DAVID Y. IGE
GOVERNOR

FILE COPY
JAN 08 2018

HAKIM OUANSAFI
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
HAWAII PUBLIC HOUSING AUTHORITY
1002 NORTH SCHOOL STREET
POST OFFICE BOX 17907
Honolulu, Hawaii 96817
FAX: (808) 832-4679

BARBARA E. ARASHIRO
EXECUTIVE ASSISTANT

IN REPLY PLEASE REFER TO:
17-OED-68

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

December 21, 2017

MEMORANDUM

TO: Mr. Scott Glenn, Director
Office of Environmental Quality Control
Department of Health

FROM: Hakim Ouansafi, Executive Director
Hawaii Public Housing Authority

SUBJECT: Transmittal of Documents for the Draft Environmental Impact Statement (DEIS) for the HPHA Administrative Offices Redevelopment Project situated at TMK (1) 1-6-009:003 (por.)

The Hawaii Public Housing Authority (HPHA) hereby transmits the documents package for the draft environmental impact statement (DEIS) for the HPHA Administrative Offices Redevelopment Project situated at TMK (1) 1-6-009:003 (por.) in the Honolulu District on the island of O'ahu, for publication of a notice of availability for public comment for 45-days in the next available edition of the Environmental Notice. The DEIS has included copies of all written and online comments received during the scoping meeting held on September 12, 2017 and during the 30-day public consultation period for the Act 172-12 EISPN ("Direct to EIS").

Also enclosed is a searchable Adobe Acrobat PDF version of the distribution list to be verified by OEQC under Section 11-200-20, Hawai'i Administrative Rules. We kindly request OEQC's adjustments to the list within enough time so that we are able to make the necessary copies of the DEIS for those on the distribution list and that they will have the full 45-day statutory period to review and comment on the DEIS.

Finally, enclosed is a completed hard copy of the OEQC Publication Form, one (1) hard copy of the draft EIS, three (3) searchable Adobe Acrobat PDF files of the same, and an electronic copy of the publication form in MS Word format.

If there are any questions, please contact Mr. Kevin Auger with HPHA at kevin.d.auger@hawaii.gov and (808) 832-4672 or Mr. Greg Nakai with PBR HAWAII at HPHAschoolstreet@pbrhawaii.com and (808) 521-5631.

Enclosures

18-264

AGENCY
PUBLICATION FORM

Project Name:	Hawaii Public Housing Authority Administrative Offices Redevelopment
Project Short Name:	HPHA Administrative Offices Redevelopment
HRS §343-5 Trigger(s):	Use of State or County lands and funds.
Island(s):	O'ahu
Judicial District(s):	Honolulu
TMK(s):	1-6-009:003 (por.)
Permit(s)/Approval(s):	Rezoning or 201H, HRS Zoning Waiver (if not Rezoning or 201H, HRS) Grubbing, Grading, and Stockpiling Permit; Building Permit for Building, Electrical, Plumbing, Water, Sidewalk/Driveway and Demolition work; Sewer Connection Permits; Street Usage Permit; National Pollutant Dishcarge Ellimination System (NPDES) Permit; Noise Permit; Permit to Perform Work within a State Right of Way; Historic Site Review
Proposing/Determining Agency:	Hawaii Public Housing Authority (HPHA)
Contact Name, Email, Telephone, Address	Mr. Hakim Ouansafi, Executive Director Hakim.Ouansafi@hawaii.gov Telephone: (808) 832-4682 Hawaii Public Housing Authority (HPHA) 1002 N. School Street Honolulu, HI 96817
Accepting Authority:	Governor, State of Hawai'i
Contact Name, Email, Telephone, Address	The Honorable David Y. Ige http://governor.hawaii.gov/contact-us/contact-the-governor/ Telephone: (808) 586-0034 Governor, State of Hawai'i Executive Chambers, State Capitol 415 South Beretania Street Honolulu, Hawai'i 96813
Consultant:	PBR HAWAII & ASSOCIATES, Inc.
Contact Name, Email, Telephone, Address	Mr. Greg Nakai, Planner HPHAschoolstreet@pbrhawaii.com Telephone: (808) 521-5631 Fax: (808) 523-1402 PBR HAWAII & Associates, Inc. 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813 *Comments may also be submitted online at: http://schoolstreet.hpha.commentinput.com/

Status (select one)	**Submittal Requirements**
____ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
____ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2)

	this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
___ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
_X_ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or non-acceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
____FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.
____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

Hawaii Public Housing Authority (HPHA) has partnered with Retirement Housing Foundation to redevelop the property into a mixed-use community to increase the amount of affordable housing provided in this bus transit-available neighborhood. The project proposes the replacement of the existing HPHA administrative offices with a new HPHA administrative office building; 800 affordable senior rental apartments; commercial space; vehicular access via existing driveways; parking; open spaces and new landscaping.

The use of State lands and funds triggers Chapter 343, HRS compliance, requiring either an Environmental Assessment or an Environmental Impact Statement (EIS). Based on the significance criteria set forth under HAR Section 11-200-12(b), HPHA determined that the preparation of an EIS is required and published an EIS preparation notice (EISPN), as allowed under Act 172-12, in August 2017. This draft EIS includes comments received from the public EIS scoping meeting and the 30-day public comment period following the EISPN publication. This draft EIS intends to assess both short-term and long-term potential impacts of the proposed redevelopment as well as include a discussion of reasonable development alternatives to the proposed action.

Hawaii Public Housing Authority Administrative Offices Redevelopment

Draft Environmental Impact Statement

Proposing Agency:

Hawaii Public Housing Authority

Accepting Authority:

Governor, State of Hawai'i

Prepared by:

PBR HAWAII & ASSOCIATES, INC.

December 2017

HAWAII PUBLIC HOUSING AUTHORITY ADMINISTRATIVE OFFICES REDEVELOPMENT

Draft Environmental Impact Statement

Proposing Agency:

HAWAII PUBLIC HOUSING AUTHORITY

This document and all ancillary documents were prepared under my direction and in accordance with the content requirements of Chapter 343, Hawai'i Revised Statutes, and Title 11, Chapter 200, Hawai'i Administrative Rules.

Hakim Ouansafi, Executive Director	DEC 22 2017 Date

Accepting Authority:

GOVERNOR, STATE OF HAWAI'I

Prepared by:

PBR HAWAII & ASSOCIATES, INC.

December 26, 2017

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PREFACE

Preparation of an Environmental Impact Statement (EIS) is required pursuant to Chapter 343, Hawaiʻi Revised Statutes and Chapter 200, Title 11, State of Hawaiʻi Department of Health Administrative Rules, based on the use of State funds and State lands.

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SUMMARY SHEET

Brief Description of the Action - The Hawaii Public Housing Authority ("HPHA") will be partnering with Retirement Housing Foundation ("RHF") under a Master Development Agreement to redevelop a six-acre portion of an underutilized state-owned land parcel. The state-owned land currently houses HPHA's existing, inefficient and outdated administrative office and maintenance facilities. By consolidating HPHA's existing 13-building administrative campus into a single, efficiently designed, 30,000 square foot office building, occupying a significantly smaller footprint on the existing site, the balance of the remaining state land may be more effectively utilized to develop a new, mixed-use project containing 800, age-restricted, affordable rental housing units and ancillary commercial uses (hereinafter referred to as the "Proposed Project"). The Proposed Project is located at 1002 North School Street, Kapālama, Honolulu, Hawaiʻi, on a portion of parcel identified as TMK parcel number: 1-6-009:003 (por.), the present location of HPHA's administrative campus (hereinafter referred to as the "Project Site").

No public housing is included in the Proposed Project. All residential units within the Proposed Project will be designed and built as affordable senior rental housing which, in the context of identifying the persons intended to be served by such housing, would primarily include senior households whose incomes are between 30% and 60% of the area median income ("AMI"). The Proposed Project is essential for achieving the State of Hawai'i's legislative goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026, pursuant to Act 127, SLH 2016.

The Proposed Project is envisioned to be a cohesive community that combines a mix of residential, retail, commercial, and public office spaces in a compact, transit oriented development located nearby Downtown Honolulu's Primary Urban Center and existing concentrations of retail, commercial and medical facilities. The Proposed Project's unique mixed-use character and high-quality design will create a new community with comfortable streets for walking or biking, and a mix of uses complementary to the surrounding neighborhood. The Project Site also provides convenient access to public transportation including existing bus lines and two planned HART rail stations located less than one mile from the Project Site.

Significant Beneficial and Adverse Impacts – The beneficial impact of the Proposed Project is to provide 800 new, affordable senior rental housing units to address the critical demand for affordable housing in the State of Hawai'i and City of Honolulu. It is acknowledged that there are neighbors who oppose the Proposed Project due to concerns related to: increased traffic congestion and parking demand on surrounding streets, particularly during peak hours; strains on existing sewer capacity and infrastructure; changes in current view planes and channels due to the height of the various buildings comprising the Proposed Project; perceived negative impacts to property values and a potential for increased crime in the area due to an increase in population.

Proposed Mitigation Measures – The delivery of new, affordable rental housing units throughout the State of Hawai'i is critical. To balance this critical social need with local community concerns, the Proposed Project will be age-restricted to seniors only. No families or school-aged children will be allowed to reside in the residential units, thereby reducing traffic impact and parking concerns. As all residences will be age-restricted, most residents are likely to avoid peak traffic hours or are unlikely to drive at all. Accordingly, it is expected that the Proposed Project will generate significantly less peak-hour traffic demand than similar residential developments catering to working families with children. Nonetheless, the Proposed Project will integrate additional traffic mitigation measures designed and undertaken to specifically address these traffic concerns (see section 5.8). Most significantly, the Proposed Project has been scaled back from its originally proposed 1,000 residential units, to the current 800 residential units envisioned under the current Master Plan, which will be further restricted to affordable senior rental housing.

It is acknowledged, that the Project Site's current view plane will be affected to increase the existing density of the Project Site in order to provide as many units on-site as possible to meet the State of Hawai'i's critical demand for affordable rental housing. The Proposed Project will also benefit from planned infrastructure upgrades and improvements, particularly the Awa Street Wastewater Pump Station scheduled for completion in June 2020 (See Section 5.9), which will address existing inadequacies. Further, the Proposed Project is not anticipated to lower surrounding property values (see "Affordable Housing Brief" in Appendix A) or result in an increase in crime in the area as the conceptual Master Plan for the Proposed Project will embrace a "Complete Street" design approach (see Section 6.3.6) in order to create a comprehensive, integrated network of streets that are safe and convenient for all people whether traveling by foot, bicycle, transit, or automobile, regardless of age or ability.

Alternatives Proposals Considered – The alternatives considered included the following:

- "No Action";
- 1,000 total residential units (60% family, 40% senior units);
- 1,000 total residential units (40% family, 60% senior units); and
- 1,000 total residential units (100% senior units).

Unresolved Issues – The following is a list of the unresolved issues at the time of the preparation of this EIS for the Proposed Project. Ongoing coordination with respective government agencies, community groups, and technical experts will continue to support the implementation of the Proposed Project. A full discussion of these unresolved issues is provided in Section 8.8.

- City and County of Honolulu's Complete Streets program
- City and County of Honolulu Land Use Permits Process

Compatibility with Land Use Plans and Policies, and List of Permits or Approvals - Public uses and structures are generally viewed as permitted uses, but require environmental review (such as this EIS). A preliminary list of approvals is provided below (pending final determinations from responsible agencies):

Honolulu City Council:
- Rezoning; or
- HRS 201H.

City and County of Honolulu Department of Planning and Permitting:
- Zoning Waiver (if not Rezoning or 201H, HRS as mentioned above)
- Grubbing, Grading, and Stockpiling Permit
- Building Permit for Building, Electrical, Plumbing, Sidewalk/Driveway, and Demolition Work
- Sewer Connection Permit

City and County of Honolulu Department of Transportation Services:
- Street Usage Permit

State of Hawaiʻi Department of Health:
- NPDES Permit
- Noise Permit

State of Hawaiʻi Department of Transportation:
- Permit to Perform Work within a State Right of Way

State Historic Preservation Division:
- Historic Site Review

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10/10/17

Project Site

"SUBJECT TO CHANGE"

SCALE (FEET)
0 20 40 80 160

North

FIGURE 1:
Conceptual Master Plan
HPHA Administrative Offices Redevelopment

Hawai`i Public Housing Authority
Island of O`ahu

DESIGN PARTNERS INCORPORATED
concordia
PBR HAWAII & ASSOCIATES, INC.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
ALISH	Agricultural Lands of Importance to the State of Hawaiʻi
AMI	Area Median Income
BMP	Best Management Practices
BWS	Honolulu Board of Water Supply
CCH	City and County of Honolulu
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CH_4	Methane
City	City and County of Honolulu
CMP	Construction Management Plan
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CZM	Coastal Zone Management
CWRM	Commission on Water Resource Management, State of Hawaiʻi
DAR	Division of Aquatic Resources, State of Hawaiʻi
dB	Decibels
dBA	Decibels in the "A-weighted scale" (normal hearing sensitivity range of the human ear)
DBEDT	Department of Business, Economic, Development, and Tourism, State of Hawaiʻi
DCAB	Disability and Communication Access Board, State of Hawaiʻi
DCCA	Department of Commerce and Consumer Affairs, State of Hawaiʻi
DEIS	Draft Environmental Impact Statement
DLNR	Department of Land and Natural Resources, State of Hawaiʻi
DNL	Day-night average sound level
DOH	Department of Health, State of Hawaiʻi
DOT	Department of Transportation, State of Hawaiʻi
DP	Development Plan, City and County of Honolulu
DPP	Department of Planning and Permitting, City and County of Honolulu
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
EJ	Environmental justice
ENV	Department of Environmental Services, City and County of Honolulu
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FEMA	U.S. Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FTA	Federal Transit Administration
GDP	Gross Domestic Product
GHG	Greenhouse Gas
gpd	Gallons per day

HAR	Hawaiʻi Administrative Rules
HART	Honolulu Authority for Rapid Transportation
HDOT	Department of Transportation, State of Hawaiʻi
HECO	Hawaiian Electric Company
HEER	Hazard Evaluation and Emergency Response, State of Hawaiʻi
HNL	Daniel K. Inouye International Airport
HPD	Honolulu Police Department
HPHA	Hawaii Public Housing Authority, State of Hawaiʻi
HRS	Hawaiʻi Revised Statutes
HRTP	Honolulu Rail Transit Project
HTCO	Hawaiian Telcom
H-POWER	Honolulu Program of Waste Energy Recovery
HUD	U.S. Department of Housing and Urban Development
ICAP	Center for Island Climate Adaptation and Policy
L_{dn}	Day-Night Noise Level
L_{eq}	Equivalent Noise Level
LSB	Land Study Bureau, University of Hawaiʻi
LID	Low Impact Development
LOS	Level of Service
LUC	Land Use Commission, State of Hawaiʻi
LUO	Land Use Ordinance, City and County of Honolulu
mgd	Millions of gallons per day
MSL	Mean Sea Level
mg/L	Milligrams per Liter
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination Systems
NRCS	U.S. Department of Agriculture Natural Resources Conservation Services
OEQC	Office of Environmental Quality Control, State of Hawaiʻi
OHA	Office of Hawaiian Affairs, State of Hawaiʻi
OCCL	Office of Conservation and Coastal Lands, State of Hawaiʻi
OTWC	Oceanic Time Warner Cable (now Spectrum)
PER	Preliminary Engineering Report
ppd	Pounds per day
PUC	Primary Urban Center, City and County of Honolulu
PV	Photovoltaics
RFP	Request for Proposal
RHF	Retirement Housing Foundation
RLS	Reconnaissance Level Survey
ROH	Revised Ordinances of Honolulu
ROW	Right-of-Way
SHPD	State Historic Preservation Division, State of Hawaiʻi
SIHP	Statewide Inventory of Historic Places, State of Hawaiʻi
SIWWTP	Sand Island Wastewater Treatment Plant
SLR	Sea Level Rise
SMA	Special Management Area
SOEST	University of Hawaiʻi School of Ocean and Earth Science and Technology

State PUC	State of Hawaiʻi Public Utilities Commission
SWMPP	Storm Water Management Program Plans
TAHA	Terry A. Hayes Associates, Inc.
TDM	Transportation Demand Management
TIAR	Transportation Impact Analysis Report
TMK	Tax Map Key
TMP	Traffic (Demand) Management Plan
tpy	Tons per year
TOD	Transit-Oriented Development
UH	University of Hawaiʻi
Sea Grant	Sea Grant College Program
UHERO	University of Hawaiʻi Economic Research Organization
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WQV	Water Quality Volume
WWB	Waste Water Branch, Department of Planning and Permitting, City and County of Honolulu
WWPS	Waste Water Pump Station
ZCTA	Zip Code Tabulation Area

1 STATEMENT OF PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 PURPOSE AND NEED

1.1.1 Project Need

The State of Hawai'i and City & County of Honolulu are currently experiencing a housing crisis. This crisis is the result of a severe shortage of affordable rental apartment units, particularly within proximity of downtown Honolulu, the civic and urban center of O'ahu. The 2015 installment of *Paycheck to Paycheck,* from the Center for Housing Policy at the National Housing Conference, ranked Honolulu the second most expensive residential rental market in the nation. This is due to an increasingly high demand for housing, coupled with a decades-low housing supply, limited land, and high production costs. As housing costs in Hawai'i continue to increase, the number of affordable apartments that are available continues to decline. Consequently, many residents are forced to relocate greater distances from their place of work in urban Honolulu, resulting in secondary impacts such as lengthening commute times, exacerbating traffic congestion, increasing pollution, social and environmental impacts associated with traffic congestion and a decreasing quality of life for commuters. In a worst-case scenario, some residents may be displaced altogether.

Senior citizens (age 65 or older) represent 22 percent of the 96817 Project Site Zip Code Tabulation Area population, significantly higher than the 15 percent for the island wide population. As of October 2017, HPHA currently had 763 individuals on its waiting list for senior housing at its Hale Po'ai and Hali'a Hale properties located across N. School Street from the Project Site, further demonstrating the urgent need for affordable senior rental housing in the Proposed Project area and justification for the development of the Proposed Project.

On June 29, 2016, SB2561, SD2, HD1, CD1, was signed into law as Act 127 (the "ACT"), Session Laws of Hawai'i (SLH), to address the affordable rental housing crisis by establishing an affordable rental housing goal, and establishing a Special Action Team on affordable rental housing ("SAT"). The SAT is chaired by the Director of the Office of Planning (OP) and its primary mission is to recommend actions to promote affordable rental housing. The primary goal of the ACT is to develop or vest the development of at least 22,500 affordable rental housing units, ready for occupancy, between January 1, 2017 and December 31, 2026.

According to the "Special Action Team on Affordable Rental Housing Report to the Hawai'i State Legislature in Response to Act 127, Session Laws of Hawai'i 2016" (State Office of Planning, 2016; see Appendix B):

> *Housing is considered "affordable" when a household spends less than 30 percent of their income on shelter and utilities. But affordable housing is a serious challenge for Hawai'i's low-income residents, who face one of the highest housing cost in the country. In a market with some of the most expensive for-sale homes in the county, 43% of the state's households must rent. This is even more difficult for Hawai'i's residents as rent increases, but wages have not kept pace. There is a sense of urgency in developing needed rental housing units, particularly for households in the rental housing "gap" group (i.e., those earning between 60% and 80% of the*

area median income (AMI)). The need for affordable housing is particularly acute for households with low incomes.

The Proposed Project specifically responds to this urgent need for developing affordable rental housing.

1.1.2 Project Purpose

HPHA's primary objective of the Proposed Project is to redevelop an underutilized State land asset to facilitate delivery of urgently needed new affordable rental units in an effort to help address the existing affordable housing crises across the State of Hawai'i. To accomplish this, HPHA proposes to consolidate its existing outdated and decentralized facilities onto a smaller footprint of the Project Site, thereby creating a much larger developable area that can be better utilized to develop 800 new, affordable senior housing rental units. The Proposed Project has the potential to significantly expand the number of quality, affordable rental apartments available in the community. The Project Site is an excellent candidate for the proposed development given its location: (i) in the urban core of Honolulu, which is highly consistent of the City and County of Honolulu's General Plan, (ii) in an existing bus-transit available neighborhood (iii) is just over ½ mile from both the Kapālama and Iwilei planned Honolulu Rail Transit Project ("HART") Stations. The current Master Plan for the Proposed Project also envisions incorporating retail and commercial uses at street level of the new buildings, complimenting existing area uses, and providing necessary services for area residents. The Proposed Project is expected to result in a reinvigorated community that is walkable, incorporates well connected thoroughfares, well designed recreational spaces, green building and sustainability concepts, and thoughtful consideration to equitable Transit Oriented Development ("TOD") design and "Complete Street" principles. In summary, it is a transformative project with the potential for far-reaching and positive impacts well beyond the boundaries of the Project Site.

