KALAE - APPENDICES

LAND BLOCK 2, PROJECT 4
HCDA PLANNED DEVELOPMENT
PERMIT APPLICATION

APRIL 2022

WARD VILLAGE

APPENDICES

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APPENDIX A

LEED Checklist

LEED-NCv4 Checklist
Block B
6/18/2021
Target = Silver

Certified 40-49 points
Silver 50-59 points
Gold 60-79 points
Platinum 80 points and above

Summary	Yes	?	No	
	54	**34**	38	**Silver**

Category	Credit	Credit Name	Yes	?	No	Status	Responsibility
Integrative Process	~~C~~	~~Integrative Process~~			1	~~Not Attempted~~	~~SCB/MEP~~
Location and Transportation	C	LEED-ND Location	**16**			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	**Y**			Required	Contractor
	C	Site Assessment	**1**			Targeted	SCB
	C	Site Development - Protect or Restore Habitat	**1**	1		Targeted	Landscape
	C	Open Space	**1**			Targeted	Landscape
	C	Rainwater Management		2	1	Targeted	Civil
	C	Heat Island Reduction	**2**			Targeted	SCB
	C	Light Pollution Reduction	**1**			Targeted	Lighting
Water Efficiency	P	Outdoor Water Use Reduction	**Y**			Required	Landscape
	P	Indoor Water Use Reduction	**Y**			Required	SCB/Owner
	P	Building-Level Water Metering	**Y**			Required	MEP
	C	Outdoor Water Use Reduction	**1**		1	Targeted	Landscape
	C	Indoor Water Use Reduction	**1**	1	4	Targeted	SCB
	D	Cooling Tower Water Use		1	1	Targeted	MEP
	C	Water Metering	**1**			Targeted	MEP
Energy and Atmosphere	P	Fundamental Commissioning and Verification	**Y**			Required	Cx
	P	Minimum Energy Performance	**Y**			Required	MEP
	P	Building-Level Energy Metering	**Y**			Required	MEP
	P	Fundamental Refrigerant Management	**Y**			Required	MEP
	C	Enhanced Commissioning	**3**	3		Targeted	Cx
	C	Optimize Energy Performance	**10**	1	7	Targeted	MEP
	C	Advanced Energy Metering	**1**			Targeted	MEP
	~~C~~	~~Demand Response~~			2	~~Not Attempted~~	~~Owner~~
	~~C~~	~~Renewable Energy Production~~			3	~~Not Attempted~~	~~MEP~~
	C	Enhanced Refrigerant Management	**1**			Targeted	MEP
	C	Green Power and Carbon Offsets		2		Deferred	Owner
Materials and Resources	P	Storage and Collection of Recyclables	**Y**			Required	SCB/Owner
	P	CDWM Planning	**Y**			Required	Contractor
	~~C~~	~~Building Life-Cycle Impact Reduction~~		3	2	~~Not Attempted~~	~~Contractor~~
	C	BPDO - Environmental Product Declarations	**1**	1		Targeted	Contractor
	C	BPDO - Sourcing of Raw Materials	**1**	1		Targeted	Contractor
	C	BPDO - Material Ingredients	**1**	1		Targeted	Contractor
	C	C&D Waste Management	**1**	1		Targeted	Contractor
Indoor Environmental Quality	P	Minimum IAQ Performance	**Y**			Required	MEP
	P	Environmental Tobacco Smoke Control	**Y**			Required	Owner
	C	Enhanced IAQ Strategies		2		Targeted	SCB
	C	Low-Emitting Materials	**2**	1		Targeted	Contractor
	C	Construction IAQ Management Plan	**1**			Targeted	Contractor
	C	Indoor Air Quality Assessment		2		Targeted	Contractor
	C	Thermal Comfort	**1**			Targeted	MEP
	C	Interior Lighting		2		Targeted	Lighting
	~~C~~	~~Daylight~~		3		~~Not Attempted~~	~~SCB~~
	C	Quality Views	**1**			Targeted	SCB
	C	Acoustic Performance	**1**			Targeted	SCB
Innovation	C	Innovation in Design: TBD	**1**			Targeted	-
	C	Innovation in Design: TBD		1		Targeted	-
	C	Innovation in Design: UHI		1		Targeted	-
	C	Innovation in Design: Quality Views		1		Targeted	-
	C	Innovation in Design: TBD		1		Targeted	-
	C	LEED Accredited Professional	**1**			Targeted	-
Regional Priority	C	C&D Waste Management	**1**			Targeted	-
	~~C~~	~~Indoor Water Use Reduction~~		1		~~Not Attempted~~	-
	~~C~~	~~Outdoor Water Use Reduction~~		1		~~Not Attempted~~	-
	C	Optimize Energy Performance	**1**			Targeted	-

LEED-NC v4 Checklist

Block B

6/18/2021

Target = Silver

Project Totals	Yes	?	No
	54	**34**	38

Checklist Certification Level: (Does not include ? credits)

Silver

Certified 40-49 points
Silver 50-59 points
Gold 60-79 points
Platinum 80 points and above

Category		Credit Name	Yes	?	No	Phase	Status	Responsibility	Requirements	Comments
Integrative Process	C	~~Integrative Process~~			1	~~D~~	~~Not Attempted~~	~~SCB/MEP~~	~~Perform preliminary energy and water budget analysis before completion of schematic design.~~	-
Location and Transportation	C	LEED-ND Location	**16**			n/a	Targeted	-	Alternative LT points option for projects within LEED-ND certified site.	This credit replaces the LT credits.
	C	~~Sensitive Land Protection~~			1	~~D~~	~~Not Attempted~~	~~SCB~~	~~Achieved if site is previously developed.~~	-
	C	~~High Priority Site~~			2	~~n/a~~	~~Not Attempted~~	~~SCB~~	~~Historical District (1pt); Priority Designation(1pt); Brownfield Remediation(2pts).~~	-
	C	~~Surrounding Density & Diverse Uses~~			5	~~D~~	~~Not Attempted~~	~~SCB~~	~~2 points for services, 3 points for density.~~	-
	C	~~Access to Quality Transit~~			5	~~D~~	~~Not Attempted~~	~~SCB~~	~~Minimum 72 weekday trips, 40 weekend trips.~~	-
	C	~~Bicycle Facilities~~			1	~~D~~	~~Not Attempted~~	~~SCB/Owner~~	~~Long Term Storage: ___ Short Term Storage: ___ Residential Storage: ___ Showers: ___~~	-
	C	~~Reduced Parking Footprint~~			1	~~D~~	~~Not Attempted~~	~~SCB/Owner~~	~~Provide ___ or fewer parking spaces and ___ preferred parking spaces.~~	-
	C	~~Green Vehicles~~			1	~~D~~	~~Not Attempted~~	~~SCB/Owner~~	~~Provide ___ charging stations and ___ preferred parking spaces.~~	-
Sustainable Sites	P	Construction Activity Pollution Prevention	**Y**			C	Required	Contractor	Develop/implement SWPP and dust control plan.	Req in in Spec 01 8113
	C	Site Assessment	**1**			D	Targeted	SCB	Assess site factors (wind, solar exposure, terrain, etc.) and describe how they influenced project design.2	WO provided info, SCB and landscape to complete
	C	Site Development - Protect or Restore Habitat	**1**	1		D	Targeted	Landscape	Restore 30% of site area, 15% or 25% under v4.1.	Approx. 32% of the site area is vegetated, grass doesn't contribute.
	C	Open Space	**1**			D	Targeted	Landscape	30% of site area open and accessible to occupants, 25% of that must be vegetated. Green roof OK on high-density sites.	71% Open(including Roof) 64% of open space is vegetated
	C	Rainwater Management		2	1	D	Targeted	Civil	Manage 95th-98th percentile rainfall and use LID practices. 80th-90th when subbing to v4.12	WO to check if met by upgrading the credit to v4.1 as thresholds are reduced
	C	Heat Island Reduction	**2**			D	Targeted	SCB	Roof and non-roof (2pt) + 75% covered parking (1 point) for EP	Include high-SRI requirements for amenity deck and courtyards paving. Specify high SRI membrane for upper roof.
	C	Light Pollution Reduction	**1**			D	Targeted	Lighting	Specify fixtures with low BUG ratings; internally illuminated signage must comply.	Exterior landscape and façade lighting must be on a separate circuit and turned off between midnight and 6am.
Water Efficiency	P	Outdoor Water Use Reduction	**Y**			D	Required	Landscape	No irrigation or reduce peak potable water usage by at least 30% from baseline.	Note that the v4 prereq is 30% reduction from baseline
	P	Indoor Water Use Reduction	**Y**			D	Required	SCB/Owner	20% reduction.	Toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling must be WaterSense labeled. Energy Star appliances: Resi dishwashers (Y) and cloth washers. Fixtures missing
	P	Building-Level Water Metering	**Y**			D	Required	MEP	Install water metering equipment and share usage data for 5 years.	Reporting typically via ARC or Energy Star Portfolio Manager, see owner's letter from VP
	C	Outdoor Water Use Reduction	**1**		1	D	Targeted	Landscape	Do not install landscape irrigation or reduce potable water 50-100%.	Landscape to confirm % reduction
	C	Indoor Water Use Reduction	**1**	1	4	D	Targeted	SCB	(1pt: 25%, 2pts: 30%, 3pts: 35%, 4pts: 40%, 5pts: 45%, 6pts: 50%).	29.68% Using: Max Flow Rates: Resi: WC: 1.28 gpf. Shower: 1.75 gpm. Sink: 1.8 gpm. Lavatory: 1.2 gpm /Retail, BOH, AMENITY: Lavatory: 0.5 gpm. WC: 1.28/0.9 gpf sink 1.5 changing lavs to 1.1 will get us
	D	Cooling Tower Water Use		1	1	D	Targeted	MEP	Limit potable water use and contaminants.	Included LEED specific testing req in the scope. ESD is awaiting water testing for H & VP
	C	Water Metering	**1**			D	Targeted	MEP	Provide water meters on 2 or more water subsystems.	ESD to plan on Sub metering irrigation and pools on H.
Energy and Atmosphere	P	Fundamental Commissioning and Verification	**Y**			C	Required	Cx	Complete commissioning activities in accordance with ASHRAE guidelines.	Cx to be engaged by end DD . Interface selected by HHC
	P	Minimum Energy Performance	**Y**			D	Required	MEP	5% reduction compared to ASHRAE 90.1-2010.	-
	P	Building-Level Energy Metering	**Y**			D	Required	MEP	Install energy meters and submeters. Reporting must be 1 month periods for 5 years.	VP got LEED Coach approval to substitute the credit and prereq for LEED v4.1 Residential Multifamily Whole Building Energy Metering. Reporting typically via ARC or Energy Star Portfolio Manager
	P	Fundamental Refrigerant Management	**Y**			D	Required	MEP	No CFC based refrigerant in any new systems.	ESD to confirm
	C	Enhanced Commissioning	**3**	3		C	Targeted	Cx	Contract enhanced Cx (3pts), include O&M performance issues (+1pt), envelope Cx (2pts).	Cx to be engaged by end DD . Interface selected by HHC
	C	Optimize Energy Performance	**10**	1	7	D	Targeted	MEP	(6%: 1pt, 8%: 2pts, 10% 3pts, etc.).2	ESD Report Number 21-031 03/16/2021 27.6% savings compare to ASHRAE 2010 = 11 pts.
	C	Advanced Energy Metering	**1**			D	Targeted	MEP	Install metering of any individual end uses accounting for 10% or more of energy use.	VP got LEED Coach approval to substitute the credit and prereq for LEED v4.1 Residential Multifamily Whole Building Energy Metering.
	C	~~Demand Response~~			2	~~C~~	~~Not Attempted~~	~~Owner~~	~~Demand response utility program for 10% of estimated building energy.~~	~~Design the building to with capability to shed 10% of the estimated peak demand and develop plan. Enroll in a min. 1 year DR program. A no in VP.~~
	C	~~Renewable Energy Production~~			3	~~n/a~~	~~Not Attempted~~	~~MEP~~	~~Produce a minimum of 1% of predicted annual energy cost.~~	-
	C	Enhanced Refrigerant Management	**1**			D	Targeted	MEP	No refrigerants or refrigerant types that do not exceed calculated project threshold.	ESD to evaluate - anticipated on H.
	C	Green Power and Carbon Offsets		2		D	Deferred	Owner	50% for 1 point, 100% for 2. Typically defer till end of process.2	One-time purchase. Hold as reserve in case needed to reach Silver. Block H estimate was $57,037 50% 5 year commitment and double for 100%
Materials and Resources	P	Storage and Collection of Recyclables	**Y**			D	Required	SCB/Owner	Provide dedicated areas for collection of building recyclable material.	Trash room 133 + chut w diverter. Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. additionally accommodate the following material types: batteries, mercury-

Materials and Resources	P	CDWM Planning	**Y**			C	Required	Contractor	Establish recycling goals for at least 5 streams of construction or demolition waste.	Spec. 1 stream >5% by weight or volume of total diverted materials.
	C	~~Building Life-Cycle Impact Reduction~~		3	2	~~D~~	~~Not Attempted~~	~~Contractor~~	~~Reuse existing structure, or conduct LCA (1 pt.) and show 5-10-20% impact reduction (2-3-4 pts)2.~~	~~3 points available for H. Analysis is very involved: Create a 60-year, cradle-to-gate LCA (life-cycle assessment) model of core and shell systems to demonstrate reduced environmental burdens for the~~
	C	BPDO - Environmental Product Declarations	**1**	1		C	Targeted	Contractor	Provide EPD for 20 products from 5 manufacturers.	To be included in spec, upgrade to v4.1
	C	BPDO - Sourcing of Raw Materials	**1**	1		C	Targeted	Contractor	Good sourcing practice for 20% of total project material cost (buyback program, recycled content, FSC wood, salvage/reuse)	When upgrading to v4.1
	C	BPDO - Material Ingredients	**1**	1		C	Targeted	Contractor	Ingredient disclosure for 20 products from 5 manufacturers (HPD, C2C, Declare)	Check Spec. Might be worth upgrading to v4.1 where option 2 is achievable.
	C	C&D Waste Management	**1**	1		C	Targeted	Contractor	Divert at least 75% of total construction material including at least 3 streams of waste. Commingled = single stream.	Upgrade to v4.1 and use lb/sf approach based on Block N total waste numbers. Changes in the waste facility may make this credit harder to achieve.
Indoor Environmental Quality	P	Minimum IAQ Performance	**Y**			D	Required	MEP	Meet ASHRAE 62.1-2010. Combustion appliances must be vented.	-
	P	Environmental Tobacco Smoke Control	**Y**			C	Required	Owner	No smoking: provide signage and nonsmoking lease/condo docs (for residential).	v4 added: no smoking during construction check spec. Show signage on plans.
	C	Enhanced IAQ Strategies		2		D	Targeted	SCB	Improve indoor air quality using combination of listed strategies. Mech + Interior	Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel at regularly used exterior entrances + Mechanical requirements. Option 2 - carbon monitoring? ESD to
	C	Low-Emitting Materials	**2**	1		C	Targeted	Contractor	Low VOC products and documentation (4 categories for full credit, sub for 4.1)	Spec 4 groups: Paints/ adhesives and sealants/ composite wood/ Ceilings/ walls/ thermal and acoustic insulation
	C	Construction IAQ Management Plan	**1**			C	Targeted	Contractor	Develop/implement IAQ plan during construction.	Spec
	C	Indoor Air Quality Assessment		2		C	Targeted	Contractor	Building flush out or air quality testing prior to occupancy.	Is this credit an option? ESD to comment and calculate how long will be reqd.
	C	Thermal Comfort	**1**			D	Targeted	MEP	Meet requirements of ASHRAE 55-2010.	ESD to evaluate - anticipated on H.
	C	Interior Lighting		2		D	Targeted	Lighting	Provide user control of interior lighting or Meet at least 4 quality criteria.	ESD to evaluate
	C	~~Daylight~~		3		~~C~~	~~Not Attempted~~	~~SCB~~	~~Provide shading and demonstrate illumination levels are met but not exceeded.~~	
	C	Quality Views	**1**			D	Targeted	SCB	75% of regularly occupied area meet at least 2 view criteria.	RR% With views - EP anticipated on VP and H.
	C	Acoustic Performance	**1**			D	Targeted	SCB	Reduce reverb, HVAC background noise, and sound transmission in all occupied spaces.	Attempted on CW by substitution to v4.1 Residential. Acoustic consultant to assess.
Innovation	C	Innovation in Design: TBD	**1**			D/C	Targeted	-	EP SSc Heat Island 100% parking under cover	100% under cover and achieve option 2
	C	Innovation in Design: TBD		1		D/C	Targeted	-	TBD	SCB to assess
	C	Innovation in Design: UHI		1		D/C	Targeted	-	Alt: WELL feature: Beauty & Design OR Biophilic Design	SCB to assess
	C	Innovation in Design: Quality Views		1		D/C	Targeted	-	Purchasing - lamps	Coordinate w Lighting. Implement a lighting purchasing plan that specifies an overall building average of 70 picograms of mercury per lumen-hour or less for all mercury-containing lamps purchased for the
	C	Innovation in Design: TBD		1		D/C	Targeted	-	EP IEQ - Quality Views	SCB to assess
	C	LEED Accredited Professional	**1**			C	Targeted	-	Yes	To achieve all five innovation points, a project team must achieve at least one pilot credit, at least one innovation credit and no more than two exemplary performance credits.
Regional Priority	C	C&D Waste Management	**1**			D/C	Targeted	-	1-pt threshold	-
	C	~~Indoor Water Use Reduction~~		1		~~D/C~~	~~Not Attempted~~	-	~~3-pt threshold~~	-
	C	~~Outdoor Water Use Reduction~~		1		~~D/C~~	~~Not Attempted~~	-	~~2-pt threshold~~	-
	C	Optimize Energy Performance	**1**			D/C	Targeted	-	10-pt threshold	-

APPENDIX B

Ward Village Street Level Plan

WARD VILLAGE
STREET LEVEL PLAN

April 18, 2022

KEY

- Retail
- Industrial
- Office
- Residential
- Park
- Architectural Screening

Disclaimer: This figure depicts Kalae in the context of plans and approximate areas of uses previously approved by HCDA pursuant to the Ward Neighborhood Master Plan, and VWL's projected plans and approximate areas of uses consistent with the master plan as of the date of this permit application. This figure illustrates one possible future development scenario, is subject to change, and does not represent a commitment to provide the future developments and uses as shown.

WARD AVENUE

HALEKAUWILA STREET

KAMAKEE STREET

AUAHI STREET

NOT TO SCALE

APPENDIX C

SHPD Letter

DAVID Y. IGE
GOVERNOR OF
HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

January 21, 2022

IN REPLY REFER TO:
Project No. 2017PR25234
Doc. No. 2201SL01
Archaeology

Deepak Neupane, P.E., AIA
Executive Director
Hawaii Community Development Authority
547 Queen Street
Honolulu, HI 96817
deepak.neupane@hawaii.gov

Dear Mr. Neupane:

SUBJECT: **Chapter 6E-42 Historic Preservation Review**
Victoria Ward Ltd. (VWL) Block B Project
Request for Concurrence with 2-Step Verification Process
Honolulu Ahupua'a, Honolulu (Kona) District, Island of O'ahu
TMK: (1) 2-3-001:128

The State Historic Preservation Division (SHPD) received a letter dated April 27, 2021 from the Hawaii Community Development Authority (HCDA) notifying our office that Victoria Ward Limited (VWL), proponent of the Block B project intends to submit an HCDA Development Permit Application and that prior to issuance of the permit, HCDA requires SHPD's concurrence with the project proceeding under a 2-step verification process, as defined in HAR §13-284-9(d)(1). SHPD received this letter on May 4, 2021 (Submission No. 2017PR25234.002) and subsequent follow-up correspondence requesting SHPD's review on October 13 and 25, 2021, and December 7, 15, and 20, 2021 (Submission Nos. 2017PR25234.003 through 2017PR25234.005).

HCDA's letter indicates that pursuant to HRS §6E-42, HAR §6E-43, and HAR §13-284-3(b)(1-5), Victoria Ward Limited (VWL) has completed the following five of the six historic preservation review procedural steps:

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

(1) Identification and Inventory. The Block B Project has undergone multiple design modifications between 2014 and 2021. In 2014 and 2015, archaeological inventory survey (AIS) investigations were conducted for two properties in the Kakaako area part of VWL's Ward Neighborhood Master Plan: Block B East and Block B West. SHPD accepted the Block B East AIS (Pammer et al. 2014) on October 21, 2014 (Log No. 2014.04569, Doc. No. 1410SL25) and the Block B West AIS (Sroat et al. 2017) on August 15, 2017 (Log No. 2015.01784, Doc. No. 1708JA07).

Pursuant to HAR §13-284-3(b)(1), the Block B East AIS identified five historic properties:
(1) 50-80-14-7655 (salt pans and associated berms);
(2) 50-80-14-7656 (an isolated human cranial fragment found in reworked sand);

(3) 50-80-14-7658 (a buried post-Contact surface including asphalt, concrete, coral and tar pavement, oil-rolled surfaces, and fence lines associated with development of the area;
(4) 50-80-14-7659 (a portion of the concreted Ward Estate Ditch); and
(5) 50-80-14-7660 (a historic refuse deposit within an abandoned drain line box).

Pursuant to HAR §13-284-3(b)(1), the Block B West AIS identified five historic properties:
(1) 50-80-14-7655 (salt pans and associated berms);
(2) 50-80-14-7658 (a buried post-Contact surface including asphalt, concrete, coral and tar pavement, oil-rolled surfaces, and fence lines associated with development of the area;
(3) 50-80-14-7770 (two cultural deposits and 10 associated features);
(4) 50-80-14-7771 (a refuse deposit with pit-feature components); and
(5) 50-80-14-7772 (an isolated find of previously disturbed human remains).

(2) Evaluation of Significance. Pursuant to HAR §13-284-3(b)(2), VWL provided the following site significance evaluations, HAR §13-284-6, which SHPD concurred with for the Block B East project area on October 21, 2014 (Log No. 2014.04569, Doc. No. 1410SL25):

Site 7655 is considered significant under Criteria "c" (excellent example of site type) and "d" (information content). Site 7656 is assessed as significant under Criteria "d" (information content) and "e" (significance to native Hawaiians), and Sites 7658 through 7660 are assessed as significant under Criterion "d" (information content).

Additionally, pursuant to HAR §13-284-3(b)(2), VWL provided the following site significance evaluations, pursuant to HAR §13-284-6, which SHPD concurred with for the Block B West project area on August 15, 2017 (Log No. 2015.01784, Doc. No. 1708JA07):

Site 7655 is considered significant under Criteria c and d. Sites 7658 and 7771 are significant under Criterion d, and Sites 7770 and 7772 are significant under Criteria d and e.

(3) Effect Determination. Pursuant to HAR §13-284-3(b)(3), VWL provided the following project effect recommendation, which SHPD concurred with on October 21, 2014, for Block B East and on August 15, 2017, for Block B West (see above):

The project effect determination is "Effect, with proposed mitigation commitments."

(4) Mitigation Commitments. Pursuant to HAR §13-284-3(b)(4), SHPD concurred with the following agreed upon mitigation commitments on October 21, 2014, for Block B East and on August 15, 2017, for Block B West (see above):

(1) Archaeological monitoring for the entirety of the project area. On-site archaeological monitoring will facilitate identification and appropriate documentation and/or treatment for all historic properties encountered during construction.
(2) Site 50-80-14-7655 (data recovery)
(3) Site 50-80-14-7656 (burial treatment)
(4) Site 50-80-14-7658
(5) Site 50-80-14-7659
(6) Site 50-80-14-7660
(7) Site 50-80-14-7770 (burial treatment)
(8) Site 50-80-14-7771
(9) Site 50-80-14-7772 (burial treatment)

No further work was recommended for Sites 7658, 7659, 7660, and 7771, which were all assessed as adequately documented.

(5) Mitigation Plans. Pursuant to HAR §13-284-3(b)(5), VWL has completed, and SHPD has reviewed and accepted the following agreed-upon mitigation plans and/or documentation:

(1) *Archaeological Data Recovery Plan for SIHP #50-80-14-7655, Ward Village Gateway Project (Block B East and Block C West), Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu. TMK: (1) 2-3-001:005 (por.)* (Sroat and McDermott 2014) was reviewed and accepted by SHPD on November 19, 2014 (Log No. 2014.05179, Doc. No. 1411SL21).
(2) *Burial Treatment Plan for SIHP # 50-80-14-7656, Block B East Project, Kakaʻako Ahupuaʻa, Honolulu (Kona) District, Oʻahu TMK: [1] 2-3-001:005 (por.)* (Sroat and McDermott 2014) was reviewed and accepted by SHPD on October 22, 2014 (Log No. 2014.04392, Doc. No. 1410.HR01).
(3) *Burial Site Component of a Preservation Plan for SIHP # 50-80-14-7656, Block B East Project, Kakaʻako Ahupuaʻa, Honolulu (Kona) District, Oʻahu TMK: [1] 2-3-001:005 (por.)* (Sroat and McDermott 2014) was reviewed and accepted by SHPD on November 18, 2014 (Log No. 2014.04396, Doc. No. 1411RH01).
(4) *Archaeological Monitoring Plan for the Ward Village Gateway Project, Block B East and Block C West Project Areas, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu. TMK: (1) 2-3-001:005 (por.)* (Sroat and McDermott 2014) was reviewed and accepted by SHPD on November 18, 2014 (Log No. 2014.04818, Doc. No. 1411SL19).
(5) *Archaeological Monitoring Plan for the Block B West Project, Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (portion)* (Farley and McDermott 2017) was reviewed and accepted on September 2, 2017 (Log No. 2017.01895, Doc. No. 1709SH01).
(6) *Burial Site Component of a Data Recovery and Preservation Plan for Iwi Kūpuna at SIHP # 50-80-14-7770 and SIHP # 50-80-14-7772 at the Howard Hughes Corporation's Block B West Project, Kakaʻako Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (por.)* (Reveal et al. 2017).
(7) *End of Fieldwork Report for Archaeological Data Recovery for the Ward Village Gateway Project (Block B East and Block C West), Kakaʻako, Honolulu Ahupuaʻa, Honolulu (Kona) District, Oʻahu, TMK: [1] 2-3-001:005 (por.)* (Sroat 2017) was accepted on August 8, 2017 (Log No. 2017.01583, Doc. No. 1708JA03).

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

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

Based on the above, SHPD indicates that it has reviewed and commented on the effect of the proposed project pursuant to HRS §6E-42 and HAR §13-284-3; that it is SHPD's determination that VWL has completed Steps 1 through 5 pursuant to HAR §13-284-3(b)(1-5); and that **SHPD concurs** with HCDA's request for the project to proceed under the 2-step verification process detailed in HAR §13-284-9(d) and with the procedures and schedule VWL has proposed to complete Step 6 (verification of completion) per HAR §13-284-3(b).

Please contact Susan A. Lebo, Archaeology Branch Chief, at Susan.A.Lebo@hawaii.gov for any matters regarding this letter.

Aloha,

Alan Downer

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

cc: Lee Cramer, Director, The Howard Hughes Corp., lee.cramer@howardhughes.com
Jim Miller, Director, The Howard Hughes Corp., jim.miller@howardhughes.com
Matt McDermott, Project Manager, Cultural Surveys Hawaiʻi, Inc., mmcdermott@culturalsurveys.com

APPENDIX D

Traffic Impact Report

From: Andrade, Kamakaokalani M <kandrade1@honolulu.gov>
Sent: Thursday, August 12, 2021 8:52 AM
To: Jennylyn Tapat
Subject: Block B TIR

Jenny,

TRB has no comments regarding the Block B TIR. If you have any questions then let me know.

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

Traffic Impact Report

Block B

Prepared for:
Victoria Ward, Ltd.

Prepared by:
Wilson Okamoto Corporation

May 2021

TRAFFIC IMPACT REPORT

FOR

BLOCK B

Prepared for:

Victoria Ward Limited
1240 Ala Moana Blvd., Suite 200
Honolulu, HI 96813

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #8206-72

May 2021

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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 B development of the Ward Village Master Plan in Kakaako on the island of Oahu. A previous assessment including the Block B development was included in the "Transportation Master Plan and Assessment for the Ward Villages Master Plan" (hereafter referred to as the "Ward Villages TMP") dated October 2020. This report is a supplemental study to specifically address the Block B development and incorporate the most recent development plans which include residential uses.

B. Scope of Study

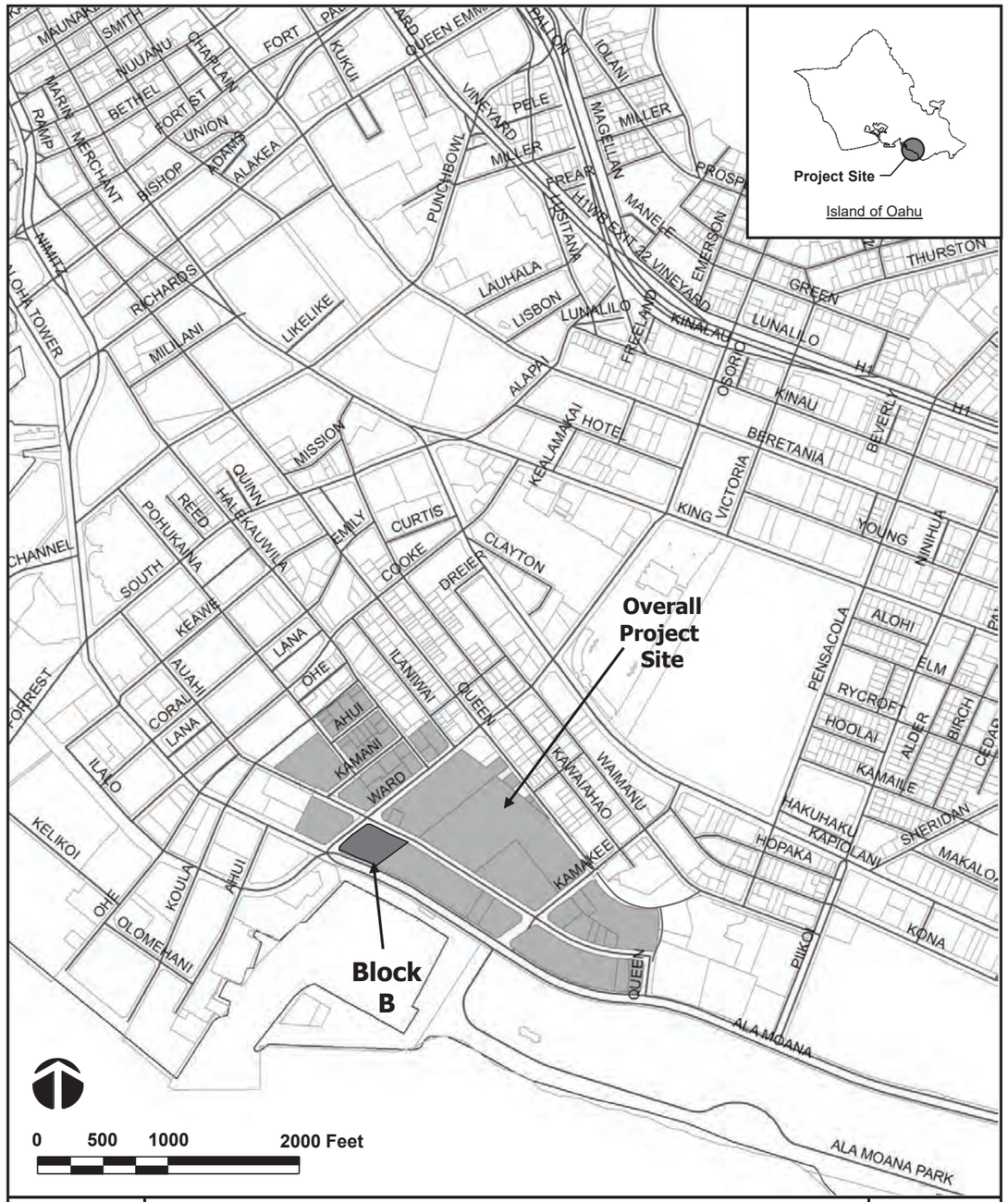
This report presents the findings and conclusions of the traffic study, the scope of which includes:

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

II. PROJECT DESCRIPTION

A. Location

The project site for the proposed Block B development is located adjacent to Auahi Street in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Auahi Street to the north, Ala Moana Boulevard to the south, Ward Avenue to the west, and the future Victoria Ward Makai Park to the east. Access to the project site is expected to be provided via a two-way driveway off Auahi Street.



WILSON OKAMOTO CORPORATION	BLOCK B LOCATION AND VICINITY MAP	FIGURE 1

B. Project Characteristics

The overall Ward Village Master Plan entails the redevelopment of Ward Center, Ward Village Shops, and other surrounding commercial and office buildings implemented in five (5) phases over a span of 10-15 years. At the time of this report, Phase 1 has been completed which includes Blocks C East (Waiea), K (Anaha), M (Ae'o), and O (Ke Kilohana). Phase 2, which includes Blocks N-East (Aalii), I (Koula), and C-West (Victoria Place), is currently under construction with the entire phase expected to be completed by Year 2023.

The Block B development is the last development included in Phase 3 of the overall Ward Village Master Plan preceded by Blocks H (The Park Ward Village) and F (Ulana Ward Village) and is expected to be completed by Year 2025. It should be noted that the completion date of Year 2025 reflects a slight change (Year 2024) from the anticipated completion date for Block B previously assumed in the Ward Villages TMP. The project site for the proposed Block B development formerly housed the Ward Warehouse Shopping Center but has since been cleared of its former uses except for the parking garage that previously served the shopping center. The remaining parcel has been temporarily converted to at-grade parking that, with the parking garage, is used as temporary construction parking for adjacent developments and for other special events within Ward Village. The proposed project entails the development of a new residential tower that will include 350 residential units. Parking for the proposed project is expected to be provided on-site within the development's parking garage. The parking garage is intended to be for the use of the development's residents and its guests only with access to be provided via a new driveway off Auahi Street. The driveway off Auahi Street is expected to be restricted to right-turn in right-turn out movements only due to the driveway's proximity to Ward Avenue. Another access off Ward Avenue is expected to serve the development's service and loading/unloading areas. The driveway off Ward Avenue is also expected to be restricted to right-turn in right-turn out movements only due to this driveways' proximity to Ala Moana Boulevard and to the bicycle facilities along Ward Avenue. It should be noted that in conjunction with other roadway improvements planned for the overall Ward Village Master Plan, Auahi Street will be

realigned east of Ward Avenue to intersect Pohukaina Street further north. West of Ward Avenue, the segment of Auahi Street between Ward Avenue and Kamani Street is expected to be closed to vehicular traffic with the remaining portion of Auahi Street serving only as an access for the adjacent Block F development. Figure 2 shows the proposed site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

East-west traffic flow through the Kakaako area is served by a number of existing major roadways which include Ala Moana Boulevard, Queen Street, and Kapiolani Boulevard that provide continuous east-west mobility through the project vicinity. These major roadways are supported by a network of connector roadways including Auahi Street, Pohukaina Street, and Halekauwila Street that provide alternate east-west routes through the surrounding areas. North-south traffic through the Kakaako area is served by a number of existing major roadways including Ward Avenue and Piikoi Street that support either one-way or two-way travel through the project vicinity. These major roadways are supported by a network of connector roadways including Cooke Street and Kamakee Street that provide alternate north-south routes through the surrounding areas. Figure 3 shows the existing lane use at key locations within the study area.

