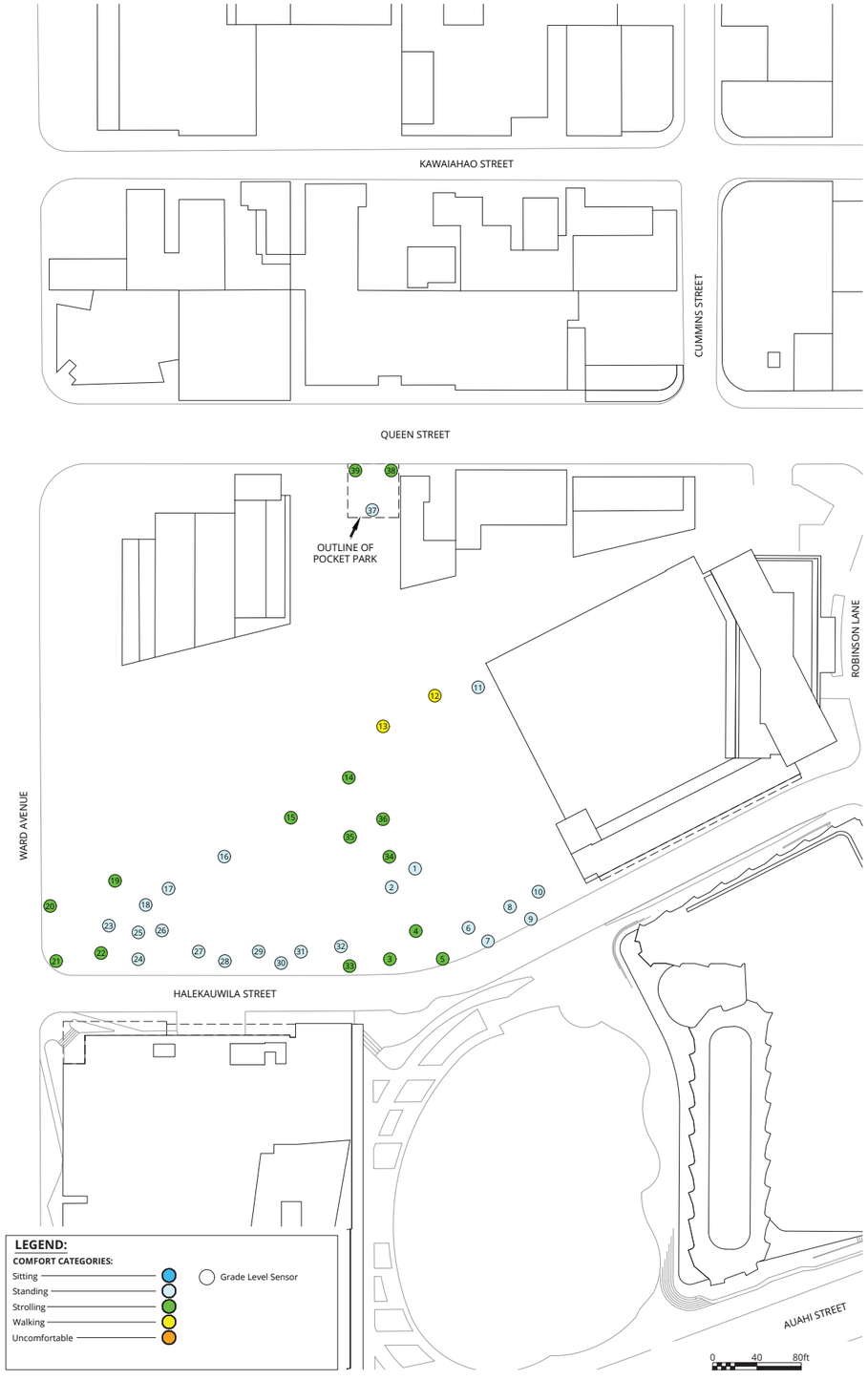
Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (mph)	Rating	Speed (mph)	Rating	Speed (mph)	Rating
86	Proposed	7	Standing	7	Standing	22	Pass
	Future	7	Standing	6	Sitting	22	Pass
87	Proposed	7	Standing	6	Sitting	21	Pass
	Future	6	Sitting	6	Sitting	21	Pass
88	Proposed	8	Standing	7	Standing	26	Pass
	Future	8	Standing	7	Standing	26	Pass
89	Proposed	10	Strolling	9	Strolling	29	Pass
	Future	10	Strolling	9	Strolling	28	Pass

Season	Months	Hours
Summer	May - October	6:00 - 23:00 for comfort
Winter	November - April	6:00 - 23:00 for comfort
Annual	January - December	0:00 - 23:00 for safety
Configurations		
Proposed	Project with existing surroundings	
Future	Project with future surroundings	