1.1.3 Hawai'i Public Housing Authority

The proposing agency is the Hawaii Public Housing Authority (HPHA), a public body and a body corporate and politic of the State of Hawai'i established by the Territory of Hawai'i in 1935. HPHA's primary mission is to provide safe, decent, and sanitary housing for low-income residents of the State of Hawai'i. HPHA is governed by the Hawai'i State Legislature under Chapter 356D, Hawai'i Revised Statutes ("HRS") and is the sole statewide public housing agency in the State of Hawai'i. Guided by an eleven-member Board of Directors appointed by the Governor, HPHA's efforts are focused on developing public and affordable rental and supportive housing, and the efficient and fair delivery of housing services to the people of Hawai`i, without discrimination. HPHAs Federal and State Low-Income Public Housing and rental assistance programs currently serve over 10,000 families, totaling more than 27,000 individuals.

In January 2015, through an open procurement process, HPHA issued a solicitation ("Request for Proposal" or "RFP") seeking a developer to work with the agency under a public private partnership to redevelop of HPHA's existing administrative offices with a new, mixed-use project that includes new offices for HPHA and affordable housing on the balance of the Project Site. Several developers submitted proposals in response to the RFP. After a careful and lengthy review, HPHA selected Retirement Housing Foundation as its development partner for the Proposed Project.

1.1.4 Retirement Housing Foundation

Retirement Housing Foundation is a non-profit organization of 191 communities and nearly 2,800 employees located in 29 states, Washington, D.C., Puerto Rico, and the U.S. Virgin Islands. Founded in 1961, Retirement Housing Foundation provides housing and services to more than 21,500 older adults, low-income families, and persons with disabilities. Retirement Housing Foundation is one of the largest organizations in the United States devoted to building and preserving affordable housing for the most vulnerable members of society.

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2 SUMMARY

This Draft Environmental Impact Statement (DEIS) has been prepared in accordance with Chapter 343, Hawaiʻi Revised Statutes (HRS), Title 11, Chapter 200, Hawaiʻi Administrative Rules (HAR) for a proposed redevelopment of HPHA's existing Administrative Offices on a state owned land site. The Proposed Project Site is located in the Kapālama and Honolulu ahupuaʻa, island of Oʻahu, State of Hawaiʻi. Figure 2 shows the location of the property. Figure 3 shows an aerial photograph of the site and Figure 4 is the tax map.

2.1 PROJECT PROFILE

Name:	Hawaii Public Housing Authority Administrative Offices Redevelopment
Judicial District:	Honolulu Judicial District, Oʻahu
Tax Map Key (TMK):	1-6-009:003 (por.) (Figure 4)
Proposing Agency:	State of Hawaiʻi, HPHA
Accepting Authority:	Governor, State of Hawaiʻi
Land Area:	Approximately 6 acres
Existing Use:	Offices, parking and base yard
Proposed Action:	HPHA is proposing to redevelop its Administrative Offices complex, which will include replacement HPHA offices, 800 affordable senior apartments and complimentary neighborhood commercial-type uses.
Land Use Designations:	State Land Use District: Urban Primary Urban Center Development Plan: "Lower Density Residential" City and County of Honolulu Zoning District: R-5 Residential (Figure 5)
Special Management Area (SMA):	Not located in the SMA

Major Anticipated Approvals/Issuing Body:

Honolulu City Council:
- Rezoning; or
- HRS 201H.

City and County of Honolulu Department of Planning andPermitting:

- Zoning Waiver (if not Rezoning or 201H, HRS as mentioned above)
- Grubbing, Grading, and Stockpiling Permits
- Building Permits for Building, Electrical, Plumbing, Sidewalk/Driveway, and Demolition Work
- Sewer Connection Permits

City and County of Honolulu Department of Transportation Services:
- Street Usage Permit

State of Hawaiʻi Department of Health:
- National Pollutant Discharge Elimination System (NPDES) Permit
- Noise Permit

State of Hawaiʻi Department of Transportation:
- Permit to Perform Work within a State Right of Way

State Historic Preservation Division:
- Historic Site Review

Alternatives Considered:

- No Action
- 1,000 total residential units (60% family, 40% senior units)
- 1,000 total residential units (40% family, 60% senior units)
- 1,000 total residential units (100% senior units)

2.2 LOCATION

The Proposed Project is located at 1002 North School Street, Kapālama, Honolulu, Hawaiʻi.

2.3 LAND OWNERSHIP

The land under the Project Site is owned by the State of Hawaiʻi and is "leased to" HPHA per Executive Order No. 1274.

2.4 SURROUNDING USES

The Project Site is bounded on two sides by existing streets: North School Street and Lanakila Avenue (Figure 3). The site consists of a portion of one parcel identified as TMK: 1-6-009:003 (por.) (Figure 4). The surrounding area has a mix of: residential uses, including apartments, single-family homes and assisted living; a park; and civic institutions, including a senior center, a health center and a public elementary school.

2.5 IDENTIFICATION OF THE PROPOSING AGENCY

Contact: Mr. Hakim Ouansafi, Executive Director
Hawaii Public Housing Authority
1002 North School Street
Honolulu, HI 96817
Phone: (808) 832-4682
Fax (808) 832-4679

2.6 IDENTIFICATION OF THE ENVIRONMENTAL CONSULTANT

The Proposed Project's environmental planning consultant is PBR HAWAII & Associates, Inc.

Contact: Mr. Greg Nakai
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813
Phone: (808) 521-5631
Fax: (808) 523-1402
Email: HPHAschoolstreet@pbrhawaii.com

2.7 IDENTIFICATION OF THE ACCEPTING AUTHORITY

The accepting authority and responsible entity is the Governor of the State of Hawaiʻi (State), or his authorized representative.

Contact: The Honorable David Y. Ige
Governor, State of Hawaiʻi
Executive Chambers, State Capitol
415 South Beretania Street
Honolulu, HI 96813
Phone: (808) 586-0034

2.8 COMPLIANCE WITH STATE OF HAWAIʻI ENVIRONMENTAL LAW

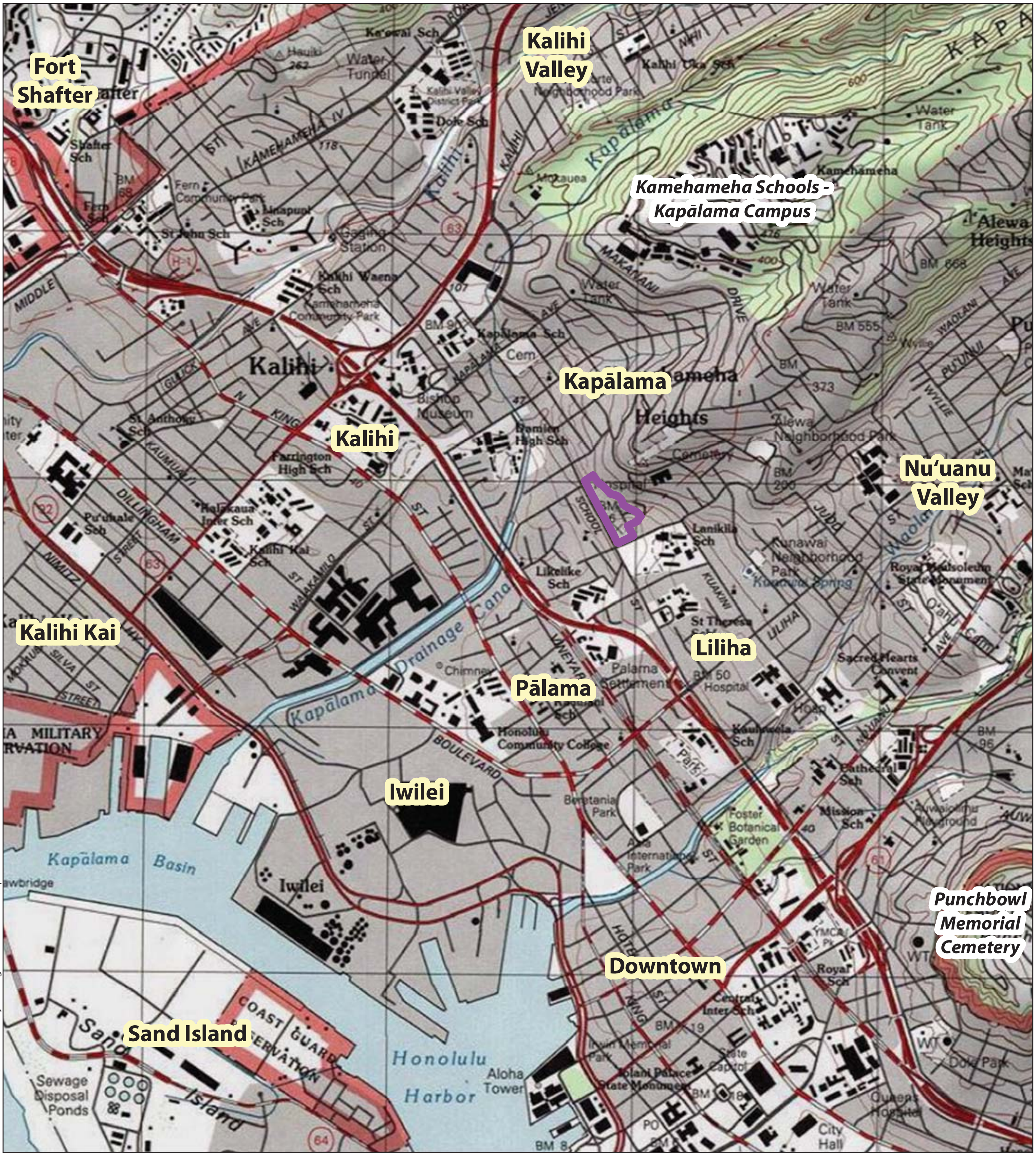
Preparation of this document is in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200, HAR pertaining to Environmental Impact Statements. Section 343-5, HRS identifies nine types of actions that "trigger" compliance, which require either an Environmental Assessment or an Environmental Impact Statement (EIS). The use of State or County funds and/or lands is one of these "triggers." The preparation of an Environmental Impact Statement is required because the Proposed Project is located on State lands and will use State funds. It will also include improvements and/or connections to, and/or easements across, State or County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, drainage or other facilities. While the specific nature of each improvement is not known at this time, the EIS is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the Proposed Project.

The Draft EIS was preceded by the *Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment Environmental Impact Statement Preparation Notice* (EISPN). HPHA submitted the EISPN to the State of Hawaiʻi Office of Environmental Quality Control (OEQC) on August 10, 2017. Notice of the availability of the EISPN was published in the August 23, 2017 edition of the OEQC's *The Environmental Notice*, and was also posted on the OEQC website. Copies of the EISPN were provided to various government agencies, elected officials, utilities, regional public libraries, media outlets, and other individuals and community organizations. (See Section 9.2.1 for the complete list.) The public comment period for the EISPN began on August 23, 2017 and ended on September 22, 2017. A public scoping meeting was held on September 12, 2017. Written comments as well as notes summarizing verbal comments from that meeting can be found in Appendix P. Comments received during the public comment period on the EISPN and the respective responses are incorporated in this EIS and copies of the letters are provided in Appendix O.

2.9 STUDIES CONTRIBUTING TO THIS EIS

The information contained in this report has been developed from site visits, generally available information regarding the characteristics of the Project Site and surrounding areas, information and input gathered during the Master Planning process, and technical studies prepared specifically for the Proposed Project. The following is a list of the technical reports and studies prepared for the Proposed Project. Each is attached as an appendix to this Draft EIS.

- Air Quality Study
- Noise and Vibration Study
- Archaeological Inventory Survey
- Architectural Inventory Survey
- Cultural Impact Assessment
- Economic & Fiscal Impact Assessment
- Flora and Fauna Survey
- Transportation Impact Analysis Report
- Draft Construction Management Plan
- Draft Traffic Management Plan
- Retail Demand Assessment
- Master Planning Process Status Report Update



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DATE: 11/3/2017

LEGEND

Project Site

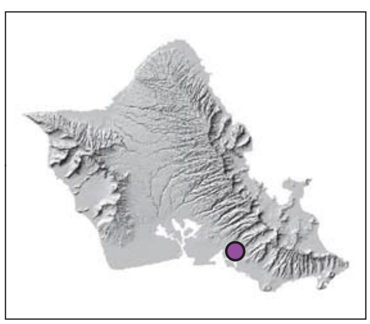


Figure 2:
Regional Location

HPHA Administrative Offices Redevelopment

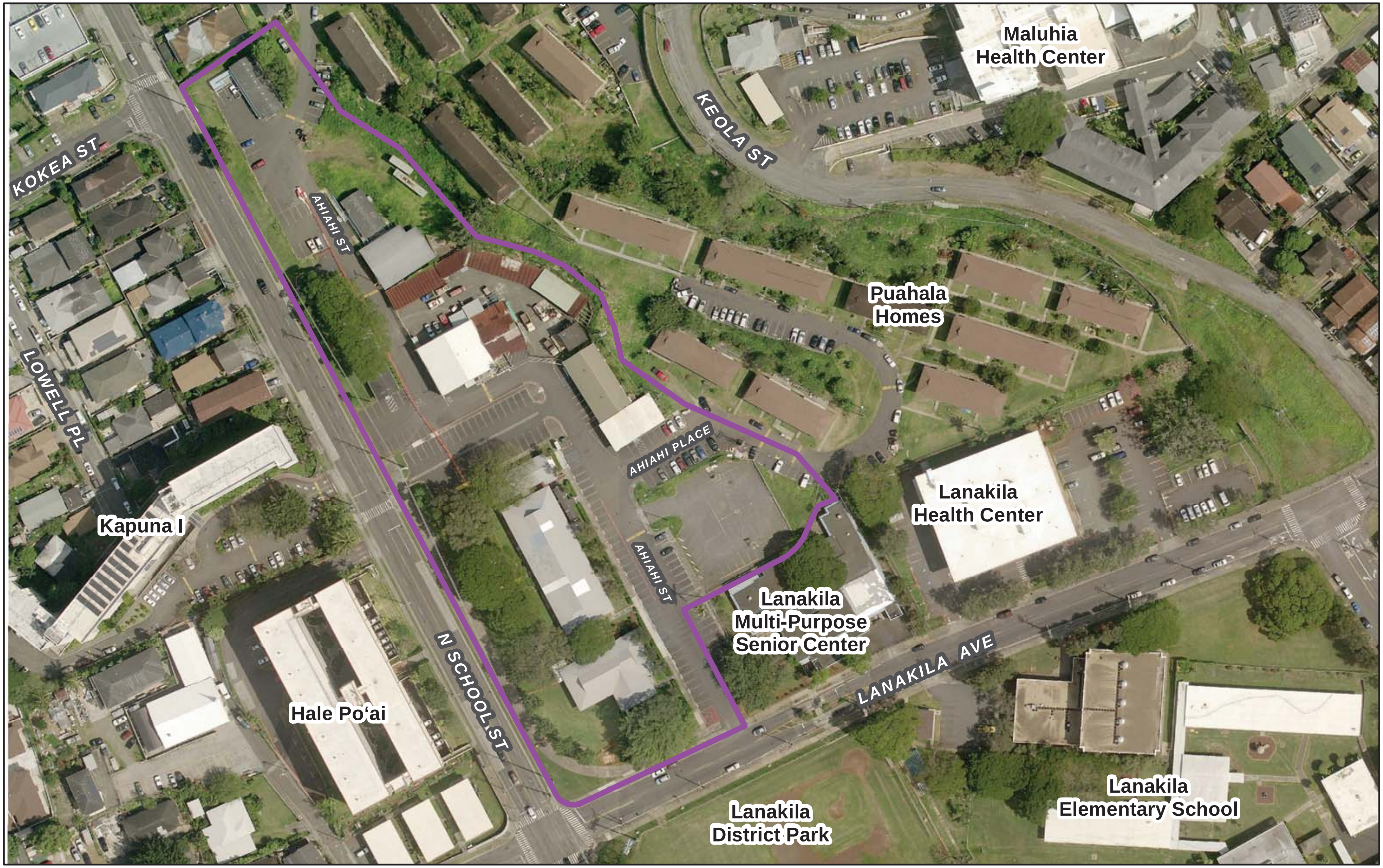
Hawaiʻi Public Housing Authority | Island of Oʻahu

North

Linear Scale (feet)
0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2017. ESRI Online Basemaps.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Source: City & County of Honolulu, 2017. Pictometry, 2013.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary Interpretations or other spatial analysis.

DATE: 11/3/2017

LEGEND

Project Site

Figure 3: Aerial Photograph

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

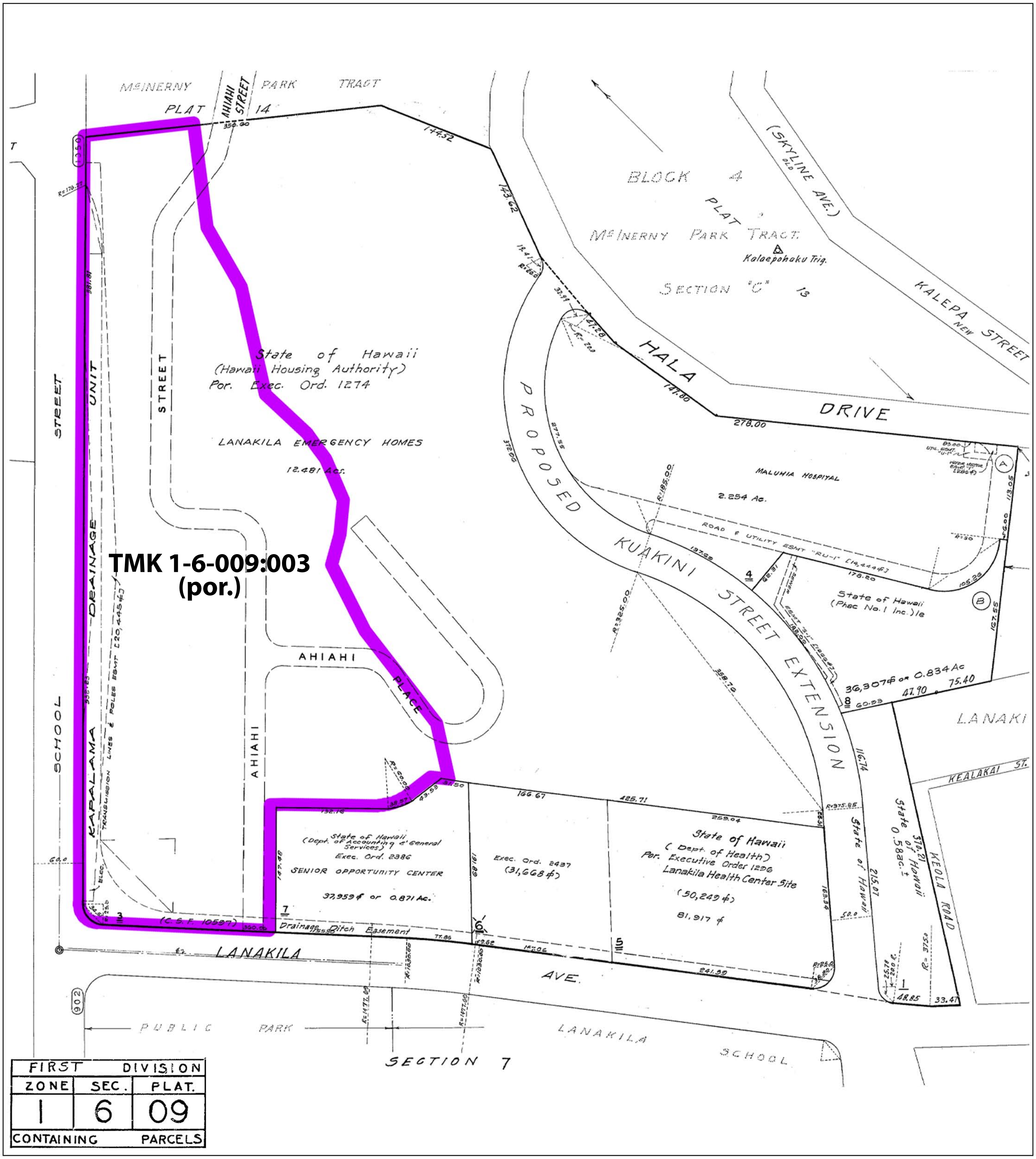
Island of O'ahu

North

Linear Scale (feet)

0 75 150

PBR HAWAII & ASSOCIATES, INC.



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DATE: 10/25/2017

LEGEND

Project Site (TMK 1-6-009:003 por.)