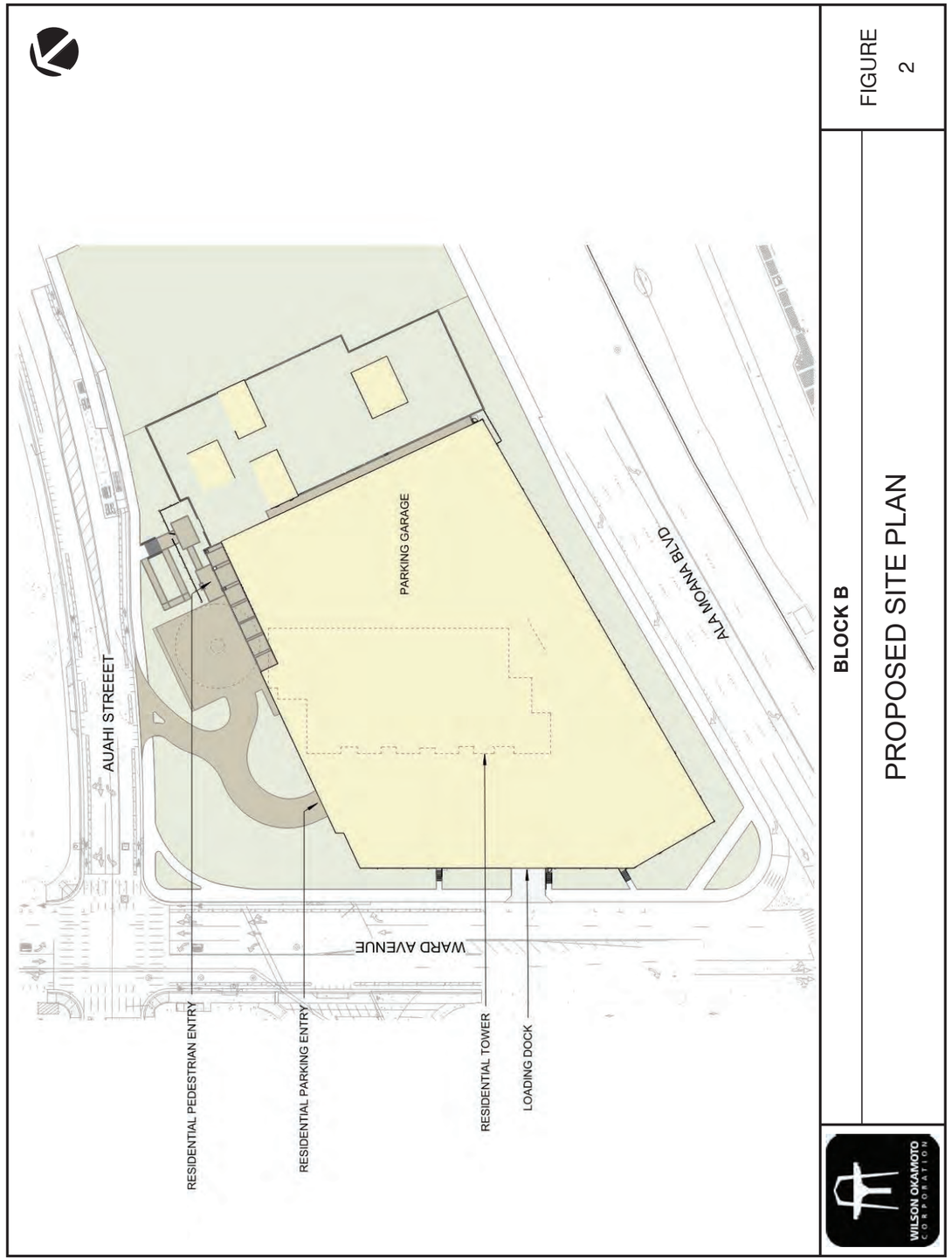
B. Traffic Volumes and Conditions

1. General

a. Field Investigation

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

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



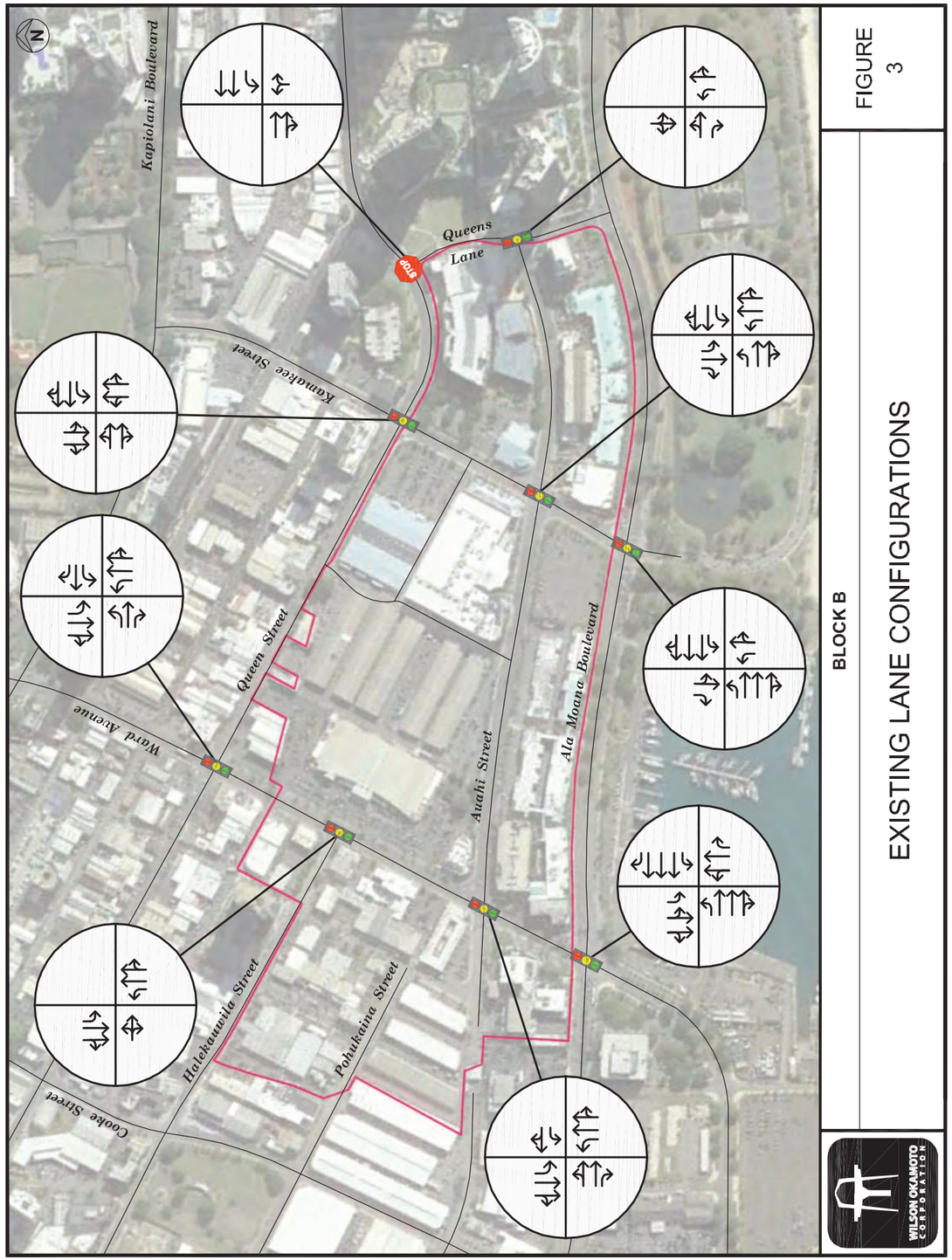


FIGURE 3

BLOCK B

EXISTING LANE CONFIGURATIONS

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

It should be noted that at the time field investigations were conducted, Blocks C East, K, and M had been completed and occupied and as such, the trips associated with these blocks are assumed to be captured within the surveyed existing volumes. In addition, the project sites for Blocks N East, I, C West, B, and A had been cleared of their existing uses at the time of the field investigation. Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. It should be noted that the HCM 2010 methodology is available with the Synchro software; however, as previously discussed in the Ward Villages Master Plan, analysis conducted using that methodology is unable to accommodate all of the exclusive and shared-use lane configurations in the study area. As such, for the purpose of this report, the HCM 2000 methodology output was used for consistency with the overall traffic study. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

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

and LOS "F" unacceptable or potentially congested traffic operating conditions.

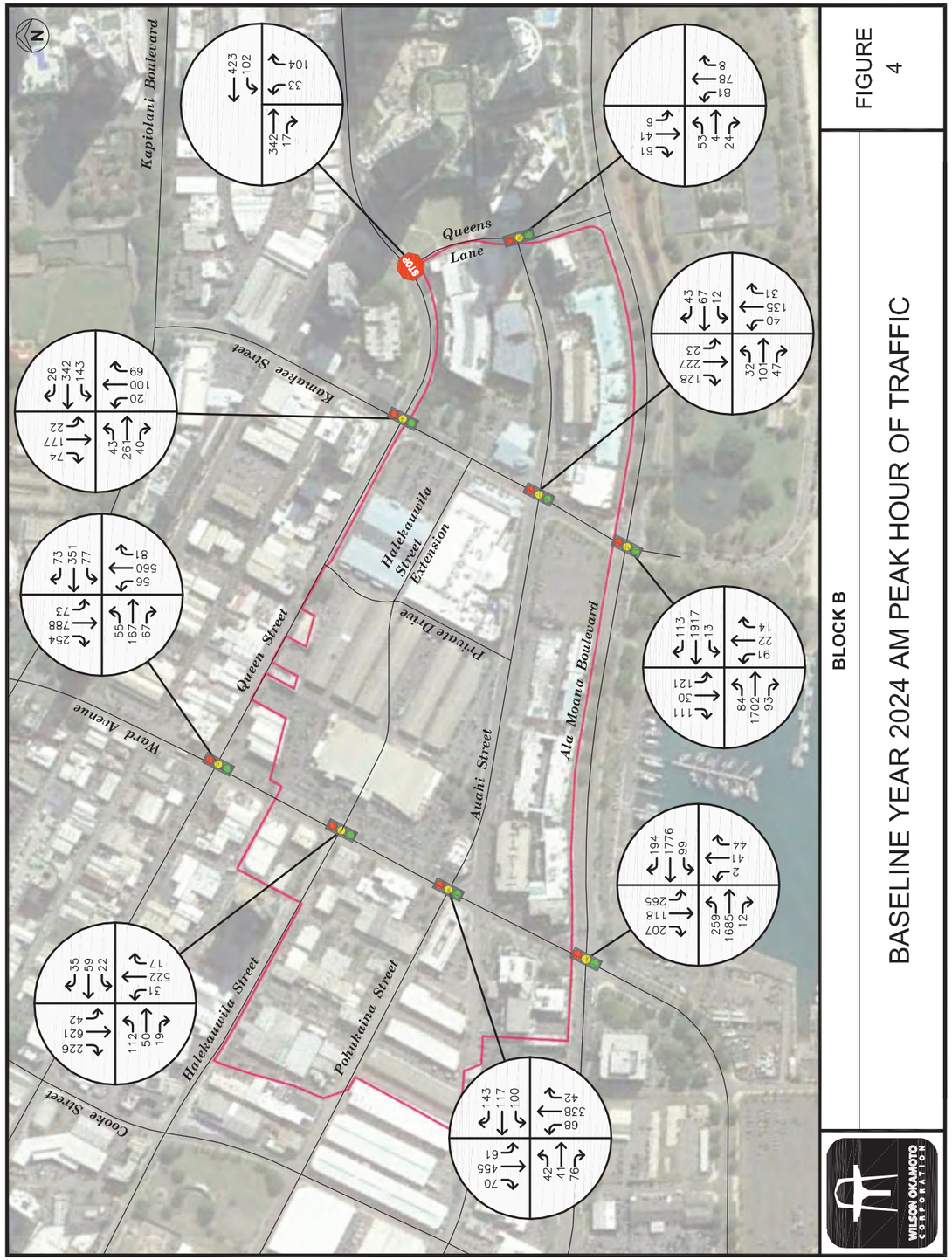
"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying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

2. Baseline Peak Hour Traffic

a. General

Figures 4 and 5 show the baseline Year 2024 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 and 2 of the Ward Village Master Plan. Those phases are expected to include residential and commercial/retail uses for Blocks C East, K, M, O, N East, I, C West, H, and F. The baseline traffic conditions are based on the projected Year 2024 conditions included in the "Traffic Impact Report for Block F" dated December 2020. It should be noted that in conjunction with the other developments in the Ward Village Master Plan, improvements to the surrounding roadways are also planned. One such improvement is the realignment of Auahi Street east of Ward Avenue that will connect Auahi Street to Pohukaina Street. The expected completion date of the realignment is Year 2024 and was included in the baseline calculations.

The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between 4:30 PM and 5:30 PM. Although the peak hours of traffic generally occur around the same time periods at each of the study intersections, the absolute commuter peak hour time periods for each intersection may differ slightly. The analysis is based on these absolute commuter peak hour time periods to identify the traffic



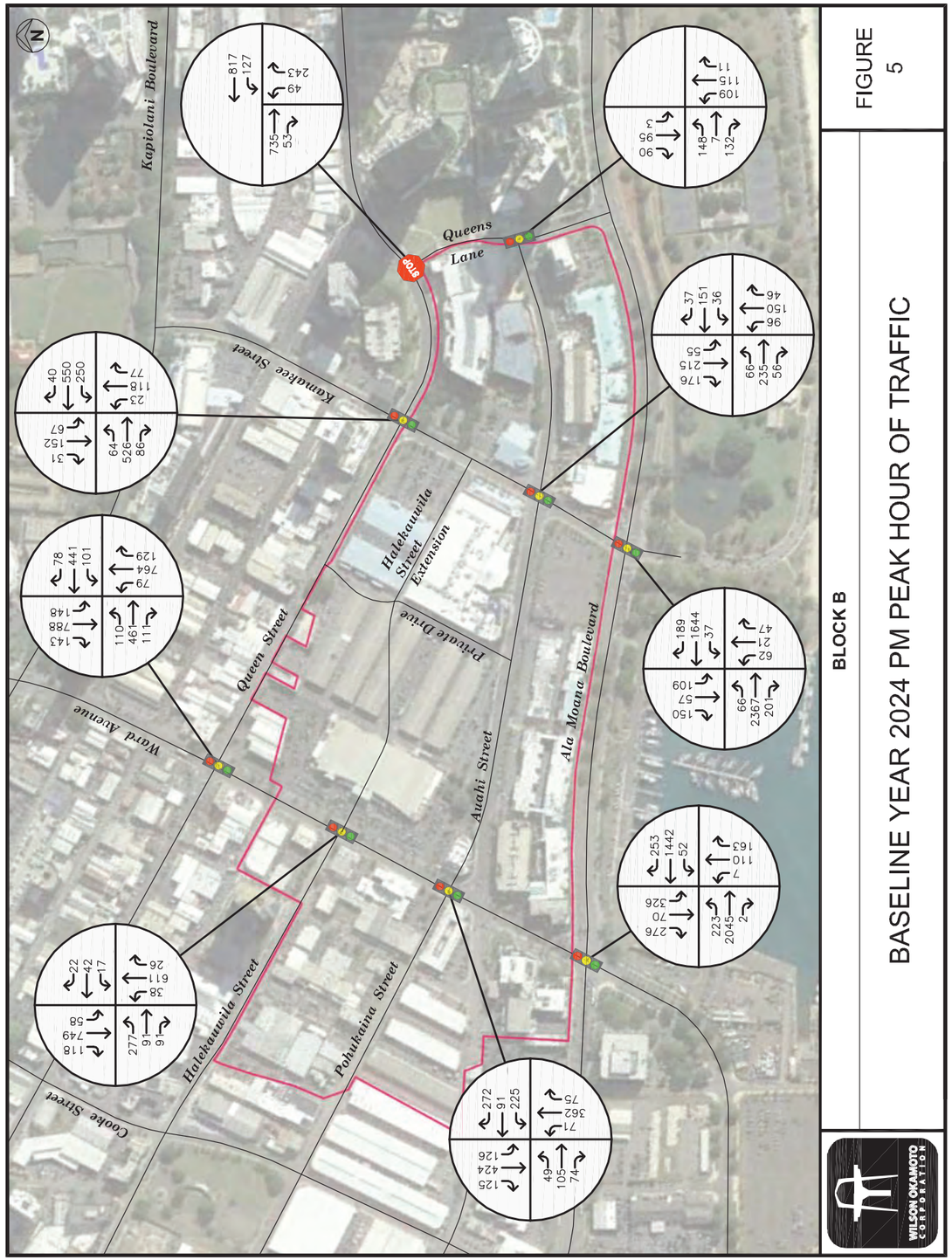


FIGURE 5

BLOCK B

BASELINE YEAR 2024 PM PEAK HOUR OF TRAFFIC

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impacts resulting from the proposed project. LOS calculations for the study intersections are included in Appendix C.

b. Ward Avenue and Queen Street

At the intersection with Queen Street, Ward Avenue carries 697 vehicles northbound and 1,115 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 972 vehicles traveling northbound and 1,079 vehicles traveling southbound. The northbound and southbound approaches of the intersection operate at LOS "B" and LOS "C" during the AM and PM peak periods, respectively.

The Queen Street approaches of the intersection carry 289 vehicles eastbound and 501 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 682 vehicles traveling eastbound and 620 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "D" during the AM and PM peak periods, respectively while the westbound approach operates at LOS "C" and LOS "D" during the AM and PM peak periods, respectively. It should be noted that during the Fall of 2020, modifications to the lane uses on the Queen Street approaches of the intersection were implemented to provide exclusive turning lanes and a through lane.

c. Queen Street and Kamakee Street

At the intersection with Kamakee Street, Queen Street carries 344 vehicles eastbound and 511 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 676 vehicles traveling eastbound and 840 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "B" during both peak periods.

The Kamakee Street approaches carry 189 vehicles northbound and 273 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is similar with 218 vehicles traveling northbound and 250 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS "B" during the AM peak period and LOS "C" during the PM peak period.

d. Queen Street and Queens Lane

At the intersection with Queens Lane, Queen Street carries 359 vehicles eastbound and 525 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 788 vehicles traveling eastbound and 944 vehicles traveling westbound. The westbound left-turn traffic movement operates at LOS "A" during the AM peak period and at LOS "B" during the PM peak period.

Queens Lane carries 137 vehicles northbound during the AM peak period and 292 vehicles during the PM peak period. The Queens Lane approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively.

e. Ward Avenue and Halekauwila Street

At the intersection with Halekauwila Street, Ward Avenue carries 570 vehicles northbound and 889 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 675 vehicles traveling northbound and 925 vehicles traveling southbound. Both approaches of Ward Avenue operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period.

The Halekauwila Street approach of the intersection carries 181 vehicles eastbound and 116 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 459 vehicles traveling eastbound and 81 vehicles traveling westbound.

The eastbound and westbound approaches of Halekauwila Street operates at LOS "B" during both peak periods.

f. Ward Avenue, Auahi Street, and Pohukaina Street

At the intersection with Auahi Street, Ward Avenue carries 448 vehicles northbound and 586 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 508 vehicles traveling northbound and 675 vehicles traveling southbound. During the AM peak period both approaches of Ward Avenue operates at LOS "A" while both approaches operate at LOS "B" during the PM peak period.

The Auahi Street approach of the intersection carries 360 vehicles westbound during the AM peak period and 588 vehicles during the PM peak period. The Auahi Street approaches operate at LOS "B" during both peak periods. The Pohukaina Street approach of the intersection carries 159 eastbound vehicles during the AM peak period and 228 vehicles during the PM peak period. The eastbound approach operates at LOS "B" during both peak periods.

g. Kamakee Street and Auahi Street

At the intersection with Auahi Street, Kamakee Street carries 206 vehicles northbound and 378 vehicles southbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 292 vehicles traveling northbound and 446 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period.

Auahi Street carries 180 vehicles eastbound and 122 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 357 vehicles traveling eastbound and 224 vehicles traveling westbound. The eastbound approach operates at LOS "B" during both peak periods while the westbound approach

operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively.

h. Auahi Street, Queens Lane, and Queen Street

At the intersection with Queens Lane and Queen Street, Auahi Street carries 81 vehicles eastbound during the AM peak period and 287 vehicles during the PM peak period. The eastbound approach of Auahi Street operates at LOS "B" during both peak periods.

The Queens Lane approach carries 108 vehicles southbound during the AM peak period and 188 vehicles during the PM peak period. The Queens Lane approach operates at operates at LOS "A" during AM peak period and LOS "B" during the PM peak period. The northbound approach is comprised of Queen Street which carries 167 vehicles during the AM peak period and 235 vehicles during the PM peak period. The Queen Street approach operates at LOS "B" during both peak periods.

i. Ala Moana Boulevard and Ward Avenue

At the intersection with Ward Avenue, Ala Moana Boulevard carries 1,956 vehicles eastbound and 2,069 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 2,270 vehicles traveling eastbound and 1,747 vehicles traveling westbound. The eastbound approach operates at LOS "D" during both peak periods, while the westbound approach at LOS "E" and LOS "D" during the AM and PM peak periods, respectively.

The Ward Avenue approaches of the intersection carry 87 vehicles northbound and 590 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 280 vehicles traveling northbound and 672 vehicles traveling southbound. The northbound approach operates at LOS "D" during both peak periods while the southbound approach operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively.

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

At the intersection with Kamakee Street, Ala Moana Boulevard carries 1,879 vehicles eastbound and 2,043 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,634 vehicles traveling eastbound and 1,870 vehicles traveling westbound. The eastbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively.

The Kamakee Street approach of the intersection carries 262 vehicles southbound during the AM peak period and 316 vehicles during the PM peak period. The Kamakee Street approach operates at LOS "D" during both peak periods. The northbound approach is comprised of Ala Moana Park Drive which carries 127 vehicles during the AM peak period and 130 vehicles during the PM peak period. The Ala Moana Park Drive operates at LOS "D" during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 10th Edition," 2017. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit. The trip generation methodology developed by ITE also includes provisions for multi-modal trips. Multi-modal trips are trips made utilizing non-motorized modes of travel such as walking and biking, as well as trips made using transit. The project site is currently served by established, convenient transit routes that may reduce the number of vehicular trips added to the surrounding major roadways. In addition, the City

and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to potentially the central Honolulu area, thereby providing an alternate mode of travel through the Kakaako area. However, the planned system is not expected to be completed prior to the completion of the Block B development and as such, trip reductions associated with the fixed guideway transit system were not incorporated into projected conditions. The trip generation characteristics for the proposed project were adjusted to account for trips made using alternative modes of transportation. Table 1 summarizes the adjusted proposed trip generation characteristics for the Block B development. Appendix D includes a detailed trip generation worksheet for the Block B development.

Table 1: Adjusted Peak Hour Trip Generation

MULTIFAMILY HOUSING (HIGH-RISE) INDEPENDENT VARIABLE: Dwelling Units = 350		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	21
	EXIT	65
	TOTAL	86
PM PEAK	ENTER	65
	EXIT	42
	TOTAL	107

2. Trip Distribution and Through Traffic Forecasting Methodology

The travel forecast utilized for this study is based on the OMPO regional forecasting model which contains estimated land usage for the island of Oahu by the Year 2035 including the development of other projects such as the adjacent Kamehameha Schools/Bishop Estate (KSBE) lands to the west. The travel forecast utilized for the OMPO model is based on Socio-Economic Data (SED) which represents the population distribution within a multitude of traffic analysis zones. The model utilizes this data to forecast individual vehicle trips between destinations within the model. The use of the OMPO model more accurately reflects the anticipated impacts of development on the island more than the use of historical travel patterns or traffic count data. Figures 6 to 8 show the trip distribution percentages and the distribution of

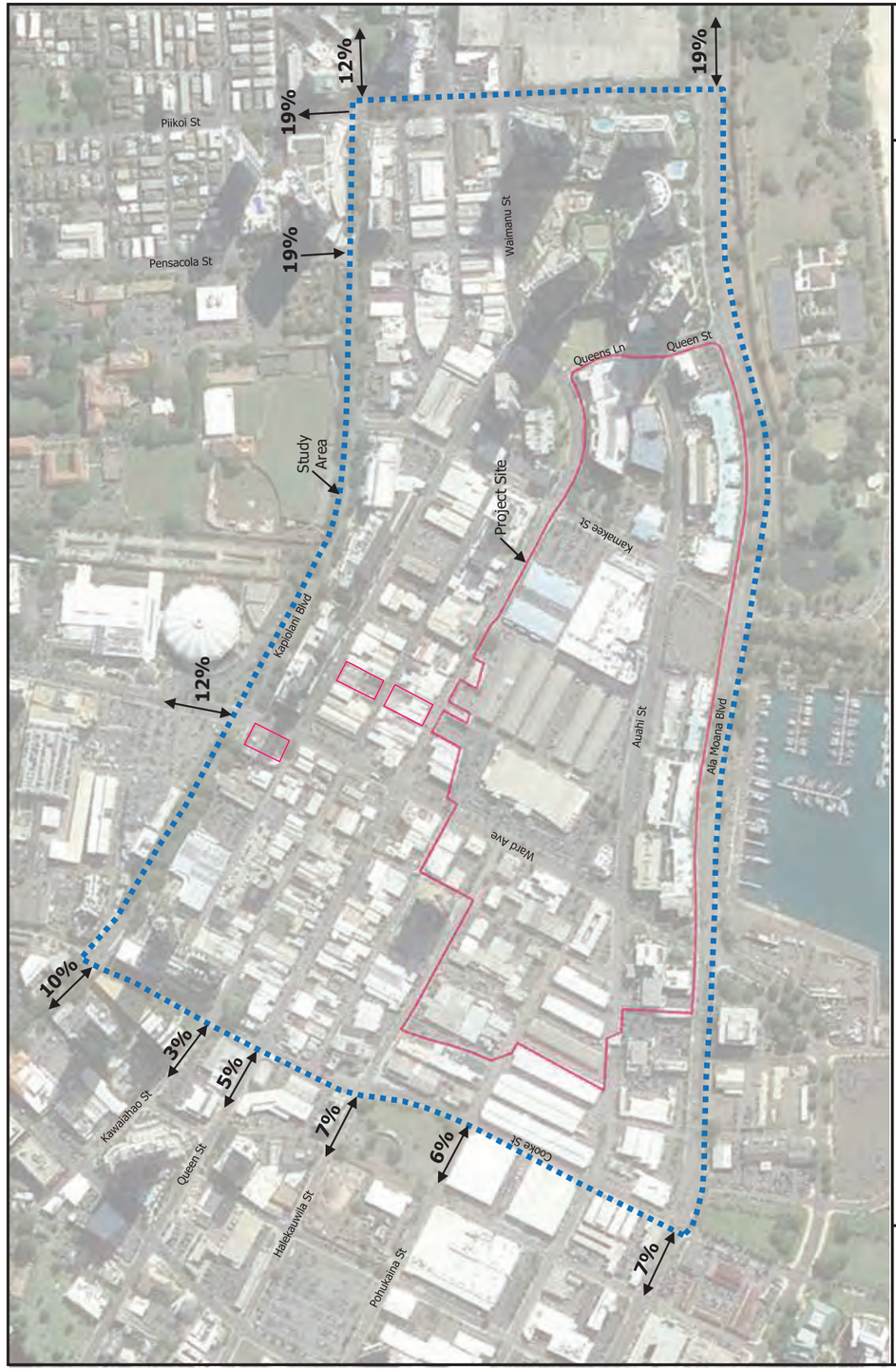

FIGURE 6

DISTRIBUTION OF EXTERNAL SITE-GENERATED TRIPS

BLOCK B

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BLOCK B

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

FIGURE 7

BLOCK B

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

FIGURE 8

site-generated traffic during the AM and PM peak periods based on the OMPO model. Due to the proximity of the Auahi Street driveway to Ward Avenue, that driveway is expected to be restricted to right-turn in right-turn out movements only. 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. In addition, population estimates for the island of Oahu indicate that growth is expected to be relatively linear to the Year 2035. As such, a corresponding growth factor was interpolated for the Year 2025.

B. Other Considerations

As previously discussed, a number of roadway improvements are also planned in the vicinity of the project as part of the overall Ward Village Master Plan. Among these include the Auahi Street improvements collectively called the "Auahi Street Promenade" project which entails two general phases. The first phase entails conversion of that roadway from a four-lane roadway to a two-lane roadway to accommodate enhanced pedestrian and bicycle facilities. The second phase entails the realignment of Auahi Street east of Ward Avenue to intersect Pohukaina Street. The realignment of Auahi Street is expected to provide a more direct and continuous east-west route through the Kakaako area and provide further mobility throughout the area.

With the realignment of Auahi Street, the Ward Village TMP recommended the provision of exclusive left-turn lanes and a shared through and right-turn lane on the eastbound and westbound approaches of the new intersection of the realigned Auahi Street, Pohukaina Street, and Ward Avenue. During consultation with the reviewing agencies for the Auahi Street Promenade project, consideration was given to the provision of exclusive turning lanes to minimize potential conflicts between vehicular and crossing pedestrian traffic on the north side of that intersection. The civil engineer for the project conducted an assessment, however, due to the set right-of-way and property line restrictions, the provision of an exclusive right-turn lane was determined to be unfeasible. As such, for the purpose of the analysis contained in this report, the lane uses assumed in the Ward Village TMP were maintained.

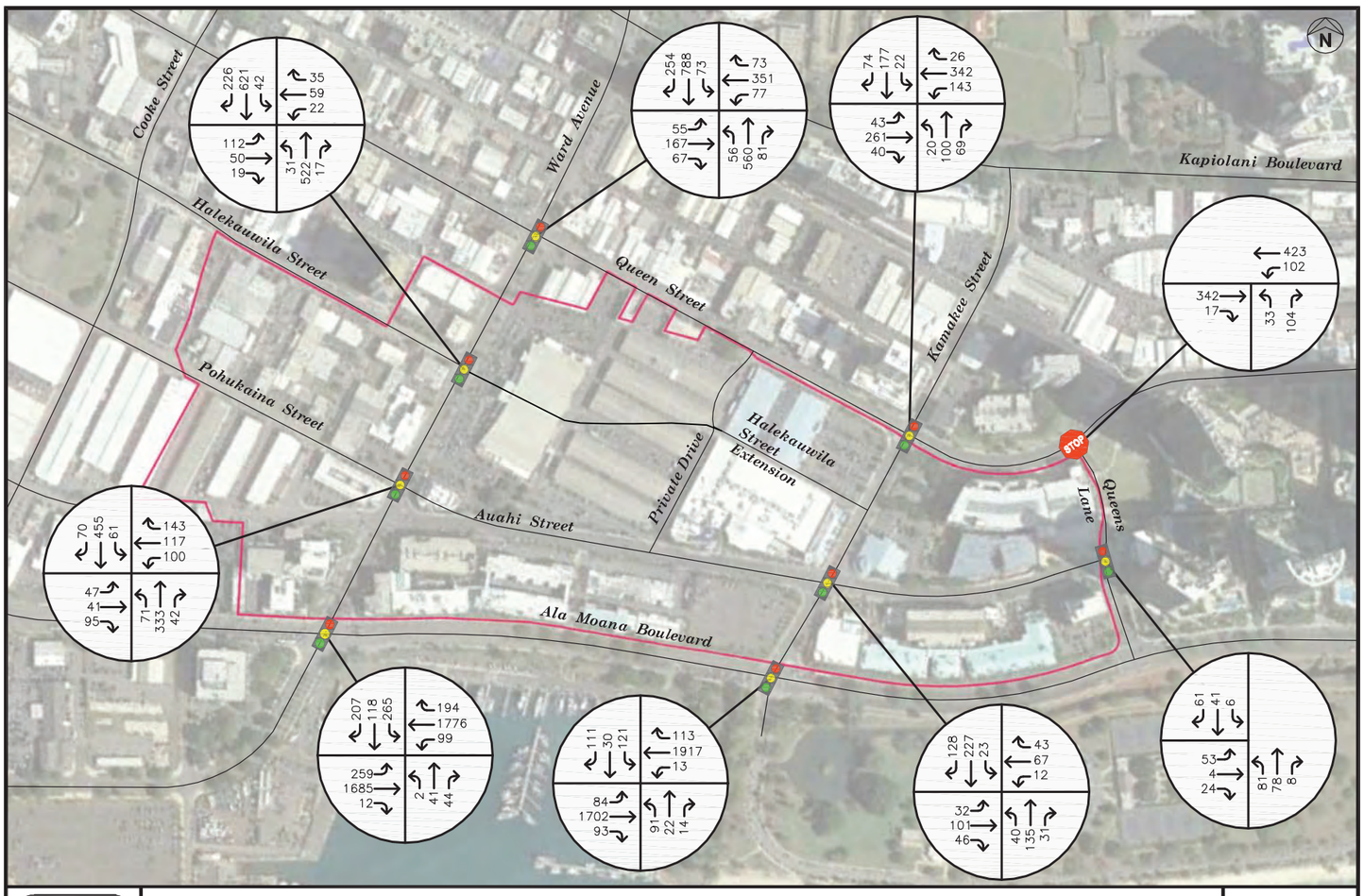
C. Total Traffic Volumes Without Project

The projected Year 2025 AM and PM peak period traffic volumes and operating conditions without the Block B 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 Blocks C East, K, O, M, N East, I, C West, H, and F of the Ward Villages Master Plan and the anticipated ambient growth in traffic in the vicinity. In addition, the analysis also incorporates the roadway improvements associated with the realignment of Auahi Street. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 3: Baseline and Projected Year 2025 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Base-line*	Year 2025 w/out Proj	Base-line*	Year 2025 w/out Proj
Ward Ave/ Queen St	Eastbound	B	B	D	D
	Westbound	C	C	D	D
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Queen Lane	Westbound	A	A	B	B
	Northbound	B	B	C	C
Ward Ave/ Halekauwila St	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B

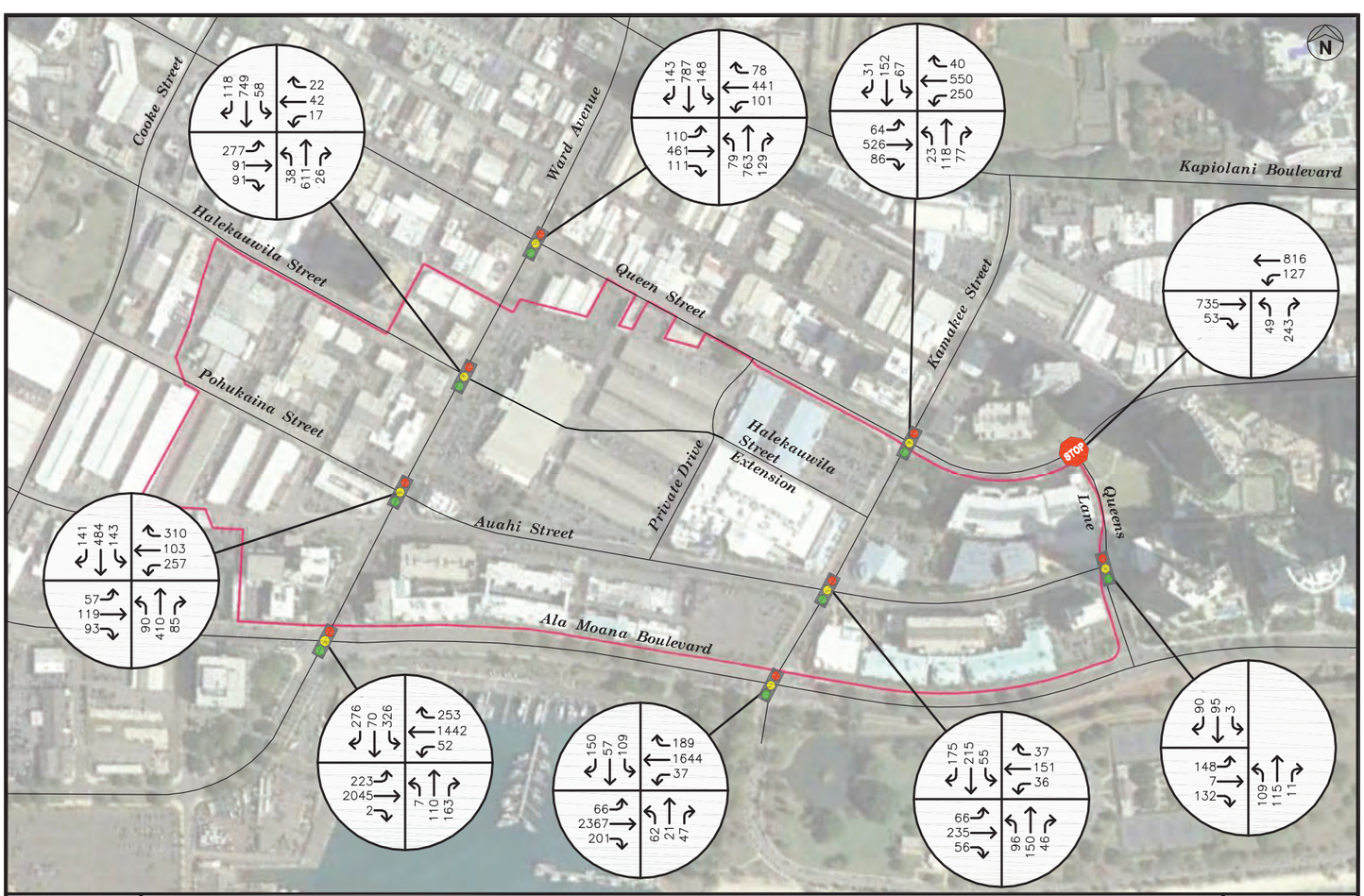
*Year 2024 conditions which incorporate the completion of Blocks C East, K, M, O, N East, I, C West, H, and F.