Comfort Speed (mph)	
(20% Seasonal Exceedance)	
≤ 7	Sitting
8 - 9	Standing
10 - 11	Strolling
12 - > 12	Walking
	Uncomfortable

Safety Speed (mph)	
(0.1% Annual Exceedance)	
≤ 56	Pass
> 56	Exceeded

APPENDIX A

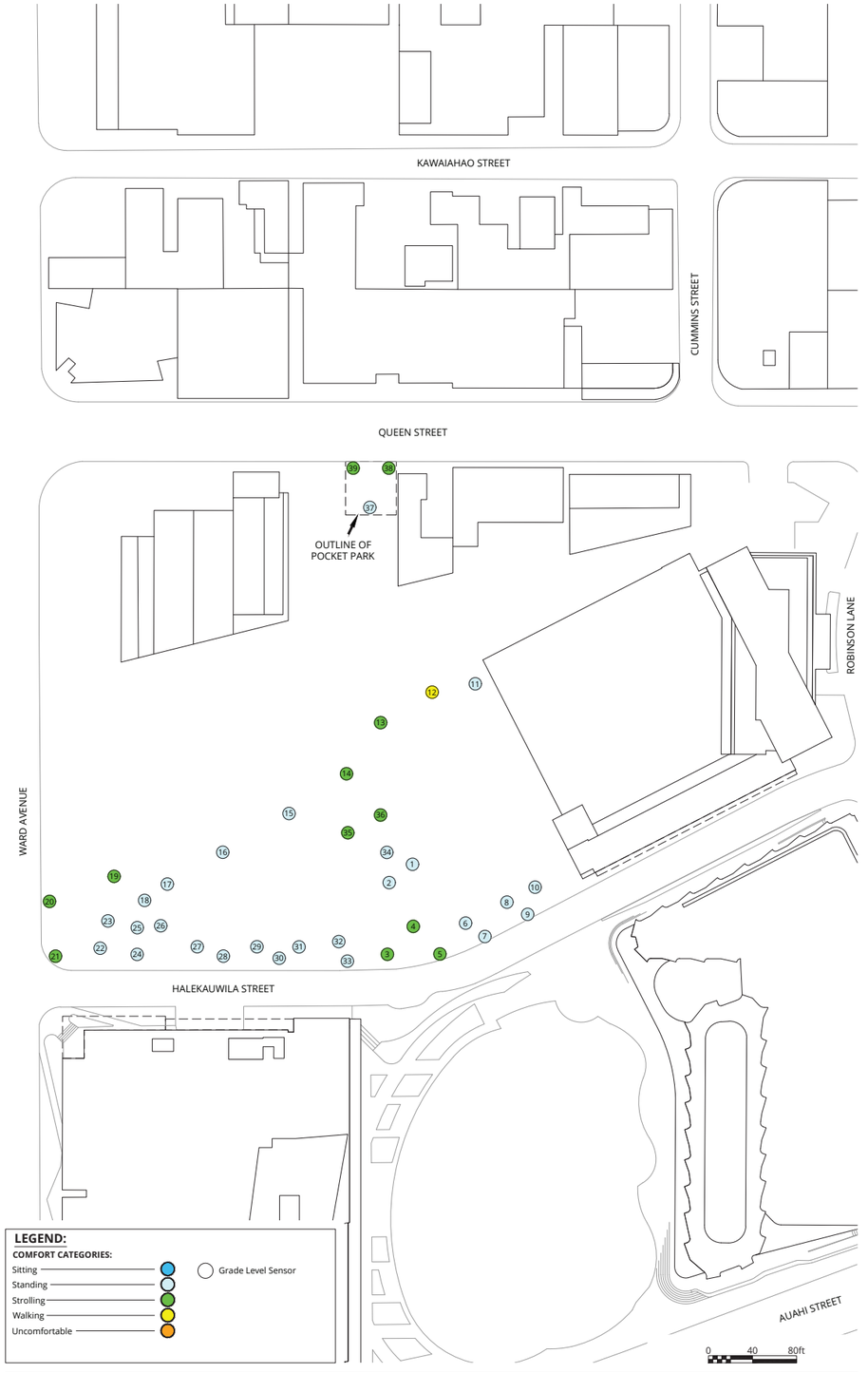


Pedestrian Wind Comfort Conditions
Existing Configuration
Summer (May to October, 6:00 to 23:00)

True North

Drawn by:	GRE	Figure:	1A
Approx. Scale:	1"=80'		
Date Revised:	Jan. 23, 2024		

Ward Village Block N - Honolulu, HI
Project #2302847



Pedestrian Wind Comfort Conditions
Existing Configuration
Winter (November to April, 6:00 to 23:00)