Figure 4:

Tax Map Key Parcel

HPHA Administrative Offices Redevelopment

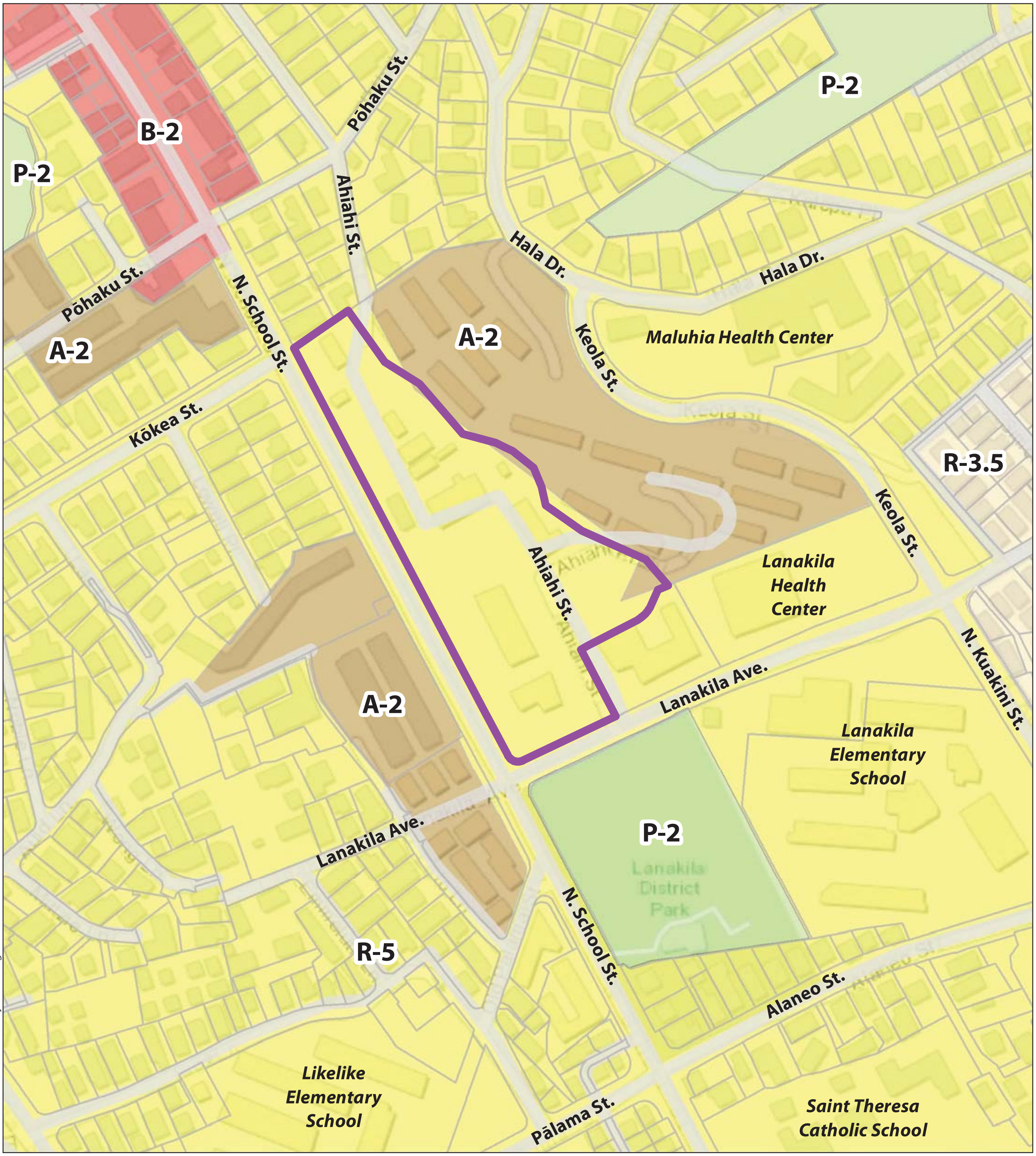
Hawai'i Public Housing Authority — Island of O'ahu

North

(Not to scale)

PBR HAWAII & ASSOCIATES, INC.

Source: City and County of Honolulu (2017); ESRI Online Basemaps.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



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DATE: 11/3/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway
- A-2 Apartment
- B-2 Business
- P-2 Preservation
- R-3.5 Residential
- R-5 Residential

Figure 5:
City & County of Honolulu Zoning

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority — Island of O'ahu

North

Linear Scale (feet)
0 75 150 300

PBR HAWAII & ASSOCIATES, INC.

Source: City and County of Honolulu (2017); ESRI Online Basemaps.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

3 DESCRIPTION OF THE PROPOSED PROJECT

This chapter includes background information and a general description of the Proposed Project.

3.1 STATEMENT OF OBJECTIVES

On January 13, 2015, through an open procurement process conducted pursuant to 356D-12.5 HRS and U.S. Department of Housing and Urban Development regulations, HPHA issued a solicitation ("Request for Proposal" or "RFP") seeking a development partner to work with the agency to undertake the redevelopment of HPHA's administrative offices site with a new, mixed-use project that could leverage an under-utilized State asset for the purpose of expanding the supply of affordable rental housing. HPHA's objectives for the Proposed Project include:

i. *Increasing the supply of affordable rental housing. On June 29, 2016, SB2561, SD2, HD1, CD1, was signed into law as Act 127, Session Laws of Hawai'i (SLH), to address the critical need for affordable housing in Hawai'i, establish a rental housing goal, and a Special Action Team on affordable rental housing, chaired by the Director of the Office of Planning (OP), to make recommendations on actions to promote rental housing. The goal is to develop or vest the development of at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026. The Proposed Project is intended to help fulfill this goal.*

ii. *High quality design. The design of the new affordable rental housing units should take into consideration innovative and non-traditional design that maximizes space and resources for greater utility and which is cost-effective, sustainable, and replicable in an extremely high-cost environment.*

iii. *Sustainable design. Create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project.*

iv. *Leverage resources. Pursue funding sources appropriate for the redevelopment program and maximize private funding to minimize the need for public resources. Work collaboratively with local, state and federal agencies, for-profit organizations, non-profit organizations, etc. to identify a variety of resources to support the redevelopment effort.*

v. *Neighborhood integration. Create a diverse new community that is incorporated into the surrounding neighborhood, strengthens the economic vitality of the area and supports the functions of daily life.*

vi. *Developing new Administrative Offices for the HPHA. The HPHA desires a new, modern central office in which to operate its federal and state low-income public housing and rental subsidy administrative programs. The office space needs to be able to accommodate the current staff of approximately 200 employees and current space requirements of approximately 30,000 square feet.*

3.2 BACKGROUND INFORMATION

3.2.1 Existing Location and Development

The Project Site is located on the site of the existing HPHA Administrative Offices located at 1002 North School Street, Honolulu, Hawai'i on the Island of Oʻahu. (Figure 2 and Figure 3). The Project Site is most closely associated with two ahupuaʻa, Kalihi and Kapālama. This EIS will refer to the general region as Lanakila. The site consists of a portion of one parcel identified as TMK: 1-7-029:003 (por.) (Figure 4), a 6-acre site owned by HPHA, with Ahiahi Place bisecting it. The property is bounded by two existing roadways: North School Street and Lanakila Avenue.

The Proposed Project does not include Puahala Homes, a series of low-rise public housing properties managed by HPHA located along the northern perimeter of the Project Site.

3.2.2 Existing Facilities and Uses

The Project Site currently houses administrative offices and maintenance facilities supporting HPHA's operations. The site is inefficient and contains thirteen low-rise buildings located throughout the Proposed Site that are functionally obsolete. Five of these buildings are over fifty years of age: the original administration building built in 1955 (Building A); a maintenance shop and semi-attached central store room (together referred to as Building D); a set of garages; and a facilities office building (Building C), and the present administration building (Building E) which was erected in 1978. None of these building is of important significant value. More information on these buildings can be found in Section 5.1.2 and in Appendix G.

3.2.3 Historic Perspective

The *ahupuaʻa*[1] of Kapālama is bounded on the west by Kalihi Ahupuaʻa and the east by Honolulu Ahupuaʻa, all within the Kona District. The name Kapālama refers to an enclosure (*pā*) of *lama* wood which surrounded the residence of high ranking *aliʻi* (chiefs). The two streams Kalihi and Niuhelewai, on each side of the *ahupuaʻa*, provided optimal environmental conditions that were well suited for Pre-contact native Hawaiian subsistence practices. The Kapālama Ahupuaʻa was well-watered by the two streams as well as numerous springs, ideal for the construction of *loʻi* (irrigated terraces) for taro in an almost continuous, three quarters of a mile long system both *makai* to *mauka* (southwest to northeast); from ʻIwilei to the Koʻolau foothills above School Street and between the two streams (northwest to southeast).

Post-Western contact land tenure changed, and by the middle of the nineteenth century, the ever-growing population of Westerners forced the establishment of a Euro-American style of land ownership

[1] A division of land usually extending from the uplands to the sea

in the Hawaiian Islands. As a result, the Great *Māhele*[2] became the vehicle for determining ownership of native lands. During this period, land interests of the King (Kamehameha III), the high-ranking chiefs, and the low-ranking chiefs, the *konohiki,* were defined. Because of its agricultural productivity, Kapālama Ahupuaʻa was a very desirable part of the south shore of Oʻahu (along with Nuʻuanu, Mānoa, and Waikīkī). Following Kamehameha's victory over Oʻahu, the islands lands were divided among the *aliʻi* and he "… 'kept of himself' the *ahupuaʻa* of Kapālama" (Kameʻeleihiwa 1992:59). Years later, during the *Māhele*, Kapālama Ahupuaʻa was retained as Crown Land by King Kamehameha III, which included the current Project Site.

The 1851 map (Figure 16 of Appendix F) by A. Bishop is the first map to show any level of detail of Kapālama, which includes the surrounding *ʻili*, a spring (*pūnāwai*) and stream (*kahawai*), along the northwest end of the Project Site. Niuhelewai Stream is also depicted on the map and the course of the stream generally corresponds to the boundary between Kapālama and Honolulu ahupuaʻa.

3.3 GENERAL DESCRIPTION OF THE ACTION'S TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS

3.3.1 Technical Characteristics

Guided by HPHA's objectives for the site (refer to Section 3.1), Retirement Housing Foundation conducted a series of community meetings and charrettes that engaged with community members and stakeholders as co-designers in the planning and designing of the Proposed Project (the "Master Plan").

The first community meeting was held on October 12, 2016, at HPHA offices on North School Street. At this meeting, neighborhood residents and other community stakeholders discussed their neighborhood's assets and needs, and their concerns about how the proposed Redevelopment could affect them, providing valuable input that was incorporated into the Master Plan for the Proposed Project.

A second community meeting was held on the evening of November 29, 2016, also at the HPHA offices, and a follow-up workshop was held during the daytime on November 30, 2016, at the adjacent Lanakila Senior Center. At both of these November meetings, attendees provided suggestions for programs, services, and amenities at the proposed Redevelopment. Attendees at the November 29 meeting also provided valuable recommendations regarding the Project Site's layout and its connectivity (vehicular, pedestrian, and bicycle) to the surrounding neighborhood.

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[2] As a verb "Māhele" means "to divide" or could be a noun meaning a division, piece, or portion. It is often referred to the Māhele of 1848 which was the land Redistribution Act by Kamehameha III. Māhele was the beginning of private land ownership in Hawaiʻi.

In January 2017, two 2-day charrettes and public meetings were held. The first 2-day charrette and public meeting was held on January 26 at HPHA's offices, and on January 27 at the Lanakila Senior Center. During Charrette #1, neighborhood residents and other community stakeholders previewed and provided input on alternative site plans and architectural style. The community's input was then incorporated into an updated draft conceptual plan for the second 2-day charrette & public meeting, which was held on January 30 at the HPHA office, and on January 31 at the Lanakila Senior Center. At Charrette #2, participants previewed the resulting updated draft conceptual plan and provided additional input and comment, which has informed further revision and refinement of the Master Plan. During the most recent presentations, the number of units studied was 1,000 rental apartments, however, no decision was made regarding whether the units would be for families or seniors or a combination of both.

A final round of community meetings was held for the Conceptual Master Plan. The same meeting agenda was conducted in the evening of October 18, 2017, at the HPHA Administrative Offices Board Room and again the following morning, October 19, 2017, at the Lanakila Multi-Purpose Senior Center. Over 60 people were in attendance on the 18th and 30 attended the meeting at the Senior Center the following day.

A Power Point presentation was shared that documented the progression of the conceptual design plans based on the community's input. The presentation addressed the urgent need for affordable housing in Hawai'i, and explained how undertaking the redevelopment project, on state land, presented a unique opportunity to address the urgent need for affordable housing in the state in a cost-effective manner by leveraging an under-utilized state asset. During these meetings, a small number of local area residents expressed concerns about the overall number of unit; density; impact to existing infrastructure, particularly sewers; traffic impact, particularly during high traffic hours; the potential negative impact to property values and potential for increased crime. A number of participants perceived that the Proposed Project would bring more "public housing" to the community, which would increase crime and affect property values. The presentation attempted to assuage this concern pointing out that all 800 units were to be designated as affordable senior housing, not public housing.

Additional valuable community feedback incorporated into the Master Planning process included:

1. A desire for both public and private green space.
2. Elimination of standalone parking buildings. Parking now included within the apartments units.
3. Building heights that are stepped back so that the full height is not noticeable from the street.
4. An affordable housing project strictly catering to seniors.

During these meetings participants were asked to discuss and document responses to the following questions that will further influence the development of the project in the next stages.

1. How can the HPHA development be the best neighbors? – The community is most concerned about two elements. First, how will the Proposed Project impact infrastructure - namely sewer, water, electricity and transportation. While we discussed this at the round 6 meetings, community members don't understand that the EIS will establish how the Proposed Project will impact infrastructure and that project will be designed to exist meeting capacity. The second consideration desired by the community is there be consideration for the scale and design of the Proposed Project that maintains and compliments the existing neighborhood.

2. What amenities in the public green space can best serve the community? The most consistent recommendation is for there to be as much public and private green space as possible. The community wants gardens, benches, and walking paths. Additionally, there is a strong desire to save the trees.

3. What about this community can the HPHA redevelopment best celebrate? There are two most popular characteristics of the neighborhood that the community wants to maintain and celebrate – diversity and walkability.

As a result of the Master Planning Process [, the following significant adjustments were incorporated into the [Conceptual? Master Plan:

- The Proposed Project was realigned to provide 800 affordable senior residential rental units

- The units are proposed in mid-rise (15 to 16 stories) buildings with up to three apartment buildings, which would range from 144' to 153' in height.

- The lower-and mid-rise buildings would line the Project Site along the streets in order to respect the surrounding community and the taller buildings are set back from the streets and oriented mauka-makai to minimize impact to distant mauka views (see Conceptual Master Plan, Figure 1). A copy of the draft Master Plan is included in Appendix C. Up to 10,000 SF of retail and commercial space is proposed on the lower floors of the mixed-use buildings. (The specific uses have not yet been determined but they provide an opportunity to activate street frontages and encourage pedestrian access between residential and commercial uses. They will not only serve the new residents, but complement the diverse commercial uses already in the area and provide additional services and job opportunities to a growing and diverse neighborhood. A retail market demand assessment was conducted for the Project Site, and is included in Appendix D).

- Parking is proposed as structured parking to increase site efficiencies and is wrapped by the lower-and mid-rise mixed-use buildings. This will help minimize views of the parking from the street and provide direct access to units wherever possible. The number of parking stalls constructed will be based on City and County of Honolulu standards and requirements, but they may be decoupled from the residential units in order to give future residents the option of having or not having a parking stall, given the easy access to public transportation and proximity to a concentration of medical providers. This option could potentially reduce rents and make apartments more affordable for the residents if they opt not to have parking.

- Landscaped and open spaces were redesigned to soften streetscapes, provide comfortable places to recreate, gather with family and friends, and reconnect with nature. Open spaces, community gardens, and recreational decks are dispersed throughout the site creating a hierarchy of well-organized outdoor open spaces that bridge the interior and exterior elements and provide opportunities for future residents to enjoy the outdoors, grow their own food for better health and wellness, and recreate. Culturally significant plants and lei plants will also be considered in the landscape design of the Proposed Project so the plantings can serve multiple purposes of being useful as well as providing shade, comfort and aesthetics.

3.3.2 Economic Characteristics

Due to the size and complexity of the Proposed Project, construction costs for the Proposed Project are provided as very preliminary rough order-of-magnitude cost estimates and will be better defined during the detailed design and engineering phases. The Proposed Project is anticipated to cost approximately $370,000,000 in construction costs, which include demolition, sitework, vertical construction, infrastructure and utilities, and landscaping.

3.3.3 Social Characteristics

All of the residential units are proposed as affordable (currently proposed to be affordable to those households earning 30% - 60% of AMI). The 2017 income limits for the targeted affordable income groups for Honolulu County are as follows based on family size and are subject to change based on the Department of Housing and Urban Development's (HUD) annual income limits:

Table 3-1: 2017 Honolulu County Income Schedule by Family Size

Area Median Income Limits	1-Person	2-Person	3-Person	4-Person	5-Person	6-Person	7-Person	8-Person
30%	$21,990	$25,110	$28,260	$31,380	$33,900	$36,420	$38,940	$41,430
60%	$43,980	$50,220	$56,520	$62,760	$67,800	$72,840	$77,880	$82,860
80%	$58,640	$66,960	$75,360	$83,680	$90,400	$97,120	$103,840	$110,480
100%	$73,300	$83,700	$94,200	$104,600	$113,000	$121,400	$129,800	$138,100
120%	$87,960	$100,440	$113,040	$125,520	$135,600	$145,680	$155,760	$165,720
Source: Hawaiʻi Housing Finance and Development Corporation website: https://dbedt.hawaiiHawaiʻi.gov/hhfdc/files/2017/05/2017-HUD-Income-Limits-Honolulu.pdf								

3.3.4 Environmental Characteristics

During the EISPN Public Review period, the State Office of Planning wrote:

"9. The DEIS should describe the measures that could be taken to address the expressed desire in HPHA's solicitation for "high quality design" that would incorporate state of-the-art energy conservation and green practices in the project."

As noted above, HPHA's RFP solicitation stated the following program requirements:

"Create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project..."

To achieve the above policy, HPHA will require Retirement Housing Foundation to build the Proposed Project to achieve the U.S. Green Building Council's *Leadership in Energy and Environmental Design* (LEED) "Silver" rating or equivalent.

The development team will employ an integrated design process to research the latest in design, construction, and operation best practices to incorporate as many sustainable design elements as financially feasible related to energy conservation, such as green materials and technologies to help lower construction, maintenance, and operating costs while exercising responsible environmental stewardship in order to reduce the Proposed Project's overall impact on the environment. This integrated design process will include:

- Site review and assessment for Master Planning, usability, and environmental conditions;
- Comprehensive green design charrettes with project partners, designers, and the construction team;
- Comprehensive development plan, including Green elements;
- Computer modeling of energy efficiency, lighting, renewable energy, water, and storm water;
- Selection, cost analysis, and durability of materials and products;
- Research on current incentives, tax credits, rebates, and other financial resources;
- Building Commissioning and performance measurement;
- Continuous improvement to design checklists to incorporate experience, cost/benefit trade-offs, and new design and construction elements.

Some examples of sustainable design elements that will be explored for the Proposed Project as it transitions to detailed design and construction phases include:

- Optimal building placement that maximizes prevailing trade winds and responds to the natural patterns of the sun;
- Using natural ventilation through design and orientation where feasible to provide residents with fresh air and an alternative to using air conditioning;
- Buildings that minimize weather infiltration and inhibit intrusion from mold and pests;
- Water use reductions beyond the requirements of Energy Policy Act and the installation of low flow or ultra-low flow faucets and fixtures;
- Natural lighting and solar tubes to minimize the need for interior lighting and thus reducing electrical costs for the residents;
- Compliance with the International Energy Code and Energy Star for Homes through careful design and minimizing the installation of HVAC and hot water systems, appliances, lighting, equipment, and building envelope;
- Installation of ceiling fans for improved air ventilation and quality;
- Providing Energy Star appliances;
- Installing solar hot water heaters and solar photovoltaics wherever possible;
- Providing high-efficiency lighting, such as compact fluorescent and LED fixtures and bulbs;
- Installing smart meters and dashboards in residences as an option so residents can monitor energy use;
- Using building insulation to reduce the need for air conditioning;
- Improved resident health and comfort with low-VOC emitting materials;
- Use of recycled and sustainable materials to limit the use of natural resources;
- Installation of native and climate-adapted plants for landscaping;

- Integrated landscape and site design options that employ low impact storm water management techniques such as raingardens and bioswales, green roofs, and pervious concrete or pavers;
- Rainwater catchment and use of non-potable water for landscape irrigation;
- Automated irrigation systems with moisture sensors to prevent overwatering;
- Environmentally sensitive site preparation and construction techniques, including diversion of construction waste and prevention of airborne pollution and storm water runoff; and
- Neighborhood amenities that encourage residents to maximize transit options, activate public green spaces, and limit automobile use.

3.4 USE OF PUBLIC FUNDS OR LANDS FOR THE ACTION

3.4.1 Use of Public Funds

Public funds will be required for completion of the Proposed Project.

It is possible that due to the need to correct aging infrastructure in the immediate area, public funding will be sought to address these deficiencies although infrastructure upgrades and improvements, particularly the completion of the Awa Street Wastewater Pump Station scheduled for June 2020 (See Section 5.9.2), are already under way.

3.4.2 Use of Public Lands

The Project Site is owned by the State of Hawai'i and is “leased” to HPHA per Executive Order 1274.