BLOCK B

YEAR 2025 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 9



BLOCK B

YEAR 2025 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 10

Table 3: Baseline and Projected Year 2025 (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Base-line*	Year 2025 w/out Proj	Base-line*	Year 2025 w/out Proj
Ward Ave/ Auahi St/ Pohukaina St	Eastbound	A	A	B	B
	Westbound	A	A	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	B	B	B
	Westbound	C	C	B	B
	Northbound	A	A	B	B
	Southbound	B	B	B	B
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	A	A	B	B
Ala Moana Blvd/ Ward Ave	Eastbound	E	E	E	E
	Westbound	E	E	E	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	C	C	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D

*Year 2024 conditions which incorporate the completion of Blocks C East, K, M, O, N East, I, C West, H, and F.

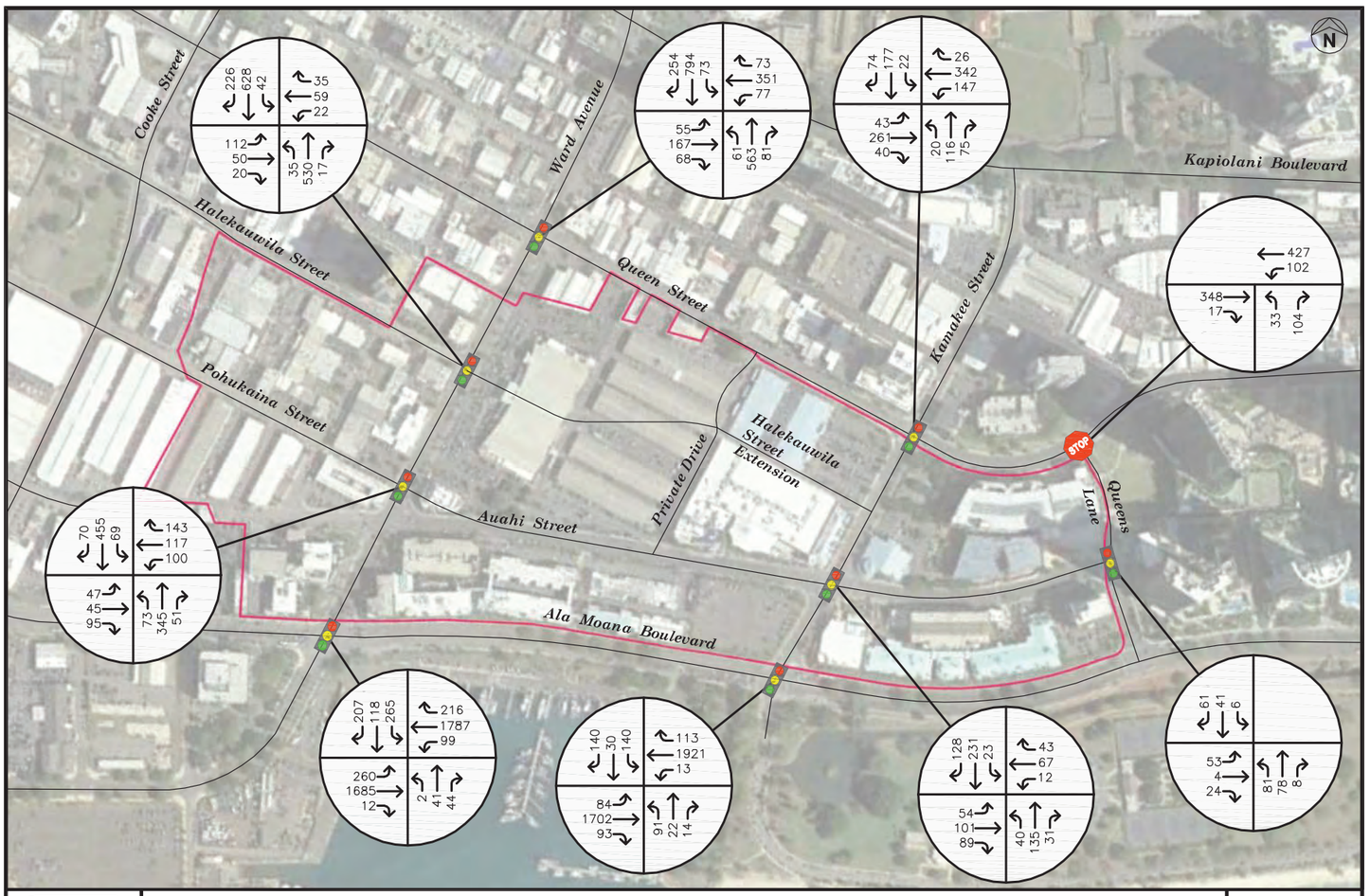
Traffic operations under Year 2025 without project conditions are generally expected to remain similar to baseline conditions. Along Ala Moana Boulevard, traffic operations at the intersections with Kamakee Street are expected to continue operating at LOS "D" or better during both peak periods while those at the intersection with Ward Avenue are expected to continue operating at LOS "E" or better during both peak periods. The low levels of service at this intersection is primarily due to the high volume of east-west through traffic at this intersection. Along Auahi Street, the approaches at the intersections with Ward Avenue and

Pohukaina Street are expected to continue operating at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, while those at the intersection with Kamakee Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "B" during the PM peak period. Traffic operations at the remaining study intersections are also expected to continue operating similar to baseline conditions.

As previously discussed, consideration was given to modifying the design of the new intersection of Ward Avenue, Auahi Street, and Pohukaina Street in conjunction with the Auahi Street Promenade project based upon consultations with the reviewing agencies. However, a design assessment conducted by the civil engineer for the project indicated that improvements to the layout of the intersection were not feasible due to the set right-of-way and property line restrictions. As such, an additional assessment was conducted to determine what the resulting queues would be without the provision of exclusive right-turn lanes. Along Auahi Street, average queues of ~238 feet are expected on the westbound approach while average queues of ~56 feet are expected on the eastbound approach along Pohukaina Street. Although some vehicular queues are expected, it should be noted that the narrower roadway width without the provision of additional turning lanes provides a shorter crossing distance for pedestrians and lessens potential conflicts for bicyclists traversing through the intersection. In addition, it maintains the planned bike lanes along that roadway that will provide separation between bicyclists and motorists. As such, the benefits to pedestrians and bicyclists were determined to outweigh the potential queues for motorists.

D. Total Traffic Volumes With Project

Figures 11 and 12 show the Year 2025 cumulative AM and PM peak hour traffic conditions resulting from the completion of the Block B development. The cumulative volumes consist of site-generated traffic superimposed over Year 2025 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.



BLOCK B

YEAR 2025 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 11

BLOCK B

YEAR 2025 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 12

V. TRAFFIC IMPACT ANALYSIS

The Year 2025 cumulative AM and PM peak hour traffic conditions with the completion of the Block B development are shown on Figures 11 and 12 and summarized in Table 4. The projected Year 2025 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix G.

Table 4: Projected Year 2025 (Without and With Project)
LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2025		Year 2025	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ward Ave/ Queen St	Eastbound	B	C	D	D
	Westbound	C	C	D	D
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Queens Ln	Westbound	A	A	B	B
	Northbound	B	B	C	C
Ward Ave/ Halekauwila St	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Ward Ave/ Auahi St/ Pohukaina St	Eastbound	A	A	B	B
	Westbound	A	A	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	C	B	B
	Westbound	C	C	B	B
	Northbound	A	B	B	B
	Southbound	B	B	B	B

Table 4: Projected Year 2025 (Without and With Project)
LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2025		Year 2025	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Queens Ln/ Queen St/ Auahi St	Eastbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	A	A	B	B
Ala Moana Blvd/ Ward Ave	Eastbound	E	E	E	E
	Westbound	E	E	E	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	C	C	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D

Traffic operations under Year 2025 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 Ward Avenue, traffic operations at the intersection with Queen Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period, while those at the intersection with Halekauwila Street are expected to continue operating at LOS "B" or better during both peak periods. At Ala Moana Boulevard, traffic operations are expected to continue being influenced by the high volume of east-west through traffic along this corridor. Along Auahi Street, the approaches at the intersections with Ward Avenue and Queen Lane are expected to continue operating at LOS "B" or better during both peak periods whereas those at Kamakee Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "B" 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 which include Auahi Street, Ward Avenue, and Ala Moana Boulevard. These facilities provide connections to destinations within Ward Village, as well as to the surrounding uses with pedestrian crossings facilitated by protected pedestrian phases at the signalized intersections of those roadways. A signalized midblock crossing is also provided along Auahi Street between Ward Avenue and Kamakee Street.

2. Projected Conditions

The proposed project is expected to maintain the existing pedestrian facilities in the vicinity of the project with additional improvements planned in conjunction with the overall Ward Village Master Plan. As previously discussed, the Auahi Street Promenade project will convert Auahi Street from a four-lane roadway into a two-lane roadway to accommodate a pedestrian promenade along the north side of that roadway. Trees and other landscaping treatments will be provided to enhance the overall pedestrian experience. In addition, a vacant parcel adjacent to the project is expected to be developed as the future Victoria Ward Makai Park. The Victoria Ward Makai Park will connect to the Victoria Ward Mauka Park north of Auahi Street via a new signalized midblock crossing. When completed, these parks will include open spaces and pedestrian walkways that will serve as a north-south connection between Auahi Street and Ala Moana Boulevard. An assessment for that midblock crossing was previously included in the Year 2020 update of the Ward Village TMP.

B. Bicycle Facilities

1. Existing Facilities

A number of bicycle parking areas are currently provided throughout Ward Village. In addition, the proposed Block B development is located

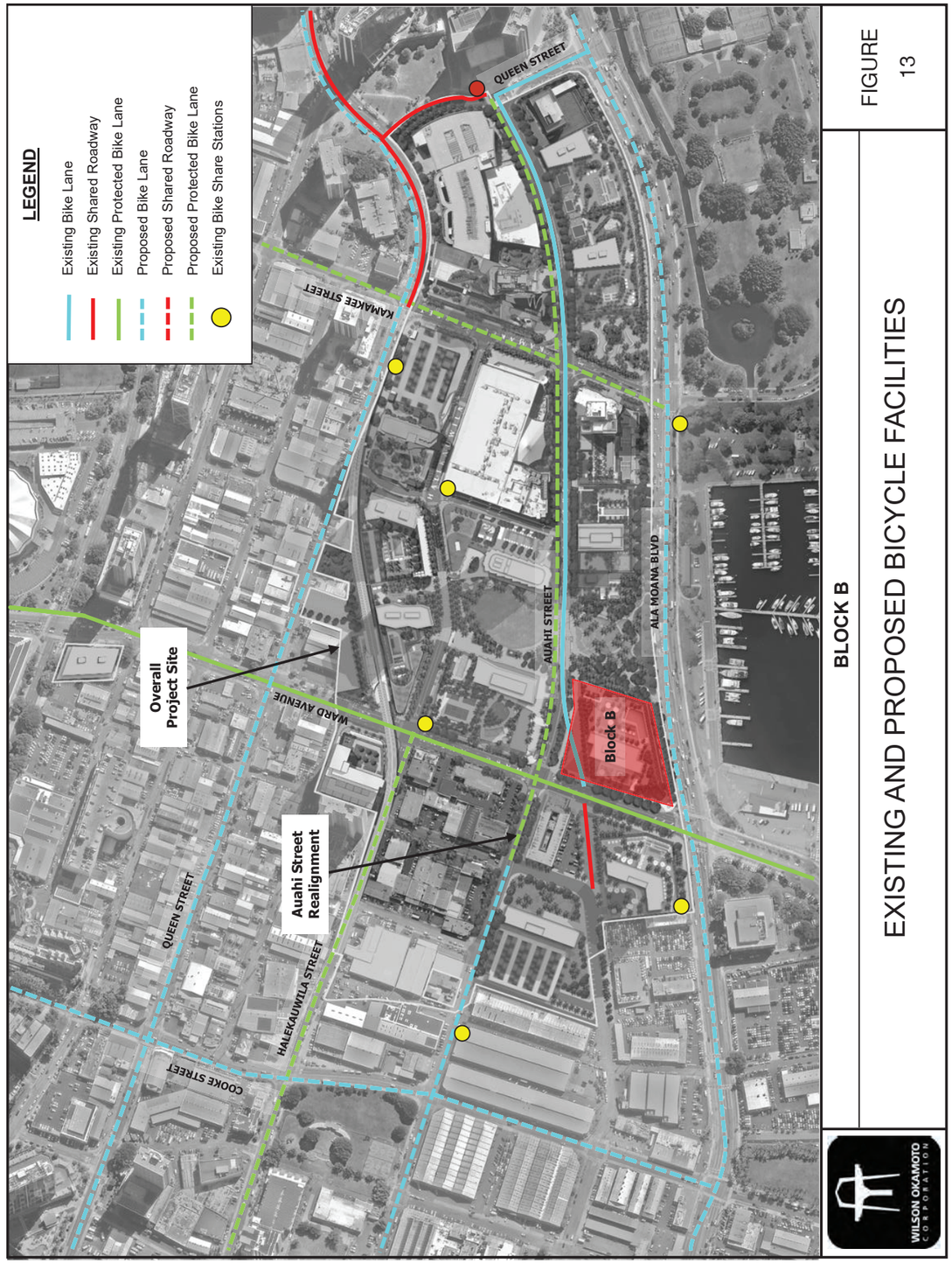
within close proximity to a number of BIKI bikeshare facilities, which are operated by Bikeshare Hawaii. The nearest BIKI station to the project site is located just west of the project site at the northwest corner of intersection of Ward Avenue and Ala Moana Boulevard with additional bike share stations located near the intersections of Ward Avenue and Halekauwila Street, Kamakee Street and Halekauwila Street, and Kamakee Street and Ala Moana Boulevard.

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) and a bike route along Queen Street east of Kamakee Street. Additionally, buffered bike lanes were recently installed along Ward Avenue between Ala Moana Boulevard and South King 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.

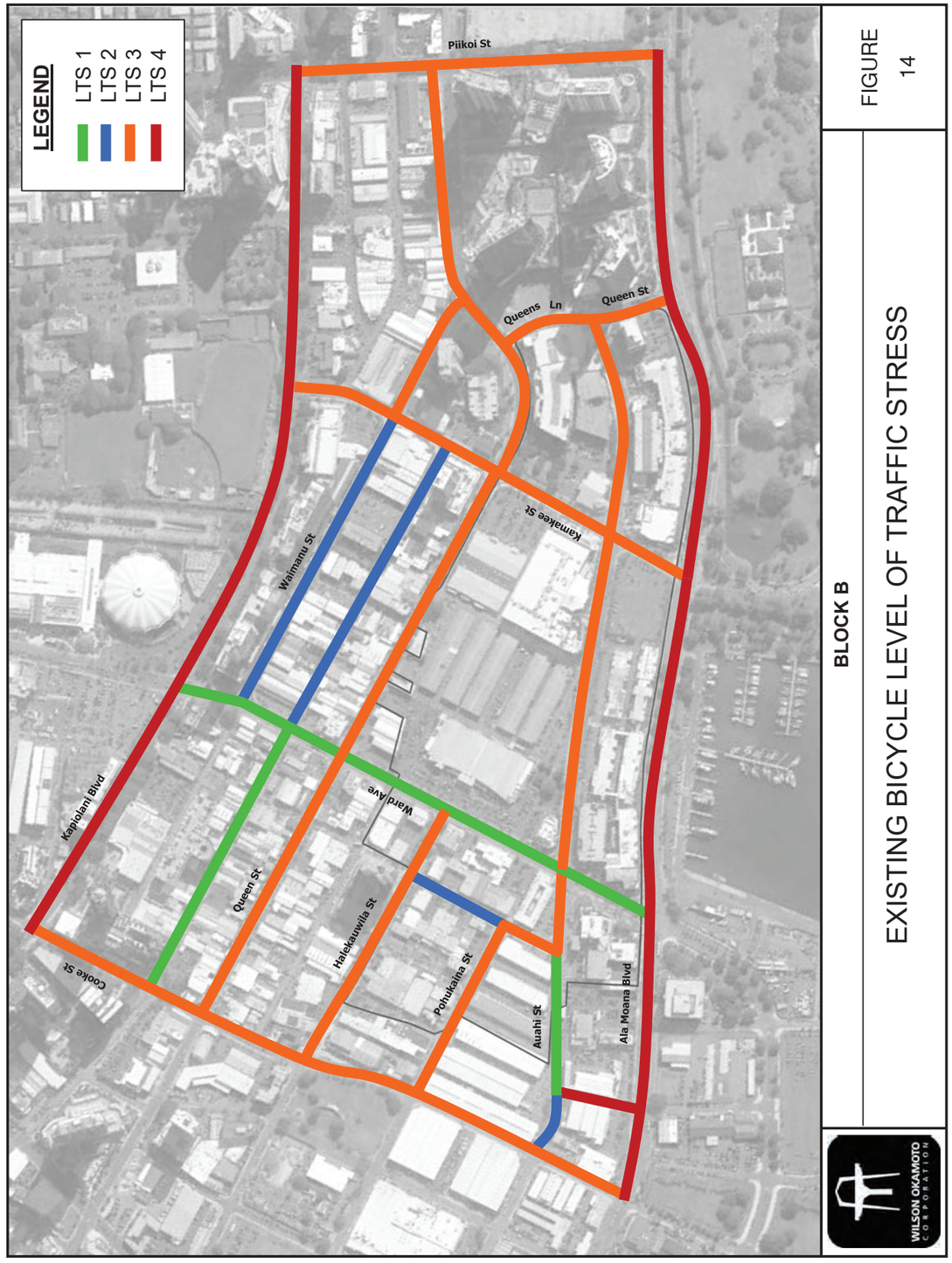


- LTS 3: Involves interaction with moderate speed or multilane traffic, or close proximity to higher speed traffic. Refers to a level of traffic stress acceptable to those classified as enthused and confident.
- LTS 4: Involves interaction with higher speed traffic or close proximity to high speed traffic. 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 B development are depicted in Figure 14. As shown in Figure 14, Ward Avenue is rated at LTS 1 due to the provision of buffered bike lanes along this roadway while Auahi Street is rated LTS 3. Based on the LTS ranking system, the level of traffic stress for bikes in mixed traffic increases with traffic speed and the number of lanes. Although the prevailing speeds along this roadway is within 5 miles of the posted speed limit of 25 miles per hour (mph), Auahi Street is currently comprised of 2 lanes or more with average daily traffic volumes that are greater than 3,000 vehicles per day, and as such, rated LTS 3.

3. Projected Conditions

The proposed project is expected to provide short-term and long-term bicycle facilities on-site for residents, guests, and employees to encourage the use of alternate modes of transportation. In addition, there are also future bike improvements planned in conjunction with the overall Ward Village Master Plan to enhance bicycle connectivity within the Ward Village area as well to the surrounding uses. As previously discussed, the Auahi Street Promenade project will convert the existing 4-lane roadway to a 2-lane roadway to accommodate enhanced multimodal facilities. In conjunction with this project, additional pavement striping will be installed to convert the existing bike lanes along this roadway to buffered bike lanes and provide additional separation between bicyclists and vehicles. With this improvement the LTS for Auahi Street is expected to improve to LTS 1.



In addition, there are 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:

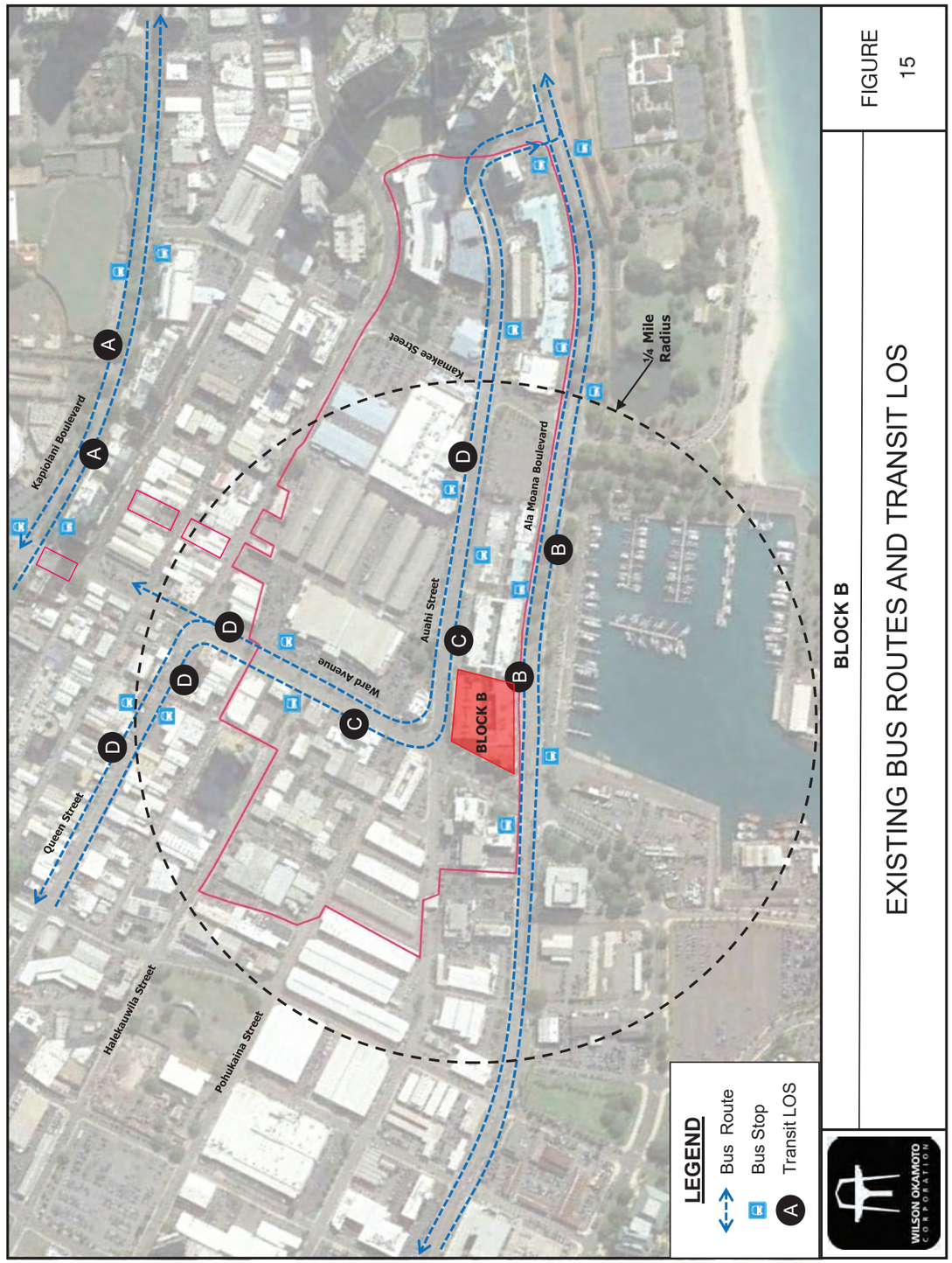
- Bike lanes along Ala Moana Boulevard between Nimitz Highway and Kalakaua Avenue
- Bike lanes along Kamakee Street between Auahi Street and Ala Moana Boulevard
- Protected bike lanes along Auahi Street between South Street and Ward Avenue
- Protected bike lanes along Halekauwila Street between Ala Moana 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 8 transit stops that are served by 7 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 Oli Oli (JTB), Lealea (H.I.S.), Waikiki Trolley, and JALPAK.



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

In general, the existing transit facilities are expected to be maintained under projected conditions, with the exception of those along Auahi Street. 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. East of Kamakee Street, an existing bus stop located south of the roadway is expected to be relocated further east near Queen Street, while a new bus stop will be provided on the north side of the roadway near the driveway that serves the adjacent Ward Village Shops. 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 (Block H) 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. Although some of the bus stop locations are expected to be modified under with project conditions, service to those stops are not expected to change significantly and as such, the levels of service for transit in the vicinity of the project are anticipated to remain similar to existing conditions.

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 Ward Villages development, the guideway alignment is expected to run along Halekauwila Street, cross over to Queen Street and then follow that roadway to Waimanu Street. The nearest transit station is expected to be the Kakaako Station located less 1,000 feet to the north of the project site. However, as previously noted, the rail project is expected to be completed after the completion of Block B.

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 driveways to ensure visibility between pedestrians, bicyclists, motorists, or other users at these conflict points.

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 to avoid vehicle-reversing maneuvers onto public roadways. Consider monitoring the loading/unloading area to further minimize any potential conflict between vehicles, bicyclists, and pedestrians.

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

5. The Auahi Street corridor is expected to accommodate increased pedestrian and bicycle activity. The developer shall continue to work with the City and County of Honolulu during the design phase of the project and shall develop alternative schemes to accommodate the potential increase in pedestrian and bicycle use along the corridor. Should the need arise, such schemes shall be approved by the City and County of Honolulu and implemented by the developer.

6. Restrict turning movements in the project driveway off Auahi Street to right-turn in and right-turn out movements only due to its proximity to Ward Avenue. Provide adequate channelization to direct vehicular movements exiting the driveway. The specific configuration shall be determined during the design phase.

7. If access at the entrance to the parking garage is 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.

8. Provide adequate passing areas along the proposed drop-off/pick-up area to ensure traffic flow through this location and minimize potential queueing.

9. Provide adequate pedestrian waiting areas at the intersection of Ward Avenue, Auahi Street and Pohukaina Street as well as at the intersection of Ala Moana Boulevard and Ward Avenue and ensure clear visibility of pedestrians and bicyclists at the intersection.

10. Provide adequate signage for entering vehicles at the project driveway to facilitate traffic flow and minimize confusion regarding the location of the porte cochere and the parking garage.

11. The developer shall continue to coordinate with the City and County of Honolulu Department of Transportation Services to modify the bike lane striping at the project driveway off Auahi as shown on the conceptual plan to conform to the City and County of Honolulu requirements.

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

13. Continue to develop and/or enhance bicycle and pedestrian facilities, as well as public transportation services in the project vicinity as described in the "Transportation Master Plan and Assessment for the Ward Villages Master Plan," dated October 2020.

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

VIII. CONCLUSION

The project site for the Ward Village Master Plan currently encompasses Ward Entertainment Center, Ward Village Shops, and other surrounding commercial and office buildings. The overall master plan is expected to be implemented in five (5) phases over a span of 10-15 years and entail the redevelopment of most of the existing commercial, office, and industrial spaces. Block B is a part of Phase 3 of the master plan which is expected to include residential uses. With the implementation of the aforementioned recommendations, traffic operations with the Block B development are generally expected to remain similar to without project conditions. In addition, the Howard Hughes Corporation 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.

Traffic Impact Report for Block B

(TIARs) continue to be prepared for each phase of the project to verify future conditions and ensure necessary mitigation measures are implemented.

APPENDIX A

TRAFFIC COUNT DATA

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

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

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

Groups Printed- Unshifted

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

	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	4	171	56	231	17	63	0	80	11	97	4	112	9	24	15	48	471
07:45 AM	11	166	50	227	13	80	8	101	16	97	11	124	17	29	18	64	516
08:00 AM	7	166	73	246	12	70	8	90	11	86	7	104	14	30	11	55	495
08:15 AM	11	150	50	211	7	63	12	82	9	108	14	131	10	42	14	66	490
Total Volume	33	653	229	915	49	276	28	353	47	388	36	471	50	125	58	233	1972
% App. Total	3.6	71.4	25		13.9	78.2	7.9		10	82.4	7.6		21.5	53.6	24.9		
PHF	.750	.955	.784	.930	.721	.863	.583	.874	.734	.898	.643	.899	.735	.744	.806	.883	.955

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Ward Avenue Southbound				Ward Avenue Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	3	135	56	194	3	89	2	94	22	1	2	25	313
07:45 AM	1	128	56	185	1	94	0	95	28	1	5	34	314
08:00 AM	2	129	42	173	4	86	1	91	20	1	5	26	290
08:15 AM	0	119	38	157	9	105	0	114	30	1	5	36	307
Total Volume	6	511	192	709	17	374	3	394	100	4	17	121	1224
% App. Total	0.8	72.1	27.1		4.3	94.9	0.8		82.6	3.3	14		
PHF	.500	.946	.857	.914	.472	.890	.375	.864	.833	1.00	.850	.840	.975

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	12	85	14	111	11	22	15	48	18	69	12	99	4	9	7	20	278
07:30 AM	9	105	11	125	15	14	10	39	18	73	6	97	6	5	17	28	289
07:45 AM	15	90	12	117	26	18	14	58	12	75	6	93	3	12	7	22	290
08:00 AM	15	85	7	107	12	17	17	46	11	61	13	85	4	6	5	15	253
Total Volume	51	365	44	460	64	71	56	191	59	278	37	374	17	32	36	85	1110
% App. Total	11.1	79.3	9.6		33.5	37.2	29.3		15.8	74.3	9.9		20	37.6	42.4		
PHF	.850	.869	.786	.920	.615	.807	.824	.823	.819	.927	.712	.944	.708	.667	.529	.759	.957

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	29	25	35	89	29	427	37	493	0	14	10	24	59	376	6	441	1047
07:30 AM	50	33	42	125	33	386	46	465	0	8	7	15	54	365	1	420	1025
07:45 AM	39	34	40	113	35	415	42	492	2	7	14	23	54	367	1	422	1050
08:00 AM	34	14	34	82	27	358	37	422	0	8	9	17	50	379	3	432	953
Total Volume	152	106	151	409	124	1586	162	1872	2	37	40	79	217	1487	11	1715	4075
% App. Total	37.2	25.9	36.9		6.6	84.7	8.7		2.5	46.8	50.6		12.7	86.7	0.6		
PHF	.760	.779	.899	.818	.886	.929	.880	.949	.250	.661	.714	.823	.919	.981	.458	.972	.970

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	5	39	20	64	4	15	9	28	6	23	5	34	3	21	5	29	155
08:15 AM	4	37	23	64	0	14	9	23	10	18	11	39	3	19	1	23	149
08:30 AM	5	30	22	57	4	19	9	32	2	10	9	21	7	22	7	36	146
08:45 AM	7	31	21	59	3	12	12	27	3	21	3	27	3	29	3	35	148
Total Volume	21	137	86	244	11	60	39	110	21	72	28	121	16	91	16	123	598
% App. Total	8.6	56.1	35.2		10	54.5	35.5		17.4	59.5	23.1		13	74	13		
PHF	.750	.878	.935	.953	.688	.789	.813	.859	.525	.783	.636	.776	.571	.784	.571	.854	.965

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	4	24	23	51	12	84	5	101	4	14	1	19	3	36	6	45	216
07:45 AM	6	23	17	46	27	79	3	109	4	25	6	35	3	19	4	26	216
08:00 AM	4	33	10	47	31	66	11	108	0	9	11	20	1	46	5	52	227
08:15 AM	6	28	12	46	26	44	4	74	10	17	8	35	3	42	10	55	210
Total Volume	20	108	62	190	96	273	23	392	18	65	26	109	10	143	25	178	869
% App. Total	10.5	56.8	32.6		24.5	69.6	5.9		16.5	59.6	23.9		5.6	80.3	14		
PHF	.833	.818	.674	.931	.774	.813	.523	.899	.450	.650	.591	.779	.833	.777	.625	.809	.957

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Park Drive Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	8	7	23	38	2	432	14	448	22	2	3	27	20	381	15	416	929
07:30 AM	5	4	19	28	5	417	4	426	26	6	2	34	16	355	26	397	885
07:45 AM	2	8	21	31	2	431	16	449	19	4	5	28	18	322	20	360	868
08:00 AM	7	8	32	47	3	426	11	440	15	8	3	26	14	367	23	404	917
Total Volume	22	27	95	144	12	1706	45	1763	82	20	13	115	68	1425	84	1577	3599
% App. Total	15.3	18.8	66		0.7	96.8	2.6		71.3	17.4	11.3		4.3	90.4	5.3		
PHF	.688	.844	.742	.766	.600	.987	.703	.982	.788	.625	.650	.846	.850	.935	.808	.948	.969

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Kapiolani Boulevard Westbound				Cooke Street Northbound				Kapiolani Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	6	4	13	109	226	58	393	15	53	10	78	0	137	12	149	633
07:30 AM	4	13	4	21	113	228	69	410	9	45	12	66	0	144	25	169	666
07:45 AM	0	11	15	26	112	211	72	395	15	41	6	62	0	145	15	160	643
08:00 AM	4	9	11	24	118	177	48	343	14	50	22	86	0	129	19	148	601
Total Volume	11	39	34	84	452	842	247	1541	53	189	50	292	0	555	71	626	2543
% App. Total	13.1	46.4	40.5		29.3	54.6	16		18.2	64.7	17.1		0	88.7	11.3		
PHF	.688	.750	.567	.808	.958	.923	.858	.940	.883	.892	.568	.849	.000	.957	.710	.926	.955

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Queen Street Westbound				Cooke Street Northbound				Queen Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	51	41	97	13	100	20	133	10	44	11	65	10	30	14	54	349
07:30 AM	1	40	47	88	19	116	9	144	6	57	10	73	10	44	17	71	376
07:45 AM	3	47	40	90	16	119	10	145	6	49	10	65	6	54	13	73	373
08:00 AM	5	41	44	90	16	99	10	125	12	58	12	82	6	45	16	67	364
Total Volume	14	179	172	365	64	434	49	547	34	208	43	285	32	173	60	265	1462
% App. Total	3.8	49	47.1		11.7	79.3	9		11.9	73	15.1		12.1	65.3	22.6		
PHF	.700	.877	.915	.941	.842	.912	.613	.943	.708	.897	.896	.869	.800	.801	.882	.908	.972