True North

Drawn by:	GRE	Figure:	2A
Approx. Scale:	1"=80'		
Date Revised:	Jan. 23, 2024		

Ward Village Block N - Honolulu, HI
Project #2302847

Appendix H

ACOUSTICAL CONSULTANT LETTER

9 July 2025

Emily Kuo
Solomon Cordwell Buenz
255 California Street, Floor 3
San Francisco, CA 94111
emily.kuo@scb.com

Subject: **Ward Village Block N-West (Mahana)**
Noise Impact Summary
Salter Project 22-0479

Dear Emily:

We have conducted a noise impact summary for the project. This report summarizes the noise impacts at the project site and the mitigation measures included in the design.

The project is a new 39-story mixed-use development bounded by Queen Street and a private extension of Halekauwila Street, near the east side of Ward Avenue in Honolulu. The noise environment at the site is predominantly controlled by vehicular traffic from Ward Avenue and Queen Street. Train passbys on the future Honolulu Authority of Rapid Transit (HART) elevated tracks will also contribute to the noise environment.

ENVIRONMENTAL NOISE

Although there are no State or City codes related to environmental noise intrusion, we have completed an environmental noise study for the project. To quantify the existing noise environment, we conducted one long-term noise measurement from 9 to 13 December 2022 along Queen Street. The monitor was at a height of 12 feet above grade. This data was used in conjunction with our collected data from other Ward Village projects (i.e., Blocks A, B, C-West, H, and N-East).

The future HART system will be directly adjacent to the Block N-West residential tower. We have included the HART passbys as a noise source in our calculations.

Based on our measured data and future noise projections, we used the CadnaA 3-D noise model to calculate noise levels at the building facade. Using the room sizes and locations shown in the drawings,

we calculated the window STC ratings needed to meet the project criterion[1], which range from 30 to 36. We understand the glazing used for the project will meet or exceed the STC ratings shown in our Environmental Noise Study (dated 28 April 2025).

INTERIOR SOUND ISOLATION

Residences

Party walls and floor-ceiling assemblies have been designed to meet industry standards for market-rate condominiums, which exceeds the Code minimum standards. Residential entry doors will be equipped with perimeter sound gasketing, door shoes, and solid thresholds to be tight-fitting to the frame and sill, as required by Code.

Amenity Spaces

The design includes methods of reducing noise and vibration from the Level 8 amenities to adjacent spaces, including upgraded flooring and ceilings at specific noise-sensitive adjacencies (e.g., guest suites, residences). Limiting amenity use during nighttime hours may also be recommended.

PROJECT-RELATED NOISE IMPACT

Noise mitigation recommendations will be made throughout the design and construction phases project-wide. The following recommendations are intended to reduce environmental noise complaints from future residents and neighboring properties.

MEP Equipment

MEP equipment noise impact to adjacent properties will be analyzed throughout the project design. Potential noise sources include the ground floor transformers, garage exhaust fans, and rooftop mechanical equipment. All stationary mechanical equipment (e.g., garage exhaust fans, rooftop cooling towers) will comply with the required noise limits at the property lines.

Potential recommendations to mitigate MEP equipment noise include acoustical duct liner, silencers, louvers, and barriers. We will review equipment sound data and provide more specific input when this information is available.

1 The Hawai'i Building Code (i.e., 2012 International Building Code) does not include standards for environmental noise intrusion. However, the Department of Housing and Urban Development (HUD) has a criterion of DNL 45 dB for multi-family residential projects, which is used as the criterion for this project. This criterion is also used in the California Building Code.

Salter
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salter-inc.com
Acoustics
Audiovisual
Telecommunications
Security

Parking and Loading Area

Parking and loading areas might generate intrusive noise to nearby residences and adjacent properties. Potential mitigation includes adding absorptive finishes, selecting a garage floor finish that does not easily cause “tire squeal”, and keeping potential noise-making obstructions outside of the drive aisle.

Construction

Temporary construction noise might impact nearby properties. The contractor should utilize best practices to mitigate construction noise, as feasible. The contractor is required to submit for a noise permit with the Hawai’i Department of Health. Noise-generating construction activity is permitted from 7:00 am to 6:00 pm on weekdays and 9:00 am to 6:00 pm on Saturdays. Noise-generating construction activity is prohibited on Sundays and holidays.[2]

* * *

This concludes our noise impact summary for Ward Village Block N-West (Mahana). Should you have any questions, please give us a call.

Best,

SALTER

Blake Wells, LEED GA
Senior Associate

Eric Mori, PE
Executive Vice President

2 Hawai’i Administrative Rules, Title 11 Department of Health, Chapter 46 Community Noise Control