3.5 PHASING AND TIMING OF THE ACTION

The timeline for the Proposed Project is ongoing and is contingent upon Environmental Impact Statement (EIS) acceptance, permit approvals, market forces, and funding and financing. However, for the purposes of this EIS, the onsite construction is estimated to be completed in four phases estimated at roughly two years per phase for a total construction period of at least eight years.

The first phase is proposed at the northern end of the site, in order to reduce disruptions to the current operations of the HPHA Administrative Offices. This phase will include the construction of the replacement offices.

4 DESCRIPTION OF THE AFFECTED NATURAL ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATION MEASURES

This section describes the existing conditions of the physical and natural environment, potential impacts of the Proposed Project on the environment, and the proposed mitigation measures to minimize any potentially negative impacts.

4.1 CLIMATE

Existing Conditions

In Liliha, in the vicinity of the Project Site, trade wind showers are relatively common and although heavy rains occur at times, most of the showers are light and of short duration. Normal annual rainfall is greater than 120 inches at the top of Nuʻuanu Valley, but significantly less in the area of the Project Site, (30 to 45 inches), most of which occurs during the wet season from November through April.

Surface winds are generally around 13 to 24 miles per hour from the northeast. There are some seasonal changes in prevailing wind direction in winter with southerly Kona winds. Strong winds do occur at times in connection with storm systems moving through the area. Daily variations include diurnal effects of winds from the southwest quadrant during the night and morning hours, shifting to the northeast during the day.

Potential Impacts and Mitigation Measures

The Proposed Project is not expected to have a significant effect on general regional climatic conditions. However, micro-climatic effects at the property and surrounding vicinity, such as temperature and wind changes may occur. With regard to temperature, any heat island effects that may arise with the intensification of development onsite will be mitigated with proposed landscaping and the use of lighter colors on new pavement and buildings, which reflect rather than absorb heat. Other design considerations include new street trees, rooftop gardens, and landscaped recreational decks. As detailed designs for the buildings are developed, wind studies should be performed on the proposed designs to determine if there are any impacts to surrounding properties or internally at outdoor recreational spaces. Adjustments to the structures early in the design phase should be done to mitigate any wind impacts.

4.2 GEOLOGY AND TOPOGRAPHY

Existing Conditions

The Island of Oʻahu was formed by two shield volcanoes the remnants of which form the Koʻolau Range to the east and the older Waiʻanae Range to the west. The long expanse of the Koʻolau mountain range separates the windward side of Oʻahu to the northeast from the leeward side to the southwest. The Koʻolau Range also runs perpendicular to the trade winds, which deposit most of the moisture on the windward side of the island where they interact with the mountain range. In contrast, the leeward side of the Koʻolau Range as well as the Waiʻanae Range are much drier as they receive less of the moisture carried by the trade winds (University of Hawaiʻi, SOEST, 2013).

The Project Site slopes slightly from north to south (School Street) with an elevation of approximately 60 feet above mean sea level (MSL) to approximately 40 feet above MSL.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Accounting and General Services wrote:

> *"…There is ground settlement in the area and an underground stream. A soil survey and groundwater survey should be performed due to the geology of the site. Effects of new construction, including construction vibrations and changes to the underground hydraulic flow, should be addressed."*

Prior to the design of any new structures, geotechnical studies will be conducted. The site already has been extensively modified by improvements related to the existing administrative offices and baseyard facilities. The proposed redevelopment will occur over nearly all of the office, baseyard and parking portions of the property resulting in grading and land disturbance. However, the development will not adversely impact the topographic nature of the property relative to the surrounding lands for the following reasons:

1. The finish grade elevations will be fairly similar to the current existing grade on the site.
2. The project does not include Puahala Homes and will not disturb any grading that will affect Puahala homes.

Any grading will follow Best Management Practices (BMPs). The site development and earth disturbance will be limited to surface soils. All grading operations will be conducted in full compliance with dust, erosion control and other requirements of the City and County of Honolulu Grading Ordinance. All construction activities will comply with the provisions of Chapter 11-60.1, Hawai'i Administrative Rules, on fugitive dust.

4.3 SOILS

There are three soil suitability studies prepared for Hawai'i whose principal focus has been on describing the physical attributes of land and the relative productivity of different land types for agricultural production. These are (1) the Land Study Bureau Detailed Land Classification, (2) the U.S. Department of Agriculture Soil Conservation Service Soil Survey, and (3) the Agricultural Lands of Importance to the State of Hawai'i (ALISH). The three soil suitability studies are discussed in section 4.3.

Existing Conditions

4.3.1 Land Study Bureau Detailed Land Classification

The Land Study Bureau Detailed Land Classification (1965 through 1972) series was produced by the Land Study Bureau (LSB) of the University of Hawai'i for each island. The LSB classification system groups land into homogeneous units called Land Types, describes their condition and environment, delineates the areas on aerial photo base maps, rates the lands on their overall quality (productivity) in relation to other lands, and appraises their performance under selected alternative agricultural crops. This series of reports were produced with the intention of developing a land inventory and productivity evaluation based on statewide "standards" of crop yields and levels of management.

The University of Hawaiʻi Land Study Bureau (LSB) Detailed Land Classification, Island of Oʻahu, classifies non-urban land by a five-class productivity rating system, which indicates the degree of overall suitability of the land for agricultural use, using the letters A, B, C, D, and E, where "A" represents the highest class of productivity and "E" represents the lowest class of productivity. The HPHA Administrative Offices site is urban, unclassified land (Nelson, 1972).

4.3.2 Soil Conservation Service Soil Survey

The Soil Conservation Service Soil Survey (1972) series for each island was prepared by the U.S. Department of Agriculture Soil Conservation Service (SCS) and the University of Hawai'i Agricultural Experiment Station. These reports are somewhat similar to those of the Land Study Bureau, except that they are patterned after a soil classification procedure adapted for nationwide, uniform application. Soil types are ranked according to their suitability for most kinds of crops. Also provided are listings of crops commonly grown on the soil types and their expected productivity under present management.

The USDA Soil Survey classifies all of the soils underlying the Project Site as Kaena clay, 2-6% slopes (Figure 6).

4.3.3 Agricultural Lands of Importance to the State of Hawaiʻi

The Agricultural Lands of Importance to the State of Hawai'i (ALISH) (1977) system includes the entire state. The State of Hawaiʻi Department of Agriculture's Lands of Importance to the State of Hawaiʻi (ALISH) system rates agricultural land as "Prime," "Unique," or "Other." The remaining land is not classified. The land under the Project Site is not classified. A map of the land classification in the area can be seen in.

The Project Site is classified as "Existing Urban Development" by the ALISH system most likely due to its use of the past century for urban uses. No portion of the site is classified as "Prime," "Unique," or "Other Important" agricultural land.

Potential Impacts and Mitigation Measures

The Proposed Project will not reduce the inventory of agriculturally significant land as it has been urbanized for over a century.

During the EISPN Public Review period, the State Department of Health, Environmental Planning Office wrote:

> *"If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.Hawai'i.gov or call (808) 586-4200."*

During the construction phases of the Proposed Project, dust generation is anticipated and there is a potential for water-borne soil erosion. Construction activities will follow strict erosion control measures specified by applicable State and City regulations. Prior to issuance of a grading permit by the City and County of Honolulu, an erosion control plan and best management practices will be submitted describing the implementation of appropriate erosion control measures. In addition, a watering program will be implemented to minimize soil loss through fugitive dust emissions during construction. After construction, establishment of permanent landscaping will serve as long-term erosion control for unpaved areas with underground catchment proposed for storm water control. A National Pollutant Discharge Elimination System (NPDES) permit for Storm Water Associated with Construction Activity will be necessary since the entire site will be developed and it is roughly 6 acres in size and each development phase is anticipated to exceed an acre.

PDF: Q:\Oahu\HPHA\PDF\USDA NRCS Soils.pdf
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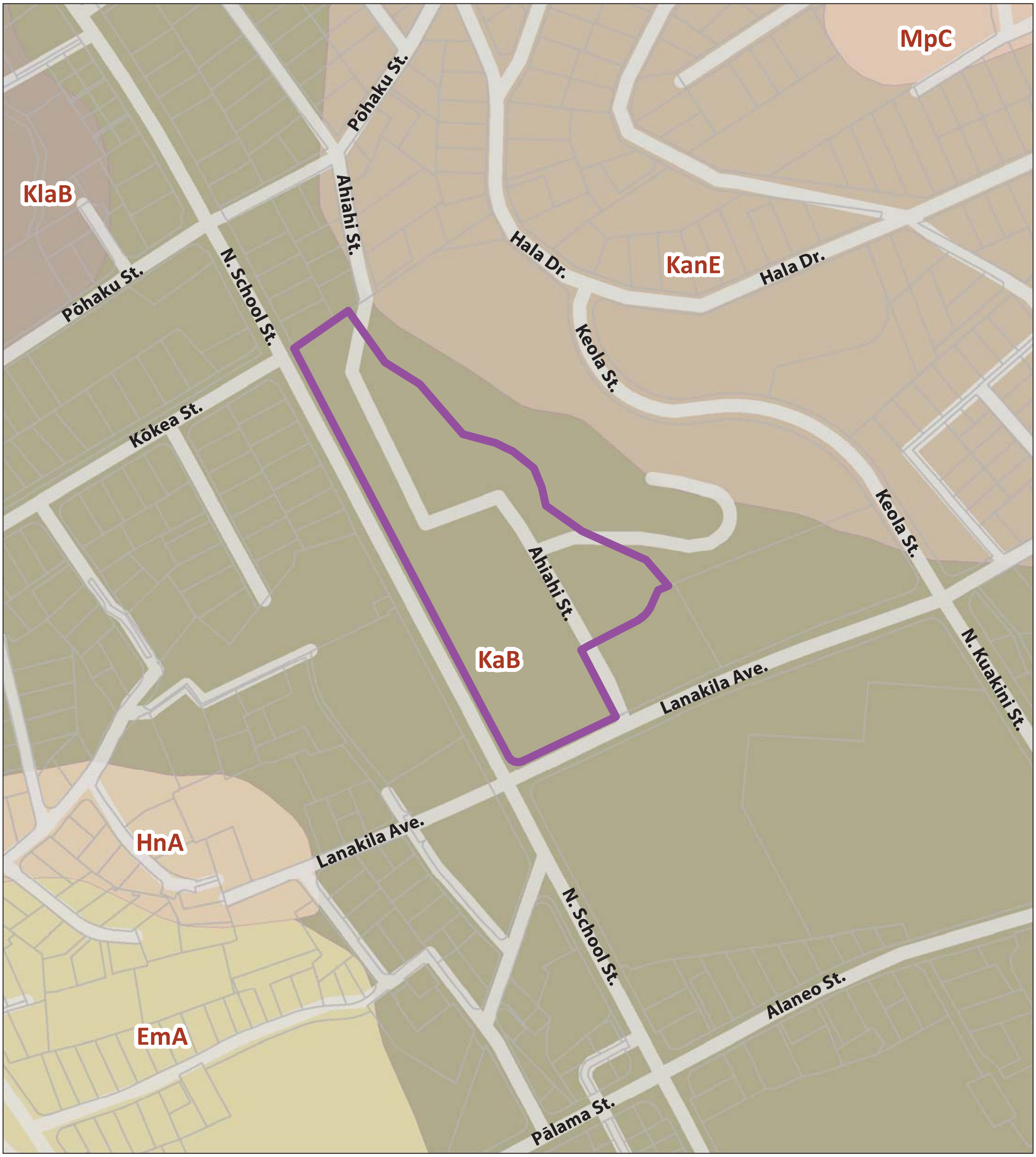
Source: USDA NRCS, 2001. City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



DATE: 10/25/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway
- EmA - Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes
- HnA - Hanalei silty clay, 0 to 2 percent slopes
- KaB - Kaena clay, 2 to 6 percent slopes
- KanE - Kaena very stony clay, 10 to 35 percent slopes
- KlaB - Kawaihapai stony clay loam, 2 to 6 percent slopes
- MpC - Manana silty clay, 8 to 15 percent slopes

Figure 6:
USDA NRCS Soils

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)

0 75 150 300

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4.4 GROUNDWATER AND SURFACE WATER RESOURCES

4.4.1 Groundwater Resources

Existing Conditions

Groundwater in the State of Hawaiʻi is the primary source of municipal water supplies in addition to providing 50% of the total water used throughout the state. Groundwater refers to any water found beneath the surface of the earth and occurs in various forms depending on the surrounding geology. Aquifers are types of these geologic formations that can store or transmit water in quantities large enough to provide sufficient supply for people's use. Groundwater resources of the Hawaiian Islands are predominantly volcanic rock aquifers, which are identified through a coding system based on location and geological characteristics for management purposes.

According to the State of Hawaiʻi Commission on Water Resource Management (CWRM), the HPHA Administrative Offices site overlies the Kalihi Aquifer System (30103) of the Honolulu Aquifer Sector (301). The Kalihi Aquifer System is a basal aquifer, a type of aquifer that is sourced from underground fresh water floating below the lowest water table but above denser salt water. It has a recommended sustainable yield of approximately 9 million gallons per day (mgd). As of July 2005, existing water use was approximately 8.4 mgd for the Kalihi Aquifer System (Wilson Okamoto Corporation, 2008).

The Project Site is also located above the Underground Injection Control line and therefore the underlying aquifer is considered a drinking water source by the State Department of Health Safe Drinking Water Branch. There were no contaminated samples detected in groundwater testing near the Project Site according to the State Department of Health Groundwater Contamination Viewer (https://eha-cloud.dohhawaii.hawaii.gov/sdwb/#/viewer) when accessed on August 5, 2017.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Land and Natural Resources, Engineering Division wrote:

> *"The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections."*

As requested, water demands and calculations will be provided to the State DLNR Engineering Division. No impacts to groundwater resources are expected from activities associated with the redevelopment. In addition, no injection wells are proposed for the Proposed Project. During the EISPN public review period, BWS initially commented that the existing water system is presently adequate to accommodate the Proposed Project, which will draw water from an existing network of groundwater wells. A request for service was later submitted by the project engineers for the 1,000 multifamily units and 10,000 SF of commercial uses to which BWS responded that the existing water system would be adequate but subject to availability when the building permits are reviewed. Follow up will be required with BWS to determine if the additional 5,000 SF of commercial uses can also be accommodated if pursued by the development.

Water conservation measures will be implemented wherever possible as a part of the Proposed Project's sustainable design priorities including but not limited to the installation of low flow or ultra-low flow faucets and fixtures, rainwater catchment and reuse, use of non-potable water for landscape irrigation, and automated irrigation systems with moisture sensors to prevent overwatering.

4.4.2 Surface Water Resources

Existing Conditions

The existing site does not contain any naturally occurring surface water resources or wetlands. The Project Site is located in the Nuʻuanu Watershed and the closest surface water resources are the channelized Kapālama Stream, running *mauka* to *makai* approximately 0.4 miles ʻewa (west) of the Project Site, and the partially channelized Nuʻuanu Stream, which runs mauka to makai approximately 0.3 miles to the Diamond Head side of the Project Site. Both of these streams are perennial (flow continuously throughout the year) and discharge into Honolulu Harbor makai of the Project Site. According to the "2014 State of Hawaiʻi Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)," both the Kapālama Stream and Nuʻuanu Stream are classified by the Department of Health as an impaired waterbody, exceeding water quality standards for total nitrogen, nitrites, nitrates, total phosphorus, and turbidity and notes trash as an additional pollutant. In addition, Nuʻuanu Stream is not in attainment for total suspended solids and contains dieldrin, and chlordane as other pollutants.

The 2016 draft update to this report shows the same determinations for Kapālama and Nuʻuanu Streams except that Nuʻuanu Stream has reached attainment for total suspended solids during the wet season.

Potential Impacts and Mitigation Measures

The Proposed Project does not anticipate any impact to wetlands given the distance to the nearest wetlands. In order to minimize potential impacts to surface waters, the Proposed Project will adhere to all requirements of the City's newly adopted "Rules Relating to Water Quality," which went into effect on August 16, 2017, as well as implement low impact development (LID) design wherever feasible. The implementation of best practices for erosion control during construction and sewer connection to the municipal wastewater system will mitigate potential impacts to surface waters at the site or secondary impacts to downstream coastal resources.

4.4.3 Nearshore Marine Resources

Existing Conditions

The Project Site does not contain any nearshore marine resources onsite as the property is located approximately one mile from the nearest marine water body, Honolulu Harbor. DOH classifies Honolulu Harbor as a Class A water body, which are to be protected for recreational use and aesthetic enjoyment while remaining compatible with the protection and propagation of wildlife. According to Section 11-54-3, HAR, Honolulu Harbor is also an exception with the DOH Class A designation, which may be permitted to receive industrial discharges that fall under acceptable non-contact thermal and drydock or marine railway discharges.

Potential Impacts and Mitigation Measures

The Proposed Project is not anticipated to directly impact nearshore marine resources as the Project Site is not directly adjacent to the shoreline. However, mitigation measures will be taken to avoid any potential impacts from on-site activities during construction as well as storm water runoff from land-based pollutants. To prevent indirect or cumulative impacts on nearshore marine resources, BMPs will be implemented during and after construction to prevent erosion from the Project Site from entering into storm drains and the long-term build-up of sediments. Compliance with City's newly adopted "Rules Relating to Water Quality" and LID measures as discussed in Sections 4.4.2 and 5.9.3 will also mitigate potential impacts to nearshore marine resources. Additional measures may include garbage enclosures to prevent leakage or runoff into stormwater drainage areas and the installation of rain gardens and bioswales within landscaped areas to help capture potential pollutants prior to entering the Proposed Project's drainage system.

4.5 NATURAL HAZARDS

The Hawaiian Islands are susceptible to natural hazards, such as flooding, tsunami inundation, hurricanes, and earthquakes. The following sections describe the potential impacts due to natural hazards.

4.5.1 Flood

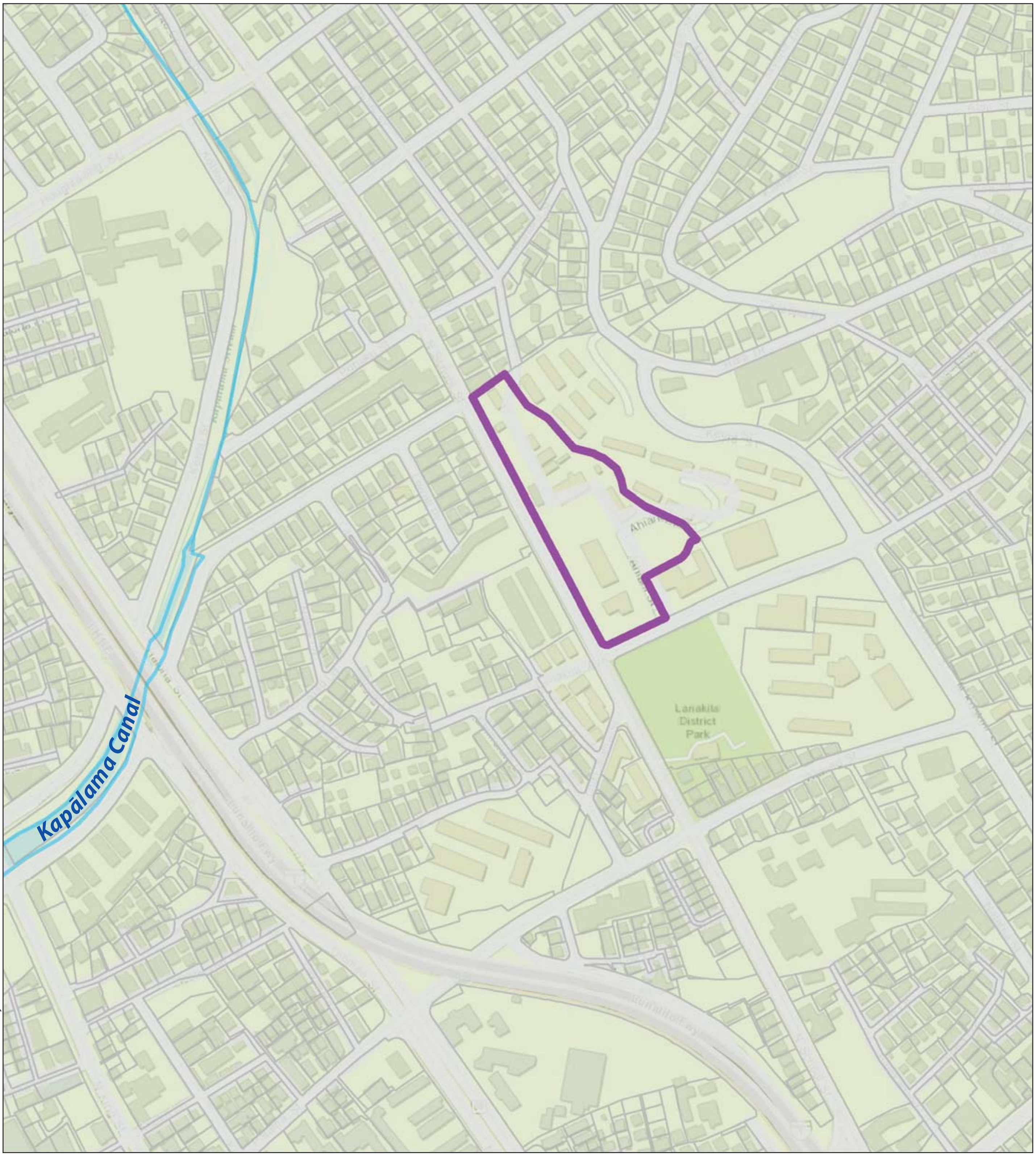
Existing Conditions

The Federal Emergency Management Agency (FEMA) publishes flood information in the form of Flood Insurance Rate Maps (FIRM). These maps are used by government agencies and insurance companies to assess the relative potential for damage during flood events.