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	10	56	14	80	9	21	8	38	6	47	10	63	13	22	6	41	222
08:00 AM	4	54	13	71	9	12	7	28	5	49	9	63	14	14	3	31	193
08:15 AM	5	64	15	84	6	16	9	31	4	40	3	47	18	16	15	49	211
08:30 AM	7	55	12	74	2	17	8	27	4	68	9	81	16	10	9	35	217
Total Volume	26	229	54	309	26	66	32	124	19	204	31	254	61	62	33	156	843
% App. Total	8.4	74.1	17.5		21	53.2	25.8		7.5	80.3	12.2		39.1	39.7	21.2		
PHF	.650	.895	.900	.920	.722	.786	.889	.816	.792	.750	.775	.784	.847	.705	.550	.796	.949

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	6	38	22	66	8	25	7	40	5	39	6	50	15	17	2	34	190
08:00 AM	2	38	24	64	7	29	12	48	8	39	5	52	14	16	3	33	197
08:15 AM	9	38	34	81	6	29	4	39	4	32	7	43	7	24	5	36	199
08:30 AM	5	42	23	70	8	22	16	46	7	38	10	55	25	16	4	45	216
Total Volume	22	156	103	281	29	105	39	173	24	148	28	200	61	73	14	148	802
% App. Total	7.8	55.5	36.7		16.8	60.7	22.5		12	74	14		41.2	49.3	9.5		
PHF	.611	.929	.757	.867	.906	.905	.609	.901	.750	.949	.700	.909	.610	.760	.700	.822	.928

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Auahi Street Westbound				Cooke Street Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	30	18	49	1	5	7	13	7	30	1	38	8	0	1	9	109
08:00 AM	8	22	13	43	0	3	8	11	7	34	1	42	15	1	4	20	116
08:15 AM	6	31	9	46	2	1	12	15	6	28	0	34	6	7	3	16	111
08:30 AM	7	32	14	53	3	5	14	22	2	42	3	47	8	2	5	15	137
Total Volume	22	115	54	191	6	14	41	61	22	134	5	161	37	10	13	60	473
% App. Total	11.5	60.2	28.3		9.8	23	67.2		13.7	83.2	3.1		61.7	16.7	21.7		
PHF	.688	.898	.750	.901	.500	.700	.732	.693	.786	.798	.417	.856	.617	.357	.650	.750	.863

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	13	0	21	34	2	448	10	460	2	3	1	6	15	426	6	447	947
07:45 AM	6	10	17	33	4	416	12	432	5	4	3	12	23	458	7	488	965
08:00 AM	11	4	10	25	3	455	21	479	0	6	1	7	17	453	7	477	988
08:15 AM	12	7	13	32	4	325	17	346	5	6	2	13	9	450	9	468	859
Total Volume	42	21	61	124	13	1644	60	1717	12	19	7	38	64	1787	29	1880	3759
% App. Total	33.9	16.9	49.2		0.8	95.7	3.5		31.6	50	18.4		3.4	95.1	1.5		
PHF	.808	.525	.726	.912	.813	.903	.714	.896	.600	.792	.583	.731	.696	.975	.806	.963	.951

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

Wilson Okamoto Corporation

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

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

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

Groups Printed- Unshifted

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

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

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

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

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

Groups Printed- Unshifted

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

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

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

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

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

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

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

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

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

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

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

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

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

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

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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

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

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

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

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

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
BASELINE YEAR 2024 PEAK PERIOD TRAFFIC ANALYSIS

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
Future Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
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	0.88	1.00	1.00	0.98	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.91	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	1391	1616	1863	1547	1770	3390		1770	3364	
Flt Permitted	0.33	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	610	1863	1391	1073	1863	1547	1770	3390		1770	3364	
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)	58	176	71	81	369	77	59	589	85	77	829	267
RTOR Reduction (vph)	0	0	50	0	0	55	0	13	0	0	34	0
Lane Group Flow (vph)	58	176	21	81	369	22	59	661	0	77	1062	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)	20.6	20.6	20.6	20.6	20.6	20.6	3.4	29.4		6.3	32.3	
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	3.4	29.4		6.3	32.3	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.41		0.09	0.45	
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)	176	538	401	310	538	446	84	1397		156	1523	
v/s Ratio Prot		0.09			c0.20		0.03	0.20		c0.04	c0.32	
v/s Ratio Perm	0.10		0.01	0.08		0.01						
v/c Ratio	0.33	0.33	0.05	0.26	0.69	0.05	0.70	0.47		0.49	0.70	
Uniform Delay, d1	19.9	19.9	18.3	19.5	22.5	18.3	33.5	15.3		31.0	15.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.4	0.1	0.5	3.6	0.0	23.3	0.3		2.4	1.4	
Delay (s)	21.0	20.3	18.3	19.9	26.1	18.3	56.7	15.6		33.4	17.0	
Level of Service	C	C	B	B	C	B	E	B		C	B	
Approach Delay (s)		20.0			24.0			18.9			18.1	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	461	111	101	441	78	79	764	129	148	788	143
Future Volume (vph)	110	461	111	101	441	78	79	764	129	148	788	143
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	0.87	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.95	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)	1687	1863	1372	1689	1863	1380	1770	3257		1770	3410	
Flt Permitted	0.23	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	405	1863	1372	358	1863	1380	1770	3257		1770	3410	
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)	116	485	117	106	464	82	83	804	136	156	829	151
RTOR Reduction (vph)	0	0	58	0	0	56	0	15	0	0	15	0
Lane Group Flow (vph)	116	485	59	106	464	26	83	925	0	156	965	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)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Effective Green, g (s)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.06	0.37		0.13	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)	130	599	441	115	599	444	113	1192		226	1466	
v/s Ratio Prot		0.26			0.25		0.05	c0.28		c0.09	0.28	
v/s Ratio Perm	0.29		0.04	c0.30		0.02						
v/c Ratio	0.89	0.81	0.13	0.92	0.77	0.06	0.73	0.78		0.69	0.66	
Uniform Delay, d1	26.3	25.3	19.6	26.6	24.9	19.1	37.4	22.8		34.0	18.4	
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	47.7	8.0	0.1	59.7	6.2	0.1	21.7	3.2		8.8	1.1	
Delay (s)	73.9	33.3	19.7	86.3	31.1	19.1	59.1	26.1		42.7	19.5	
Level of Service	E	C	B	F	C	B	E	C		D	B	
Approach Delay (s)		37.6			38.6			28.8			22.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Future Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		3430		1770	3497			3297			3324	
Flt Permitted		0.86		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2967		1770	3497			3002			3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	45	272	42	149	356	27	21	104	72	23	184	77
RTOR Reduction (vph)	0	10	0	0	6	0	0	50	0	0	31	0
Lane Group Flow (vph)	0	349	0	149	377	0	0	147	0	0	253	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.6		8.6	28.2			17.3			17.3	
Effective Green, g (s)		14.6		8.6	28.2			17.3			17.3	
Actuated g/C Ratio		0.26		0.15	0.51			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		780		274	1776			935			959	
v/s Ratio Prot				c0.08	0.11							
v/s Ratio Perm		c0.12						0.05			c0.08	
v/c Ratio		0.45		0.54	0.21			0.16			0.26	
Uniform Delay, d1		17.1		21.6	7.5			13.8			14.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.2	0.1			0.1			0.1	
Delay (s)		17.5		23.8	7.6			13.9			14.5	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.5			12.1			13.9			14.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Future Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.96	
Flpb, ped/bikes		1.00		1.00	1.00			0.98			1.00	
Frt		0.98		1.00	0.99			0.95			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3375		1770	3495			3234			3287	
Flt Permitted		0.83		0.95	1.00			0.90			0.80	
Satd. Flow (perm)		2814		1770	3495			2920			2662	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	67	548	90	260	573	42	24	123	80	70	158	32
RTOR Reduction (vph)	0	11	0	0	6	0	0	60	0	0	9	0
Lane Group Flow (vph)	0	694	0	260	609	0	0	167	0	0	251	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		27.9		17.5	50.4			15.5			15.5	
Effective Green, g (s)		27.9		17.5	50.4			15.5			15.5	
Actuated g/C Ratio		0.37		0.23	0.66			0.20			0.20	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1034		408	2320			596			543	
v/s Ratio Prot				c0.15	0.17							
v/s Ratio Perm		c0.25						0.06			c0.09	
v/c Ratio		0.67		0.64	0.26			0.28			0.46	
Uniform Delay, d1		20.2		26.3	5.2			25.5			26.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.7		3.3	0.1			0.3			0.6	
Delay (s)		21.9		29.6	5.2			25.8			27.2	
Level of Service		C		C	A			C			C	
Approach Delay (s)		21.9			12.5			25.8			27.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	342	17	102	423	33	104
Future Volume (Veh/h)	342	17	102	423	33	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	380	19	113	470	37	116
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			407		858	208
vC1, stage 1 conf vol					398	
vC2, stage 2 conf vol					461	
vCu, unblocked vol			407		858	208
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		93	86
cM capacity (veh/h)			1141		540	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	253	146	113	235	235	153
Volume Left	0	0	113	0	0	37
Volume Right	0	19	0	0	0	116
cSH	1700	1700	1141	1700	1700	742
Volume to Capacity	0.15	0.09	0.10	0.14	0.14	0.21
Queue Length 95th (ft)	0	0	8	0	0	19
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	11.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.6			11.1
Approach LOS						B

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	34.7%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	735	53	127	817	49	243
Future Volume (Veh/h)	735	53	127	817	49	243
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	774	56	134	860	52	256
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			857		1527	442
vC1, stage 1 conf vol					829	
vC2, stage 2 conf vol					698	
vCu, unblocked vol			623		1366	163
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		86	68
cM capacity (veh/h)			841		374	788

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	516	314	134	430	430	308
Volume Left	0	0	134	0	0	52
Volume Right	0	56	0	0	0	256
cSH	1700	1700	841	1700	1700	664
Volume to Capacity	0.30	0.18	0.16	0.25	0.25	0.46
Queue Length 95th (ft)	0	0	14	0	0	62
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.0
Lane LOS			B			C
Approach Delay (s)	0.0		1.4			15.0
Approach LOS						C

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	56.9%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
Future Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.96			0.96		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1757			1741		1718	3515		1770	3284	
Flt Permitted	0.80	1.00			0.94		0.28	1.00		0.44	1.00	
Satd. Flow (perm)	1488	1757			1656		508	3515		827	3284	
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)	115	52	20	23	61	36	32	538	18	43	640	233
RTOR Reduction (vph)	0	14	0	0	19	0	0	3	0	0	43	0
Lane Group Flow (vph)	115	58	0	0	101	0	32	553	0	43	830	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)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Effective Green, g (s)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Actuated g/C Ratio	0.29	0.29			0.29		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	436	515			486		258	1785		420	1668	
v/s Ratio Prot		0.03						0.16			c0.25	
v/s Ratio Perm	c0.08				0.06		0.06			0.05		
v/c Ratio	0.26	0.11			0.21		0.12	0.31		0.10	0.50	
Uniform Delay, d1	13.6	13.0			13.4		6.5	7.2		6.4	8.2	
Progression Factor	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	0.1		0.1	0.2	
Delay (s)	14.0	13.1			13.6		6.7	7.3		6.5	8.4	
Level of Service	B	B			B		A	A		A	A	
Approach Delay (s)		13.6			13.6			7.3			8.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
Future Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93			0.96		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.88	1.00			0.98		0.94	1.00		0.93	1.00	
Frt	1.00	0.93			0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1552	1603			1669		1671	3494		1652	3345	
Flt Permitted	0.70	1.00			0.93		0.22	1.00		0.34	1.00	
Satd. Flow (perm)	1147	1603			1575		379	3494		593	3345	
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)	289	95	95	18	44	23	40	636	27	60	780	123
RTOR Reduction (vph)	0	18	0	0	13	0	0	4	0	0	14	0
Lane Group Flow (vph)	289	172	0	0	72	0	40	659	0	60	889	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)	26.0	26.0			26.0		24.9	24.9		24.9	24.9	
Effective Green, g (s)	26.0	26.0			26.0		24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.43	0.43			0.43		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	489	684			672		154	1428		242	1367	
v/s Ratio Prot		0.11						0.19			c0.27	
v/s Ratio Perm	c0.25				0.05		0.11			0.10		
v/c Ratio	0.59	0.25			0.11		0.26	0.46		0.25	0.65	
Uniform Delay, d1	13.4	11.2			10.5		11.9	13.1		11.8	14.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.2			0.1		0.9	0.2		0.5	1.1	
Delay (s)	15.3	11.4			10.5		12.8	13.4		12.4	15.6	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		13.7			10.5			13.3			15.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.3%	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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	41	76	100	117	143	68	338	42	61	455	70
Future Volume (vph)	42	41	76	100	117	143	68	338	42	61	455	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	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	0.99	1.00		0.97	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.98		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)	1759	1626		1710	1690		1708	3461		1731	3425	
Flt Permitted	0.59	1.00		0.68	1.00		0.45	1.00		0.52	1.00	
Satd. Flow (perm)	1097	1626		1222	1690		805	3461		945	3425	
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)	44	43	79	104	122	149	71	352	44	64	474	73
RTOR Reduction (vph)	0	55	0	0	60	0	0	12	0	0	15	0
Lane Group Flow (vph)	44	67	0	104	211	0	71	384	0	64	532	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)	9.7	9.7		9.7	9.7		12.1	12.1		12.1	12.1	
Effective Green, g (s)	9.7	9.7		9.7	9.7		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.38	0.38		0.38	0.38	
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)	334	495		372	515		306	1316		359	1303	
v/s Ratio Prot		0.04			c0.12			0.11			c0.16	
v/s Ratio Perm	0.04			0.09			0.09			0.07		
v/c Ratio	0.13	0.14		0.28	0.41		0.23	0.29		0.18	0.41	
Uniform Delay, d1	8.0	8.0		8.4	8.8		6.7	6.9		6.5	7.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.5		0.4	0.1		0.2	0.2	
Delay (s)	8.2	8.1		8.8	9.3		7.1	7.0		6.8	7.4	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		8.1			9.2			7.0			7.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	31.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	105	74	225	91	272	71	362	75	126	424	125
Future Volume (vph)	49	105	74	225	91	272	71	362	75	126	424	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	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	0.90		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	0.94	1.00		0.94	1.00		0.97	1.00		0.94	1.00	
Frt	1.00	0.94		1.00	0.89		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1657	1687		1670	1492		1718	3369		1657	3324	
Flt Permitted	0.43	1.00		0.63	1.00		0.38	1.00		0.46	1.00	
Satd. Flow (perm)	749	1687		1116	1492		682	3369		804	3324	
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)	54	115	81	247	100	299	78	398	82	138	466	137
RTOR Reduction (vph)	0	30	0	0	56	0	0	20	0	0	32	0
Lane Group Flow (vph)	54	166	0	247	343	0	78	460	0	138	571	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)	25.9	25.9		25.9	25.9		24.4	24.4		24.4	24.4	
Effective Green, g (s)	25.9	25.9		25.9	25.9		24.4	24.4		24.4	24.4	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.40	0.40		0.40	0.40	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	724		479	640		275	1363		325	1345	
v/s Ratio Prot		0.10			c0.23			0.14			c0.17	
v/s Ratio Perm	0.07			0.22			0.11			0.17		
v/c Ratio	0.17	0.23		0.52	0.54		0.28	0.34		0.42	0.42	
Uniform Delay, d1	10.6	10.9		12.6	12.7		12.1	12.4		12.9	12.9	
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		0.9	0.9		0.6	0.1		0.9	0.2	
Delay (s)	10.8	11.0		13.5	13.6		12.6	12.5		13.8	13.1	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.0			13.6			12.5			13.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	128
Future Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	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	0.98		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	0.96	1.00	1.00	0.98	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	1746		1770	1863	1509	1692	1863	1514	1735	1863	1457
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	1746		1770	1863	1509	1090	1863	1514	1218	1863	1457
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)	33	105	49	12	70	45	42	141	32	24	236	133
RTOR Reduction (vph)	0	24	0	0	0	33	0	0	19	0	0	78
Lane Group Flow (vph)	33	130	0	13	70	12	42	141	13	24	236	55
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Effective Green, g (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.03	0.29		0.01	0.27	0.27	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	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)	57	506		16	497	402	449	768	624	502	768	601
v/s Ratio Prot	c0.02	c0.07		0.01	0.04			0.08			c0.13	
v/s Ratio Perm						0.01	0.04		0.01	0.02		0.04
v/c Ratio	0.58	0.26		0.81	0.14	0.03	0.09	0.18	0.02	0.05	0.31	0.09
Uniform Delay, d1	24.8	14.2		25.8	14.6	14.1	9.3	9.7	9.1	9.2	10.3	9.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	0.3		132.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1
Delay (s)	38.3	14.5		157.9	14.7	14.1	9.4	9.8	9.1	9.2	10.5	9.4
Level of Service	D	B		F	B	B	A	A	A	A	B	A
Approach Delay (s)		18.7			29.0			9.6			10.1	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
Future Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
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	0.97		1.00	1.00	0.76	1.00	1.00	0.82	1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.87	1.00	1.00	0.86	1.00	1.00
Frt	1.00	0.97		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	1753		1770	1863	1201	1540	1863	1292	1530	1863	1212
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1770	1753		1770	1863	1201	914	1863	1292	1063	1863	1212
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	240	57	37	154	38	98	153	47	56	219	180
RTOR Reduction (vph)	0	10	0	0	0	23	0	0	33	0	0	127
Lane Group Flow (vph)	67	287	0	37	154	15	98	153	14	56	219	53
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Effective Green, g (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Actuated g/C Ratio	0.09	0.45		0.04	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	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)	155	789		77	756	487	267	545	378	311	545	354
v/s Ratio Prot	c0.04	c0.16		0.02	0.08			0.08			c0.12	
v/s Ratio Perm						0.01	0.11		0.01	0.05		0.04
v/c Ratio	0.43	0.36		0.48	0.20	0.03	0.37	0.28	0.04	0.18	0.40	0.15
Uniform Delay, d1	30.4	12.7		32.9	13.5	12.6	19.7	19.2	17.8	18.6	20.0	18.4
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	1.9	0.3		4.7	0.1	0.0	0.9	0.3	0.0	0.3	0.5	0.2
Delay (s)	32.4	13.0		37.5	13.7	12.6	20.6	19.5	17.8	18.9	20.4	18.6
Level of Service	C	B		D	B	B	C	B	B	B	C	B
Approach Delay (s)		16.6			17.3			19.6			19.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Future Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.98				1.00	1.00			0.94	
Flpb, ped/bikes		0.97	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.92	
Flt Protected		0.96	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1726	1546				1770	1830			1614	
Flt Permitted		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (perm)		1726	1546				1770	1830			1601	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	4	25	0	0	0	85	82	8	6	43	64
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	60	4	0	0	0	85	87	0	0	75	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.8			20.5	
Effective Green, g (s)		8.5	8.5				6.3	31.8			20.5	
Actuated g/C Ratio		0.17	0.17				0.13	0.63			0.41	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		291	261				221	1156			652	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.00								c0.05	
v/c Ratio		0.21	0.02				0.38	0.08			0.12	
Uniform Delay, d1		18.0	17.4				20.2	3.6			9.3	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.0				1.1	0.0			0.1	
Delay (s)		18.3	17.4				21.3	3.6			9.3	
Level of Service		B	B				C	A			A	
Approach Delay (s)		18.1			0.0			12.2			9.3	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Future Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.90	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1572	1497				1770	1817			1573	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1572	1497				1770	1817			1569	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	149	7	133	0	0	0	110	116	11	3	96	91
RTOR Reduction (vph)	0	0	100	0	0	0	0	4	0	0	36	0
Lane Group Flow (vph)	0	156	33	0	0	0	110	123	0	0	154	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.6	13.6				7.2	31.0			18.8	
Effective Green, g (s)		13.6	13.6				7.2	31.0			18.8	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.34	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		391	372				233	1031			540	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm		0.10	0.02								c0.10	
v/c Ratio		0.40	0.09				0.47	0.12			0.29	
Uniform Delay, d1		17.1	15.7				21.9	5.5			13.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.7	0.1				1.5	0.1			0.3	
Delay (s)		17.8	15.8				23.5	5.5			13.3	
Level of Service		B	B				C	A			B	
Approach Delay (s)		16.9			0.0			13.8			13.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
Future Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
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		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
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)	273	1774	13	104	1869	204	2	43	46	279	124	218
RTOR Reduction (vph)	0	1	0	0	0	84	0	0	0	0	144	0
Lane Group Flow (vph)	273	1786	0	104	1869	120	0	45	46	215	262	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)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Effective Green, g (s)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Actuated g/C Ratio	0.13	0.42		0.07	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)	237	2124		118	1783	466		654	272	298	539	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.13	0.09	
v/s Ratio Perm						0.09			c0.03			
v/c Ratio	1.15	0.84		0.88	1.05	0.26		0.07	0.17	0.72	0.49	
Uniform Delay, d1	60.2	36.3		64.4	45.1	32.2		46.7	47.6	53.3	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	105.6	3.2		48.1	35.2	0.3		0.0	0.3	8.3	0.7	
Delay (s)	165.8	39.5		112.5	80.4	32.5		46.8	47.9	61.6	51.4	
Level of Service	F	D		F	F	C		D	D	E	D	
Approach Delay (s)		56.2			77.4			47.4			54.9	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	65.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
Future Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
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	5084		1770	5085	1261		3529	1367	1610	2922	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1261		3529	1367	1610	2922	
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)	235	2153	2	55	1518	266	7	116	172	343	74	291
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	0	0	195	0
Lane Group Flow (vph)	235	2155	0	55	1518	133	0	123	172	247	266	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	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
Effective Green, g (s)	22.0	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
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	2217		67	1703	422		780	302	286	520	
v/s Ratio Prot	c0.13	c0.42		0.03	0.30			0.03		c0.15	0.09	
v/s Ratio Perm						0.11			c0.13			
v/c Ratio	0.96	0.97		0.82	0.89	0.32		0.16	0.57	0.86	0.51	
Uniform Delay, d1	67.6	43.7		75.6	49.9	39.1		49.7	54.9	63.1	58.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	44.7	13.1		52.9	6.3	0.4		0.1	2.5	22.6	0.9	
Delay (s)	112.3	56.8		128.5	56.2	39.5		49.8	57.3	85.7	59.6	
Level of Service	F	E		F	E	D		D	E	F	E	
Approach Delay (s)		62.3			56.0			54.2			68.7	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	60.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	158.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
Future Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5030		1770	5026		1770	1706			1700	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00			0.74	1.00
Satd. Flow (perm)	1770	5030		1770	5026		1006	1706			1315	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	87	1755	96	13	1976	116	94	23	14	125	31	114
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	90
Lane Group Flow (vph)	87	1848	0	13	2088	0	94	26	0	0	156	24
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Effective Green, g (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Actuated g/C Ratio	0.09	0.66		0.01	0.59		0.21	0.21			0.21	0.21
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	159	3343		23	2955		210	356			274	330
v/s Ratio Prot	c0.05	c0.37		0.01	c0.42			0.02				
v/s Ratio Perm							0.09				c0.12	0.02
v/c Ratio	0.55	0.55		0.57	0.71		0.45	0.07			0.57	0.07
Uniform Delay, d1	57.9	11.8		65.2	19.3		45.9	42.2			47.2	42.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.2		28.1	0.8		1.5	0.1			2.7	0.1
Delay (s)	61.7	12.0		93.3	20.1		47.4	42.3			49.9	42.3
Level of Service	E	B		F	C		D	D			D	D
Approach Delay (s)		14.3			20.6			46.0			46.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.0%	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

05/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
Future Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4985		1770	4962		1770	1556			1707	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.76	1.00
Satd. Flow (perm)	1770	4985		1770	4962		939	1556			1340	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)	68	2440	207	38	1695	195	64	22	48	112	59	155
RTOR Reduction (vph)	0	6	0	0	8	0	0	37	0	0	0	87
Lane Group Flow (vph)	68	2641	0	38	1882	0	64	33	0	0	171	68
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Effective Green, g (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	100	3184		76	3101		206	342			294	348
v/s Ratio Prot	c0.04	c0.53		0.02	0.38			0.02				
v/s Ratio Perm							0.07				c0.13	0.04
v/c Ratio	0.68	0.83		0.50	0.61		0.31	0.10			0.58	0.19
Uniform Delay, d1	70.7	21.2		71.5	17.3		49.9	47.5			53.3	48.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	17.3	1.9		5.1	0.3		0.9	0.1			2.9	0.3
Delay (s)	88.0	23.1		76.6	17.6		50.8	47.6			56.2	48.8
Level of Service	F	C		E	B		D	D			E	D
Approach Delay (s)		24.7			18.8			49.1			52.7	
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	0.77		
Actuated Cycle Length (s)	152.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

TRIP GENERATIONS CALCULATIONS

Trip Generation 10th Edition

Number of Units	Units	Land Use Number	Land Use No./Type	Weekday Trip Rate per Unit	Weekday Total Trips	Trip Rate per Unit	Number of Trips	AM PEAK In %	AM PEAK In Rate	AM PEAK In Trips	AM PEAK Out %	AM PEAK Out Rate	AM PEAK Out Trips	PM PEAK Trip Rate per Unit	PM PEAK Number of Trips	PM PEAK In %	PM PEAK In Rate	PM PEAK In Trips	PM PEAK Out %	PM PEAK Out Rate	PM PEAK Out Trips
Block B - Phase 3																					
Existing																					
			Existing (Retail)		*0*					*0*			*0*					*0*			*0*
			Internal Capture		*0*					*0*			*0*					*0*			*0*
			Existing Total		*0*					*0*			*0*					*0*			*0*
Proposed																					
350	units	222	High-Rise Apartment	4.45	1558	0.31	109	24	0.07	26	76	0.24	83	0.36	126	61	0.22	77	39	0.14	49
Block B - Residential /Alt Mode Trip		P1-4			**-238**		**-23**			**-5**			**-18**		**-19**			**-12**			**-7**
Reduction		P1-5			**-282**		**-28**			**-6**			**-22**		**-23**			**-15**			**-8**
		P1-4			**1320**		**86**			**21**			**65**		**107**			**65**			**42**
Block B Residential		**P1-5**			**1276**		**81**			**20**			**61**		**103**			**62**			**41**

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2025 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT

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

05/02/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
Future Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
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	0.88	1.00	1.00	0.98	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.91	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	1391	1616	1863	1547	1770	3390		1770	3364	
Flt Permitted	0.33	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	610	1863	1391	1073	1863	1547	1770	3390		1770	3364	
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)	58	176	71	81	369	77	59	589	85	77	829	267
RTOR Reduction (vph)	0	0	50	0	0	55	0	13	0	0	34	0
Lane Group Flow (vph)	58	176	21	81	369	22	59	661	0	77	1062	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)	20.6	20.6	20.6	20.6	20.6	20.6	3.4	29.4		6.3	32.3	
Effective Green, g (s)	20.6	20.6	20.6	20.6	20.6	20.6	3.4	29.4		6.3	32.3	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.41		0.09	0.45	
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)	176	538	401	310	538	446	84	1397		156	1523	
v/s Ratio Prot		0.09			c0.20		0.03	0.20		c0.04	c0.32	
v/s Ratio Perm	0.10		0.01	0.08		0.01						
v/c Ratio	0.33	0.33	0.05	0.26	0.69	0.05	0.70	0.47		0.49	0.70	
Uniform Delay, d1	19.9	19.9	18.3	19.5	22.5	18.3	33.5	15.3		31.0	15.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.4	0.1	0.5	3.6	0.0	23.3	0.3		2.4	1.4	
Delay (s)	21.0	20.3	18.3	19.9	26.1	18.3	56.7	15.6		33.4	17.0	
Level of Service	C	C	B	B	C	B	E	B		C	B	
Approach Delay (s)		20.0			24.0			18.9			18.1	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

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

05/02/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	461	111	101	441	78	79	763	129	148	787	143
Future Volume (vph)	110	461	111	101	441	78	79	763	129	148	787	143
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	0.87	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.95	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)	1687	1863	1372	1689	1863	1380	1770	3256		1770	3410	
Flt Permitted	0.23	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	405	1863	1372	358	1863	1380	1770	3256		1770	3410	
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)	116	485	117	106	464	82	83	803	136	156	828	151
RTOR Reduction (vph)	0	0	58	0	0	56	0	15	0	0	15	0
Lane Group Flow (vph)	116	485	59	106	464	26	83	924	0	156	964	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)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Effective Green, g (s)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.06	0.37		0.13	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)	130	599	441	115	599	444	113	1192		226	1466	
v/s Ratio Prot		0.26			0.25		0.05	c0.28		c0.09	0.28	
v/s Ratio Perm	0.29		0.04	c0.30		0.02						
v/c Ratio	0.89	0.81	0.13	0.92	0.77	0.06	0.73	0.78		0.69	0.66	
Uniform Delay, d1	26.3	25.3	19.6	26.6	24.9	19.1	37.4	22.8		34.0	18.4	
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	47.7	8.0	0.1	59.7	6.2	0.1	21.7	3.2		8.8	1.1	
Delay (s)	73.9	33.3	19.7	86.3	31.1	19.1	59.1	26.1		42.7	19.5	
Level of Service	E	C	B	F	C	B	E	C		D	B	
Approach Delay (s)		37.6			38.6			28.7			22.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Future Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		3430		1770	3497			3297			3325	
Flt Permitted		0.86		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2966		1770	3497			3001			3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	45	272	42	149	356	27	21	104	72	23	184	77
RTOR Reduction (vph)	0	13	0	0	7	0	0	50	0	0	43	0
Lane Group Flow (vph)	0	346	0	149	376	0	0	147	0	0	241	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.2		8.5	27.7			16.9			16.9	
Effective Green, g (s)		14.2		8.5	27.7			16.9			16.9	
Actuated g/C Ratio		0.26		0.16	0.51			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		771		275	1774			928			952	
v/s Ratio Prot				c0.08	0.11							
v/s Ratio Perm		c0.12						0.05			c0.08	
v/c Ratio		0.45		0.54	0.21			0.16			0.25	
Uniform Delay, d1		16.9		21.3	7.4			13.7			14.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.2	0.1			0.1			0.1	
Delay (s)		17.3		23.4	7.5			13.8			14.3	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.3			11.9			13.8			14.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Future Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.96	
Flpb, ped/bikes		1.00		1.00	1.00			0.98			1.00	
Frt		0.98		1.00	0.99			0.95			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3381		1770	3496			3241			3299	
Flt Permitted		0.83		0.95	1.00			0.90			0.80	
Satd. Flow (perm)		2826		1770	3496			2926			2677	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	67	548	90	260	573	42	24	123	80	70	158	32
RTOR Reduction (vph)	0	14	0	0	7	0	0	63	0	0	12	0
Lane Group Flow (vph)	0	691	0	260	608	0	0	164	0	0	248	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		24.6		15.4	45.0			14.3			14.3	
Effective Green, g (s)		24.6		15.4	45.0			14.3			14.3	
Actuated g/C Ratio		0.35		0.22	0.65			0.21			0.21	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1003		393	2270			603			552	
v/s Ratio Prot				c0.15	0.17							
v/s Ratio Perm		c0.24						0.06			c0.09	
v/c Ratio		0.69		0.66	0.27			0.27			0.45	
Uniform Delay, d1		19.1		24.6	5.2			23.1			24.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.0		4.1	0.1			0.2			0.6	
Delay (s)		21.1		28.7	5.2			23.4			24.6	
Level of Service		C		C	A			C			C	
Approach Delay (s)		21.1			12.2			23.4			24.6	
Approach LOS		C			B			C			C	

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)	69.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	342	17	102	423	33	104
Future Volume (Veh/h)	342	17	102	423	33	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	380	19	113	470	37	116
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			407		858	208
vC1, stage 1 conf vol					398	
vC2, stage 2 conf vol					461	
vCu, unblocked vol			407		858	208
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		93	86
cM capacity (veh/h)			1141		540	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	253	146	113	235	235	153
Volume Left	0	0	113	0	0	37
Volume Right	0	19	0	0	0	116
cSH	1700	1700	1141	1700	1700	742
Volume to Capacity	0.15	0.09	0.10	0.14	0.14	0.21
Queue Length 95th (ft)	0	0	8	0	0	19
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	11.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.6			11.1
Approach LOS						B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

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

02/17/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	735	53	127	816	49	243
Future Volume (Veh/h)	735	53	127	816	49	243
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	774	56	134	859	52	256
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			857		1526	442
vC1, stage 1 conf vol					829	
vC2, stage 2 conf vol					698	
vCu, unblocked vol			634		1373	176
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		86	67
cM capacity (veh/h)			837		373	780