As identified by the Federal Insurance Rate Map (FIRM) (Figure 7) (City and County of Honolulu HoLIS Website) the Project Site is located outside of the 500-year floodplain boundary and outside of the floodway boundary. It is within “Zone X.” The Zone X designation indicates areas determined to be outside the 500-year floodplain. The National Flood Insurance Program does not regulate developments within this zone.

Potential Impacts and Mitigation Measures

Because the Project Site is located in an area outside the 500-year floodplain, the proposed improvements are not expected to: 1) be highly susceptible to flooding; 2) change the 500-year floodplain; or 3) affect the floodway and are consistent with HRS § 205A-2 objectives and policies related to coastal hazards. All increases in runoff will be retained onsite as required to meet City standards and onsite drainage will be designed to flow away from buildings towards landscaped areas and bioswales. Onsite catchment and reuse of filtered runoff will also be considered as much as feasible as part of the design of the Proposed Project.



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DATE: 11/3/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway

Zone

- X: Outside of 0.2% annual chance floodplain

Figure 7:
Flood Insurance Rate Map (FIRM)
HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)

0 125 250 500

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Source: Federal Emergency Management Agency, 2016. City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

4.5.2 Tsunami

Existing Conditions

Since the early 1800s, approximately 50 tsunami have impacted the State of Hawaiʻi. Seven historical events have caused major damage. The most recent tsunami to impact Oʻahu, occurred on March 11, 2011, causing damage at several locations around the island especially the north shore. There are no records of inundation of lands within Liliha during any of the recorded tsunami.

The City and County of Honolulu uses three tsunami evacuation designations. The first is the Tsunami Evacuation Zone where evacuation is required for any tsunami warning. The second is the Extreme Tsunami Evacuation Zone where additional areas must be evacuated only during an extreme tsunami event generated from earthquakes of Magnitude 9+ on the Richter scale. Remaining areas are identified as safe areas that are anticipated to be outside of the inundated areas due tom tsunami events.

The Site is located approximately one mile inland from the nearest port and one mile from the nearest coast, outside the designated tsunami evacuation zone.

Potential Impacts and Mitigation Measures

The Proposed Project will not exacerbate any tsunami hazard conditions. The Project Site is not in a designated tsunami evacuation zone and is not expected to be adversely impacted by a tsunami.

4.5.3 Sea Level Rise and Climate Adaptation

Existing Conditions

Sea level rise (SLR) is one of the many growing concerns associated with global climate change and can be especially taxing on the limited resources of island ecosystems. Coastal areas are extremely vulnerable to sea level rise, which poses a threat to the long-term safety and operation of drinking water, wastewater, and stormwater infrastructure for cities and communities located in coastal regions. In addition, changing climate patterns, extreme weather events, and sea level rise can affect the climate patterns, magnitude of wind, flood, and rain impacts, and storm surges in coastal regions (EPA, 2016). The greatest immediate threats to the Proposed Project from sea level rise and climate change include increased intensity of weather patterns, storm surges, and hurricanes, flooding events, and damage to structures and vital infrastructure serving the property. According to the US Army Corps of Engineers (USACE) Sea Level Rise Calculator, the mean sea level trend for Honolulu is rising at 1.44 mm/year with a 95% confidence interval of +/- 0.21 mm/year based on monthly mean sea level data from 1905 to 2016 which is equivalent to a change of 0.47 feet in 100 years (http://www.corpsclimate.us/pubtools.cfm). While it cannot be known for certain how the area will be affected by sea level rise and climate change in the future, scientific models for potential climate change factors have been considered for the location of the Proposed Project. Inundation from one meter (3.28 feet) of sea level rise by 2050 has been adopted by the University of Hawaiʻi Sea Grant program based on the best available science as the most likely scenario for expected sea level rise for the Hawaiian Islands (UH Sea Grant, 2014). Computer models developed by the National Oceanic and Atmospheric Administration (NOAA) Coastal Storms Program and Dr. Chip Fletcher at the University of Hawaiʻi School of Ocean and Earth Science and Technology (SOEST) project that inundation from one meter of sea level rise will not occur in or directly adjacent to the Project Site.

Potential Impacts and Mitigation Measures

Sea level rise of one meter is not anticipated to have significant, immediate impacts to flooding at the Project Site. However, adaptation and resiliency measures should be considered for improving the safety of future residents and longevity of the proposed facilities, landscaped areas, and essential infrastructure serving the Proposed Project such as water, sewer, electrical, drainage, and roadways as secondary impacts from global climate change such as extreme weather events or worsening SLR may still impact the Proposed Project. The Proposed Project is most at risk of damage from extreme weather events and the loss of service of critical infrastructure. The Proposed Project including all structures, landscaping, and vital infrastructure should be designed to withstand water inundation and extreme weather events wherever feasible. Essential equipment will also be located on higher floors wherever feasible. Consideration will also be given to some of the strategies recommended by the U.S. Army Corps of Engineers (USACE, 2014) such as:

- Upgrades and strengthening of existing structures;
- Construction of structures to be flood-proof;
- Upgrades and modifications of infrastructure (e.g. prevention of backflows to wastewater or drainage utilities caused by inundation of sea water)

4.5.4 Hurricanes

Existing Conditions

Hurricanes are classified into one of five categories according to the Saffir-Simpson Hurricane Scale. The Scale provides some indication of the potential damage and flooding a hurricane will cause upon landfall.

Since 1980, two hurricanes have had a devastating effect on Hawaiʻi. They were Hurricane ʻIwa in 1982 (Category 1- sustained winds between 75 and 95 mph) and Hurricane ʻIniki in 1992 (Category 4- sustained winds between 131 – 155 mph). In both instances, much of the damage sustained on Oʻahu occurred along the Waiʻanae Coast as the hurricanes passed between the islands of Kauaʻi and Oʻahu.

While these events are relatively rare in Hawai'i, they do occur and may be increasing in frequency due to global climate change. The Lanakila area, as the rest of the island or state, is no more or less vulnerable to the destructive winds and torrential rains associated with hurricanes. While it is difficult to predict such natural occurrences, it is reasonable to assume that future incidents are likely, given historical events.

While hurricane storm damage is difficult to predict, the NOAA Coastal Storms Program and Dr. Kwok Fai Cheung from SOEST developed computer models to simulate Category 4 hurricane storm surges for both current sea levels and with projected one-meter SLR. At current sea levels or one meter of SLR, the storm surge is not projected to impact the Project Site.

Potential Impacts and Mitigation Measures

Similar to the mitigation measures proposed for the Proposed Project to withstand extreme weather events generated due to global climate change and SLR, the Proposed Project should be designed to provide a safe environment for future residents and improve longevity and resiliency of the proposed facilities, landscaped areas, and vital infrastructure serving the Proposed Project such as water, sewer, electrical, drainage, and roadways. It will implement hazard mitigation measures where appropriate, such as hardening of the facility against hurricanes, flooding, and high winds. In the event of a hurricane, the potential impact of destructive winds and torrential rainfall will be mitigated through compliance with the 2006 International Building Code for any new construction. Essential equipment will also be located on higher floors wherever feasible to avoid inundation from storm surges.

4.5.5 Wildfires

Existing Conditions

The greatest danger of fire is where wildland (trees and brush) borders urban areas. The Hawaiian Islands are vulnerable to wildland fires (especially during the summer months, prolonged drought and/or high winds), and the great majority of wildfires are human-caused (intentionally caused or by negligence) and start along roadsides. Wildfires can and do also occur naturally.

Potential Impacts and Mitigation Measures

While the hazard of wildland fires exists, the urbanized area in which the property is located minimizes risk of the rapid spread of these fires. Proper ongoing landscape maintenance of the Proposed Project will also mitigate the potential risks.

4.5.6 Earthquakes

Existing Conditions

Most earthquake activity in Hawai’i is related to volcanic rather than tectonic activity. Thousands of small earthquakes occur in Hawai’i each year, and moderate and disastrous earthquakes have impacted the islands in the past. The last major earthquake to be felt on Oʻahu was the Honomu Earthquake in 1973, which resulted in minor cosmetic damage to structures, but fortunately did not result in any reported injuries or deaths. Most earthquakes occur on the island of Hawaiʻi and are occasionally felt on Oʻahu. Seismic hazards in the area are no greater in the Project Site than other locations on Oʻahu.

Potential Impacts and Mitigation Measures

Older buildings such as those existing onsite may be susceptible to damage from earthquake events as building standards have been improved since they were constructed in the 1950s. The Proposed Project will be replacing the existing structures with new structures built to current standards in the Uniform Building Code. This is anticipated to improve safety for residents and resiliency of the structures due to potential damage from earthquakes.

4.6 FLORA

A walk-through botanical survey was conducted by consultant Robert Hobdy in November 2016, whose survey method entailed selecting routes to cover the entire area and all habitat types. The survey includes a complete list of plant species found on the site as well as a discussion and recommendation for the Proposed Project based on the findings. The full report is available in Appendix E and is summarized below.

Existing Conditions

The vegetation is made up primarily of low maintenance grasses and urban weeds that survive mowing. In addition, there are hedges and a variety of ornamental plantings around some of the buildings. One small area in the upper northwest corner was undeveloped and overgrown with tall grass and shrubs. A total of 73 plant species were recorded during the survey.

Four species were common within the project area: pitted beardgrass (*Bothriochloa pertusa*), Guinea grass (*Megathyrsus maximus*), straggler daisy (*Calyptocarpus vialis*) and rainbow shower (*Cassia x nealiae*). Twenty three species were ornamental landscape plants and fifty species were volunteer lawn grasses and urban weeds.

The vegetation within the Project Site area consists entirely of non-native plants. None of these are of any conservation interest or concern.

No federally listed Endangered or Threatened plant species (USFWS, 2016) were found in the Project Site. No special habitats were identified within the Proposed Project area. The Proposed Project area lies within urban Honolulu, distant from any natural habitats.

Potential Impacts and Mitigation Measures

Because of the above existing conditions, it has been determined that there is little of botanical concern in the Proposed Project area, and that the anticipated disturbances associated with the proposed redevelopment work are not expected to have a significant negative impact on the botanical resources in this part of O'ahu.

4.7 FAUNA

A walk-through fauna survey method was conducted by Robert Hobdy in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition, an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus semotus*) in the area. The fauna survey report is attached as Appendix E and summarized below.

Existing Conditions

The Proposed Project area is a fully developed urban environment that is sparsely vegetated. This discourages many forms of wildlife from utilizing the habitat. All types of wildlife, including mammals, birds and insects were poorly represented. Only a few hardy species, adapted to human activities, were observed in the project area.

No native wildlife species were observed in the Proposed Project area during the survey. All mammal, bird and insect species were common non-native species that are of no special conservation concern. As a result, no endangered or threatened wildlife species occur in the project area.

Just two non-native mammal species were observed in the Proposed Project area during two site visits. Taxonomy and nomenclature follow Tomich (1986). Mongoose (*Herpestes auropunctatus*) were of uncommon occurrence while dogs (*Canis familia*ris) were rare. Other mammal species one could expect to see in the area include cats (*Felis catus*), rats (*Rattus* spp.) and mice (*Mus domesticus*).

An evening survey was conducted within the Proposed Project area using a bat detecting device (Batbox IIID), set to the frequency of 27,000 Hertz that the Hawaiian hoary bats are known to use for echolocation in their pursuit of nocturnal flying insects. No bats were detected.

Bird life was modest in the diversity of species observed but fairly well represented in total numbers. Taxonomy and nomenclature follow American Ornithologists' Union (2014). A total of seven non-native bird species were observed during two site visits. Four non-native bird species were common in the project area, the common myna (*Acridotheres tristis*), the zebra dove (*Geopelia striata*), the spotted dove (*Streptopelia chinensis*) and the red-vented bulbul (*Pycnonotus cafer*). Three species were uncommon or rare.

Insect life was sparse throughout the Proposed Project area due primarily to the lack of habitat diversity. Eleven non-native insect species were observed during two site visits. Taxonomy and nomenclature follow Nishida et al (1992). One species was found to be abundant throughout the area, the dung fly (*Musca sorbens*). The honey bee (*Apis mellifera*) was common. Nine other insect species were uncommon or rare. No native insect species were found.

Potential Impacts and Mitigation Measures

The Proposed Project is not expected to significantly affect any federal or State of Hawaiʻi listed Threatened, Endangered, or Candidate wildlife species or their habitats, nor will it impact any critical habitats. To minimize threats to native seabirds such as Hawaiian petrels and Newell's shearwaters that may fly over the project, outdoor lighting will be fully shielded and downward facing. In addition, floodlighting will not be permitted except for emergencies and no nighttime construction work is expected to occur.

5 ASSESSMENT OF EXISTING HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the conditions of the human environment, potential impacts of the Proposed Project, and mitigation measures proposed to minimize any impacts to the human environment.

5.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

On October 31, 2016, ASM Affiliates conducted an archaeological surface inspection of the Project Site. The irregularly shaped, contiguous Project Site is oriented southeast to northwest on its long axis, along the School Street corridor. The southeastern corner of the Project Site is bisected by the *ahupuaʻa* boundary that separates Kapālama and Honolulu, with a small part of the Project Site falling within Honolulu Ahupuaʻa (refer to section 3.2.3 for a full definition). The full AIS is provided in Appendix F and summarized below.

5.1.1 Archaeological Resources

Existing Conditions

The *ahupuaʻa* of Kapālama is bounded on the west by Kalihi Ahupuaʻa and the east by Honolulu Ahupuaʻa, all within the Kona District. The name Kapālama refers to an enclosure (*pā*) of *lama* wood which surrounded the residence of high ranking *aliʻi* (chiefs). The two streams, Kalihi and Niuhelewai, on each side of the *ahupuaʻa*, provided optimal environmental conditions that were well suited for Pre-contact native Hawaiian subsistence practices. The Kapālama *ahupuaʻa* was well-watered by the two streams as well as numerous springs, ideal for the construction of *loʻi* (irrigated terraces) for taro in an almost continuous, three quarters of a mile long system both *makai* to *mauka* (southwest to northeast); from ʻIwilei to the Koʻolau foothills above School Street and between the two streams (northwest to southeast).

Post-contact land tenure changed, and by the middle of the nineteenth century, the ever-growing population of Westerners forced the establishment of a Euro-American style of land ownership in the Hawaiian Islands. As a result, the Great *Māhele* became the vehicle for determining ownership of native lands (refer to section 3.2.3 for a full definition). During this period, land interests of the King (Kamehameha III), the high-ranking chiefs, and the low-ranking chiefs, the *konohiki,* were defined. Because of its agricultural productivity, Kapālama Ahupuaʻa was a very desirable part of the south shore of Oʻahu (along with Nuʻuanu, Mānoa, and Waikīkī). Following Kamehameha's victory over Oʻahu, the islands lands were divided among the *aliʻi* and he "…'kept of himself' the *ahupuaʻa* of Kapālama" (Kameʻeleihiwa 1992:59). Years later, during the *Māhele*, Kapālama Ahupuaʻa was retained as Crown Land by King Kamehameha III, which included the current Project Site.

The 1851 map (Figure 16 of Appendix F) by A. Bishop is the first map to show any level of detail of Kapālama, which includes the surrounding *ʻili,* a spring (*pūnāwai*) and stream (*kahawai*), along the northwest end of the Project Site. Niuhelewai Stream is also depicted on the map and the course of the stream generally corresponds to the boundary between Kapālama and Honolulu ahupuaʻa. A rock quarry, Pao Kalaepohaku (on nearby Kamehameha Schools' land), is shown above the Project Site to the north. The rock quarry will play a prominent role in the later land use history of the Project Site.

The current Project Site is located on the former site of a medical facility dedicated to the care of the mentally ill, originally known as the Oʻahu Insane Asylum. In 1862, under Kamehameha IV, the Legislature proposed and passed *He Kanawai e hoonohonoho ana I hale e malama a e lapuu i na pupule* (An Act to establish an Insane Asylum) into law authorizing the establishment of the mental hospital for the purpose of "the reception of all insane persons" (Kamehameha IV 1862:32 Section 1). While the Asylum was in operation, it was determined that that proximity to the rock quarry was incompatible. Ultimately, the rock quarry was found to provide the best rock for road construction in the islands, which set in motion an effort to relocate the asylum elsewhere so that the quarry could continue its operations (ibid.). In 1903, it was decided to relocate the asylum, described as "in a tumbledown condition, the roofs of some of them having been battered in by the rocks thrown from the blasts in the adjoining stone quarry."

The search for a new location for the Oʻahu Insane Asylum that began in the early 1900s as a means of solving the rock quarry dilemma and removing the Asylum out of the area to allow further expansion and development of Honolulu, ended in late 1928, when a site in Kāneʻohe was selected as the new location for the Asylum. The 524-bed facility was known officially as the Territorial Hospital and opened in 1930.

Following the move, the former Oʻahu Insane Asylum buildings within the current Project Site went unused and languished, while various reuses were proposed for the buildings and multiple proposals for the redevelopment of the property were explored.

An aerial photo from 1952 shows the former Asylum buildings present at the site (Figure 25 of Appendix F). Also visible in the 1952 photo are the Lanakila Emergency Homes, created under a portion of Executive Order 1274 and built in 1951 by the Hawai'i Housing Authority ("HHA", now HPHA). The Lanakila Emergency Housing project was erected around the former Asylum buildings and incorporated some of the Asylum structures to further address the Honolulu housing shortage that dated back to the early 1930s and was exacerbated by World War II. In February 1951, the Territory funded the construction of the concrete block Puahala Homes, adjacent to the current Project Site, which were built in four phases between 1952 and 1959 (Fung Associates 2011). A review of City and County Building Permits from the 1950s documented that HHA also built two of the buildings currently present on the property; a one-story maintenance shop building in 1953 located in the north-central portion of the Project Site and a one-story office building in 1955, in the center of the current Project Site. Figure 26 of Appendix F shows the Project Site in 1959. From the 1950s through the 1980s, HHA, and later HPHA, built, moved, and demolished several buildings within the current Project Site.

Records on file at the Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD) indicate that the Project Site was not previously surveyed for archaeological resources. However, in 1995, the HHA, with funding from the U.S. Department of Housing and Urban Development (HUD), proposed building a new 2,880 square-foot Family Investment Center within what is now the Project Site. Following a site inspection on March 23, 1995, HHA sent a March 24, 1995 letter to DLNR-SHPD/ State Historic Preservation Officer (SHPO) stating a determination that the Proposed Project would have no effect on properties listed on or eligible for the NRHP (On file at DLNR-SHPD). A June 5, 1995 letter from DLNR-SHPD/SHPO concurred with HHA determination and stated that "A review of our records shows that there are no known historic sites at the project location. Aerial photographs from the 1970s show that the parcel has been cleared and modified making the presence of historic sites unlikely. Thus, we believe that this action will have ‘no effect’ on historic sites” (SHPD/DLNR Log No. 14731, Doc No. 9505EJ12).

Background research and the October 31, 2016 field inspection have demonstrated that the varied and interesting history of the property has resulted in the near continuous development and redevelopment of the current Project Site. This redevelopment has involved numerous, episodic and extensive ground disturbing activities, which has obliterated any potential archaeological properties that may have been present below the ground surface. Currently, there are numerous underground utilities and easements across and around the Project Site, such as the Kapālama Drainage Unit (C.S.F. 10597) located along the southeast and southwest edges of the Project Site and a 20,445 square foot Transmission Line and Pole Easement along School Street. The HPHA campus contained within the Project Site is thoroughly developed and contains thirteen different buildings (nearly 31,000 square feet total) and associated underground utilities, with most of the rest of the Project Site covered with concrete pads and sidewalks, and asphalt parking lots and driveways crisscrossed by underground storm sewers.

Potential Impacts and Mitigation Measures

Given the findings of the current study coupled with the previous DLNR-SHPD/SHPO determination, it is believed that the proposed redevelopment project in the current Project Site will have no effect on archaeological resources. In the unlikely event that any potential such resources or human skeletal remains are encountered during ground disturbing work in the Project Site, work in the immediate vicinity of the discovery will be immediately halted and DLNR-SHPD contacted as outlined in HAR 13§13-275-12.

5.1.2 Historic Architectural Resources

Fung Associates, Inc. (FAI) conducted a reconnaissance level survey (RLS) of architectural historic resources within the Project Site, in order to provide a baseline of information which will be useful in evaluating and assessing potential impacts to identified, eligible historic resources, including the structures onsite, as a result of the proposed redevelopment project. The survey followed a methodology that included performing background research, completing a site visit to photograph and gather information on the buildings located on the parcel, and writing up the results of the survey so any identified properties may be placed in the State Historic Preservation Division’s (SHPD) Statewide Inventory of Historic Places. The RLS is provided in Appendix G and summarized below.

Existing Conditions

The RLS identified thirteen buildings in the Project Site (see “Survey Coverage Map” of the RLS). Of the total, only five were over fifty years of age:

- the 1955 administration building (Building A);
- a maintenance shop and semi-attached central store room (together referred as Building D)
- a set of garages; and
- a facilities office building (Building C).

The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz.

The five buildings over fifty years of age identified in the RLS appear to meet criterion C for listing in the Hawai'i and National Registers of Historic Places. Although significant, the 1955 HHA administration building and the buildings associated with HPHA's maintenance efforts, do not appear to have high preservation value. The 1955 administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, none of the five buildings appear to be of high preservation value.

Potential Impacts and Mitigation Measures

On October 4, 2017, SHPD wrote that it accepts the RLS, and that it looked forward to receiving the 6E submittal packet, 6E submittal form, building permit application, permit set, plans and photographs.

5.2 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) prepared by ASM Affiliates for the Proposed Project is attached as Appendix H, and summarized below. The CIA incorporates cultural information from a combination of archival research and consultation, to use for the analysis of cultural impacts.

Existing Conditions

The Project Site is located at the corner of School and Lanakila Avenues on a terrace at the base of the Kamehameha Heights. The majority of the Project Site falls within Kapālama Ahupuaʻa except for the southeastern corner, which falls within Honolulu Ahupuaʻa.

The entirety of the Project Site has been altered by nearly continuous development and redevelopment, which began in the early 1860s with the construction and subsequent expansion of the Oʻahu Insane Asylum. Since the 1950s, the Project Site has been redeveloped by HPHA demolishing existing buildings and constructing new buildings and infrastructure, and by the City and County of Honolulu who has multiple utilities and infrastructure crisscrossing the property.

Potential Impacts and Mitigation Measures

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the Project Site is vital because these individuals ascribe meaning and value to traditional resources and practices. Community members may also possess traditional knowledge and beliefs of a place that are unavailable elsewhere in the historical or cultural record. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected Project Site.

As part of the current investigation the primary author contacted Leimomi Khan, Pelekikena (President) of the Kalihi-Pālama Hawaiian Civic Club. Ms. Khan then forwarded a request for information regarding any knowledge of traditional cultural practices associated with the subject parcel prepared by the primary author to each of the Civic Club Members via email. No response was received from any of the Civic Club members and a follow-up communication with Ms. Khan revealed no further leads for sources of such information. In addition, the primary author attempted to contact Leimana Damate, Executive Director of the ʻAhu Moku Advisory Committee but did not receive a response to repeated request for assistance in locating individuals who might have information regarding traditional cultural practices within the current Project Site.

There was no information provided nor were any individuals found during the consultation process relative to the identification of traditional cultural properties or practices associated with the current Project Site. A complete copy of the current study has been sent to the Office of Hawaiian Affairs (OHA) for their comment.

No archaeological sites were identified within the current Project Site as a result of the field inspection (Crowell 2017). These negative findings combined with the lack of information regarding traditional cultural practices related to the subject parcel are not unexpected; as the current Project Site was the site of an institution dedicated to the treatment of the mentally ill as early as 1862. The Asylum provided care for the Hawaiian Kingdom and the Territory of Hawaiʻi until 1930. The property then languished and was repurposed by the territorial government and the state government as military barracks and emergency housing. Any traditional cultural practices that may have been practiced within the current Project Site likely predated the establishment of the Asylum over 150 years ago. Thus, the paucity of traditional knowledge or beliefs related to the subject parcel beyond what can be gleaned from the cultural-historical context presented above is not surprising.

Given the negative findings of the current study with respect to the identification of any traditional cultural practices and properties, or any specific valued cultural, historical, or natural resources, it is our conclusion the redevelopment and continued use of the property will not result in impacts to any traditional cultural properties or practices.

5.3 NOISE

A Noise and Vibration Study was conducted for the Proposed Project by Terry A. Hayes Associates, Inc. (TAHA) in November of 2017 to comply with applicable federal, State, and local regulations for noise and vibration. The following is a summary of the noise analysis; the entire report is attached in Appendix I.

Existing Conditions

For the purposes of this analysis, noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The “A-weighted scale,” abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA.

Current sources of noise in the vicinity of the Project Site include nearby roadways. Additional sources may include surrounding land uses such as nearby apartments and residences, Lanakila District Park and nearby schools. The Project Site is located over five miles from Hickam Air Force Base and over three miles from the Daniel K. Inouye International Airport.

Existing noise levels are analyzed by the Day-Night Noise Level (L_{dn}), or the average noise over a 24-hour period. Noise levels were monitored at six points adjacent to the site that included School Street and Lanakila Avenue. The on-site monitoring locations showed L_{dn} measurements ranging from 61.0 dBA to 65.5 dBA for the different points of measurement, with an average 24-hour L_{dn} of 63.3 dBA for the entire Project Site.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Transportation Airports Division wrote:

> *"3. The project property is located between the 60 to 55 Day-Night Sound Level noise contours as shown on the Honolulu International Airport 2008 Noise Exposure Map. While noise mitigation measures may not be mandated in the design of the project, the applicants and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations."*

During the EISPN Public Review period, the State Department of Health, Environmental Planning Office wrote:

> *"If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.Hawai'i.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions."*

The Hawaiʻi Administrative Rules (HAR) define state-wide regulations for maximum permissible sound levels based on zoning districts (HAR, Chapter 11-46, Community Noise Control). In addition, the Hawaiʻi State Department of Health discusses applicable local rules for various noise sources in their *Noise Reference Manual Oʻahu Edition*.

To determine the potential noise impacts of the Proposed Project, sensitive land uses were identified both onsite and in the immediate areas surrounding the Project Site. These include a mix of residences, schools, churches, a care home, libraries, and a park; each would be considered sensitive depending on the distance from the Project Site and may warrant unique measures for protection from intruding noise.

The analysis considers construction and operational sources of noise. The noise level during the construction period at each receptor location was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. Operational noise levels were calculated based on information provided in the traffic study and stationary noise sources located on the Project Site (e.g., mechanical equipment).

To assess future noise levels at the Project Site, both railway noise from HART and traffic noise were analyzed using the HUD Day/Night Noise Level Calculator. The model calculates the Day/Night Noise Level for roadways by taking into account average vehicle speed, distance to receptor, average daily trips, road gradient, average daily trips (ADT) by vehicle type, and the percentage of ADT that occurs between the hours of 10:00 p.m. to 7:00 a.m. Railway noise is calculated using average train speed, distance to receptor, average daily train operations, track type, use of whistles and horns, railway cars per train, and the percentage of average daily train operations that occur between the hours of 10:00 p.m. to 7:00 a.m.

The analysis is split by scenario, 50 percent buildout in the year 2022 without and with the project and 100 percent buildout in the year 2029 without and with the project. The HART will be fully operational in the year 2025 and as such, railway noise has been taken into account only for assessment of year 2029. Noise assessment locations (NALs) were selected along each side of the Project Site to represent noise levels that would be experienced by sensitive receptors.

<u>Construction Activities</u>

Construction activities at the Proposed Project are expected to have temporary increases in ambient noise levels in the Project Site on an intermittent basis. Noise levels would fluctuate depending on the construction phase and type of construction activity (e.g. demolition, site preparation, pile driving, if necessary, etc.), equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers and require mitigation. Construction noise levels in the vicinity of the Project Site would likely exceed the allowable noise levels listed by DOH *Noise Reference Manual Oʻahu Edition* for local levels as well as the allowable noise levels listed by the HAR for state-wide levels due to the nature of the construction activity. Construction activity would typically only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturdays, Sundays, and holidays, which would help to minimize potential adverse effects to residents and neighboring properties from construction noise and vibration.

In addition, to minimize the potential adverse effects related to construction noise, the following measures will be undertaken:

- The Proposed Project shall obtain a noise permit associated with exceeding a noise level of 78 dBA L_{eq} as discussed in the Noise Reference Manual Oʻahu Edition.
- The Proposed Project shall obtain a noise permit associated with exceeding the maximum permissible noise levels discussed in the Hawaiʻi Administrative Rules.
- The construction contractor shall be required to use specialty equipment with enclosed engines and/or high-performance mufflers.
- The construction contractor shall be required to locate equipment and staging areas as far from noise-sensitive receivers as practicable.
- The construction contractor shall be required to limit unnecessary idling of equipment.
- The construction contractor shall be required to install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment.
- Prior to the commencement of construction activities, notification shall be provided to the on-site residential uses that discloses the construction schedule, including the various types of activities and equipment that would be occurring throughout the duration of the construction period.
- A "noise disturbance coordinator" shall be retained. The noise disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The noise disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall be required to implement reasonable measures such that the complaint is resolved. All notices that are posted at the construction site shall list the telephone number for the noise disturbance coordinator.

Operational Activities

Noise generated from project operation once construction is complete will be primarily due to traffic. The project's contribution to mobile noise sources were calculated by TAHA in November of 2017 for two project alternatives for the year 2029 (full build-out). The Proposed Project's maximum contribution to increasing noise levels for the Preferred Alternative would occur at NAL 11, with an increase of 0.5 dBA L_{dn} above future without project noise levels. The maximum increase for Alternative 2 in the year 2029 would occur at NAL 7, with an increase of 0.5 dBA L_{dn} above future without project noise levels. The Proposed Project's contribution to mobile source noise levels would be would be less than 5 dBA for both alternatives and would not result in an adverse effect related to increasing noise levels at on-site or off-site sensitive receptors.

In addition to traffic noise, the HART rail system is anticipated to be operational in the year 2025 and will operate approximately one mile to the southwest of the Project Site along Dillingham Boulevard and Kaʻaʻahi Street. The Federal Transit Administration has stated that light rail transit projects have no potential to impact sensitive land uses and distances greater than 350 feet away and therefore noise from the future rail operations are not anticipated to adversely impact the Proposed Project.

Stationary noise generated at the site would primarily be generated from the operation of ventilation and air conditioning systems. Although the precise locations of these systems are unknown until detailed site plans are created, the described stationary noise sources may potentially exceed the maximum permissible sound levels as detailed in the HAR. Therefore, mitigation will include requiring enclosures for mechanical equipment, such that noise levels do not exceed the maximum permissible noise levels listed in the Hawaiʻi Administrative Rules.

In its comment letter on the EISPN, the State Department of Transportation noted that the Project Site is located approximately 2.6 miles from the end of runway 26R of the Daniel K. Inouye International Airport (HNL) and is therefore within the 55-60 day-night average sound level (DNL) contour of the 2008 (Forecast) Five-Year Noise Exposure Map. The Federal Aviation Administration (FAA) has published land use compatibility guidelines that can be used to assess potential noise impacts to new development projects. The guidelines indicate that residential land uses exposed to aircraft-related noise levels of less than 65 dBA L_{dn} are compatible with the ambient noise environment. The current HNL noise contours indicate that the Project Site is located in a compatible noise environment related to aircraft activities and although single event noise from aircraft operations exceeding 65 DNL may be audible at the Project Site, depending on multiple variables, including time of day and type of plane, single event noise levels as measured at the site were not found to be excessive during day or night time periods. In addition, it is anticipated that interior noise levels would be consistent with applicable HUD standards for new residential development and would therefore help mitigate any single event noise generated by aircraft activities.

5.4 VIBRATION

A Noise and Vibration Study was conducted for the Proposed Project by Terry A. Hayes Associates, Inc. (TAHA) in November of 2017 to comply with applicable federal, State, and local regulations for noise and vibration. The following is a summary of the vibration analysis; the entire report is attached in Appendix I.

Existing Conditions

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.

High levels of vibration may cause physical personal injury or damage to buildings. However, ground-borne vibration levels rarely affect human health. Instead, most people consider ground-borne vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of ground-borne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to ground-borne vibration.

In contrast to noise, ground-borne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower, well below the threshold of perception for humans which is around 65 RMS. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

Neither the State of Hawaiʻi nor the City and County of Honolulu has vibration standards. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, engineered concrete and masonry buildings (no plaster) can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage. Non-engineered timber and masonry buildings can be exposed to ground-borne vibration levels of 0.2 inches per second and buildings extremely susceptible to vibration damage can be exposed to ground-borne vibration levels of 0.12 inches per second without experiencing structural damage

There are no existing stationary sources of vibrations located near the Project Site. Heavy-duty trucks can generate ground-borne vibrations that vary depending on vehicle type and weight, and pavement conditions. Based on site visits, vibration levels from adjacent roadways and aircraft operations are not typically perceptible at the Project Site. The HART rail line is estimated to be fully operational by 2025 and could potentially generate vibration at nearby receptors. However, the nearest component of HART is located approximately one mile to the southwest of the Proposed Project. Vibration is a highly localized event and typically dissipates within a few feet from the source. Therefore, vibration generated by HART would not be perceptible at the Project Site.

Potential Impacts and Mitigation Measures

Vibration standards are not identified by the State of Hawaiʻi or the City and County of Honolulu. Therefore, guidance published by the Federal Transit Administration (FTA) is used to analyze impacts relative to vibration. Ground-borne vibration would be considered an adverse vibration effect if:

- Vibration levels exceed 0.3 inches per second at off-site engineered concrete and masonry buildings; and/or
- Vibration levels exceed 0.12 inches per second at historic structures.

Construction Activities

Construction activity can result in varying degrees of ground vibration based on the equipment and methods used for construction. Several buildings abut the Project Site. Site visits performed by TAHA suggest that the majority of these buildings were constructed using engineered concrete and masonry. Federal guidance indicates that such buildings can withstand up to 0.3 inches per second without experiencing damage. The use of construction equipment that would produce high levels of vibration,

such as large bulldozers, jack hammers, and load trucks, could exceed this criterion if occurring within 11 feet of the buildings.

In order to mitigate construction-related vibration impacts, construction activity should typically only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturdays, Sundays, and holidays. In addition, to help minimize potential adverse effects associated with damage to adjacent buildings, mitigation measures for construction vibration will include the following for the sensitive structures located close to proposed construction activities:

- Prior to issuance of a grading/shoring permit, a qualified structural engineer shall survey the existing foundation and structural integrity of off-site buildings that will be located within 11 feet of large bulldozers and similar vibration-generating equipment. The survey shall be submitted to the appropriate mitigation monitor. At the conclusion of vibration causing activities, the qualified structural engineer shall issue a follow-on letter describing damage, if any, to the adjacent buildings. The letter shall identify recommendations for any repair, and certify the completion of any repairs as necessary to confirm the integrity of the foundation and structure of the adjacent buildings.

- If the construction plans call for high-vibration construction activities being performed close to structures, the contractor may be required to use alternative procedures that produce lower vibration levels. Examples of high-vibration construction activities include the use of pavement breakers, vibratory compaction, and hoe rams next to sensitive buildings. Alternative procedures shall include the use of non-vibratory compaction in limited areas and concrete saws in place of jackhammers or pavement breakers for demolition.

- If piles are required to support new structures, pile driving shall be prohibited in places of cast-in-drilled-hole (CIDH) piles or caissons.

Operational Activities

The Proposed Project would not include significant stationary sources of ground-borne vibration during ongoing operations once construction is completed. Operational ground-borne vibration in the project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, project-related traffic vibration levels would not be perceptible outside the roadway right-of-way. Therefore, the Proposed Project would not result in adverse effect related to the operational vibration.

5.5 AIR QUALITY

An Air Quality Study of the Project Site was conducted by Terry A. Hayes Associates, Inc. (TAHA) in November of 2017 (which can be found in Appendix J). Air quality emissions were also assessed for construction and operational activities. The analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. “Emissions” refer to the quantity of pollutant released into the air, measured in pounds per day (ppd) or tons per year (tpy). “Concentrations” refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter (µg/m3). It also analyzes potential air quality impacts against federal and State standards as well as potential greenhouse gas (GHG) contributions. Air quality control measures are recommended when appropriate to reduce emissions.

Air quality in the vicinity of the Proposed Project is generally considered to be good due to the presence of northeasterly trade winds that tend to disperse pollutants seaward. The City and County of Honolulu is currently designated as being in attainment of all applicable ambient air quality standards. The State of Hawaiʻi Department of Health (DOH) Clean Air Branch is responsible for state-wide air pollution control, which publishes annual air quality summary data for the state of Hawaiʻi. The island of Oʻahu has four active air monitoring stations, with the nearest air monitoring station to the Project Site being in Honolulu at 1250 Punchbowl Street on the top of the Department of Health building. This is located approximately one mile south-southeast of the Proposed Project. During the period from 2013 to 2015, the Honolulu air monitoring station did not record any violations of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide (SO_2), and two types of particulate matter (PM_{10} and $PM_{2.5}$) over any averaging period.

Air pollutant emissions from nearby stationary sources such as the Aloha Petroleum refinery, the Chevron Honolulu refinery, and the Honolulu Harbor are blown offshore in the opposite direction of the Proposed Project and do not pose environmental concerns with regards to degradation of air quality.

Potential Impacts and Mitigation Measures

All proposed activities regarding the Proposed Project must comply with Section 11-60, HAR. Potential air quality impacts would involve two sources: 1) temporary impacts related to construction, and 2) ongoing impacts generated primarily from traffic, any onsite mechanical equipment, and indirectly via offsite electricity generation. Sensitive receptors were identified both onsite and offsite due to the fact that construction is anticipated to be completed in phases. Existing residences as well as newly constructed residences would potentially be located adjacent to ongoing construction activity. These residences would be sensitive to emissions of air pollutants generated by construction activities. The offsite sensitive receptors included Lanakila and Likelike Elementary Schools as well as other residences as close as 70 feet away on School Street.

<u>Construction Activities</u>

Project Site

Construction activity would generate emissions through the use of heavy-duty construction equipment and through vehicle trips generated by construction workers traveling to and from the Project Site. Fugitive dust emissions would primarily result from site preparation (e.g., grading) activities. Nitrogen oxide emissions would primarily result from the use of construction equipment. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions.

Construction activity would occur over the entire 6-acre Project Site. A Project Site of this size would typically require an equipment inventory including a maximum of two scrapers and two graders to level the surface. This equipment inventory could potentially disturb up to three acres of the Project Site on a given day. Using USEPA AP-42 emission factors, it was determined that construction activity would generate up to ten pounds per day of fugitive dust emissions. Construction emissions would be temporary and are not considered adverse.

Construction activity may result in temporary emissions from vehicle exhaust and fugitive dust emissions from ground disturbance. Therefore, the following control measures would be engaged to reduce fugitive dust emissions:

- The construction contractor will be required to use water or suitable chemicals to control fugitive dust in the demolition of any existing buildings or structures, construction operations, the grading of roads, or the clearing of land.
- The construction contractor will be required to apply asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces which may result in fugitive dust.
- The construction contractor will be required to cover all moving, open-bodied trucks transporting materials which may result in fugitive dust.
- The construction contractor will be required to maintain roadways in a clean manner.
- The construction contractor will be required to promptly remove earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means.

The following control measures are recommended to reduce pollutant exposure to residences during the construction activities:

- Staging areas shall be located away from on-site residential land uses.
- On-site electricity shall be obtained from the electrical grid rather than temporary diesel or gasoline generators.
- Equipment and vehicle engines shall be maintained in good condition and in proper tune per manufacturers' specifications.
- All construction equipment and delivery vehicles shall be turned off when not in use or prohibited from idling in excess of five minutes. Haul trucks waiting to be called to remove soil from the Project Site shall not be allowed to idle while queuing.
- Additional care will be taken by contractors to minimize fugitive dust from materials being hauled to or away from the Project Site and mud and debris tracked onto adjacent roadways.

<u>Operational Activities</u>

During the EISPN Public Review period, the State Department of Health, Environmental Planning Office wrote:

> *"In 2015, Hawai'i passed Act 97 which amended Hawai'i's Renewable Portfolio Standards by setting a goal for Hawai'i to become one hundred percent renewable by the year 2045. To reach this goal Hawai'i should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is essential that EV charging stations be added to any planned parking areas open to the EV driving public. All future plans should strive to encourage the use of personal bicycles though the development of designated*

bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity."

Because the City & County of Honolulu is currently in an attainment area, there is no federal nexus for conformity with the federal Clean Air Act. The Proposed Project also does not include a source of direct pollutant emissions. However, indirect sources of emissions include off-site electrical generation activities (for those that are non-renewable) and tailpipe emissions from on-road vehicles and the potential air quality impacts related to the Proposed Project is therefore analyzed on those sources.