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	516	314	134	430	430	308
Volume Left	0	0	134	0	0	52
Volume Right	0	56	0	0	0	256
cSH	1700	1700	837	1700	1700	659
Volume to Capacity	0.30	0.18	0.16	0.25	0.25	0.47
Queue Length 95th (ft)	0	0	14	0	0	62
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.2
Lane LOS			B			C
Approach Delay (s)	0.0		1.4			15.2
Approach LOS						C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
Future Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.96			0.96		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1757			1741		1718	3515		1770	3284	
Flt Permitted	0.80	1.00			0.94		0.28	1.00		0.44	1.00	
Satd. Flow (perm)	1488	1757			1656		508	3515		827	3284	
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)	115	52	20	23	61	36	32	538	18	43	640	233
RTOR Reduction (vph)	0	14	0	0	19	0	0	3	0	0	43	0
Lane Group Flow (vph)	115	58	0	0	101	0	32	553	0	43	830	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)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Effective Green, g (s)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Actuated g/C Ratio	0.29	0.29			0.29		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	436	515			486		258	1785		420	1668	
v/s Ratio Prot		0.03						0.16			c0.25	
v/s Ratio Perm	c0.08				0.06		0.06			0.05		
v/c Ratio	0.26	0.11			0.21		0.12	0.31		0.10	0.50	
Uniform Delay, d1	13.6	13.0			13.4		6.5	7.2		6.4	8.2	
Progression Factor	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	0.1		0.1	0.2	
Delay (s)	14.0	13.1			13.6		6.7	7.3		6.5	8.4	
Level of Service	B	B			B		A	A		A	A	
Approach Delay (s)		13.6			13.6			7.3			8.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
Future Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93			0.96		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.88	1.00			0.98		0.94	1.00		0.93	1.00	
Frt	1.00	0.93			0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1557	1605			1671		1672	3495		1653	3347	
Flt Permitted	0.70	1.00			0.93		0.22	1.00		0.35	1.00	
Satd. Flow (perm)	1150	1605			1575		391	3495		604	3347	
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)	289	95	95	18	44	23	40	636	27	60	780	123
RTOR Reduction (vph)	0	29	0	0	14	0	0	3	0	0	16	0
Lane Group Flow (vph)	289	161	0	0	71	0	40	660	0	60	887	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)	24.5	24.5			24.5		25.0	25.0		25.0	25.0	
Effective Green, g (s)	24.5	24.5			24.5		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	473	660			648		164	1468		253	1406	
v/s Ratio Prot		0.10						0.19			c0.27	
v/s Ratio Perm	c0.25				0.05		0.10			0.10		
v/c Ratio	0.61	0.24			0.11		0.24	0.45		0.24	0.63	
Uniform Delay, d1	13.8	11.4			10.8		11.1	12.3		11.1	13.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.2			0.1		0.8	0.2		0.5	0.9	
Delay (s)	16.1	11.6			10.9		11.9	12.5		11.6	14.5	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		14.3			10.9			12.5			14.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.3%	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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	41	95	100	117	143	71	333	42	61	455	70
Future Volume (vph)	47	41	95	100	117	143	71	333	42	61	455	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	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	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.97	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.98		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)	1760	1609		1712	1690		1708	3448		1706	3426	
Flt Permitted	0.59	1.00		0.67	1.00		0.45	1.00		0.52	1.00	
Satd. Flow (perm)	1097	1609		1201	1690		805	3448		935	3426	
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)	49	43	99	104	122	149	74	347	44	64	474	73
RTOR Reduction (vph)	0	69	0	0	60	0	0	12	0	0	16	0
Lane Group Flow (vph)	49	73	0	104	211	0	74	379	0	64	531	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)	9.7	9.7		9.7	9.7		11.9	11.9		11.9	11.9	
Effective Green, g (s)	9.7	9.7		9.7	9.7		11.9	11.9		11.9	11.9	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.38	0.38		0.38	0.38	
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)	336	493		368	518		303	1298		352	1290	
v/s Ratio Prot		0.05			c0.13			0.11			c0.16	
v/s Ratio Perm	0.04			0.09			0.09			0.07		
v/c Ratio	0.15	0.15		0.28	0.41		0.24	0.29		0.18	0.41	
Uniform Delay, d1	7.9	8.0		8.3	8.7		6.8	6.9		6.6	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.5		0.4	0.1		0.2	0.2	
Delay (s)	8.1	8.1		8.7	9.2		7.2	7.0		6.8	7.5	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		8.1			9.1			7.0			7.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	31.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.1%	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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	119	93	257	103	310	90	410	85	143	484	141
Future Volume (vph)	57	119	93	257	103	310	90	410	85	143	484	141
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	0.90		1.00	0.96		1.00	0.97	
Flpb, ped/bikes	0.94	1.00		0.94	1.00		0.97	1.00		0.90	1.00	
Frt	1.00	0.93		1.00	0.89		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1663	1673		1670	1481		1722	3308		1591	3320	
Flt Permitted	0.36	1.00		0.60	1.00		0.33	1.00		0.41	1.00	
Satd. Flow (perm)	637	1673		1058	1481		593	3308		694	3320	
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)	63	131	102	282	113	341	99	451	93	157	532	155
RTOR Reduction (vph)	0	30	0	0	65	0	0	22	0	0	34	0
Lane Group Flow (vph)	63	203	0	282	389	0	99	522	0	157	653	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)	27.4	27.4		27.4	27.4		27.1	27.1		27.1	27.1	
Effective Green, g (s)	27.4	27.4		27.4	27.4		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		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)	270	710		449	629		249	1389		291	1394	
v/s Ratio Prot		0.12			0.26			0.16			0.20	
v/s Ratio Perm	0.10			c0.27			0.17			c0.23		
v/c Ratio	0.23	0.29		0.63	0.62		0.40	0.38		0.54	0.47	
Uniform Delay, d1	11.8	12.1		14.6	14.5		13.0	12.9		14.0	13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		2.7	1.8		1.0	0.2		1.9	0.2	
Delay (s)	12.3	12.4		17.3	16.3		14.1	13.0		15.9	13.7	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		12.4			16.7			13.2			14.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	101	46	12	67	43	40	135	31	23	227	128
Future Volume (vph)	32	101	46	12	67	43	40	135	31	23	227	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	0.98		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	0.96	1.00	1.00	0.98	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	1748		1770	1863	1509	1692	1863	1514	1735	1863	1457
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	1748		1770	1863	1509	1090	1863	1514	1218	1863	1457
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)	33	105	48	12	70	45	42	141	32	24	236	133
RTOR Reduction (vph)	0	23	0	0	0	33	0	0	19	0	0	78
Lane Group Flow (vph)	33	130	0	13	70	12	42	141	13	24	236	55
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Effective Green, g (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.03	0.29		0.01	0.27	0.27	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	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)	57	506		16	497	402	449	768	624	502	768	601
v/s Ratio Prot	c0.02	c0.07		0.01	0.04			0.08			c0.13	
v/s Ratio Perm						0.01	0.04		0.01	0.02		0.04
v/c Ratio	0.58	0.26		0.81	0.14	0.03	0.09	0.18	0.02	0.05	0.31	0.09
Uniform Delay, d1	24.8	14.2		25.8	14.6	14.1	9.3	9.7	9.1	9.2	10.3	9.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	0.3		132.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1
Delay (s)	38.3	14.5		157.9	14.7	14.1	9.4	9.8	9.1	9.2	10.5	9.4
Level of Service	D	B		F	B	B	A	A	A	A	B	A
Approach Delay (s)		18.7			29.0			9.6			10.1	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	175
Future Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	175
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	0.97		1.00	1.00	0.76	1.00	1.00	0.82	1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.87	1.00	1.00	0.86	1.00	1.00
Frt	1.00	0.97		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	1753		1770	1863	1201	1540	1863	1292	1530	1863	1212
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1770	1753		1770	1863	1201	914	1863	1292	1063	1863	1212
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	240	57	37	154	38	98	153	47	56	219	179
RTOR Reduction (vph)	0	10	0	0	0	23	0	0	33	0	0	127
Lane Group Flow (vph)	67	287	0	37	154	15	98	153	14	56	219	52
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Effective Green, g (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Actuated g/C Ratio	0.09	0.45		0.04	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	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)	155	789		77	756	487	267	545	378	311	545	354
v/s Ratio Prot	c0.04	c0.16		0.02	0.08			0.08			c0.12	
v/s Ratio Perm						0.01	0.11		0.01	0.05		0.04
v/c Ratio	0.43	0.36		0.48	0.20	0.03	0.37	0.28	0.04	0.18	0.40	0.15
Uniform Delay, d1	30.4	12.7		32.9	13.5	12.6	19.7	19.2	17.8	18.6	20.0	18.4
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	1.9	0.3		4.7	0.1	0.0	0.9	0.3	0.0	0.3	0.5	0.2
Delay (s)	32.4	13.0		37.5	13.7	12.6	20.6	19.5	17.8	18.9	20.4	18.6
Level of Service	C	B		D	B	B	C	B	B	B	C	B
Approach Delay (s)		16.6			17.3			19.6			19.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Future Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.98				1.00	1.00			0.94	
Flpb, ped/bikes		0.97	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.92	
Flt Protected		0.96	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1726	1546				1770	1830			1614	
Flt Permitted		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (perm)		1726	1546				1770	1830			1601	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	4	25	0	0	0	85	82	8	6	43	64
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	60	4	0	0	0	85	87	0	0	75	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.8			20.5	
Effective Green, g (s)		8.5	8.5				6.3	31.8			20.5	
Actuated g/C Ratio		0.17	0.17				0.13	0.63			0.41	
Clearance Time (s)	5.0	5.0					5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	291	261					221	1156			652	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm	0.03	0.00									c0.05	
v/c Ratio	0.21	0.02					0.38	0.08			0.12	
Uniform Delay, d1	18.0	17.4					20.2	3.6			9.3	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.4	0.0					1.1	0.0			0.1	
Delay (s)	18.3	17.4					21.3	3.6			9.3	
Level of Service	B	B					C	A			A	
Approach Delay (s)	18.1			0.0				12.2			9.3	
Approach LOS	B			A				B			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Future Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.90	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1572	1497				1770	1817			1573	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1572	1497				1770	1817			1569	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	149	7	133	0	0	0	110	116	11	3	96	91
RTOR Reduction (vph)	0	0	100	0	0	0	0	4	0	0	36	0
Lane Group Flow (vph)	0	156	33	0	0	0	110	123	0	0	154	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.6	13.6				7.2	31.0			18.8	
Effective Green, g (s)		13.6	13.6				7.2	31.0			18.8	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.34	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)	391	372					233	1031			540	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm	0.10	0.02									c0.10	
v/c Ratio	0.40	0.09					0.47	0.12			0.29	
Uniform Delay, d1	17.1	15.7					21.9	5.5			13.0	
Progression Factor	1.00	1.00					1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1					1.5	0.1			0.3	
Delay (s)	17.8	15.8					23.5	5.5			13.3	
Level of Service	B	B					C	A			B	
Approach Delay (s)	16.9		0.0					13.8			13.3	
Approach LOS	B		A					B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
Future Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
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		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
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)	273	1774	13	104	1869	204	2	43	46	279	124	218
RTOR Reduction (vph)	0	1	0	0	0	84	0	0	0	0	144	0
Lane Group Flow (vph)	273	1786	0	104	1869	120	0	45	46	215	262	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)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Effective Green, g (s)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Actuated g/C Ratio	0.13	0.42		0.07	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)	237	2124		118	1783	466		654	272	298	539	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.13	0.09	
v/s Ratio Perm						0.09			c0.03			
v/c Ratio	1.15	0.84		0.88	1.05	0.26		0.07	0.17	0.72	0.49	
Uniform Delay, d1	60.2	36.3		64.4	45.1	32.2		46.7	47.6	53.3	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	105.6	3.2		48.1	35.2	0.3		0.0	0.3	8.3	0.7	
Delay (s)	165.8	39.5		112.5	80.4	32.5		46.8	47.9	61.6	51.4	
Level of Service	F	D		F	F	C		D	D	E	D	
Approach Delay (s)		56.2			77.4			47.4			54.9	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	65.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
Future Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
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	5084		1770	5085	1261		3529	1367	1610	2922	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1261		3529	1367	1610	2922	
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)	235	2153	2	55	1518	266	7	116	172	343	74	291
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	0	0	195	0
Lane Group Flow (vph)	235	2155	0	55	1518	133	0	123	172	247	266	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	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
Effective Green, g (s)	22.0	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
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	2217		67	1703	422		780	302	286	520	
v/s Ratio Prot	c0.13	c0.42		0.03	0.30			0.03		c0.15	0.09	
v/s Ratio Perm						0.11			c0.13			
v/c Ratio	0.96	0.97		0.82	0.89	0.32		0.16	0.57	0.86	0.51	
Uniform Delay, d1	67.6	43.7		75.6	49.9	39.1		49.7	54.9	63.1	58.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	44.7	13.1		52.9	6.3	0.4		0.1	2.5	22.6	0.9	
Delay (s)	112.3	56.8		128.5	56.2	39.5		49.8	57.3	85.7	59.6	
Level of Service	F	E		F	E	D		D	E	F	E	
Approach Delay (s)		62.3			56.0			54.2			68.7	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	60.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	158.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
Future Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5030		1770	5026		1770	1706			1700	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00			0.74	1.00
Satd. Flow (perm)	1770	5030		1770	5026		1006	1706			1315	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	87	1755	96	13	1976	116	94	23	14	125	31	114
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	90
Lane Group Flow (vph)	87	1848	0	13	2088	0	94	26	0	0	156	24
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Effective Green, g (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Actuated g/C Ratio	0.09	0.66		0.01	0.59		0.21	0.21			0.21	0.21
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	159	3343		23	2955		210	356			274	330
v/s Ratio Prot	c0.05	c0.37		0.01	c0.42			0.02				
v/s Ratio Perm							0.09				c0.12	0.02
v/c Ratio	0.55	0.55		0.57	0.71		0.45	0.07			0.57	0.07
Uniform Delay, d1	57.9	11.8		65.2	19.3		45.9	42.2			47.2	42.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.2		28.1	0.8		1.5	0.1			2.7	0.1
Delay (s)	61.7	12.0		93.3	20.1		47.4	42.3			49.9	42.3
Level of Service	E	B		F	C		D	D			D	D
Approach Delay (s)		14.3			20.6			46.0			46.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
Future Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4985		1770	4962		1770	1556			1707	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.76	1.00
Satd. Flow (perm)	1770	4985		1770	4962		939	1556			1340	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)	68	2440	207	38	1695	195	64	22	48	112	59	155
RTOR Reduction (vph)	0	6	0	0	8	0	0	37	0	0	0	87
Lane Group Flow (vph)	68	2641	0	38	1882	0	64	33	0	0	171	68
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Effective Green, g (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	100	3184		76	3101		206	342			294	348
v/s Ratio Prot	c0.04	c0.53		0.02	0.38			0.02				
v/s Ratio Perm							0.07				c0.13	0.04
v/c Ratio	0.68	0.83		0.50	0.61		0.31	0.10			0.58	0.19
Uniform Delay, d1	70.7	21.2		71.5	17.3		49.9	47.5			53.3	48.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	17.3	1.9		5.1	0.3		0.9	0.1			2.9	0.3
Delay (s)	88.0	23.1		76.6	17.6		50.8	47.6			56.2	48.8
Level of Service	F	C		E	B		D	D			E	D
Approach Delay (s)		24.7			18.8			49.1			52.7	
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	0.77		
Actuated Cycle Length (s)	152.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

**CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2025 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT**

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

05/02/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	167	68	77	351	73	61	567	81	73	794	254
Future Volume (vph)	55	167	68	77	351	73	61	567	81	73	794	254
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	0.88	1.00	1.00	0.98	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.91	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	1390	1615	1863	1546	1770	3391		1770	3365	
Flt Permitted	0.33	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	607	1863	1390	1070	1863	1546	1770	3391		1770	3365	
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)	58	176	72	81	369	77	64	597	85	77	836	267
RTOR Reduction (vph)	0	0	51	0	0	55	0	12	0	0	33	0
Lane Group Flow (vph)	58	176	21	81	369	22	64	670	0	77	1070	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)	20.7	20.7	20.7	20.7	20.7	20.7	3.9	29.8		6.3	32.2	
Effective Green, g (s)	20.7	20.7	20.7	20.7	20.7	20.7	3.9	29.8		6.3	32.2	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.42		0.09	0.45	
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)	174	537	400	308	537	445	96	1407		155	1509	
v/s Ratio Prot		0.09			c0.20		0.04	0.20		c0.04	c0.32	
v/s Ratio Perm	0.10		0.01	0.08		0.01						
v/c Ratio	0.33	0.33	0.05	0.26	0.69	0.05	0.67	0.48		0.50	0.71	
Uniform Delay, d1	20.1	20.1	18.5	19.7	22.7	18.4	33.3	15.3		31.2	16.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.4	0.1	0.5	3.6	0.0	16.1	0.3		2.5	1.6	
Delay (s)	21.3	20.4	18.5	20.1	26.3	18.5	49.4	15.6		33.7	17.6	
Level of Service	C	C	B	C	C	B	D	B		C	B	
Approach Delay (s)		20.1			24.2			18.5			18.6	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	71.8	Sum of lost time (s)		15.0	
Intersection Capacity Utilization	78.3%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

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

05/02/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	461	114	101	441	78	83	766	129	148	806	143
Future Volume (vph)	110	461	114	101	441	78	83	766	129	148	806	143
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	0.87	1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.95	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)	1687	1863	1372	1689	1863	1380	1770	3257		1770	3412	
Flt Permitted	0.23	1.00	1.00	0.20	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	405	1863	1372	358	1863	1380	1770	3257		1770	3412	
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)	116	485	120	106	464	82	87	806	136	156	848	151
RTOR Reduction (vph)	0	0	58	0	0	56	0	15	0	0	15	0
Lane Group Flow (vph)	116	485	62	106	464	26	87	927	0	156	984	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)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Effective Green, g (s)	26.2	26.2	26.2	26.2	26.2	26.2	5.2	29.8		10.4	35.0	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.06	0.37		0.13	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)	130	599	441	115	599	444	113	1192		226	1467	
v/s Ratio Prot		0.26			0.25		0.05	c0.28		c0.09	0.29	
v/s Ratio Perm	0.29		0.05	c0.30		0.02						
v/c Ratio	0.89	0.81	0.14	0.92	0.77	0.06	0.77	0.78		0.69	0.67	
Uniform Delay, d1	26.3	25.3	19.6	26.6	24.9	19.1	37.5	22.9		34.0	18.6	
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	47.7	8.0	0.1	59.7	6.2	0.1	26.5	3.3		8.8	1.2	
Delay (s)	73.9	33.3	19.8	86.3	31.1	19.1	64.0	26.1		42.7	19.8	
Level of Service	E	C	B	F	C	B	E	C		D	B	
Approach Delay (s)		37.6			38.6			29.3			22.9	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	81.4	Sum of lost time (s)		15.0	
Intersection Capacity Utilization	81.3%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	261	40	147	342	26	20	112	75	22	177	74
Future Volume (vph)	43	261	40	147	342	26	20	112	75	22	177	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3430		1770	3497			3302			3325	
Flt Permitted		0.86		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2965		1770	3497			3017			3073	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	45	272	42	153	356	27	21	117	78	23	184	77
RTOR Reduction (vph)	0	13	0	0	7	0	0	54	0	0	43	0
Lane Group Flow (vph)	0	346	0	153	376	0	0	162	0	0	241	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.2		8.7	27.9			17.0			17.0	
Effective Green, g (s)		14.2		8.7	27.9			17.0			17.0	
Actuated g/C Ratio		0.26		0.16	0.51			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		766		280	1777			934			951	
v/s Ratio Prot				c0.09	0.11							
v/s Ratio Perm		c0.12						0.05			c0.08	
v/c Ratio		0.45		0.55	0.21			0.17			0.25	
Uniform Delay, d1		17.1		21.3	7.4			13.8			14.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.2	0.1			0.1			0.1	
Delay (s)		17.5		23.5	7.5			13.9			14.3	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.5			12.1			13.9			14.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	526	86	262	550	40	23	128	81	67	152	31
Future Volume (vph)	64	526	86	262	550	40	23	128	81	67	152	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.96	
Flpb, ped/bikes		1.00		1.00	1.00			0.98			1.00	
Frt		0.98		1.00	0.99			0.95			0.98	
Flt Protected		1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		3380		1770	3495			3248			3297	
Flt Permitted		0.83		0.95	1.00			0.90			0.80	
Satd. Flow (perm)		2823		1770	3495			2939			2661	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	67	548	90	273	573	42	24	133	84	70	158	32
RTOR Reduction (vph)	0	14	0	0	7	0	0	67	0	0	12	0
Lane Group Flow (vph)	0	691	0	273	608	0	0	174	0	0	248	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		24.8		16.1	45.9			14.3			14.3	
Effective Green, g (s)		24.8		16.1	45.9			14.3			14.3	
Actuated g/C Ratio		0.35		0.23	0.65			0.20			0.20	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		997		405	2285			598			542	
v/s Ratio Prot				c0.15	0.17							
v/s Ratio Perm		c0.24						0.06			c0.09	
v/c Ratio		0.69		0.67	0.27			0.29			0.46	
Uniform Delay, d1		19.4		24.7	5.1			23.7			24.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.1		4.4	0.1			0.3			0.6	
Delay (s)		21.6		29.0	5.2			23.9			25.2	
Level of Service		C		C	A			C			C	
Approach Delay (s)		21.6			12.5			23.9			25.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	348	17	102	427	33	104
Future Volume (Veh/h)	348	17	102	427	33	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	387	19	113	474	37	116
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			414		868	211
vC1, stage 1 conf vol					404	
vC2, stage 2 conf vol					463	
vCu, unblocked vol			414		868	211
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		93	86
cM capacity (veh/h)			1134		537	839

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	258	148	113	237	237	153
Volume Left	0	0	113	0	0	37
Volume Right	0	19	0	0	0	116
cSH	1700	1700	1134	1700	1700	738
Volume to Capacity	0.15	0.09	0.10	0.14	0.14	0.21
Queue Length 95th (ft)	0	0	8	0	0	19
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	11.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.6			11.1
Approach LOS						B

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	34.8%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

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

02/17/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	739	53	127	829	49	243
Future Volume (Veh/h)	739	53	127	829	49	243
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	778	56	134	873	52	256
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			861		1538	444
vC1, stage 1 conf vol					833	
vC2, stage 2 conf vol					704	
vCu, unblocked vol			634		1382	173
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		86	67
cM capacity (veh/h)			835		371	781

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	519	315	134	436	436	308
Volume Left	0	0	134	0	0	52
Volume Right	0	56	0	0	0	256
cSH	1700	1700	835	1700	1700	658
Volume to Capacity	0.31	0.19	0.16	0.26	0.26	0.47
Queue Length 95th (ft)	0	0	14	0	0	62
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.2
Lane LOS			B			C
Approach Delay (s)	0.0		1.3			15.2
Approach LOS						C

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	50	19	22	59	35	35	534	17	42	628	226
Future Volume (vph)	112	50	19	22	59	35	35	534	17	42	628	226
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.96			0.96		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1757			1741		1719	3515		1770	3286	
Flt Permitted	0.80	1.00			0.94		0.28	1.00		0.44	1.00	
Satd. Flow (perm)	1486	1757			1655		503	3515		816	3286	
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)	115	52	20	23	61	36	36	551	18	43	647	233
RTOR Reduction (vph)	0	14	0	0	19	0	0	2	0	0	43	0
Lane Group Flow (vph)	115	58	0	0	101	0	36	567	0	43	837	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)	14.8	14.8			14.8		25.8	25.8		25.8	25.8	
Effective Green, g (s)	14.8	14.8			14.8		25.8	25.8		25.8	25.8	
Actuated g/C Ratio	0.29	0.29			0.29		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	434	513			484		256	1792		416	1675	
v/s Ratio Prot		0.03						0.16			c0.25	
v/s Ratio Perm	c0.08				0.06		0.07			0.05		
v/c Ratio	0.26	0.11			0.21		0.14	0.32		0.10	0.50	
Uniform Delay, d1	13.7	13.1			13.5		6.5	7.2		6.4	8.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1			0.2		0.3	0.1		0.1	0.2	
Delay (s)	14.1	13.2			13.7		6.8	7.3		6.5	8.4	
Level of Service	B	B			B		A	A		A	A	
Approach Delay (s)		13.7			13.7			7.3			8.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	91	93	17	42	22	41	616	26	58	771	118
Future Volume (vph)	277	91	93	17	42	22	41	616	26	58	771	118
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	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.93			0.96		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.88	1.00			0.98		0.95	1.00		0.93	1.00	
Frt	1.00	0.92			0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1551	1599			1668		1675	3495		1652	3349	
Flt Permitted	0.70	1.00			0.93		0.21	1.00		0.34	1.00	
Satd. Flow (perm)	1145	1599			1573		363	3495		588	3349	
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)	289	95	97	18	44	23	43	642	27	60	803	123
RTOR Reduction (vph)	0	17	0	0	13	0	0	4	0	0	14	0
Lane Group Flow (vph)	289	175	0	0	72	0	43	665	0	60	912	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)	26.1	26.1			26.1		25.3	25.3		25.3	25.3	
Effective Green, g (s)	26.1	26.1			26.1		25.3	25.3		25.3	25.3	
Actuated g/C Ratio	0.43	0.43			0.43		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	486	679			668		149	1440		242	1379	
v/s Ratio Prot		0.11						0.19			c0.27	
v/s Ratio Perm	c0.25				0.05		0.12			0.10		
v/c Ratio	0.59	0.26			0.11		0.29	0.46		0.25	0.66	
Uniform Delay, d1	13.6	11.4			10.6		12.0	13.1		11.8	14.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.2			0.1		1.1	0.2		0.5	1.2	
Delay (s)	15.5	11.6			10.7		13.1	13.3		12.4	15.8	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		14.0			10.7			13.3			15.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.9%	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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	44	95	100	117	147	73	345	52	69	455	70
Future Volume (vph)	47	44	95	100	117	147	73	345	52	69	455	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	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	0.99	1.00		0.97	1.00		0.97	1.00		0.97	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.98		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)	1760	1614		1712	1688		1708	3433		1708	3426	
Flt Permitted	0.59	1.00		0.66	1.00		0.45	1.00		0.51	1.00	
Satd. Flow (perm)	1094	1614		1198	1688		805	3433		917	3426	
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)	49	46	99	104	122	153	76	359	54	72	474	73
RTOR Reduction (vph)	0	69	0	0	62	0	0	15	0	0	16	0
Lane Group Flow (vph)	49	76	0	104	213	0	76	398	0	72	531	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)	9.7	9.7		9.7	9.7		11.8	11.8		11.8	11.8	
Effective Green, g (s)	9.7	9.7		9.7	9.7		11.8	11.8		11.8	11.8	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.37	0.37		0.37	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	336	497		368	519		301	1286		343	1283	
v/s Ratio Prot		0.05			c0.13			0.12			c0.16	
v/s Ratio Perm	0.04			0.09			0.09			0.08		
v/c Ratio	0.15	0.15		0.28	0.41		0.25	0.31		0.21	0.41	
Uniform Delay, d1	7.9	7.9		8.3	8.6		6.8	7.0		6.7	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.5		0.4	0.1		0.3	0.2	
Delay (s)	8.1	8.1		8.7	9.2		7.2	7.1		7.0	7.5	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		8.1			9.0			7.1			7.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	31.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.5%	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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	132	93	257	103	310	91	419	118	170	484	141
Future Volume (vph)	57	132	93	257	103	310	91	419	118	170	484	141
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	0.89		1.00	0.95		1.00	0.97	
Flpb, ped/bikes	0.94	1.00		0.94	1.00		0.97	1.00		0.90	1.00	
Frt	1.00	0.94		1.00	0.89		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1660	1680		1668	1474		1720	3234		1597	3317	
Flt Permitted	0.36	1.00		0.58	1.00		0.33	1.00		0.38	1.00	
Satd. Flow (perm)	625	1680		1019	1474		593	3234		646	3317	
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)	63	145	102	282	113	341	100	460	130	187	532	155
RTOR Reduction (vph)	0	28	0	0	60	0	0	31	0	0	33	0
Lane Group Flow (vph)	63	219	0	282	394	0	100	559	0	187	654	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)	28.5	28.5		28.5	28.5		29.0	29.0		29.0	29.0	
Effective Green, g (s)	28.5	28.5		28.5	28.5		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		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)	263	709		430	622		254	1389		277	1425	
v/s Ratio Prot		0.13			0.27			0.17			0.20	
v/s Ratio Perm	0.10			c0.28			0.17			c0.29		
v/c Ratio	0.24	0.31		0.66	0.63		0.39	0.40		0.68	0.46	
Uniform Delay, d1	12.5	13.0		15.6	15.4		13.2	13.3		15.5	13.7	
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		3.6	2.1		1.0	0.2		6.4	0.2	
Delay (s)	13.0	13.2		19.2	17.5		14.2	13.5		21.8	13.9	
Level of Service	B	B		B	B		B	B		C	B	
Approach Delay (s)		13.2			18.1			13.6			15.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	101	90	12	67	43	40	135	31	23	231	128
Future Volume (vph)	50	101	90	12	67	43	40	135	31	23	231	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	0.98		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	0.96	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.93		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	1690		1770	1863	1508	1691	1863	1514	1734	1863	1456
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.60	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	1690		1770	1863	1508	1075	1863	1514	1217	1863	1456
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)	52	105	94	12	70	45	42	141	32	24	241	133
RTOR Reduction (vph)	0	44	0	0	0	31	0	0	20	0	0	84
Lane Group Flow (vph)	52	155	0	13	70	14	42	141	12	24	241	49
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	2.0	17.9		0.5	16.4	16.4	19.7	19.7	19.7	19.7	19.7	19.7
Effective Green, g (s)	2.0	17.9		0.5	16.4	16.4	19.7	19.7	19.7	19.7	19.7	19.7
Actuated g/C Ratio	0.04	0.34		0.01	0.31	0.31	0.37	0.37	0.37	0.37	0.37	0.37
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)	66	569		16	575	465	398	691	561	451	691	540
v/s Ratio Prot	c0.03	c0.09		0.01	0.04			0.08			c0.13	
v/s Ratio Perm						0.01	0.04		0.01	0.02		0.03
v/c Ratio	0.79	0.27		0.81	0.12	0.03	0.11	0.20	0.02	0.05	0.35	0.09
Uniform Delay, d1	25.3	12.8		26.3	13.2	12.8	10.9	11.4	10.6	10.7	12.1	10.9
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	44.9	0.3		132.2	0.1	0.0	0.1	0.1	0.0	0.0	0.3	0.1
Delay (s)	70.3	13.1		158.4	13.3	12.8	11.0	11.5	10.6	10.8	12.4	10.9
Level of Service	E	B		F	B	B	B	B	B	B	B	B
Approach Delay (s)		24.9			27.9			11.3			11.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	235	83	36	151	37	96	150	46	55	227	175
Future Volume (vph)	80	235	83	36	151	37	96	150	46	55	227	175
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	0.76	1.00	1.00	0.82	1.00	1.00	0.76
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.87	1.00	1.00	0.86	1.00	1.00
Frt	1.00	0.96		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	1713		1770	1863	1199	1545	1863	1291	1529	1863	1210
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.54	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1770	1713		1770	1863	1199	880	1863	1291	1062	1863	1210
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)	82	240	85	37	154	38	98	153	47	56	232	179
RTOR Reduction (vph)	0	14	0	0	0	23	0	0	33	0	0	127
Lane Group Flow (vph)	82	311	0	37	154	15	98	153	14	56	232	52
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	6.6	31.7		3.6	28.7	28.7	20.5	20.5	20.5	20.5	20.5	20.5
Effective Green, g (s)	6.6	31.7		3.6	28.7	28.7	20.5	20.5	20.5	20.5	20.5	20.5
Actuated g/C Ratio	0.09	0.45		0.05	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	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)	165	766		90	755	486	254	539	373	307	539	350
v/s Ratio Prot	c0.05	c0.18		0.02	0.08			0.08			c0.12	
v/s Ratio Perm						0.01	0.11		0.01	0.05		0.04
v/c Ratio	0.50	0.41		0.41	0.20	0.03	0.39	0.28	0.04	0.18	0.43	0.15
Uniform Delay, d1	30.5	13.2		32.6	13.6	12.7	20.1	19.5	18.1	18.9	20.4	18.7
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	2.3	0.4		3.0	0.1	0.0	1.0	0.3	0.0	0.3	0.6	0.2
Delay (s)	32.9	13.5		35.6	13.8	12.7	21.1	19.8	18.1	19.2	21.0	18.9
Level of Service	C	B		D	B	B	C	B	B	B	C	B
Approach Delay (s)		17.4			17.1			19.9			19.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Future Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.98				1.00	1.00			0.94	
Flpb, ped/bikes		0.97	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.92	
Flt Protected		0.96	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1726	1546				1770	1830			1614	
Flt Permitted		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (perm)		1726	1546				1770	1830			1601	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	4	25	0	0	0	85	82	8	6	43	64
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	60	4	0	0	0	85	87	0	0	75	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.8			20.5	
Effective Green, g (s)		8.5	8.5				6.3	31.8			20.5	
Actuated g/C Ratio		0.17	0.17				0.13	0.63			0.41	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		291	261				221	1156			652	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.00								c0.05	
v/c Ratio		0.21	0.02				0.38	0.08			0.12	
Uniform Delay, d1		18.0	17.4				20.2	3.6			9.3	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.0				1.1	0.0			0.1	
Delay (s)		18.3	17.4				21.3	3.6			9.3	
Level of Service		B	B				C	A			A	
Approach Delay (s)		18.1			0.0			12.2			9.3	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Future Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.90	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1572	1497				1770	1817			1573	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1572	1497				1770	1817			1569	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	149	7	133	0	0	0	110	116	11	3	96	91
RTOR Reduction (vph)	0	0	100	0	0	0	0	4	0	0	36	0
Lane Group Flow (vph)	0	156	33	0	0	0	110	123	0	0	154	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.6	13.6				7.2	31.0			18.8	
Effective Green, g (s)		13.6	13.6				7.2	31.0			18.8	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.34	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		391	372				233	1031			540	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm		0.10	0.02								c0.10	
v/c Ratio		0.40	0.09				0.47	0.12			0.29	
Uniform Delay, d1		17.1	15.7				21.9	5.5			13.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.7	0.1				1.5	0.1			0.3	
Delay (s)		17.8	15.8				23.5	5.5			13.3	
Level of Service		B	B				C	A			B	
Approach Delay (s)		16.9			0.0			13.8			13.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	1685	12	99	1786	216	2	41	44	265	118	207
Future Volume (vph)	260	1685	12	99	1786	216	2	41	44	265	118	207
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		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5078		1770	5085	1330		3531	1470	1610	2908	
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)	274	1774	13	104	1880	227	2	43	46	279	124	218
RTOR Reduction (vph)	0	1	0	0	0	93	0	0	0	0	144	0
Lane Group Flow (vph)	274	1786	0	104	1880	134	0	45	46	215	262	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)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Effective Green, g (s)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Actuated g/C Ratio	0.13	0.42		0.07	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)	237	2124		118	1783	466		654	272	298	539	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.13	0.09	
v/s Ratio Perm						0.10			c0.03			
v/c Ratio	1.16	0.84		0.88	1.05	0.29		0.07	0.17	0.72	0.49	
Uniform Delay, d1	60.2	36.3		64.4	45.1	32.6		46.7	47.6	53.3	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	107.1	3.2		48.1	37.3	0.3		0.0	0.3	8.3	0.7	
Delay (s)	167.3	39.5		112.5	82.5	32.9		46.8	47.9	61.6	51.4	
Level of Service	F	D		F	F	C		D	D	E	D	
Approach Delay (s)		56.5			78.8			47.4			54.9	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	66.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	2045	2	52	1449	286	7	110	163	326	70	276
Future Volume (vph)	227	2045	2	52	1449	286	7	110	163	326	70	276
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	5084		1770	5085	1261		3529	1367	1610	2922	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1261		3529	1367	1610	2922	
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)	239	2153	2	55	1525	301	7	116	172	343	74	291
RTOR Reduction (vph)	0	0	0	0	0	150	0	0	0	0	195	0
Lane Group Flow (vph)	239	2155	0	55	1525	151	0	123	172	247	266	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	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
Effective Green, g (s)	22.0	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
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	2217		67	1703	422		780	302	286	520	
v/s Ratio Prot	c0.14	c0.42		0.03	0.30			0.03		c0.15	0.09	
v/s Ratio Perm						0.12			c0.13			
v/c Ratio	0.97	0.97		0.82	0.90	0.36		0.16	0.57	0.86	0.51	
Uniform Delay, d1	67.8	43.7		75.6	50.0	39.8		49.7	54.9	63.1	58.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	49.2	13.1		52.9	6.5	0.5		0.1	2.5	22.6	0.9	
Delay (s)	116.9	56.8		128.5	56.5	40.3		49.8	57.3	85.7	59.6	
Level of Service	F	E		F	E	D		D	E	F	E	
Approach Delay (s)		62.8			56.0			54.2			68.7	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	60.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	158.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd 02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1702	93	13	1921	113	91	22	14	140	30	140
Future Volume (vph)	84	1702	93	13	1921	113	91	22	14	140	30	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5030		1770	5026		1770	1706			1696	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.74	1.00
Satd. Flow (perm)	1770	5030		1770	5026		940	1706			1304	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	87	1755	96	13	1980	116	94	23	14	144	31	144
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	108
Lane Group Flow (vph)	87	1848	0	13	2092	0	94	26	0	0	175	36
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	11.8	87.8		1.8	77.8		28.5	28.5			28.5	28.5
Effective Green, g (s)	11.8	87.8		1.8	77.8		28.5	28.5			28.5	28.5
Actuated g/C Ratio	0.09	0.66		0.01	0.58		0.21	0.21			0.21	0.21
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	156	3318		23	2937		201	365			279	338
v/s Ratio Prot	c0.05	c0.37		0.01	c0.42			0.02				
v/s Ratio Perm							0.10				c0.13	0.02
v/c Ratio	0.56	0.56		0.57	0.71		0.47	0.07			0.63	0.11
Uniform Delay, d1	58.1	12.2		65.3	19.7		45.7	41.7			47.5	42.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.3	0.2		28.1	0.8		1.7	0.1			4.4	0.1
Delay (s)	62.4	12.4		93.4	20.5		47.4	41.8			51.8	42.2
Level of Service	E	B		F	C		D	D			D	D
Approach Delay (s)		14.6			21.0			45.8			47.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	133.1	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
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd 02/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	2367	201	37	1657	189	62	21	47	121	57	178
Future Volume (vph)	66	2367	201	37	1657	189	62	21	47	121	57	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4985		1770	4963		1770	1556			1701	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00			0.75	1.00
Satd. Flow (perm)	1770	4985		1770	4963		896	1556			1325	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)	68	2440	207	38	1708	195	64	22	48	125	59	184
RTOR Reduction (vph)	0	6	0	0	8	0	0	37	0	0	0	86
Lane Group Flow (vph)	68	2641	0	38	1895	0	64	33	0	0	184	98
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	96.9		6.6	94.8		34.0	34.0			34.0	34.0
Effective Green, g (s)	8.7	96.9		6.6	94.8		34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	100	3167		76	3085		199	346			295	352
v/s Ratio Prot	c0.04	c0.53		0.02	0.38			0.02				
v/s Ratio Perm							0.07				c0.14	0.06
v/c Ratio	0.68	0.83		0.50	0.61		0.32	0.09			0.62	0.28
Uniform Delay, d1	70.5	21.6		71.3	17.7		49.6	47.0			53.5	49.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	17.3	2.0		5.1	0.4		0.9	0.1			4.1	0.4
Delay (s)	87.9	23.6		76.4	18.0		50.5	47.2			57.5	49.5
Level of Service	F	C		E	B		D	D			E	D
Approach Delay (s)		25.2			19.2			48.8			53.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	152.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX G

TRANSIT CAPACITY ANALYSIS CALCULATIONS

APPENDIX E

Infrastructure Availability Report

Block B
Infrastructure Availability Report

Honolulu, Oahu, Hawaii
Tax Map Key: 2-3-001:Por 128

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

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

April 2021

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APPENDIX A

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

1 INTRODUCTION

1.1 Purpose

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

1.2 Proposed Project Location and Description

The Howard Hughes Corporation (HHC) proposes the development of a 350-unit high-rise condominium tower in Kaka`ako on the island of Oahu (see Figures 1-1 and 1-2). The project site is approximately 2.98 acres, generally located at TMK: (1) 2-3-001:Por 128. The project site is bounded by Auahi Street to the north, Ward Avenue to the west, Ala Moana Boulevard to the south and future Makai Park to the east.