Based on the traffic impact analysis report (TIAR) completed for the Proposed Project, the Preferred Alternative at full buildout would introduce approximately 2,896 new daily trips to the Project Site, including 147 trips during the AM peak hour and 227 trips during the PM peak hour. Alternative 2 for the Proposed Project in the year 2029 would introduce approximately 4,305 new daily trips to the Project Site, including 273 trips during the AM peak hour and 372 trips during the PM peak hour. The maximum peak hour intersection volume in 2029 following full buildout would be approximately 5,286 vehicles under the Preferred Alternative and 5,317 vehicles under Alternative 2 at the intersection of North School Street and Kalihi Street. Based on carbon monoxide (CO) dispersing models developed to analyze traffic-related impacts, it is projected that the roughly 10,000 vehicles (about twice the maximum vehicles within the Proposed Project area would generate a maximum 1-hour CO concentration of approximately 4.6 ppm. The applicable State 1-hour average CO ambient air quality standard is 9.0 ppm. Therefore, the maximum intersection volume in the Project Site following full buildout of the Proposed Project is approximately 25 percent of the volume that could potentially exceed the State 1-hour standard for CO.

Additionally, the maximum background 1-hour CO concentration measured in the vicinity of the Project Site was 1.4 ppm in 2015, which is approximately one-sixth of the applicable State 1-hour standard for CO. According to the TIAR, the maximum existing peak hour intersection volume in the Project Site is 4.893 vehicles at the intersection of North School Street and Kalihi Street. Under the 2029 full buildout conditions, peak hour volumes at this intersection would be 5,286 vehicles under the Preferred Alternative and 5,317 vehicles under Alternative 2, which represent an increase of approximately eight percent relative to existing conditions. This incremental increase in maximum peak hour traffic volumes would not have the potential to increase maximum 1-hour CO concentrations in the Project Site to exceed state standards. Therefore, neither the implementation of the Preferred Alternative nor Alternative 2 of the Proposed Project would result in potential CO hot spots within the Project Site.

The Proposed Project would result in indirect greenhouse gas (GHG) emissions through electricity generation at an off-site facility. The project will require a maximum of 3.1 megawatts of power which would lead to indirect generation of GHG emissions. Hawaiʻi is committed to renewable energy production, which does not generate GHG emissions. In 2016, 25.8 percent of energy produced by the Hawaiian Electric Companies (HECO) was renewable. Hawaiʻi has enacted a law that mandates that all of the State's electricity comes from renewable sources no later than 2045. As the HECO continues to achieve those goals, project-related indirect emissions would proportionally decline until 2045, or when the State achieves a fully renewable supply of energy.

Project emissions have been conservatively estimated using existing generation information and emission rates. The 2015 Hawaiʻi State Electricity Profile indicates that approximately 1,600 pounds of carbon dioxide is emitted per megawatt-hour of electricity used. The analysis assumes that the average daily power use, including nighttime hours, at the Project Site would be 50 percent of the maximum power load. The indirect emissions from electricity use would be approximately 3,557 metric tons per year. These emissions would quickly decrease through 2045 as the State becomes fully reliant on renewable energy. Hawaiian Electric has stated there is existing capacity to service the project. The project would not interfere with the development of clean energy supplies and would not include a substantial on-site source of GHG emissions. The Preferred Alternative and Alternative 2 would locate in-fill development near existing public transportation and shopping areas, thereby reducing mobile source emissions compared to development located outside of urban areas. For example, the trip generation analysis prepared for the Proposed Project anticipates that walking/biking trips would reduce passenger vehicle trips by 10 percent, residential-related transit trips would reduce passenger vehicle trips by 15 percent, and retail related transit trips would reduce passenger vehicle trips by 10 percent at full buildout. Energy conservation features and in-fill development benefits would ensure that neither the Preferred Alternative nor Alternative 2 would result in a significant GHG impact.

Residential Exposure

The Proposed Project would introduce new residential receptors to the Project Site that could potentially be adversely affected by existing sources of air pollution. For instance, the H-1 Freeway is located approximately 1,350 feet west of the Project Site (and downwind of the site during predominant tradewind conditions). According to the most recently available data obtained by the State in 2012, annual average daily traffic on the segment of the H-1 Freeway in closest proximity to the Project Site was approximately 174,000 vehicles. Research conducted in the State of California determined that air pollution near freeways decreased by approximately 70 percent at a distance of 500 feet from the source, prompting the California Air Resource Board (CARB) to publish a recommended screening distance of 500 feet for siting new residences in proximity to freeways without mitigation. The Proposed Project would be located at a distance from the H-1 freeway over twice the California recommended screening threshold. Additionally, air pollution generated by mobile sources on the H-1 freeway would diminish by more than 80 percent before reaching the Proposed Project. Therefore, long-term habitation of future residences on the Project Site would not have the potential to expose occupants to unacceptable levels of air pollution and no adverse effects would occur.

The Project Site is located approximately 2.7 miles from the end of runway 26R of the Daniel K. Inouye Honolulu International Airport. Air quality in the vicinity of the Proposed Project is generally considered to be good due to the presence of northeasterly trade winds that tend to disperse pollutants seaward. Air pollutant emissions from the airport are typically blown offshore in the opposite direction of the Proposed Project and do not pose a significant exposure concern for future residents.

5.6 VISUAL RESOURCES

The Primary Urban Center Development Plan ("PUCDP") identifies significant panoramic views in the Primary Urban Center, which includes the Proposed Project. Scenic Views, Section 3.1.1.2 of the PUCDP, discusses the panoramic views of the urban skyline. Map A.1, Significant Panoramic Views depicts vantage points and orientation of major panoramic views within the Primary Urban Center (Figure 8). View objects identified in this section which may be impacted by the Proposed Project include the Koʻolau Mountain Range, Lēʻahi Crater (Diamond Head) and Pūowaina Crater (Punchbowl). Of these geographical features, only Pūowaina Crater is visible from the Diamond Head end of the site, and that view is largely obstructed by buildings and the tall light poles of Lanakila District Park. This section of the PUCDP also discusses panoramic views of the urban skyline from arrival points by air and sea, from above the Koʻolau and from outlying areas to the east and west as an important aspect of the City's image, as it establishes a distinctive identity for Honolulu, defines sub-districts within it, and provides directional orientation.

This section of the PUCDP also notes that the lateral extent of Honolulu's skyline is defined by Nuʻuanu Stream on the west and Kapiʻolani Park and Diamond Head on the east. At present, Downtown, with its taller profile and denser clustering of building emphasized by the low-rise profiles of the Chinatown and Hawaiʻi Capitol Districts, is a visually prominent element of the skyline in the western portion of the Primary Urban Center is less pronounced than in Honolulu.

The PUCDP also discusses framed views, or view "corridors," of mountains and the shoreline along streets that are aligned in the mauka-makai orientation) (including makai to mauka views towards Kamehameha Schools (Kapālama Heights)). The width of the street, combined width of the street, combined with building setback requirements, create and retain these views. Views of the mountains or shoreline along the street are important directional reference points for pedestrians and motorist, particularly those who are not familiar with the City's street system or urban landmarks.

The project is linear, and the makai end, fronts North School Street. This portion of School Street (between Lanakila Avenue and Kokea Street) is straight and runs parallel to the general orientation of the Primary Urban Center (northwest to southeast). However, there is no prominent landform in either direction of School Street, and views of School Street fronting the Project Site include the following prominent features:

- Overhead utility lines on wooden poles along the makai side of School Street fronting apartment buildings (including one approximately 10 stories high) and single-family residences;
- Tall 138kV lines on tall metal poles along the mauka side of School Street;
- Very different scenery along the Project Site frontage (mauka side of School Street) from two permanent looking buildings with hipped roofs setback from School Street and mature trees, to portable and industrial-looking buildings with less mature trees;
- When there are little or no trees, there are views available of HPHA's Puahala Homes and Kapālama Heights beyond.

The mauka side of the site is largely open and affords views of Puahala Homes and lower Kapālama Heights, which is largely covered by single-family homes.

Potential Impacts and Mitigation Measures

During the EISPN public review period, the City and County of Honolulu, Department of Planning and Permitting wrote:

> *"The Draft Environmental Impact Statement (DEIS) should include the following:*
>
> 1. *Discussion on how the proposed project meets the planning principles and guidelines for the Primary Urban Center Development Plan and the Oʻahu General Plan.*
>
> 2. *Exhibits showing the proposed heights of the new apartment and administrative buildings. These elevation views could then be assessed for their potential to block makai views from the residences on Keola Street and block mauka views from properties on the makai side of North School Street.*

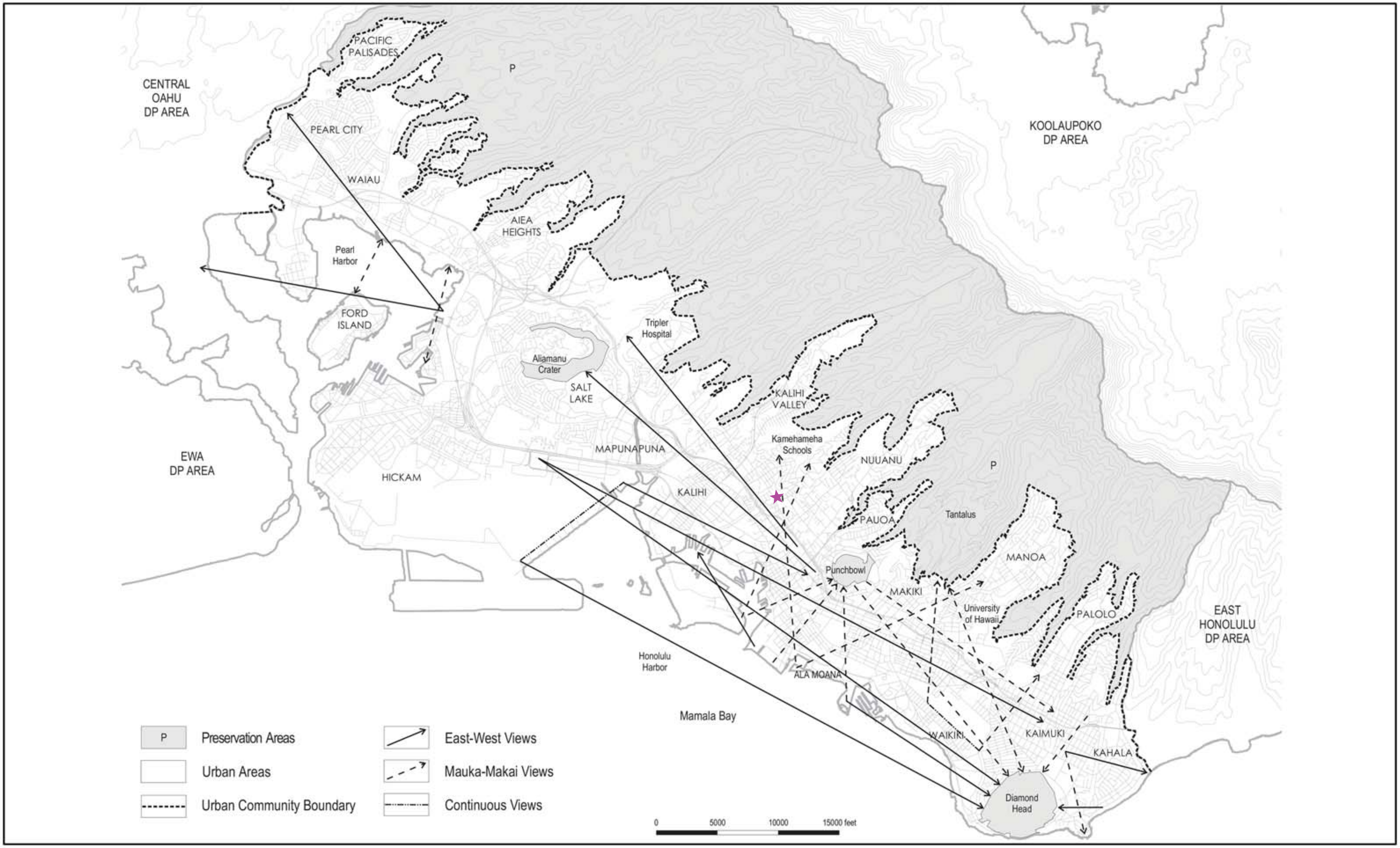
5. *Description of landscape buffers and screening the redevelopment will provide to adjacent properties."*

Three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Project Site should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Figure 8). The visual impacts from the project, however, must take into consideration:

- the existing multi-family and single-family development of this area;
- existing buildings such as Maluhia Health Center, Kapuna I, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center;
- overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and
- the tall field lights at Lanakila District Park. (See Figure 9.)

The current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. It breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The Proposed Project Master Plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by:

- Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views;
- Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets;
- Creating a more interesting skyline by varying building heights;
- Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and
- Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.



Source: Primary Urban Center Development Plan, City & County of Honolulu, 2004.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

DATE: 10/30/2017

LEGEND

★ Project Site

Figure 8: Significant Panoramic Views

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

(NOT TO SCALE)

PBR HAWAII & ASSOCIATES, INC.

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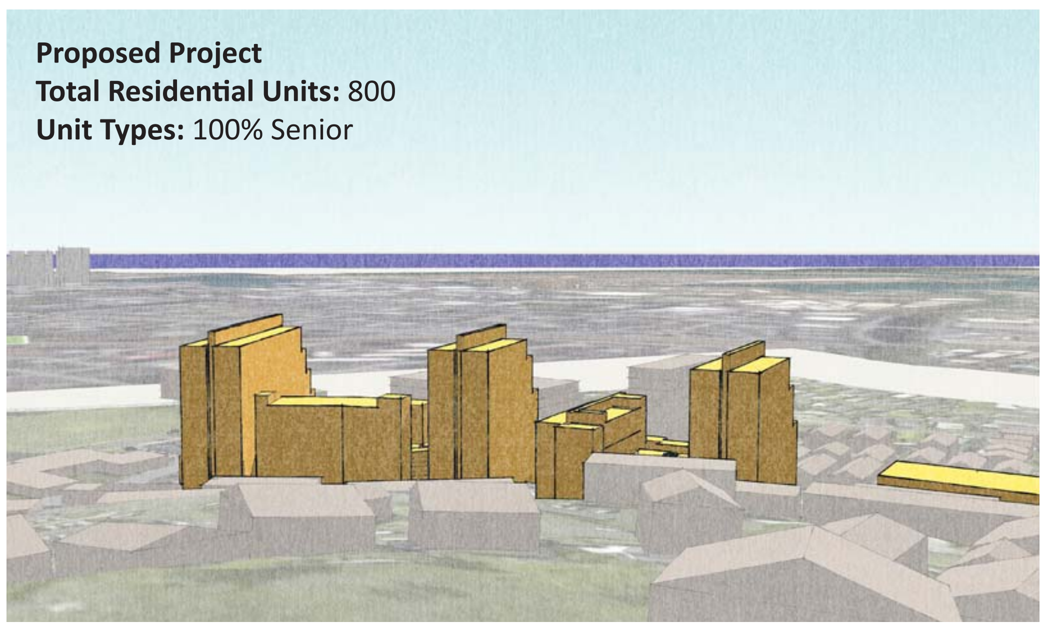

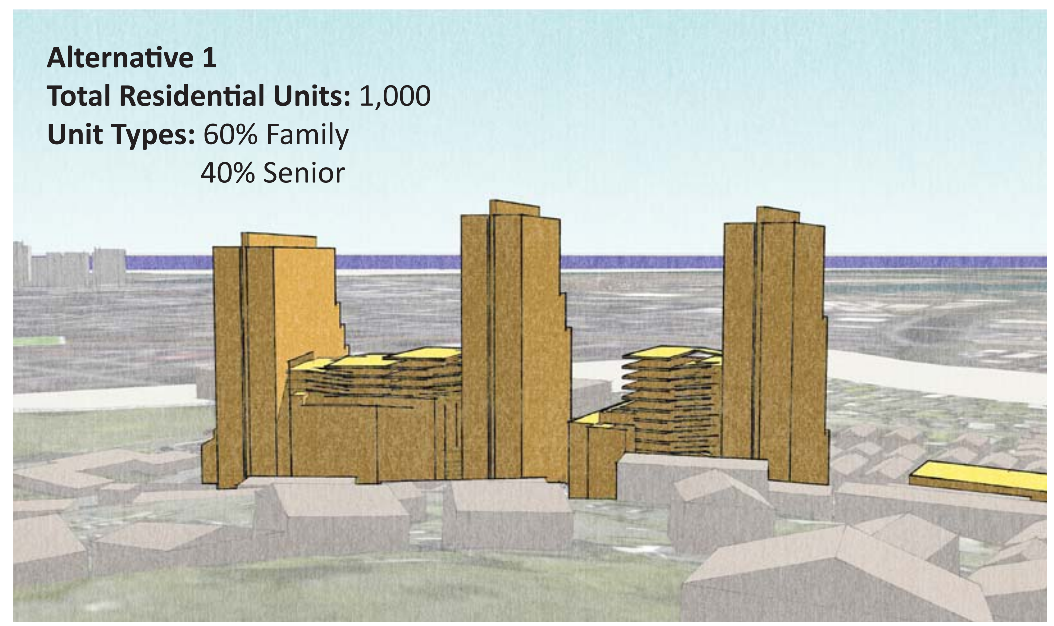

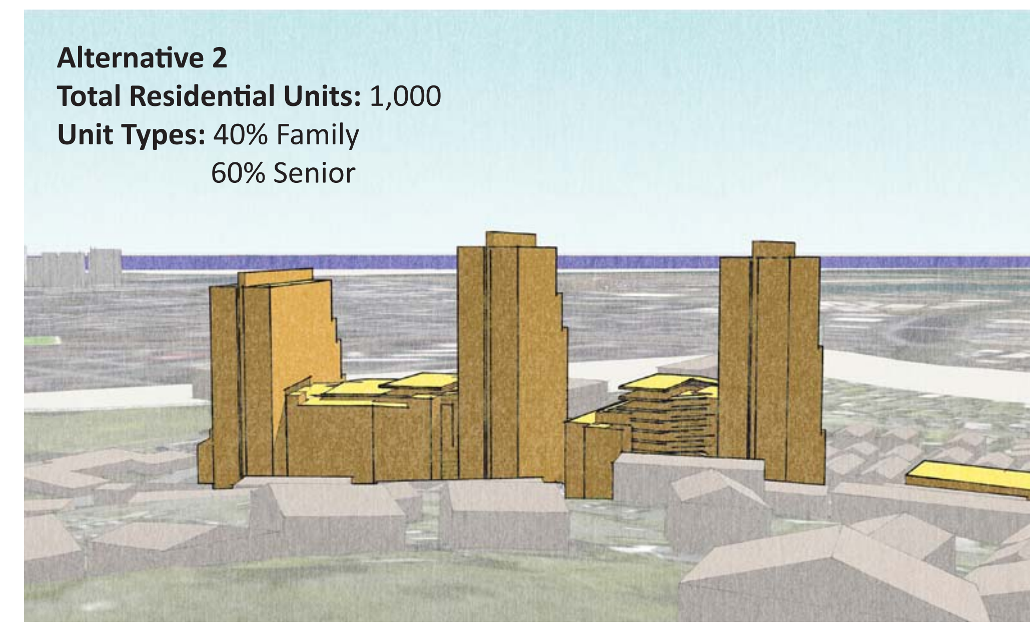

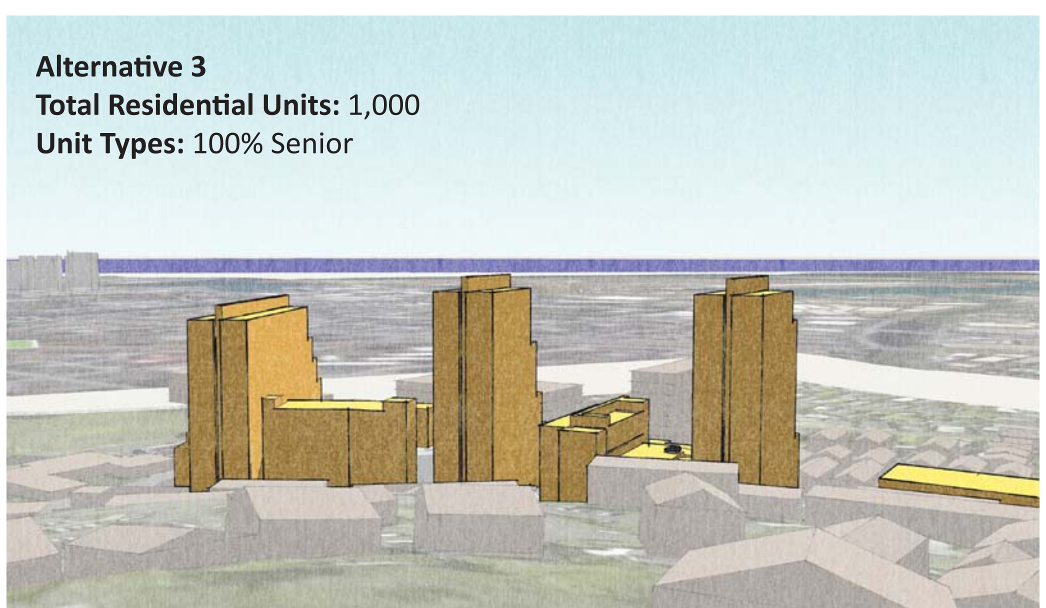

Figure 9:
Visual Impact Analysis
HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority — Island of O'ahu

PBR HAWAII & ASSOCIATES, INC.