1.3 Existing Topography

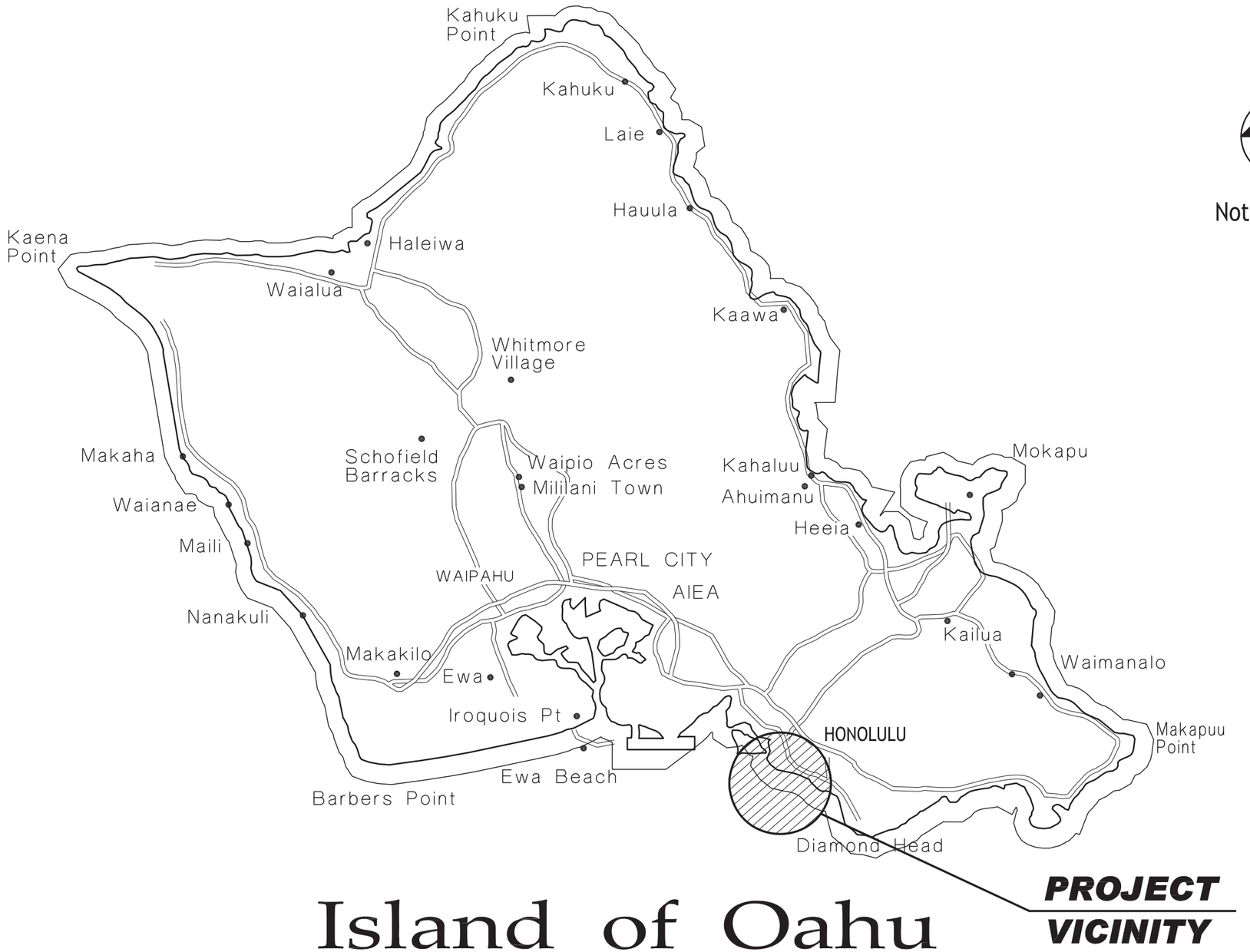
The project site is currently an existing A.C. parking lot and a parking lot structure. Sewer manholes are located in various locations along Auahi Street, Ward Avenue and Ala Moana Boulevard, which bound the vicinity of the project area. Drain inlets are located in various locations along the project site to collect and convey storm water runoff. See Figure 1-3 for topographic survey prepared October 2012 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 (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%. The property's Flood Base Elevations is at 8 to 9 feet. The proposed finish floor elevation at Level 1 for the project is 9.25 feet.

1.5 Sea Level Rise

The Pacific Islands Ocean Observing System (PacIOOS) Hawai'i Sea Level Rise Viewer shows that a portion of the project area will be inundated by a 3.2-ft sea level rise by the year 2100 due to combined passive flooding and annual high wave flooding. The portion that will be affected by the sea level rise is at the western side of the project area (see Figure 1-5). The proposed finish floor of the project is above the property's Flood Base elevation; thus, the project site will not be impacted by the 3.2-ft sea level rise.

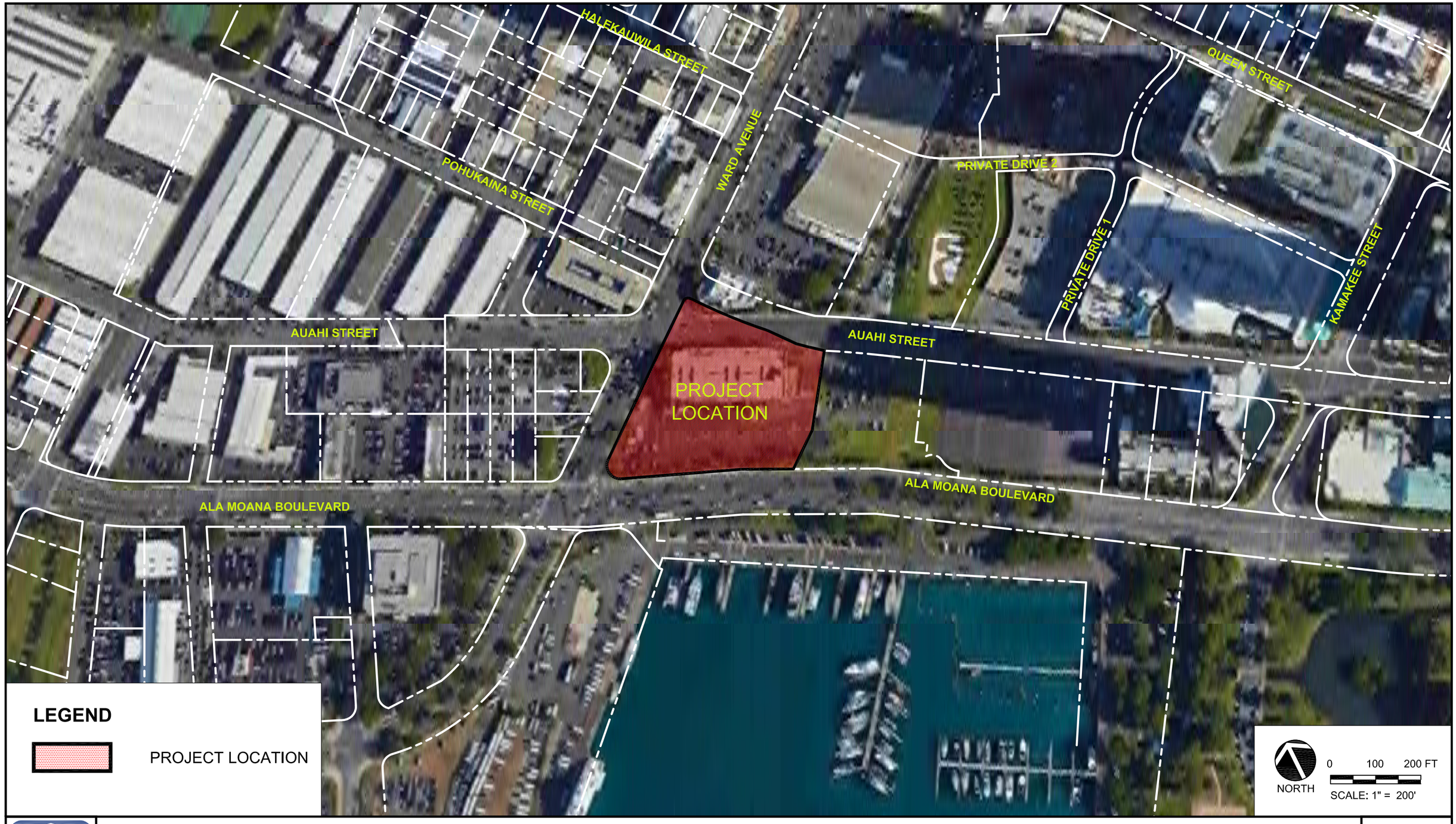


BLOCK B INFRASTRUCTURE AVAILABILITY REPORT
HONOLULU, OAHU, HAWAII

VICINITY MAP

Figure 1-1

WILSON OKAMOTO CORPORATION

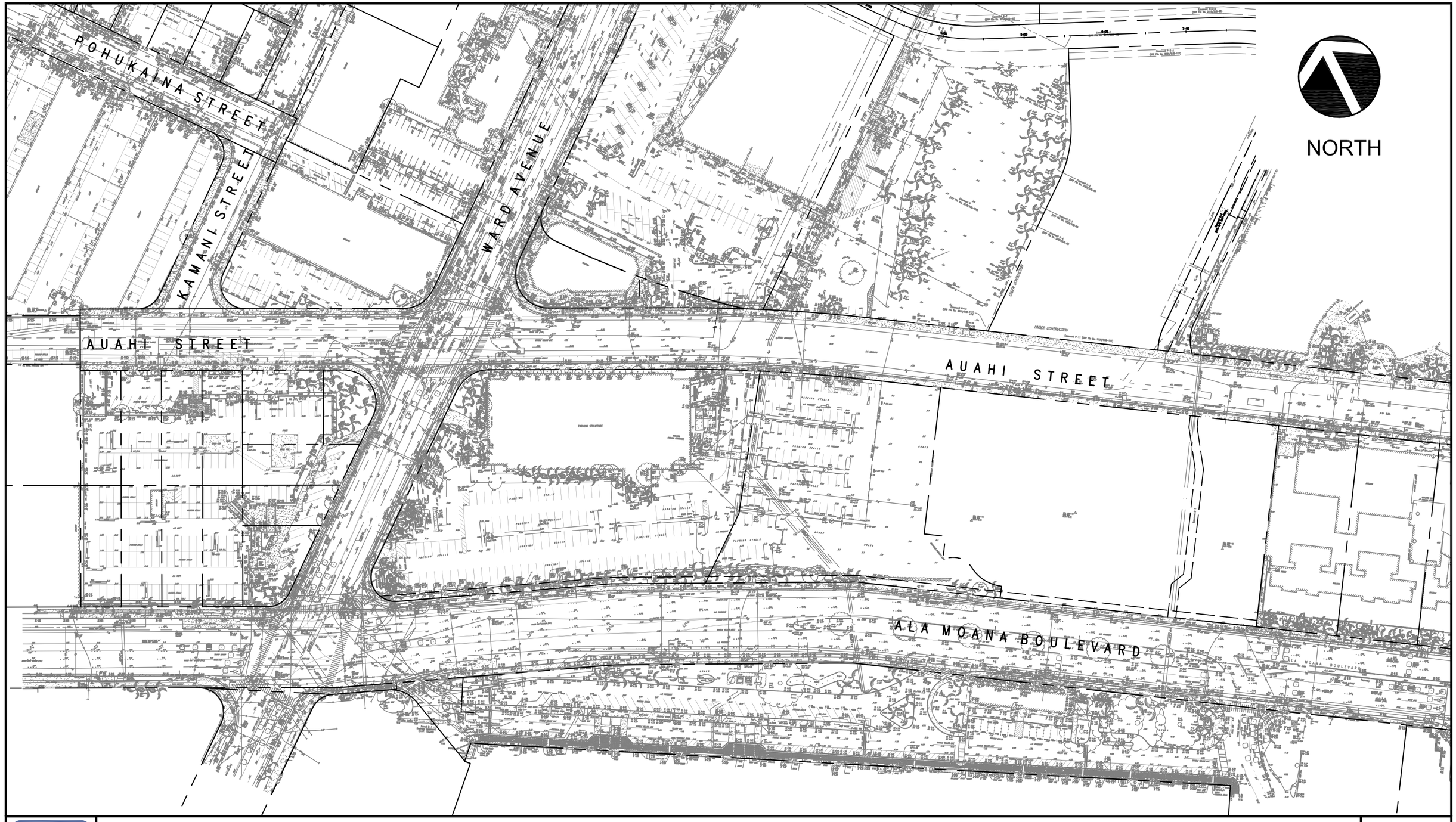


WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT
HONOLULU, OAHU, HAWAII

LOCATION MAP

Figure 1-2

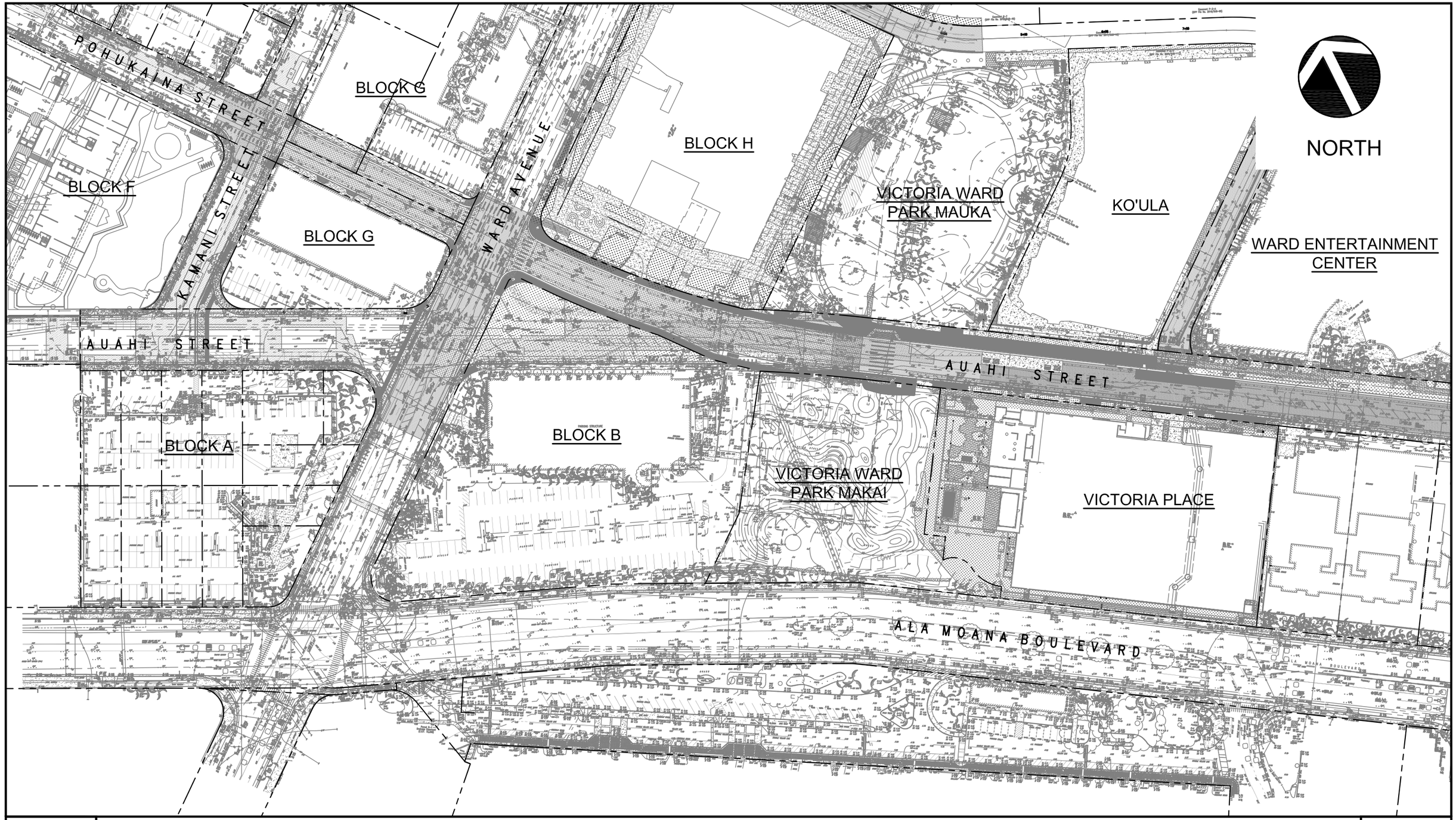


BLOCK B INFRASTRUCTURE AVAILABILITY REPORT

HONOLULU, OAHU, HAWAII

CURRENT EXISTING CONDITION

Figure 1-3A

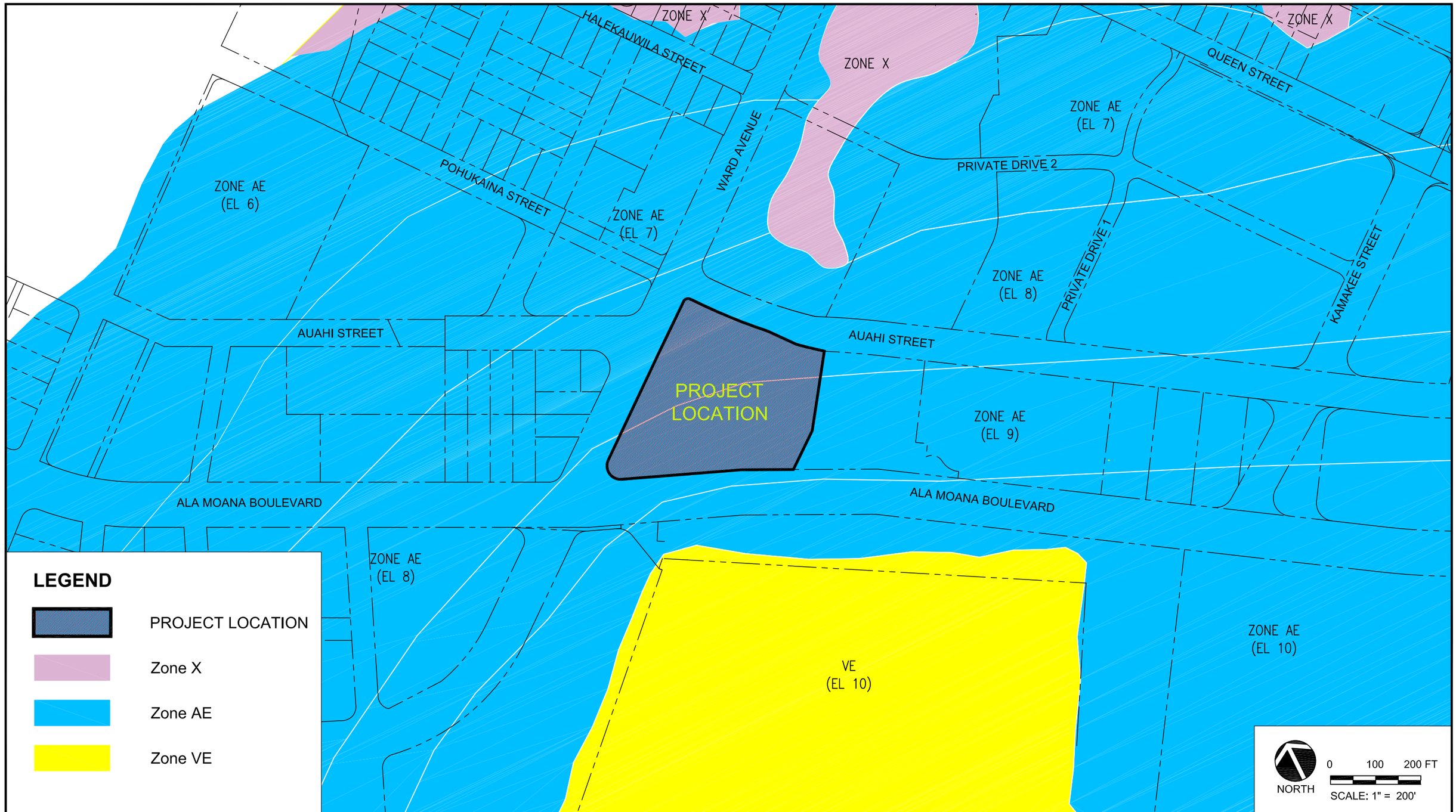


WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT
HONOLULU, OAHU, HAWAII

FUTURE EXISTING CONDITION

Figure
1-3B



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BLOCK B INFRASTRUCTURE AVAILABILITY REPORT
HONOLULU, OAHU, HAWAII

FLOOD HAZARD MAP

Figure
1-4

HALEKAUWILA STREET
WARD AVENUE
QUEEN STREET
POHUKAINA STREET
PRIVATE DRIVE 2
PRIVATE DRIVE 1
KAMAKEE STREET
AUAHI STREET
AUAHI STREET
PROJECT LOCATION
ALA MOANA BOULEVARD
ALA MOANA BOULEVARD

LEGEND

PROJECT LOCATION

3.2 FT Sea Level Rise

NORTH

0 100 200 FT

SCALE: 1" = 200'

WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT

HONOLULU, OAHU, HAWAII

3.2-FT SEA LEVEL RISE

Figure 1-5

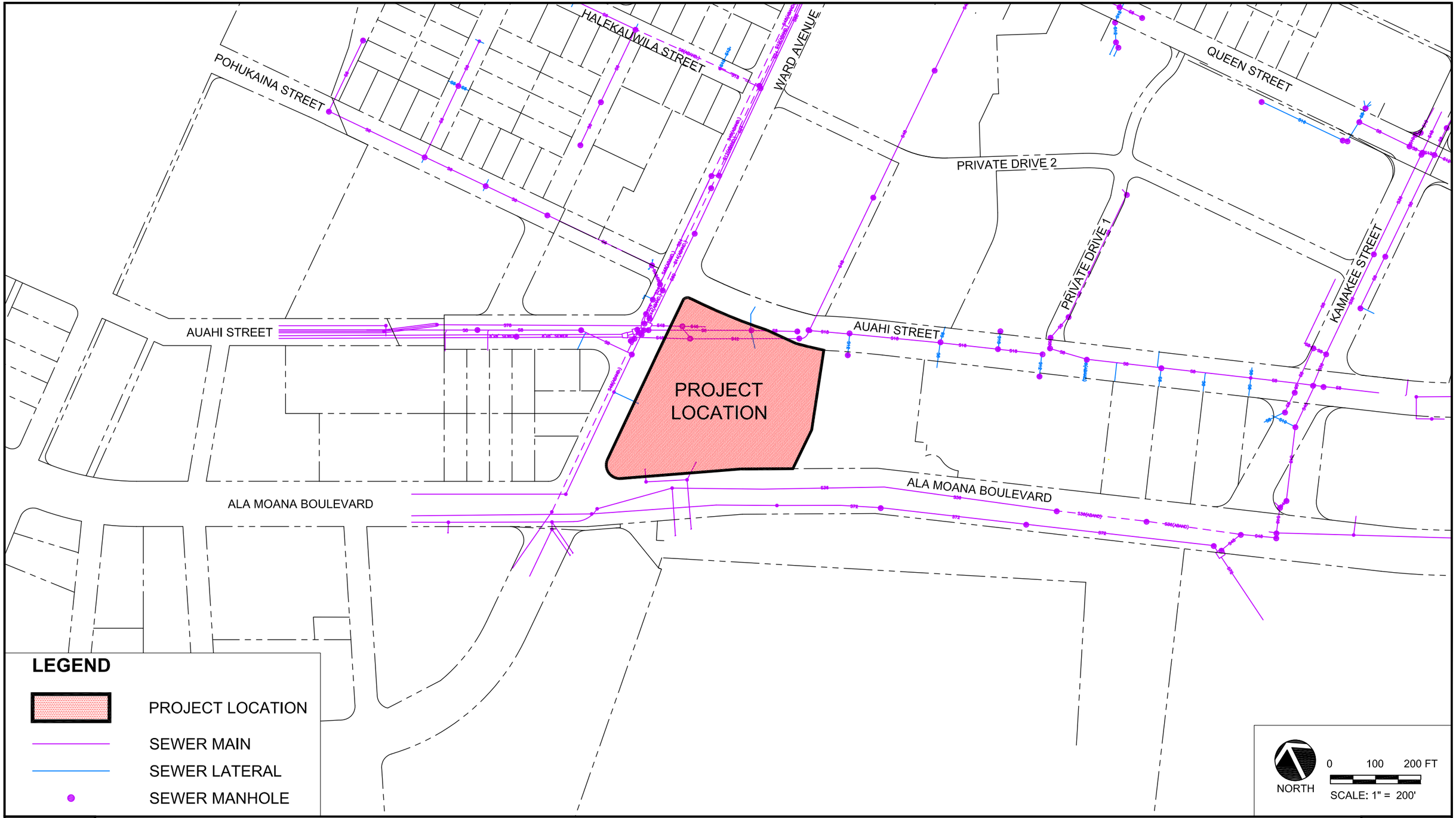
2 UTILITIES

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 project area is located within the Sand Island collection system where 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 a 12-inch sewer lateral which is to be constructed within Block B that will connect to the existing 42" sewer main in Auahi Street. See Figure 2-1 which identifies the existing sewer system within the project vicinity.

A sewer connection application was submitted on December 13, 2019 to the City Department of Planning and Permitting (DPP), Wastewater Branch (WWB) to confirm the existing sanitary sewer system can accommodate the project. An approved sewer connection application dated January 06, 2020 was received confirming available capacity (see Appendix A).



WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT

HONOLULU, OAHU, HAWAII

EXISTING SANITARY SEWER SYSTEM

Figure 2-1

2.2 Water System

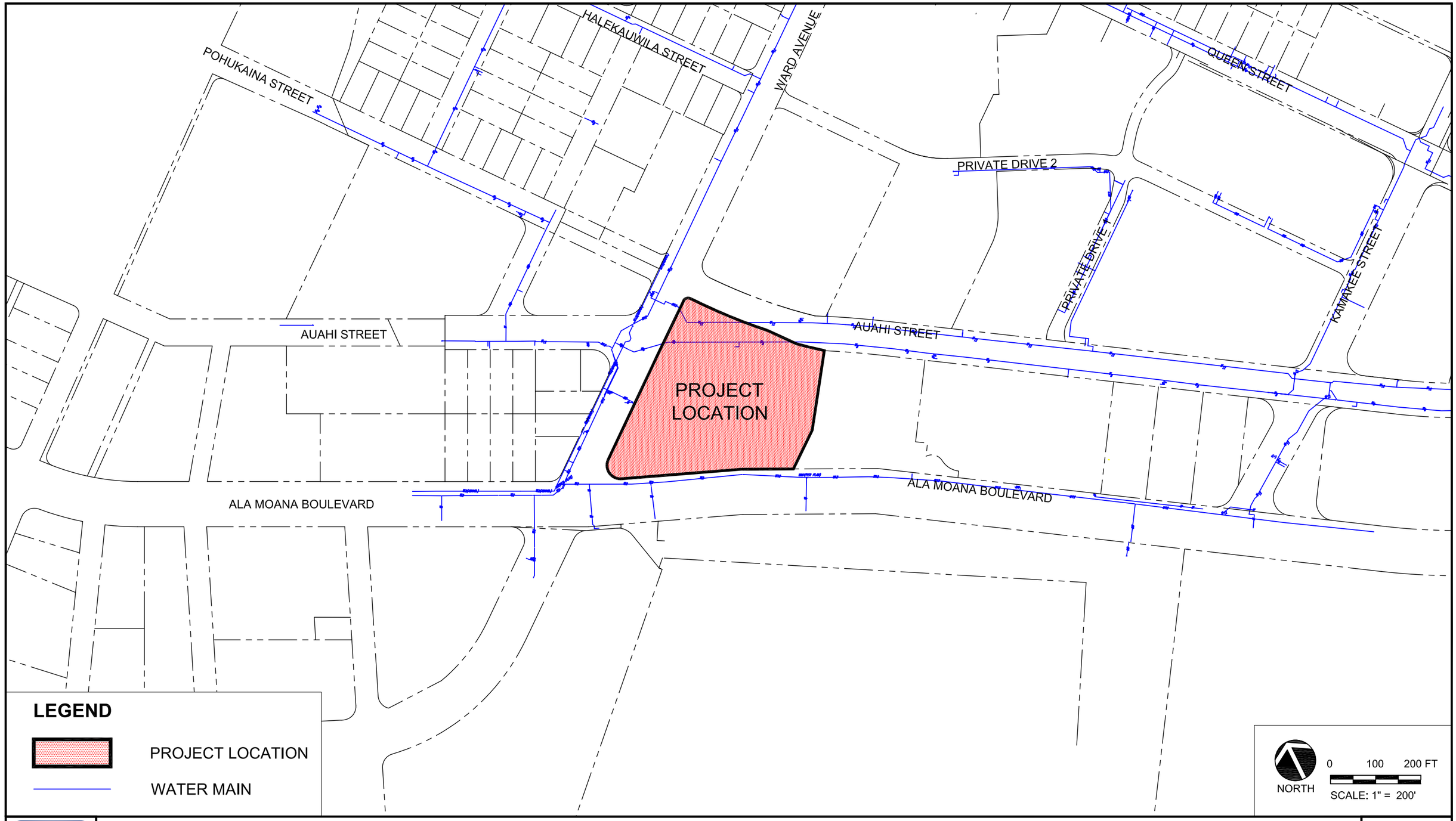
2.2.1 Potable Water

Potable water service for the project will be provided by the City and County of Honolulu's Board of Water Supply (BWS). The BWS 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 Auahi Street to accommodate both the residential tower and the commercial/light industrial building. 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. A letter request to BWS dated December 17, 2020 was sent to confirm that the existing water system can accommodate the project. An adequacy letter dated January 14, 2021 was received confirming available capacity (see Appendix A). It was stated that the developer shall complete the upgrade of the 6-inch water main on Queen Street, from Cooke Street up to the existing 12-inch water main located between Cummins and Kamakee Street, to a 12-inch water main as indicated per BWS comments regarding the Victoria Ward, LTD. Redevelopment Project and Master Plan prior to the start of Phase 3 of the Master Plan. The proposed Ward Village Block B development is within Phase 3 of the Victoria Ward Redevelopment Master Plan.

2.2.2 Fire Protection

Fire protection will be provided by public fire hydrants. Water supply from a public fire hydrant must be provided within 450 feet from the furthest point of the building to the fire access road. A fire sprinkler system will be installed in the building. The size and location of the fire line that will supply the sprinkler system will be confirmed during the final design phase. The Honolulu Fire Department (HFD) was consulted on March 31, 2021 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.



WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT
HONOLULU, OAHU, HAWAII

EXISTING WATER SYSTEM

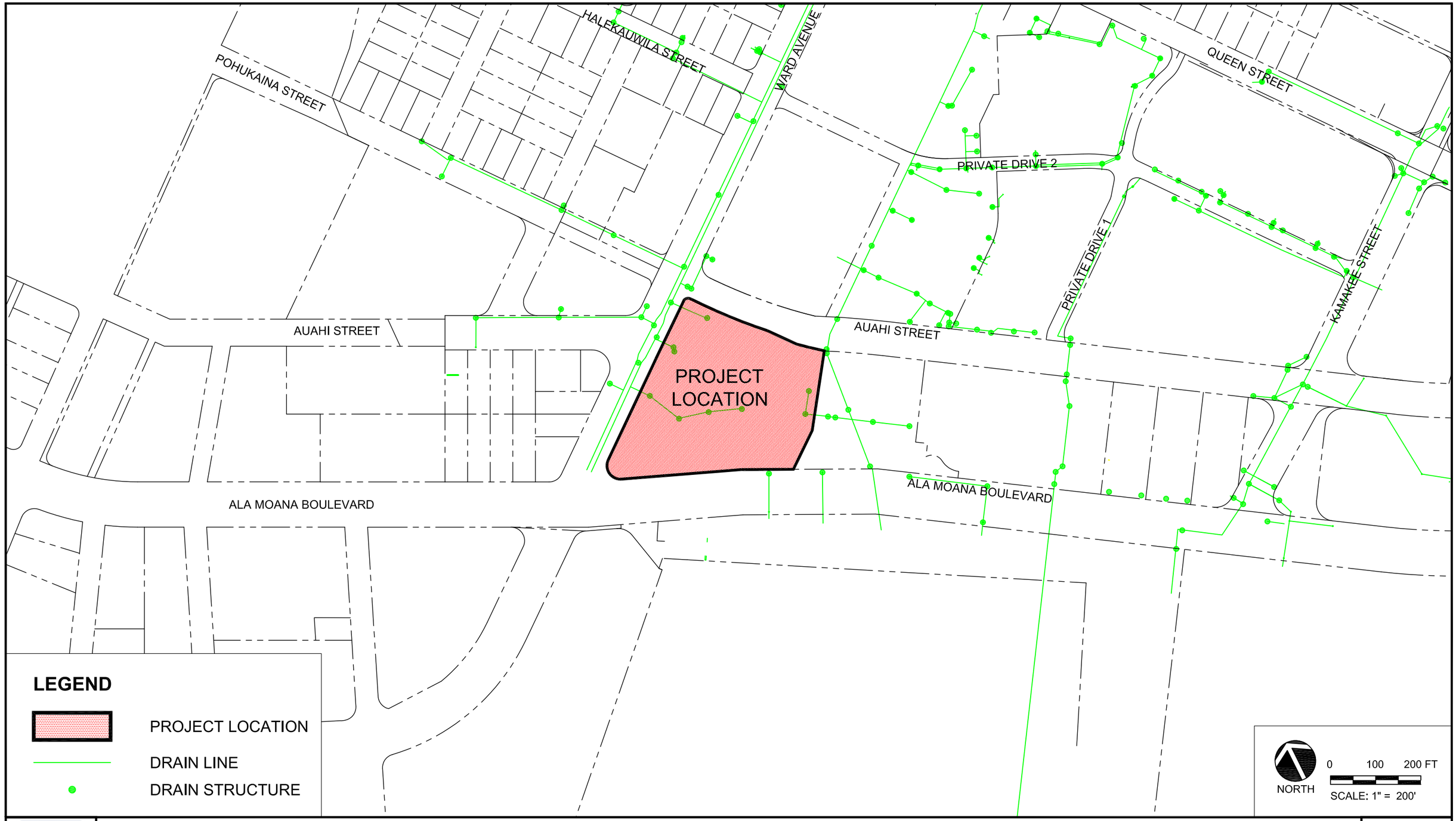
Figure
2-2

2.3 Site Drainage and Low Impact Development

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

The runoff from the project site will be collected within a private drainage system owned and maintained by HHC with a series of grated drain inlets. 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 vegetated buffer strips, which will be located in the two parks within the property. The vegetated buffer strips will be surrounding the drain inlets located within the parks. Storm water will be collected by the drain inlets and will be directed to the existing catch basin located between Auahi Street (Private) and Kamani Street (Private). Email correspondence for the LID Site Design Strategies is attached in Appendix A.



WILSON OKAMOTO CORPORATION

BLOCK B INFRASTRUCTURE AVAILABILITY REPORT

HONOLULU, OAHU, HAWAII

EXISTING DRAINAGE SYSTEM

Figure 2-3

2.4 Electrical Power Facilities

The Hawaiian Electric Company (HECo) was consulted on March 24, 2021 by Ronald N. S. Ho & Associates, Inc. to confirm that the existing electrical system can accommodate the project. A Will Serve letter was received on April 19, 2021 confirming that HECo will design and construct the required infrastructure upgrades to serve Block B (see Appendix A).

2.5 Telephone System

The Hawaiian Telecom Inc. was consulted on March 24, 2021 by Ronald N. S. Ho & Associates, Inc. to confirm that the existing communication system can accommodate the project. An assessment letter dated April 8, 2021 was received confirming available service connection for the Block B project (see Appendix A).

2.6 Cable Television System

The Spectrum (formerly Oceanic and Charter Communications) was consulted on March 24, 2021 by Ronald N. S. Ho & Associates, Inc. to confirm that the existing cable system can accommodate the project. An email correspondence dated April 8, 2021 was received confirming available capacity for the Block B project (see Appendix A).

2.7 Gas System

The Hawaiian Gas was consulted on December 23, 2021 to confirm that the existing gas system can accommodate the project. An email correspondence dated December 29, 2021 was received confirming available capacity for the Block B project (see Appendix A).

APPENDIX A

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- Spectrum(Formerly Oceanic and Charter Communications): Utility Assessment Request Letter and Email Correspondence
- Hawaii Gas: Email Correspondence

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

Approved Sewer Connection Application

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

SEWER CONNECTION APPLICATION

APPLICATION NO.: **2020/SCA-0380** STATUS: **Approved with conditions**

DATE RECEIVED: **03/12/2020** IWDP APP. NO.:

PROJECT NAME: **2020/SCA-0380 Victoria Ward Village Block B - 350 New MFD**

$1,620,920.00
Estimated Wastewater System Facility Charge*

LOCATION:

Zone	Section	Plat	Parcel
2	3	001	128

81,593 Sq. Ft.

SPECIFIC LOCATION: **1050 ALA MOANA BLVD**

APPLICANT: **Kevin T. Goto**
1907 S Beretania St. Suite 400
Honolulu, Hawaii 96826-1301

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

OTHER USES:

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

PROPOSED UNITS	EXISTING UNITS	UNITS TO BE DEMOLISHED
No. of New Units: **350**	No. of Existing Units: **0**	No. of Units to be Demolished: **0**
Studios:	Studios:	Studios:
1-Bedroom: **140**	1-Bedroom:	1-Bedroom:
2-Bedroom: **140**	2-Bedroom:	2-Bedroom:
3-Bedroom: **70**	3-Bedroom:	3-Bedroom:
4-Bedroom:	4-Bedroom:	4-Bedroom:
5-Bedroom:	5-Bedroom:	5-Bedroom:
6-Bedroom:	6-Bedroom:	6-Bedroom:

REMARKS **Submit construction plans for review and approval.**

APPROVAL DATE: **02/09/2021**

EXPIRATION DATE: **02/09/2023**

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

REVIEWED BY: ***Jing Meng***

Site Development Division, Wastewater Branch

ExternalID: **080414701-001** JobId: **80414701**

Initial Print Date: Tuesday February 9, 2021 2:11 pm

Honolulu Board of Water Supply

Request Letter
Adequacy Letter

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

8206-62
December 18, 2020

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

Attention: Mr. Robert Chun, Prinicipal Executive – Customer Care Division

Subject: Ward Village Block B – BWS Water System Adequacy

Dear Mr. Chun:

We are requesting Board of Water Supply assistance to determine the adequacy of the existing source, storage and water distribution system in Kaka'ako to support residential development with a total of 350 units located at TMK: 2-3-001: 029.

The development will include the construction of a new residential high-rise condominium:

- 1 Bedroom – 140 units
- 2 Bedrooms – 140 units
- 3 Bedrooms – 70 units

In addition to your review of the existing system, we are requesting Board of Water Supply flow information, pressure information, record drawings, and facility maps related to the property. Any existing facility information that can be provided will be used in the project planning and design process to minimize potential conflicts during construction

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

Sincerely,

Kevin Goto, PE, LEED AP
Project Manager

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

Enclosure: Project Vicinity and Location Map
Tax Map Key

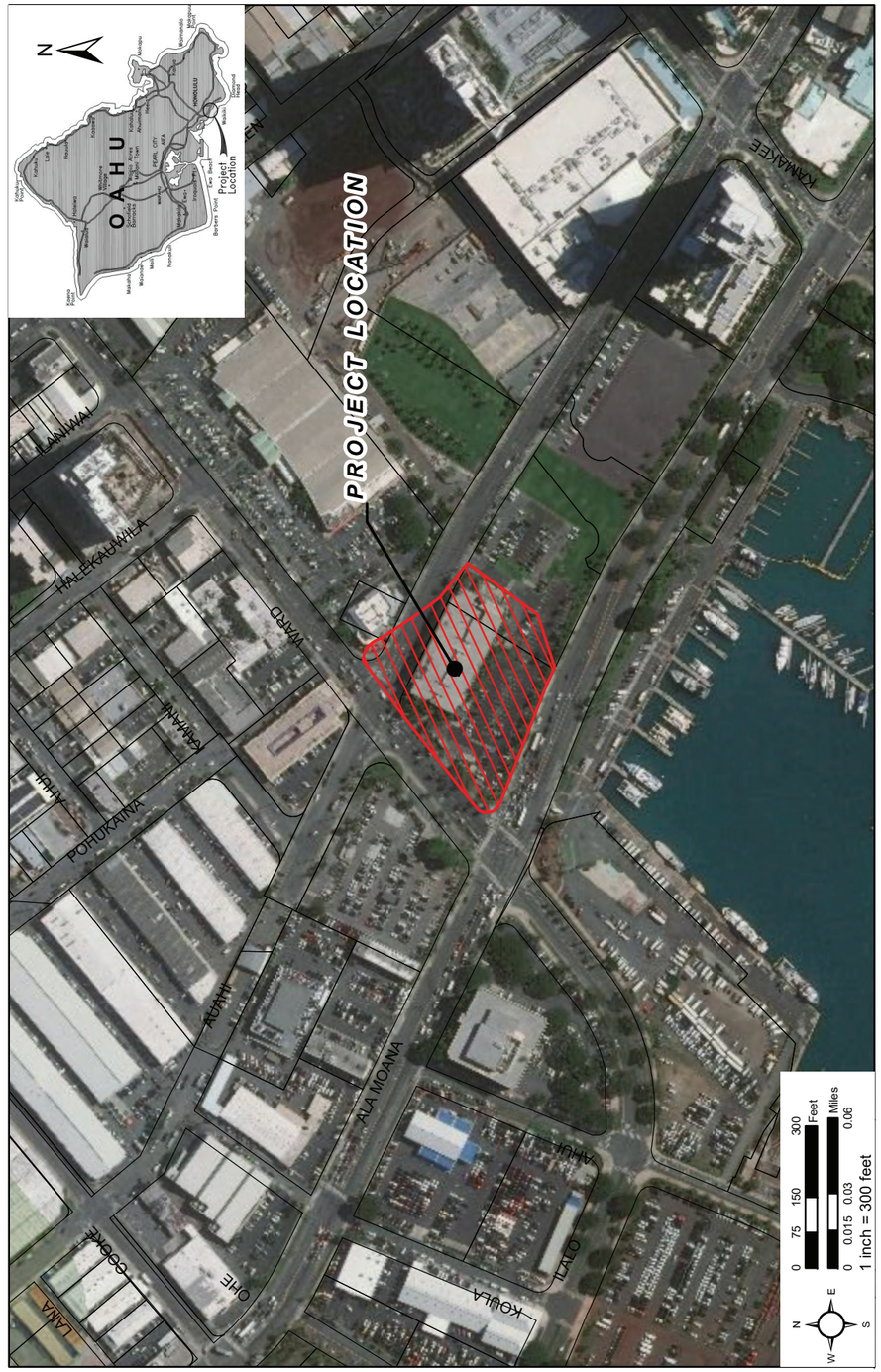


FIGURE 1

PROJECT LOCATION AND VICINITY MAP

WARD VILLAGE BLOCK B / HONOLULU, OAHU, HAWAII

WILSON OKAMOTO CORPORATION

FIGURE 2
TAX MAP

BLOCK B / HONOLULU, O'AHU, HAWAI'I

BOARD OF WATER SUPPLY

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

January 14, 2021

RICK BLANGIARDI, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
RAY C. SOON
MAX J. SWORD

JADE T. BUTAY, Ex-Officio

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

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

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

RECEIVED
JAN 15 2021
WILSON OKAMOTO CORPORATION

Dear Mr. Goto:

Subject: Your Letter Dated December 17, 2020 Regarding Water Availability for the Ward Village Block B, Located at the Corner of Ward Avenue and Ala Moana Boulevard – Tax Map Key: 2-3-001: 029

Thank you for your letter regarding the proposed residential high-rise condominium, which consists of 140 1-bedroom units, 140 2-bedroom units, and 70 3-bedroom units.

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

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

Water conservation measures are 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.

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 proposed Ward Village Block B development is within Phase 3 of the Victoria Ward Redevelopment Master Plan. The developer shall complete the upgrade of the 6-inch water main on Queen Street, from Cooke Street up to the existing 12-inch water main located between Cummins and Kamakee Streets, to a 12-inch water main as indicated in our comments regarding the Victoria Ward, LTD. Redevelopment Project and Master plan prior to the start of Phase 3.

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:

Fire Hydrant Number	Location	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)
M00147	Ala Moana Blvd.	76	60	4,000
M03197	Auahi St.	76	45	4,000
M05627	Ward Ave.	76	62	4,000

The data are 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.

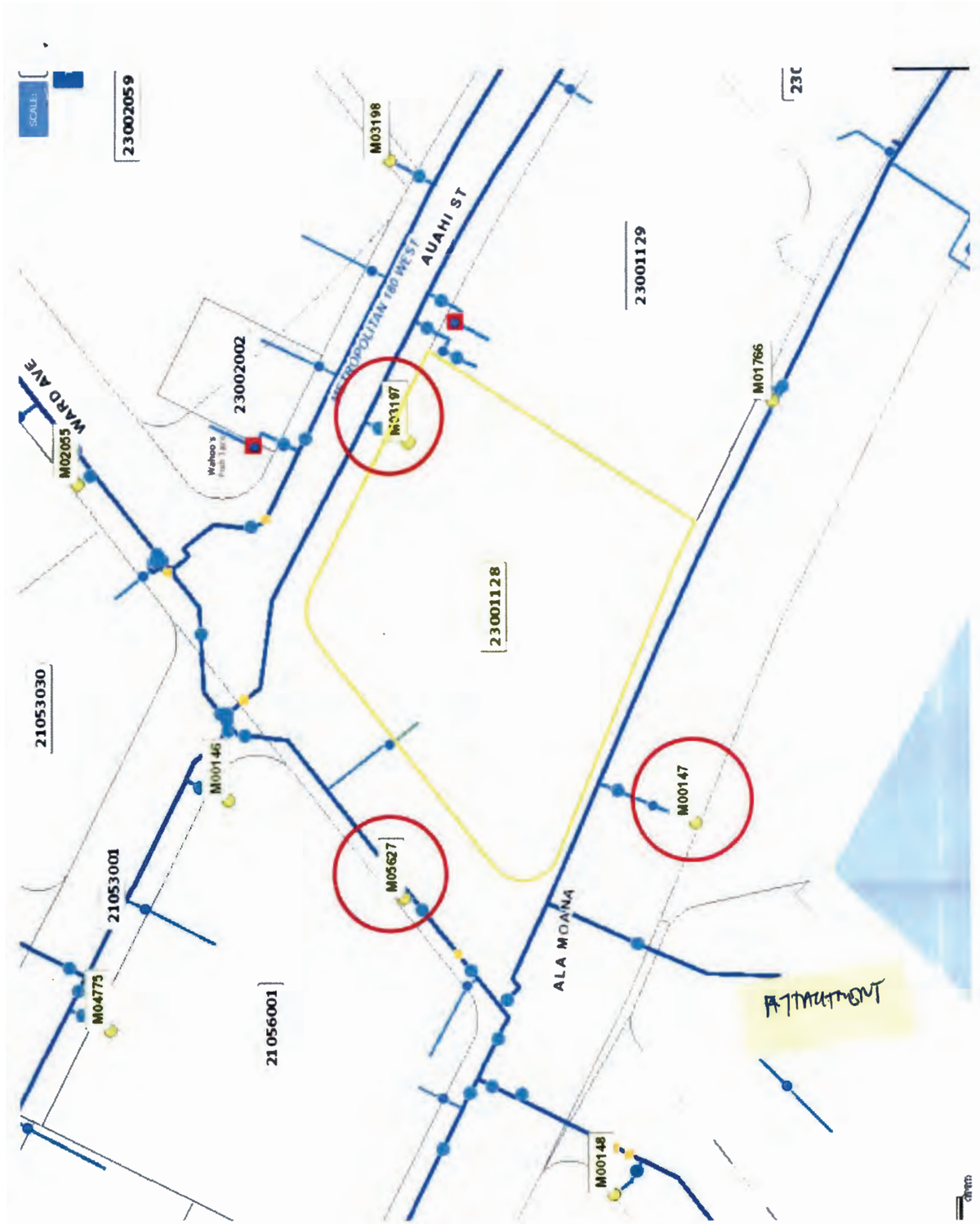
The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

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

Very truly yours,

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

Attachment



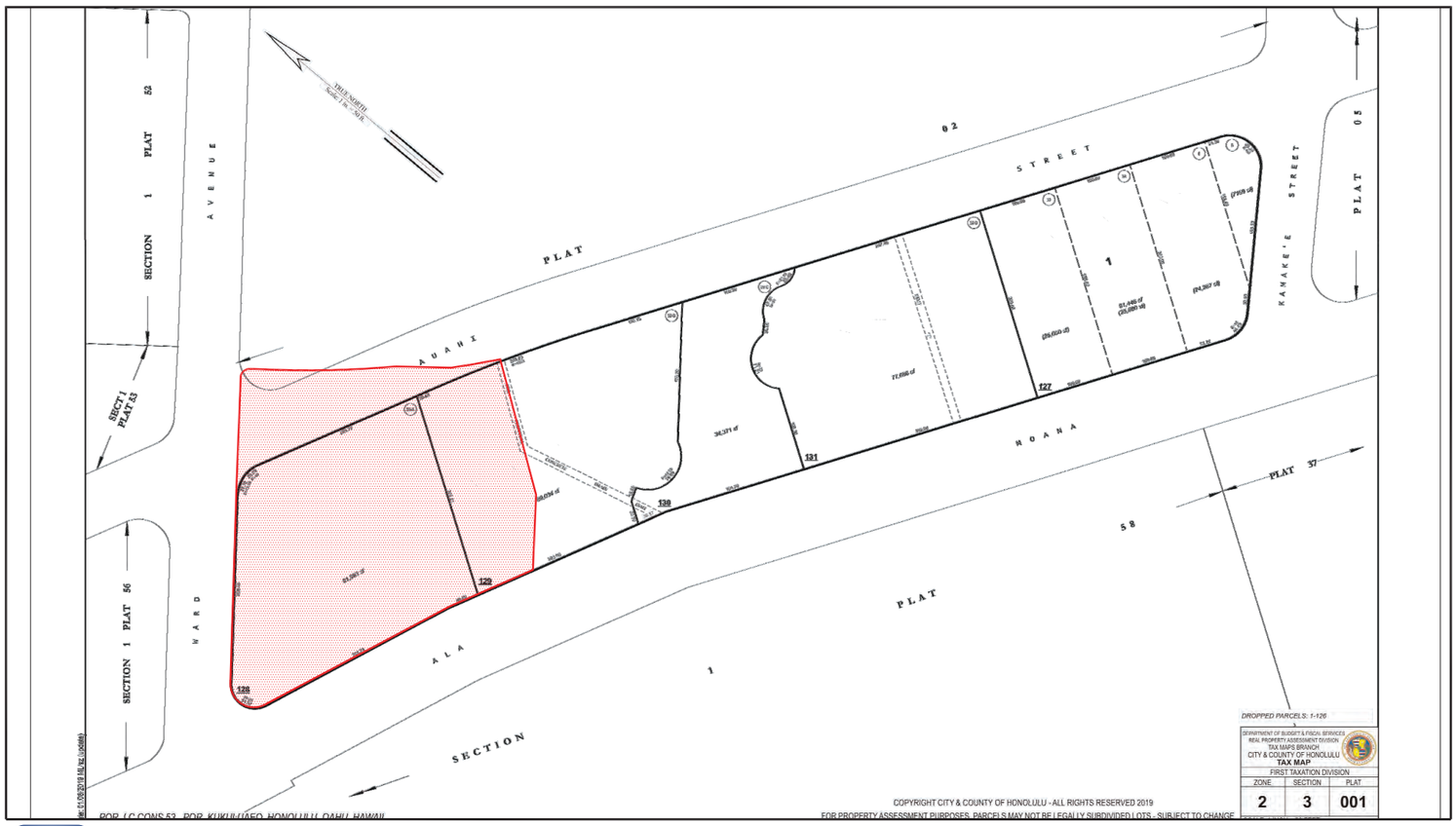


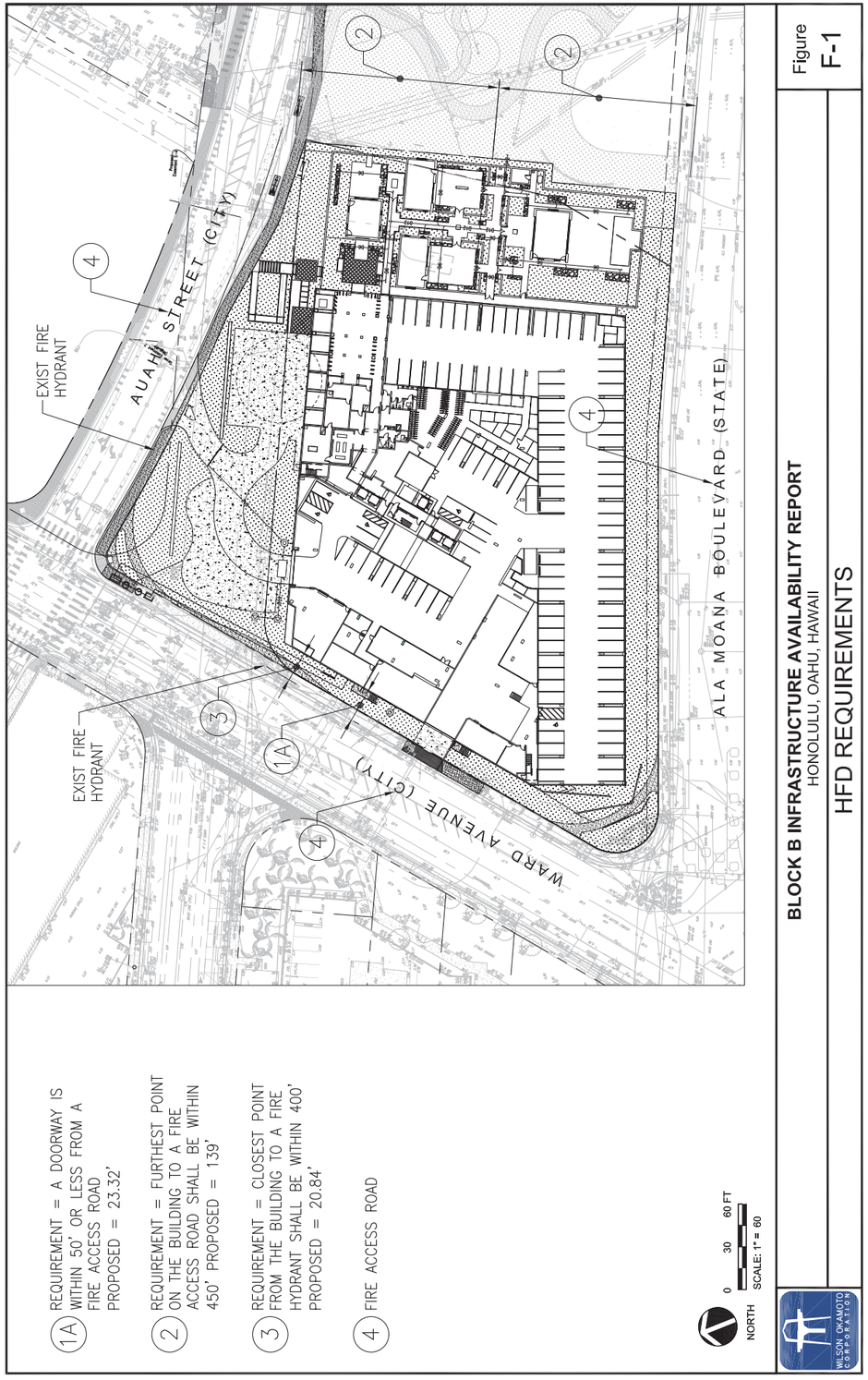
FIGURE 2

TAX MAP

BLOCK B / HONOLULU, O`AHU, HAWAI`I

Honolulu Fire Department

HFD REQUIREMENTS



From: Zapata, Ricardo A <rzapata@honolulu.gov>
Sent: Tuesday, April 6, 2021 4:07 AM
To: Rika Okino
Subject: RE: Block B - HFD Review

Rika,
Thank you very much. This looks Good!
Ricardo

From: Rika Okino [mailto:ROkino@wilsonokamoto.com]
Sent: Monday, April 5, 2021 9:47 AM
To: Zapata, Ricardo A <rzapata@honolulu.gov>
Cc: Kevin Goto <kgoto@wilsonokamoto.com>; Cara Itai <CItai@wilsonokamoto.com>
Subject: RE: Block B - HFD Review

CAUTION: Email received from an EXTERNAL sender. Please confirm the content is safe prior to opening attachments or links.

Hi Ricardo,

Based on the fire protection drawings, the location is currently shown within 20' of the anticipated fire access road, will be labeled, and is clear and unobstructed. See attached for your reference.

Thanks,

Rika Okino
Civil Engineer

WILSON OKAMOTO CORPORATION

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

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From: Zapata, Ricardo A <rzapata@honolulu.gov>
Sent: Thursday, April 1, 2021 1:25 PM
To: Rika Okino <ROkino@wilsonokamoto.com>
Subject: RE: Block B - HFD Review

Rika,
Where will be the fire command center? Ensure that it meets the requirements of 2012 NFPA 1 section 11.9 to include the State of Hawaii amendment for section 11.9.5. Additionally, ensure that the fire department connection (FDC) is located within 20 feet of a fire access road and that it is properly labeled and clear & unobstructed.

Ricardo

From: Rika Okino [mailto:ROkino@wilsonokamoto.com]
Sent: Wednesday, March 31, 2021 3:45 PM
To: Zapata, Ricardo A <rzapata@honolulu.gov>
Cc: Kevin Goto <kgoto@wilsonokamoto.com>; Cara Itai <CItai@wilsonokamoto.com>
Subject: Block B - HFD Review

CAUTION: Email received from an EXTERNAL sender. Please confirm the content is safe prior to opening attachments or links.

Hi Ricardo,

I attached the site layout plan and HFD figure with dimensions of the high-rise condominium tower project "Block B" in Ward Village for HFD review.
Please let us know if you have any questions or concerns with our plan.

Thanks,

Rika Okino
Civil Engineer

WILSON OKAMOTO CORPORATION

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

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

LID Correspondence with Keith Miyashiro

From: Miyashiro, Keith K <kmiyashiro1@honolulu.gov>
Sent: Friday, January 29, 2021 8:01 AM
To: Rika Okino
Cc: Kevin Goto; Cara Itai
Subject: RE: Project: WARD VILLAGE - BLOCK B - File Transfer - Block B - Concept Design Plans

Thanks for the clarification Rika.

Based on the description and concept it appears that alternative compliance may be feasible to address water quality treatment however as mentioned we will need to confirm this during the 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: Rika Okino [mailto:ROkino@wilsonokamoto.com]
Sent: Thursday, January 28, 2021 1:15 PM
To: Miyashiro, Keith K
Cc: Kevin Goto; Cara Itai
Subject: RE: Project: WARD VILLAGE - BLOCK B - File Transfer - Block B - Concept Design Plans

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Hi Keith,

The elevation differences are still the issue in those areas you described. If we opt to have vegetated swales or buffer strips in those areas, they would be where the grade is sloping down around 5' in height.

Thanks,

Rika Okino
Civil Engineer

WILSON OKAMOTO CORPORATION

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

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From: Miyashiro, Keith K [mailto:kmiyashiro1@honolulu.gov]
Sent: Thursday, January 28, 2021 12:39 PM
To: Rika Okino <ROkino@wilsonokamoto.com>
Subject: RE: Project: WARD VILLAGE - BLOCK B - File Transfer - Block B - Concept Design Plans

Rika,

I have taken a look at the proposed concept. Is there a reason as to why the landscaped areas both mauka and Makai of the development cannot be used as vegetated swales or buffer strips? The runoff captured from the building seems to be able to utilize an MTD however this is purely based off the proposed concept. Actual determination the outcome of Appendix F is based on the review of the SWQR and Plans. CEB is not able to "pre-approve" the outcome of Appendix F.

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: Rika Okino [mailto:ROkino@wilsonokamoto.com]
Sent: Wednesday, January 27, 2021 4:58 PM
To: Miyashiro, Keith K
Subject: Project: WARD VILLAGE - BLOCK B - File Transfer - Block B - Concept Design Plans

CAUTION: Email received from an EXTERNAL sender. Please confirm the content is safe prior to opening attachments or links.

A transfer (File Transfer) has arrived on the Wilson Okamoto Corporation Info Exchange Site.

Download all associated files

Additional links:
Reply to All

Project Name:	WARD VILLAGE - BLOCK B
Project Number:	8206-62
From:	Rika Okino (Wilson Okamoto Corporation)
To:	Keith Miyashiro
CC:	Cara Itai (Wilson Okamoto Corporation); Kevin Goto (Wilson Okamoto Corporation)
Subject:	Block B - Concept Design Plans
Sent via:	Info Exchange
Expiration Date:	2/10/2021
Remarks:	Hi Keith, Here are the concept design plans from the architect. Please note that the finish floor elevation needs to be at +9.25. Thanks,

Rika

Transferred Files

NAME	TYPE	DATE	TIME	SIZE
20.12.04 Block B CONCEPT.pdf	PDF File	12/17/2020	6:39 PM	30,828 KB

TRIBUTARY AREA	AREA (ACRES)	Q (CFS)	DISCHARGE POINT	TREATMENT
P1	0.26	0.66	EXIST CB 1	SELF-MITIGATING
P2	0.38	1.66	EXIST CB 2	MTD
P3	0.33	1.80	EXIST CB 2	MTD
P4	0.91	3.28	DMH 3	GREEN ROOF
P5	0.35	1.91	EXIST CB 2	MTD
P6	0.48	2.13	EXIST SDMH 4	INFILTRATION TRENCH
P7	0.32	0.57	EXIST CB 5	SELF-MITIGATING
P8	0.05	0.08	EXIST CB 6	SELF-MITIGATING
TOTAL	3.08	12.09		

LEGEND

- DISCHARGE POINT
- (#) BASIN AREA
- FLOW ARROW
- TRIBUTARY AREA
- DE MINIMIS AREA = 4,288.52 SF (3.18%)

NOTE:

1. TOTAL PROJECT SIZE = 3.08 ACRES
2. DE MINIMIS (5% OF PROJECT SIZE) = 12,3426.78 SF

NORTH

0 30 60 FT

SCALE: 1" = 60

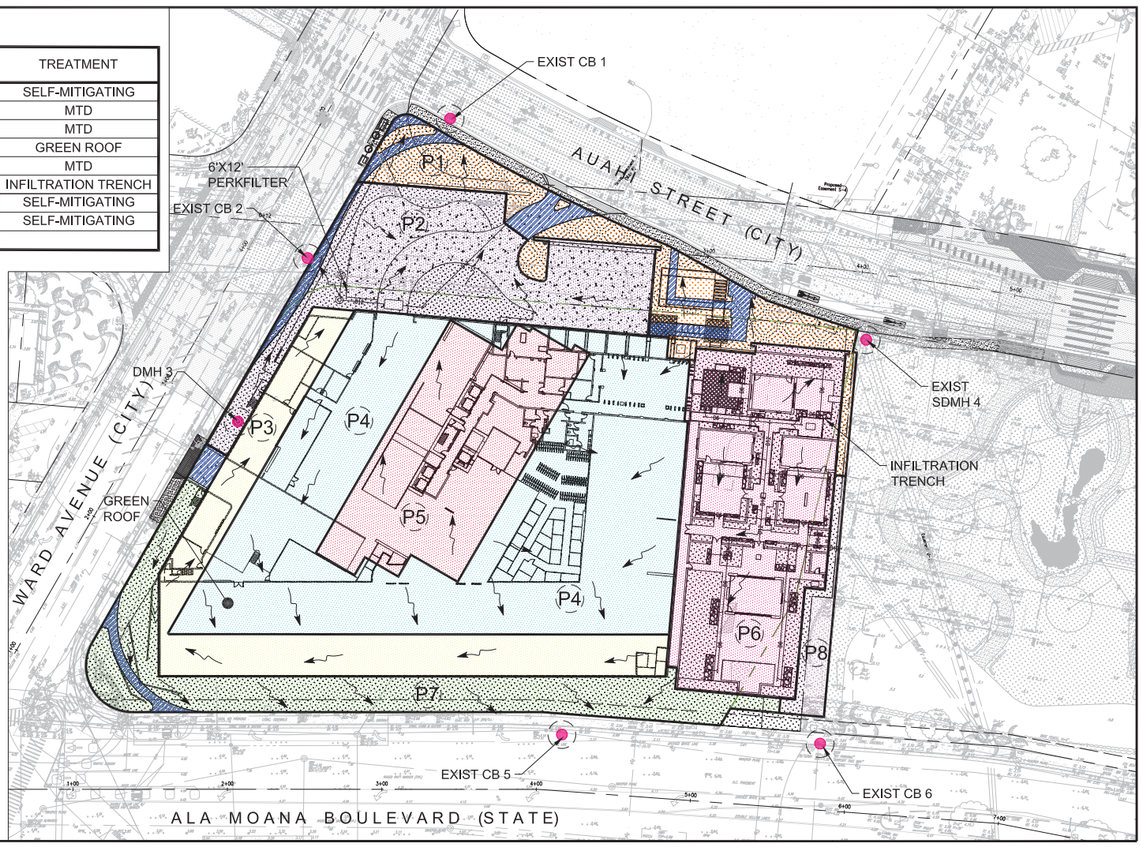


FIGURE 3

STORM WATER QUALITY ANALYSIS

BLOCK B / HONOLULU, O`AHU, HAWAI`I

Hawaiian Electric Company

Request Letter and Will Serve Letter

Ronald N. S. Ho & Associates, Inc. electrical engineers
Sean K. Sugai, P.E. • Steven H. Sakai, P.E. • Dennis I. Toba, P.E. • Ronald N. S. Ho, P.E. • Gary I. Funasaki, P.E

24 March 2021

Hawaiian Electric Co.
820 Ward Avenue
Honolulu, HI 96840

RECEIVED
MAR 29 2021
WILSON OKAMOTO CORPORATION

Attention: Eric Shimono, P.E.

Project: Ward Village Block B Utility Assessment

Enclosures: (a) Block B Concept Site Plan
(b) TMK No. 2-3-001:128

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block B development (TMK No. 2-3-001:128). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 320 dwelling units. Based on a diversified per unit demand load of 5 kVA, the preliminary peak demand load would be 1,600 kVA. This peak demand load is for planning purposes and it should be noted that the building load, when calculated based on the currently enforced edition of the National Electrical Code, will be higher than this calculation. Please advise on the following:

1. HECO's preferred service connection point for this development. We understand that off-site improvements will be required to provide sufficient capacity to service this development. The off-site improvements include 6-6"C electrical on Auahi Street which will be constructed in a separate off-site project preceding the construction of this property and 4-6"C electrical on Ward Avenue to the HECO building service equipment. Please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

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

2153 North King Street #201 • Honolulu, Hawaii 96819 • Tel (808) 941-0577 • E-mail: postmaster@rnsha.com • Website: www.rnsha.com

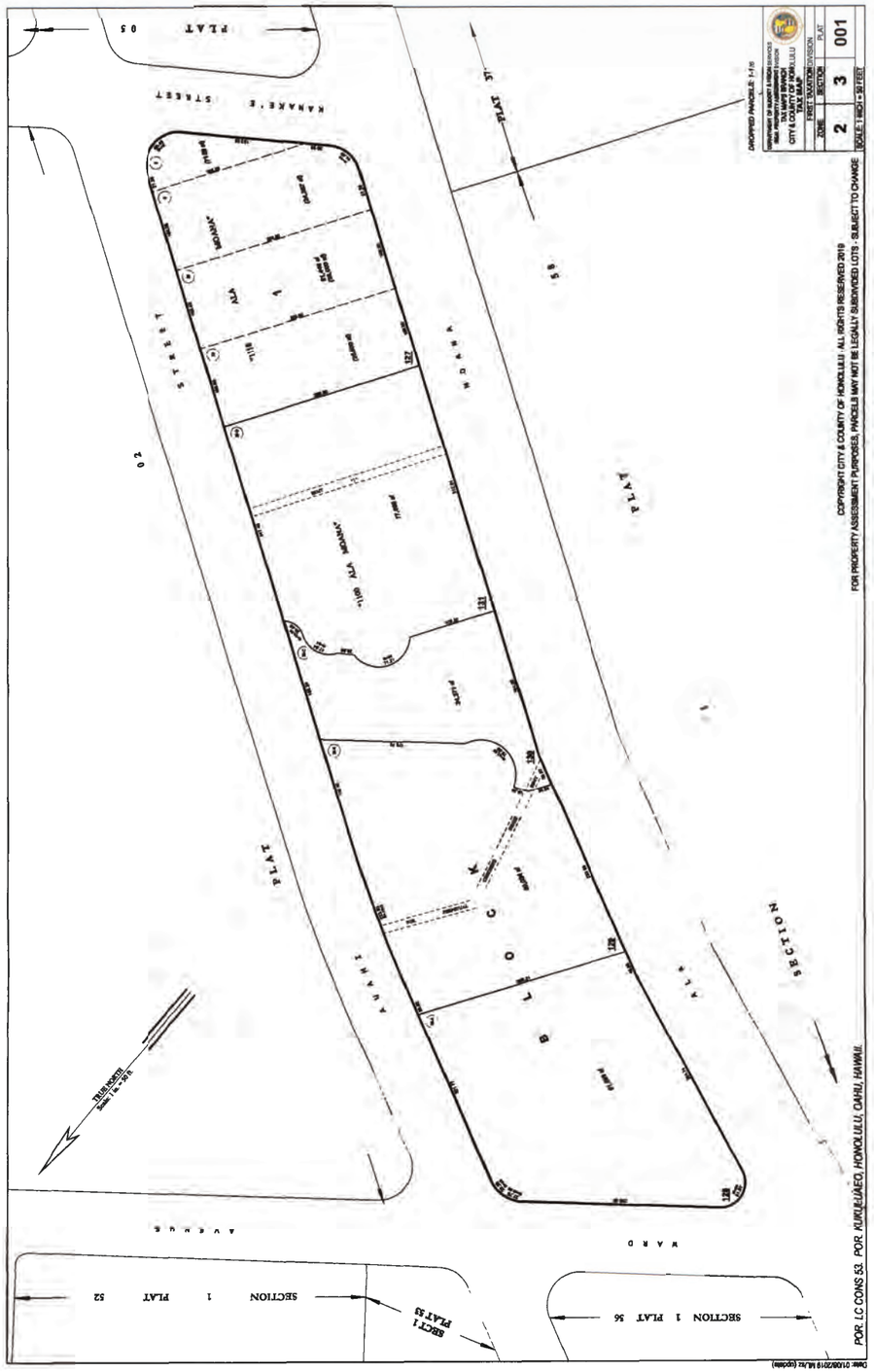
Hawaiian Electric Co.
Project: Ward Village Block B Utility Assessment
Page – 2

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

Very truly yours,

Scott Shiraishi

cc: Gary Fukumoto, HECO
Kevin Goto, WOC



April 19, 2021

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

Dear Mr. Sakai:

Re: Ward Village – Block B

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

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

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

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

Sincerely,

Shimono, Eric
Digitally signed by Shimono, Eric
Date: 2021.04.20 00:18:02 -10'00'

Eric Shimono
Acting Supervisor
Transmission and Distribution Engineering Department
Engineering Division

ES:es

Hawaiian Telcom

Request Letter and Assessment Letter

Ronald N. S. Ho & Associates, Inc. *electrical engineers*

Sean K. Sugai, P.E. • Steven H. Sakai, P.E. • Dennis I. Toba, P.E. • Ronald N. S. Ho, P.E. • Gary I. Funasaki, P.E

24 March 2021

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

RECEIVED
MAR 29 2021
WILSON OKAMOTO CORPORATION

Attention: Ms. Cassandra Yamamoto

Project: Ward Village Block B Utility Assessment

Enclosures: (a) Block B Concept Site Plan
(b) TMK No. 2-3-001:128

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block B development (TMK No. 2-3-001:128). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 320 dwelling units. Based on these figures and assuming conventional telecommunications provisioning, it appears that, for planning purposes, approximately 520 telephone pairs would be required. Please advise on the following:

1. We understand that HTCO's distribution system in the area has sufficient capacity to provide service to this development. Off-site improvements will include 6-4"C telecommunication conduits on Auahi Street, which will be constructed in a separate off-site project preceding the construction of this property and 2-4"C telecommunication conduits providing service to this site. Please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

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

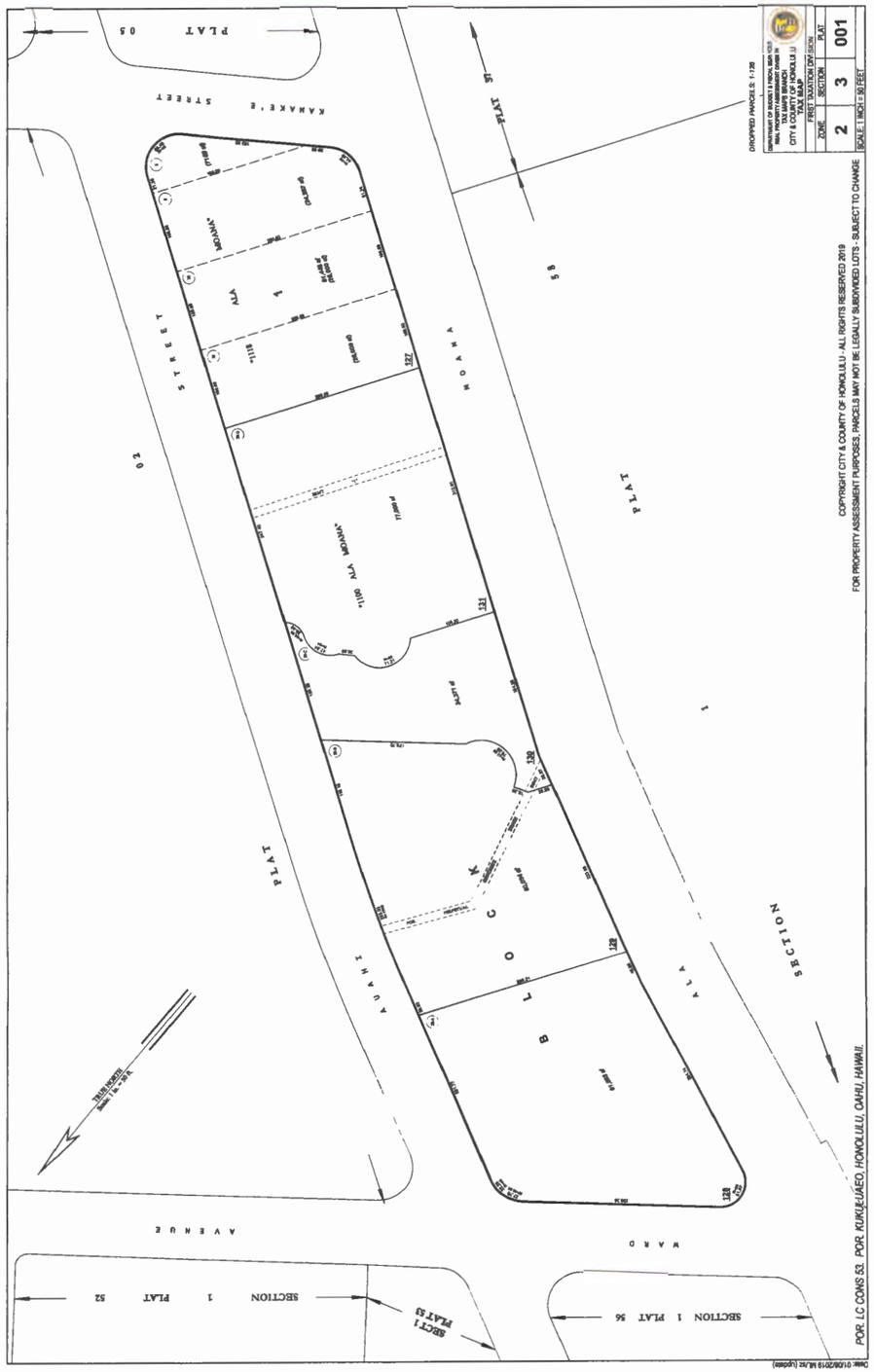
2153 North King Street #201 • Honolulu, Hawaii 96819 • Tel (808) 941-0577 • E-mail: postmaster@rnsha.com • Website: www.rnsha.com

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

Very truly yours,

Scott Shiraishi

cc: Tracy Hiyane, HTCO
Kevin Goto, WOC



Hawaiian Telcom

April 8, 2021

Scott Shiraishi
Ron Ho & Associates
2153 North King Street
Honolulu, HI 96819

Subject: Will Serve Letter
Project: Ward Village Block B
TMK: No. 2-3-001:128

Aloha Mr. Shiraishi,

Thank you for sharing information on the Ward Village Block B, located at TMK: No. 2-3-001:128 , in Honolulu. We are excited to be a part of the development and would gladly provide access to Hawaiian Telecom's phone, high speed internet and digital television to this new location.

We have received your conceptual site plans and will provide our review and comments as requested.

If you have any questions, please do not hesitate to contact me at (808) 546-1355 or email kalani.andrade@hawaiiantel.com.

Sincerely,

Kalani Andrade

Kalani Andrade
Hawaiian Telcom
Sr. Manager - Strategic Programs
Network Development

Charter Communications aka Spectrum

Utility Assessment Request Letter and Email Correspondence

Ronald N. S. Ho & Associates, Inc. electrical engineers
Sean K. Sugai, P.E. • Steven H. Sakai, P.E. • Dennis I. Toba, P.E. • Ronald N. S. Ho, P.E. • Gary I. Funasaki, P.E

24 March 2021

Charter Communications
200 Akamainui Street
Mililani, HI 96789

RECEIVED
MAR 29 2021
WILSON OKAMOTO CORPORATION

Attention: Mr. Mitchell Miyoshi

Project: Ward Village Block B Utility Assessment

Enclosures: (a) Block B Concept Site Plan
(b) TMK No. 2-3-001:128

Please be advised that we are working with Wilson Okamoto Corporation who is under contract to Howard Hughes Corporation to develop a utility assessment report for the Block B development (TMK No. 2-3-001:128). Please find attached for your review and comment enclosure (a) and enclosure (b) which indicate the conceptual site plan and location. It is currently anticipated that the building will consist of 320 dwelling units. Please advise on the following:

1. Charter's preferred service connection point for this development. We understand that Charter's distribution system in the area has sufficient capacity to provide service to this development. Off-site improvements will include 3-4"C CATV conduits in Auahi Street, which will be constructed in a separate off-site project preceding the construction of this property and 2-4"C CATV conduits on Ward Avenue, with 1-4"C CATV conduit providing service to this site. Please advise as to the nature and scope of the improvements and whether the Developer might be expected to participate in the cost of these off-site improvements. If the Developer's cost participation is anticipated, please provide an order-of-magnitude budget of the cost.

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

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

Very truly yours,

Scott Shiraishi

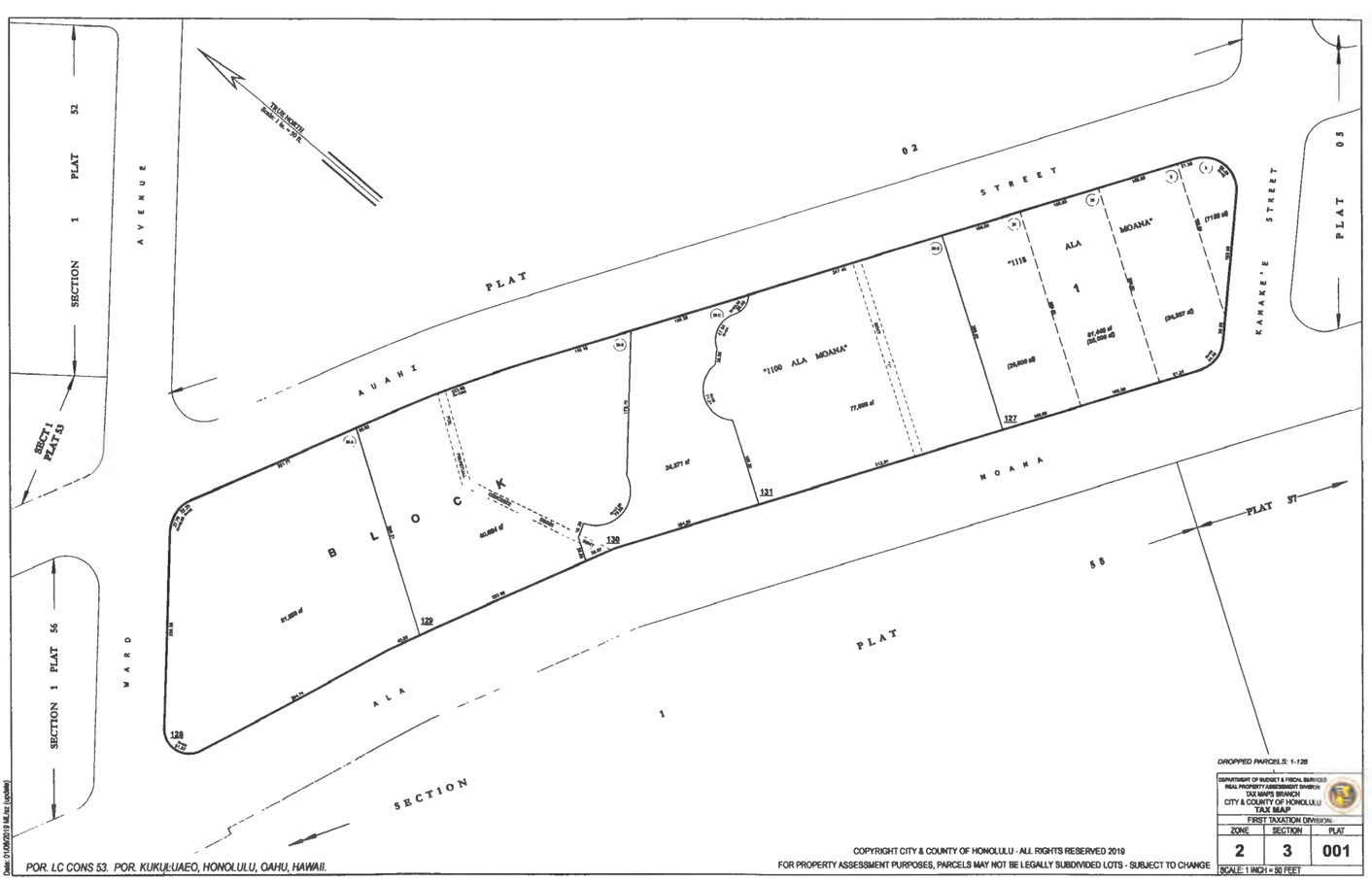
cc: Randy Makizuru, Charter
Kevin Goto, WOC

2153 North King Street #201 • Honolulu, Hawaii 96819 • Tel (808) 941-0577 • E-mail: postmaster@rnsha.com • Website: www.rnsha.com

LEVEL 1 - OVERALL PLAN

LEGEND

1. ENTRY DRIVE
2. ARRIVAL COURT
3. DROP OFF ZONE
4. PEDESTRIAN ENTRY
5. ARRIVAL COURT SCREEN WALL
6. LOBBY/SECURITY
7. LOBBY COURTYARD
8. COURTYARDS
9. ELEVATORS
10. GARAGE ENTRY
11. BUS STOP



From: Scott Shiraishi <SShiraishi@rnsha.com>
Sent: Thursday, April 8, 2021 6:24 AM
To: Rika Okino
Cc: Kevin Goto; Dustin Nakamoto; Steve Sakai
Subject: FW: Ward Village Block B Will Serve Letter
Attachments: HHC Block B.pdf; CATV point of connection Block B.png

Rika,
Please see the attached PDF drawings and Spectrum's response below to our Block B Will Serve request.

-scott

From: Makizuru, Randy T <Randy.Makizuru@charter.com>
Sent: Wednesday, April 7, 2021 11:53 AM
To: Scott Shiraishi <SShiraishi@rnsha.com>
Cc: Steve Sakai <SSakai@rnsha.com>
Subject: RE: Ward Village Block B Will Serve Letter

Hello Scott,

Please see attached drawing of the existing infrastructure surrounding the proposed Block B project. Spectrum is currently sharing space through HT conduits on Ward Ave and are on the HECO poles along Auahi ST. Spectrum has UG conduits and manholes along Ala Moana Blvd.
Our point of connection was indicated on the drawing created by Dustin Nakamoto of your office. I've attached a copy of that drawing. We are open to having our input brought in from any point along Auahi ST if necessary. We have both coax and fiber facilities surrounding Block B
to provide CATV, DATA and Telephone services.

According to Dustin's drawing the proposed Block B project would encompass the relocation of our aerial facilities to underground. The UG infrastructure would be the responsibility of the developer. Depending on the contract for the Block B project relocation cost would be applicable.

Should you have any questions or need anything clarified, please let me know.

Thank you,
Randy Makizuru
Spectrum Oceanic
Engineering
#625-8346

From: Scott Shiraishi <SShiraishi@rnsha.com>
Sent: Wednesday, April 7, 2021 7:31 AM
To: Miyoshi, Mitch M <Mitch.Miyoshi@charter.com>
Cc: Makizuru, Randy T <Randy.Makizuru@charter.com>; Steve Sakai <SSakai@rnsha.com>
Subject: [EXTERNAL] Ward Village Block B Will Serve Letter

CAUTION: The e-mail below is from an external source. Please exercise caution before opening attachments, clicking links, or following guidance.

Mitch,
Please find the attached PDF copy of the Block B Will Serve letter that was sent as a hardcopy last month. Just wanted to follow up if you could help provide us with a formal response to the letter. Thanks!

Scott Shiraishi, P.E., LEED AP$_{BD+C}$
Project Manager
Ronald N.S. Ho & Associates, Inc.
T: (808) 941-0577 | D: (808) 379-1682
sshiraishi@rnsha.com | www.rnsha.com

Engineering • Construction Management • Energy Solutions

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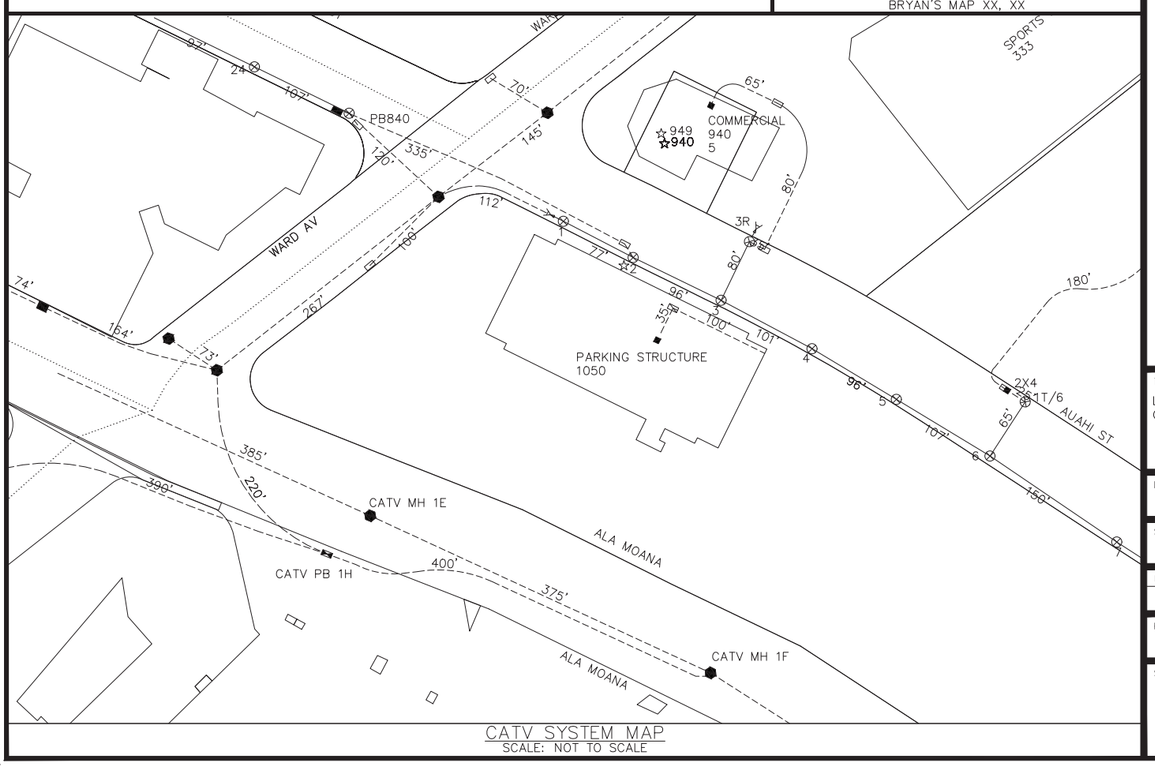
NOTES:

SPECTRUM HAS BOTH COAX AND FIBER FACILITIES ALONG AUAHI ST., WARD AVE., AND ALA MOANA BLVD.
OUR POINT OF CONNECTION FOR THE PROPOSED BLOCK B SITE WAS INDICATED ON THE DRAWING CREATED BY DUSTIN NAKAMURA OF YOUR OFFICE. PLEASE SEE ATTACHED.

LOCATION MAP
BRYAN'S MAP XX, XX



CATV SYSTEM MAP
SCALE: NOT TO SCALE

FILENAME : HHC Block B.dwg
PLOT SCALE: 1:1

200 AKAMAINUI STREET
MILILANI, HI 96789-3999
PHONE # (808) 625-2100

HHC BLOCK B
AUAHI STREET
KAKAAKO, HONOLULU

TITLE:
LOCATION MAP
CATV SYSTEM MAP

DATE: 04-07-2021

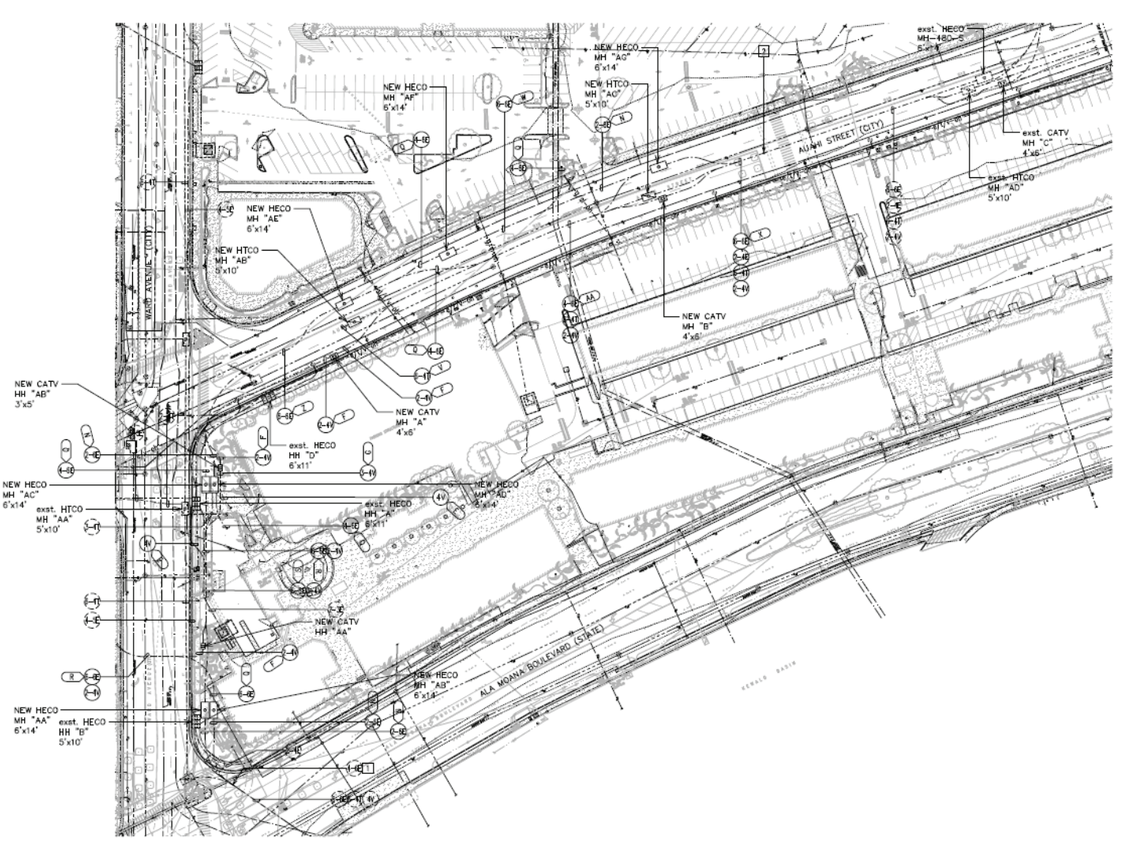
SCALE: NTS

DES. BY	DR. BY	CHK. BY
	RM	RM

PROJECT NO:

SHEET NO: 1

1 OF 1 SHEETS



ELECTRICAL SITE PLAN
SCALE: 1"=40'

SCALE: 1"=40'
GRAPHIC SCALE

WILSON OKAMOTO CORPORATION
1907 South Beretania Street Suite 400
Honolulu, Hawaii 96826
PH 808-946-2277 FX 808-946-2253

PROJECT ID

BLOCK F AND BLOCK A OFF-SITE ELECTRICAL

HONOLULU, OAHU, HAWAII

CONSULTANT

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 221
Honolulu, Hawaii 96819

RONALD N. S. HO & ASSOCIATES
LICENSED PROFESSIONAL ENGINEER
No. 14370-E
HAWAII, U.S.A.

DESIGNED BY: DN	SUPERVISED BY: SS
DRAWN BY: CAD	CHECKED BY: SS
CAD FILE:	PROJECT NO.: 5205405
SCALE: AS NOTED	DATE: APRIL 2020

REV	DATE	DESCRIPTION

SHEET TITLE
ELECTRICAL SITE PARTIAL PLAN 2

DRAWING NO.
EB.03

Z:\AUAHI HHC\DWG\5205405.EB03-ELEC-SITE PLAN-2 8/20/2020 12:40PM DNakamoto

Hawaii Gas

Email Correspondence

From: Yamamoto, Keith <kkyamamo@hawaiigas.com>
Sent: Tuesday, December 29, 2020 1:57 AM
To: Rika Okino
Cc: Cara Itai; Kevin Goto
Subject: RE: Ward Village Block B - Gas Availability
Attachments: Block B-269322-HG-APPPS-P.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Rika,

There is a 2" main on Auahi Street and a 1-1/4" main on Ala Moana Boulevard that could serve the project. Please see attached gas map.

Thanks.

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

HAWAI'I GAS
THE CLEAN ENERGY COMPANY

From: Rika Okino <ROkino@wilsonokamoto.com>
Sent: Wednesday, December 23, 2020 8:39 AM
To: Yamamoto, Keith <kkyamamo@hawaiigas.com>
Cc: Cara Itai <CItai@wilsonokamoto.com>; Kevin Goto <kgoto@wilsonokamoto.com>
Subject: Ward Village Block B - Gas Availability

Hi Keith,

Howard Hughes is proposing a new Ward Village tower project, Block B. See the attached figure for the location. The proposed unit count is 350 (140 *1-bed*, 140 *2-bed*, and 70 *3-bed*). We do not have any gas loads at this time.

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

Please let us know if you have any questions.

Thanks,
Rika Okino
Civil Engineer

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

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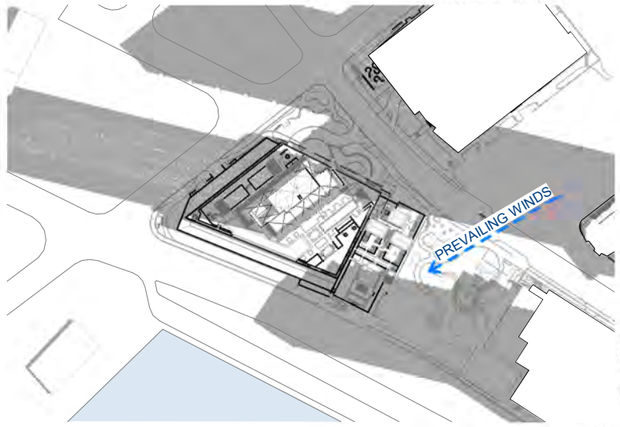
APPENDIX F

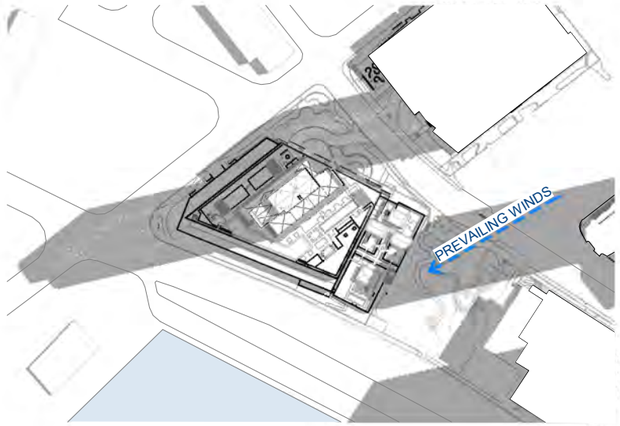
Shadow & Wind Studies



MARCH 22 9:00AM

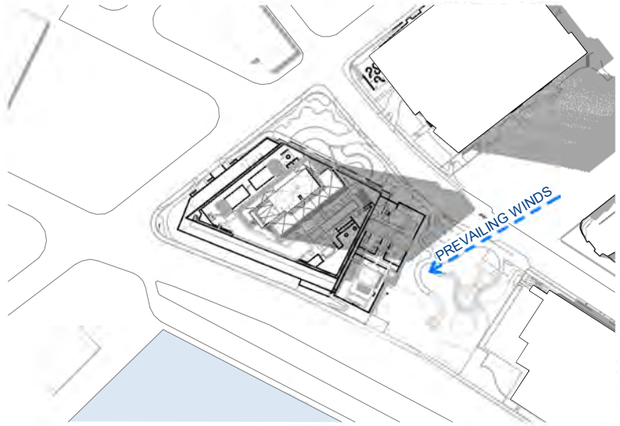
MARCH 22 12:00PM

MARCH 22 3:00PM



JUNE 22 9:00AM

JUNE 22 12:00PM



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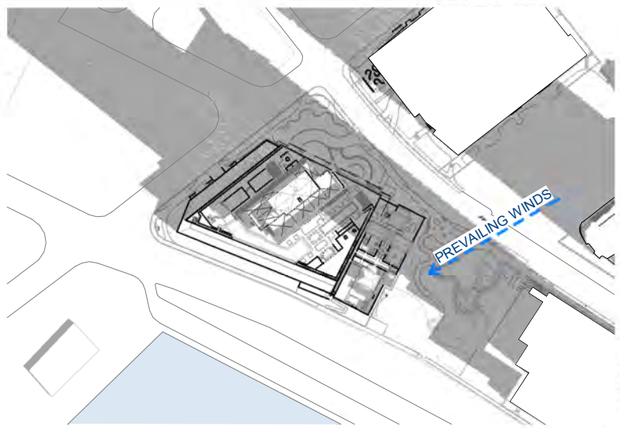
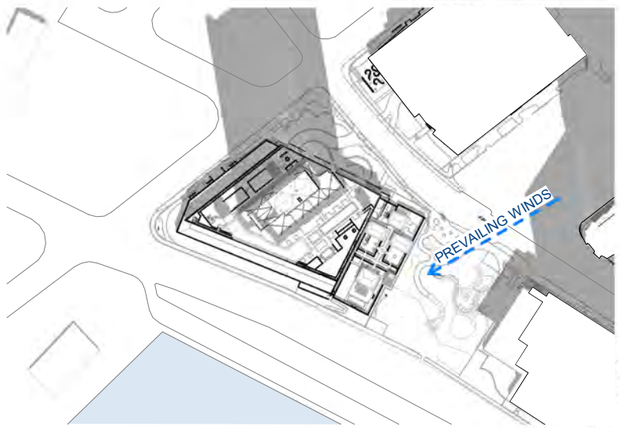
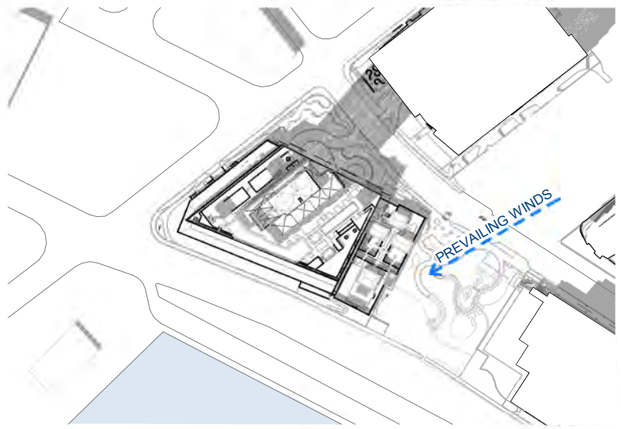


DECEMBER 22 9:00AM



DECEMBER 22 12:00PM



DECEMBER 22 3:00PM

SCB

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PROJECT NAME: KALAE **DATE:**

PROJECT NO: 2018032 **DTL./SHT. REF.:** **REV.:**

DRAWING TITLE: SHADOW STUDY **SHEET** of **C1.20**

Architecture Planning Interior Design 625 N. Michigan Ave. Chicago, IL 60611 T 312.896.1100 F 312.896.1200

APPENDIX G

Wind Consultant Letter

600 Southgate Drive
Guelph, ON N1G 4P6
Canada

Tel: +1.519.823.1311
Fax: +1.519.823.1316

July 9, 2021

Jim Miller, CFA
THE HOWARD HUGHES CORPORATION
1240 Ala Moana Boulevard, Suite 200
Honolulu, HI 96814
Jim.Miller@howardhughes.com

Re: Pedestrian Wind Conditions
Ward Village Block B
Honolulu, Hawaii
RWDI Reference No. 2100474

Dear Mr. Miller,

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

The proposed development includes a 400 ft residential tower located on the northeast corner of Ala Moana Blvd and Ward Ave. Winds around the proposed development will be simulated in one of RWDI's boundary-layer wind tunnels for the existing and proposed building configurations by using a scale model of the study building and its surroundings. The wind study will focus on frequently used pedestrian areas such as main entrances, sidewalks and outdoor seating areas at both the grade and podium levels. Wind tunnel measurements for 36 wind directions will be taken at key pedestrian areas, and will be combined with the long-term weather data collected from the nearby Honolulu International Airport to predict the wind speeds and frequencies in full scale. These data will then be compared with the RWDI wind comfort and safety criteria to determine if they are appropriate for the intended usage of the pedestrian areas on and around the development. Immediately following the wind tunnel tests, a report will be issued to summarize our main findings through tables and figures. Wind mitigation measures will be provided for areas where higher-than-desired wind speeds are detected.

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

Respectfully submitted by:

Analene Belanger

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

This document is intended for the sole use of the party to whom it is addressed and may contain information that is privileged and/or confidential. If you have received this in error, please notify us immediately.
® RWDI name and logo are registered trademarks in Canada and the United States of America.

APPENDIX H

Acoustical Consultant Letter

CENSEO
AV+Acoustics

KAILUA | DENVER | SEATTLE

Sound Advice in a World Full of Noise

June 24, 2021,

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

Re: Ward Village – Block B (#21074)
Report #1: HCDA Noise Impact Summary

Dear Ms. Kuo,

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

Project Description

This 38-story high rise housing development includes 33 floors of residential units, 1 floor of tenant amenities, and 4 floors of parking garage.

Potential Noise Sources

Vehicular Traffic and Rail Transit Noise

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

Once the Honolulu Authority of Rapid Transit (HART) system is operational, rail-transit noise will also be present. The rail alignment of the future Honolulu Authority of Rapid

Transit (HART) system is expected to be over 400 feet away from the Block B residential tower. Existing and future buildings provide a partial sound barrier effect to the Block B project site. Rail noise is expected to be minimal at the Block B project, however, it is recommend that the design consultant further evaluate rail and vehicular traffic noise and that these noise sources be considered with the building shell design.

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

Construction Noise

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

Building Operational and Mechanical Noise

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

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

Parking Structure

The project includes a parking structure for residents. It is recommended that parking level demising walls and parking structure ceiling assembly be designed to reduce noise build-up within the parking structure and limit noise “bleeding” into nearby occupied spaces or to adjacent buildings. Of particular concern are parking levels under and adjacent to amenity spaces. The design team should also review the potential noise impact of the Loading Area to the building and adjacent buildings.

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

Amenity Level Noise

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

Project Design Intent for Noise Mitigation

It is recommended that noise mitigation recommendations be made throughout the design phases, as well as during the construction phase, where applicable. The purpose of these recommendations is to minimize the number of noise related complaints from the future residents of Block B as well as from the neighboring buildings.

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

Best Regards,

Christopher Ono, PE, CTS
Senior Engineer
CENSEO AV+Acoustics LLC