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5.7 SOCIO-ECONOMIC IMPACTS

HPHA will be partnering with Retirement Housing Foundation under a Master Development Agreement to redevelop HPHA's existing offices with new offices, 800 affordable age-restricted senior housing units, and complementary commercial uses. The alternatives considered included:

- "no action";
- Mixed-use development containing 1,000 total residential units; (with 60% targeting families, and 40% targeting seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building
- Mixed-use development containing 1,000 total residential units; (with 40% targeting families, and 60% targeting seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building
- Mixed-use development containing 1,000 total residential units; (with 100% seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building

An Economic and Fiscal Impact Assessment was prepared by Belt Collins Hawaii, LLC in 2017 for the Proposed Project to assess economic and fiscal factors. The full report can be found in Appendix K, and is summarized below.

5.7.1 Resident Population and Housing

Existing Conditions

Demography

Recent demographic information is available from the American Community Survey (ACS), a series of samples drawn over five years, from 2010 through 2014. The project is in Census Tract (CT) 48, and is adjacent to CT 49 (across Lanakila Avenue). Much of the Kalihi-Pālama area is within the 96817 Zip Code Tabulation Area (ZCTA).

The demographic data cover residents in households. CT 48 also includes a population, estimated as 728 persons, in group quarters including dormitories and nearby hospitals. That total nearly 10 percent of the overall CT population, is a far higher share than found island-wide or in the adjacent CT49, where the share is less than four percent. (Much of the CT 48 group quarters population consists of Kamehameha Schools students lodging on campus.) The group quarters population is not included in Table 3-1 of Appendix K and later tables concerning the resident population.

In summary the data reveal that:

- The population in Kalihi-Pālama is older, on average, than the island's population:
  - The median age in the ZCTA is much higher than that of the island's population;
  - Senior citizens (age 65 or older) account for 22 percent of the ZCTA population (significantly higher than the 15 percent island wide population).

- The racial mix in the area includes a higher share of Asians than island-wide. CT 48 also includes a higher share of Native Hawaiians and Pacific Islanders. The share of the population born in the State of Hawaiʻi is higher in CT 48 than in the immediately surrounding area or island-wide.

Housing

Kalihi-Pālama has long been an area of urban expansion and renewal. Many of the area's residents are renters (see Table 2-2 of Appendix K.) and crowding into smaller housing units occurs more often in this ZCTA than island-wide

Data for CT 48 indicate that the owner-occupied share of housing is close to the City and County average, Household sizes are larger than in the rest of the Kalihi-Pālama area and the median household income is island wide median, unlike the rest of the surrounding community which is lower.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the Hawai'i Construction Alliance wrote:

> *"The Hawaiʻi Construction Alliance is comprised of the Hawaiʻi Regional Council of Carpenters; the Operative Plasterers' and Cement Masons' Union, Local 630; International Union of Bricklayers & Allied Craftworkers, Local 1; the Laborers' International Union of North America, Local 368; and the Operating Engineers, Local Union No. 3. Together, the member unions of the Hawaiʻi Construction Alliance represent 15,000 working men and women in the basic crafts of Hawaiʻi's construction industry.*
>
> *We have been extremely concerned about the chronic deficiency of rental apartment housing across the state, which is negatively affecting families throughout the entire community – including our members. We are pleased, therefore, to see that HPHA is proposing to develop mixed-income rental units along School Street at the site of its administrative offices. Furthermore, we appreciate the outreach that HPHA has done and will continue to do in regard to refining the final project."*

On-Site Impacts

There are currently no residential units existing on Project Site. The new 800 affordable apartment units would be built on the Project Site in phases. Affordable apartments are proposed for seniors with incomes ranging from 30 percent to 60 percent of AMI.

Since the units would be for seniors, household sizes would be smaller and school age children would not be allowed to occupy the Proposed Project. Household sizes are estimated as, on average, 1.2 persons in one-bedroom units. Figure 3-2 of Appendix K estimates on-site population on the assumption that 92 percent of the units would be occupied within the first year of occupancy (and in each subsequent phase), and occupancy would reach 97 percent in later years.

Wider Impacts

No existing residential units will be demolished in the course of construction as none presently exist. Access to in the Puahala Homes adjacent to the Project Site may need to be rerouted, but currently, the plans are for these public housing units to remain occupied during and after construction of the project.

HPHA's low-income senior housing facilities have closed waitlist, while other senior affordable housing projects typically have waitlists estimated at two to five years. In short, there is little or no supply available to respond to market demand for subsidized housing, as new supply has consistently not met demand.

Statewide, a recent study estimates need for 2,160 additional units for elderly and frail elderly persons by 2020 (SMS Research & Marketing Services, Inc., 2016). Of that number, 1,271 units would be needed on Oʻahu alone. Moreover, demand could be much greater than current estimates, since Hawaiʻi's senior population is over 300,000 people and multigenerational households are common in Hawaiʻi, with many elders living with their adult children due to a lack of housing options. Compounding this problem, about 40% of the Oʻahu senior respondents in need of housing have incomes below 80 percent of AMI. As all of the 800 residential units will be developed as affordable units targeted to households earning 30to 60% of AMI, the Proposed Project will have a positive impact in terms of increasing the supply affordable senior rental apartments in the City of Honolulu and O'ahu.

5.7.2 Employment

Existing Conditions

The tables in Appendix K provide census, economic and employment data for the Kalihi-Pālama area, including the following significant data points:

- The share of adults in the labor force is lower in the area (61.7% for the ZCTA) than island-wide (88.7%). This is not due to unemployment: the unemployed form a slightly smaller part of the civilian labor force in Kalihi-Pālama than in the City and County as a whole. Instead, it reflects the older population of the area.

- Commuting travel times are shorter than for the island as a whole, and many workers from Kalihi-Pālama rely on public transportation. However, 60 percent of the CT 48 workforce drove to work alone. This is close to the island-wide percentage.

- Table 2-5 of Appendix K shows that the incidence of poverty is higher in Kalihi-Pālama than island-wide. In CTs 48 and 49, fewer seniors have incomes below the poverty line than for the area as a whole.

- The Census also tracks sources of income and health insurance, as shown in Table 2-6 of Appendix K. In CT 48, reliance on Social Security and retirement income occurs more often than in the other areas. Similarly, while only 7.4 percent of households depend on public assistance, the share, and the amount of such assistance, is higher compared to the island and zip code area.

- The number of jobs in Kalihi-Pālama has declined from a high of nearly 37,000 in 2004 to about 31,750 in 2014, as shown in Figure 2-3 of Appendix K. The largest industry in the area is health care, followed by retail trade, accommodation and food services, and administration and support services. (Table 2-7 of Appendix K orders industries by the local share of jobs in each industry.)

Potential Impacts and Mitigation Measures

The timing of construction will depend on a number of variables including the timing of permits, entitlement, and approvals; the timing required for environmental clearance and the availability of funding. Low income housing tax credits are limited in Hawaiʻi; the timing shown in Table 3-1 of Appendix K follows from the expectation that the project will be able to draw on tax credits during phased construction of the development.

Dollar figures in Table 3-1 and later tables of Appendix K are constant 2016 dollars: inflation is not shown. All figures are for millions of dollars.

Employment impacts are associated with construction and operations of the Proposed Development. Construction employment occurs during the construction period. Operations employment will increase in size as the project's phases are completed.

For both construction and operations, it is possible to estimate direct employment and, separately, indirect and induced employment. Direct construction employment is the employment needed to build the facility. Indirect employment occurs as construction firms purchase materials and supplies in the local economy. Induced employment occurs as construction workers spend their wages in the local economy. The tables in Appendix K estimate jobs associated with particular years. Induced employment may occur over a longer time, but it is convenient to show direct, indirect and induced employment occurring as construction spending or direct operations spending occurs.

Construction Jobs and Wages

Direct construction jobs can be estimated, at this early point, from total construction spending, as shown in Table 3-3 of Appendix K. The total of 847 jobs shown are "person-years" – the equivalent of a full-time job over the course of a year. Many specialized construction jobs take less time, so a single "person-year" may cover tasks by various workers in a year. Construction work includes work at construction offices and base yards, so some construction jobs will occur away from the Project Site.

The 1,102 indirect and induced jobs are estimated from the State of Hawaiʻi's Input-Output Model, that correlates spending and jobs in particular industries with their impacts in other sectors. The model is regularly updated by the Department of Business, Economic Development and Tourism (DBEDT) Research and Economic Analysis Division.

Construction will occur over approximately nine years, with timing subject to the availability of funding. According to Belt Collins Hawaii LLC, a total of approximately 847 person-years of direct construction employment is expected, supporting another 1,102 person-years of employment in the Hawaiʻi economy.

Wages are also shown in Table 3-3 of Appendix K. Wages are estimated on the basis of current average industry wages. The actual wages paid in future years will be affected by inflation. As the Proposed Project is owned by the State of Hawai'i, employment on the Project Site will be subject to Hawaiʻi Revised Statutes (HRS) Section 104 requirements, that call for work at prevailing wages. For indirect and induced jobs, the impact is throughout the economy, so the average wage for jobs on Oʻahu is used to calculate total indirect and induced wages.

Operations Jobs and Wages

Two operations will occur on the School Street site. First, HPHA offices will continue to be staffed, in the new facility. The project is not anticipated to affect the number of HPHA administrative positions, so these are not estimated for this report. Second, Retirement Housing Foundation will operate the senior apartments on-site. Employment for these operations has been estimated by Belt Collins Hawai'i LLC on the basis of input from Retirement Housing Foundation.

Once the affordable senior apartments are built, Retirement Housing Foundation will have a manager on-site, with office, janitorial, maintenance and grounds staff. Service coordinators will conduct outreach activities with residents. In addition, contract hires will staff events and subcontractors will provide routine specialized services such as elevator repairs. Operations jobs in the new buildings operated by Retirement Housing Foundation would increase as each phase is built, and could amount to approximately 72 annual jobs upon full build-out of the Proposed Project. Table 3-4 of Appendix K estimates operations jobs.

The retail area within the Proposed Project will be constructed during the last phase of the Proposed Project and is expected to be 50 percent occupied in the first year after opening, 70 percent by the second year, and 90 percent in the third and later years.
Wages are estimated from occupational averages. As with construction, indirect and induced employment impacts are estimated in relation to operations occupational employment.

Labor Market Impacts

The unemployment rate in Hawaiʻi of 2.7 percent as of mid-2017 is low compared not only to recent years, but also to other states and the National Average. However, from mid-2016 to mid-2017, the number of jobs in construction and related industries declined by about 1,300 jobs: Given the tight labor market, a large new development such as the Proposed Project, will create demand for labor from within the state and potentially outside the state, attracting specialized workers and their families from outside Hawaiʻi. The operations jobs at the project will likely be filled by local jobseekers. On a long term basis, however, the project is not expected to significantly change labor demand or affect the Hawaiʻi labor market.

5.7.3 Fiscal Impacts

Existing Conditions

The Project Site presently contains no housing or residents. While there are existing HPHA staff located on the Proposed Site, the Proposed Project involves the construction of a new office building, and existing HPHA staff are expected to remain on site, albeit, concentrated and relocated to a portion of the existing site. The existing HPHA staff generates state and federal income taxes, and will continue to do so. As a state agency, the existing operations of HPHA do not generate real property taxes. When goods and services are provided to HPHA on this site, there is some general excise tax that is generated for the State of Hawai'i.

Potential Impacts and Mitigation Measures

Fiscal impacts arise as a project either creates new costs for government agencies or brings in new revenues. No such costs are expected, since the project will not attract new residents to Hawaiʻi or otherwise increase demand for public services. Revenues will come to the State and the City and County of Honolulu through taxation, as estimated in Table 3-5 of Appendix K.

Construction-related fiscal impacts are tied to construction spending, and come to an end as the construction period ends. Operations-related impacts increase as the phases of the project are built, and then continue for many years.

Impacts on HPHA operations due to displacement from the Proposed Project and the return of administrative jobs to the new offices on the site are not included in the analysis for this report.

Under Hawaiʻi law, affordable housing development is not subject to excise tax, so no excise taxes are due on direct construction spending. Excise taxes are, however, charged on workers' expenditures. When market-rate units are rented, excise taxes would also be levied on rental income.

From the beginning of construction through 2032, the total fiscal impact of the project is estimated at approximately $9.5 million. In later years, the State would continue to receive nearly half a million dollars a year from excise and income taxes, and the City and County would receive a modest amount from the retail operations within the Proposed Project, which would be subject to real property tax as shown in Table 3-5 of Appendix K.

5.7.4 Other Social Impacts

Community outreach with resident and community stakeholders has been ongoing since October 2016 to understand the concerns of the community related to the Proposed Project and to keep the community involved and informed throughout the Master Planning process. Additional information on the full scope of the public outreach can be found in Section 9, which provides a summary of resident and community concerns, potential social impacts that are anticipated from the Proposed Project and proposed recommendations to address them.

Existing Conditions

The project team received input from many stakeholders throughout the surrounding community, gathering information from groups such as Neighborhood Boards, area schools, community and social service organizations, businesses, clergy, elected officials, public agencies, and individual community members. Area residents have also provided input at community meetings.

The major areas of concern raised regarding existing conditions included the following:

- Capacity of existing area infrastructure, especially wastewater collection;
- Current traffic conditions; and
- Current proportion of low-income and public housing in the broader vicinity.

Potential Impacts
As noted above, the project team received input from many stakeholders through community meetings.

The major areas of concern regarding potential impacts included the following:

- Whether the project includes public housing;
- Visual impact of new buildings;
- Impact of affordable housing and nearby property values;
- Capacity of area infrastructure, especially wastewater collection from the Proposed Project; and
- Traffic impacts from the Proposed Project.

Mitigation Measures – These issues are addressed in this EIS in the following sections:

- Whether the project includes public housing (refer to Summary Sheet);
- Visual impact of new buildings (refer to Section 5.6);
- Impact of affordable housing and nearby property values (refer to Appendix A);
- Capacity of area infrastructure, especially wastewater collection from the Proposed Project (refer to Section 5.9.2); and
- Traffic impacts from the Proposed Project (refer to Section 5.8).

5.8 TRANSPORTATION AND CIRCULATION

A Transportation Impact Analysis Report (TIAR) was completed by Fehr & Peers to analyze the potential impacts of the Proposed Project to the surrounding transportation system. The complete TIAR can be found in Appendix L.

5.8.1 Roadways and Traffic

Fehr and Peers prepared a transportation impact analysis report (TIAR) for the proposed Hawai`i Public Housing Authority (HPHA) Administrative Offices redevelopment in the Lanakila neighborhood. The proposed project would replace existing HPHA Administrative Office property into a mixed-use development comprising residential, office, and retail uses. The project will include up to 800 residential units, replacement of the existing HPHA Administrative Office Building, and up to 10,000 square feet (s.f.) of retail and commercial uses. While only 800 all-Senior units are proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

Existing Conditions
The project site is bounded by N School Street on the makai side and Lanakila Avenue on the Diamond Head side. The operations of 14 existing key intersections surrounding the Proposed Project were evaluated during the weekday morning (AM) and evening (PM) peak hours. See Appendix L. The 14 intersections were:

1. North School Street / Kalihi Street
2. North School Street / Makuahine Street

3. North School Street / Houghtailing Street
4. North School Street / Kokea Street
5. North School Street / HPHA Driveway
6. North School Street / Lanakila Street
7. Ahiahi Street – HPHA Driveway / Lanakila Street
8. Kuakini Street / Lanakila Street
9. N Vineyard Boulevard / Pālama Street
10. North School Street / Alaneo Street
11. N Vineyard Boulevard / Liliha Street
12. Kiapu Place / Liliha Street
13. North School Street / Liliha Street
14. Kuakini Street/Liliha Street

Major roadways in the vicinity of the Proposed Project property are described in further detail below.

North School Street is a four-lane major arterial on the makai side of the Project Site. Within the study area, North School Street is an undivided ewa-Diamond Head roadway that parallels the H-1 freeway and extends from Notley Street/Haumana Place on the ewa side to Nuʻuanu Avenue on the Diamond Head side, where it then transitions to South School Street. North School Street provides direct access to a variety of community-oriented facilities, such as small businesses, residences, churches, and shopping centers. Since North School Street is a parallel facility to H-1, it serves high traffic volume during the AM and PM commute periods when the freeway is congested.

Lanakila Avenue is a mauka-makai two-lane local street on the Diamond Head side of the Project Site. This roadway connects Emmeluth Lane in the makai side to Luna Street/Kunawai Lane on the mauka side, where it then transitions to Judd Lane. Immediately adjacent to the Project Site, Lanakila Avenue has a posted speed limit of 15 mph. Direct access to the Project Site is provided on Lanakila Avenue via an unsignalized intersection at Ahiahi Street. On-street parking is currently permitted between the existing raised crosswalk, adjacent to the Lanakila Multipurpose Senior Center, and Kuakini Street.

Pālama Street is an undivided two-lane mauka-makai roadway that connects N King Street to North School Street. Mauka of North School Street, it transitions into Alaneo Street. Pālama Street has a posted speed limit of 25 mph and on-street parking is permitted on both sides of the roadway. An H-1 ewa-bound off-ramp is provided on Pālama Street near Likelike Elementary School. During the peak periods, moderate mauka and makai bound queues were observed on Pālama Street and Alaneo Street due to the permitted signal phasing at the North School Street intersection.

Liliha Street is a major mauka-makai arterial that provides direct access to the Project Site at the Kukui Street signalized intersection. Within the project area, this roadway contains four travel lanes, two in each direction, with separate or shared left-turn lanes at signalized intersections. This roadway is under HDOT’s jurisdiction and provides regional access via N. School Street and H-1 interchange; thus, Liliha Street serves high traffic volumes during the AM and PM peak periods, and long mauka-bound queues heading towards the H-1 interchange were observed during both peak hours.

Kalihi Street is a major mauka-makai arterial that is under HDOT's jurisdiction and includes a full H-1 interchange. It is a six-lane divided roadway that connects Auiki Street in the makai side to Makuahine Street in the mauka side, where it then transitions into Likelike Highway. Within the study area, it has a posted speed limit of 25 mph. Given that Kalihi Street provides direct access to H-1, it serves substantially high traffic volumes during the AM and PM peak periods and long makai-bound queues traveling towards H-1 were observed during the AM peak period.

North Vineyard Boulevard is a major ewa-Diamond Head arterial that extends from Olomea Street/H-1 in the ewa direction to H-1 beyond Aala Street on the Diamond Head side. Vineyard Boulevard is an undivided roadway with six travel lanes (three in each direction) and has a posted speed limit of 30 mph. Similar to N. King Street, Vineyard Boulevard is a parallel facility to H-1, and therefore, serves significant traffic volumes during the AM and PM commute periods when the freeway is congested. North Vineyard is under HDOT's jurisdiction and provides access to H-1.

Potential Impacts and Mitigation Measures
During the EISPN Public Review period, the State Office of Planning wrote:

> *"6. The DEIS should address how the project will mitigate potential traffic and pedestrian impacts that would result from increased population density, commercial, and office uses at the site. The DEIS should discuss what measures might be taken to reduce reliance on individual automobiles, reduce parking requirements, and enable residents and facility users to maximize use of bus and transit service in the area or access goods and services onsite or in the area to meet their daily needs.*
>
> *7. Similarly, the DEIS should identify how the project can maximize its physical relationship to its bounding streets to improve the pedestrian environment and streetscapes to promote active lifestyles for residents and neighbors, improve pedestrian connections between the project, neighboring health/community centers, park, and other commercial areas, and capitalize on the mid-block signalized crosswalk on North School Street in doing so."*

During the EISPN Public Review period, the State Department of Transportation Highways Division wrote:

> *"1. A Traffic Impact Analysis Report (TIAR) should be prepared and submitted to the DOT for review and acceptance…*

During the EISPN Public Review period, the City and County of Honolulu Department of Transportation Services wrote:

> *"1. We have the following comments in regards to a Transportation Impact Analysis Report (TIAR):*
>
> *a. The TIAR should be replaced with a Transportation Assessment (TA) that analyzes the multi-modal nature of the Kalihi neighborhood and recognizes the need for traffic control devices that encourage walking, bicycling, and transit use as the primary access modes for the proposed project. The T A should identify parking management strategies both on- and off-street that will support the area…*

4. The Environmental Impact Statement (EIS) should have a Traffic Management Plan (TMP)… "

During the EISPN Public Review period, the City and County of Honolulu Department of Planning and Permitting wrote:

> "*Site Development Division*
>
> > *2. A preliminary construction management plan (CMP) and a traffic demand management plan (TMP) should be included with the DE IS documents. The final CMP should be submitted at the time of the issuance of the building permit and the TMP should be submitted at the time of the certificate of occupancy of the buildings."*

The impacts of the proposed project to the surrounding transportation system were evaluated following guidelines established by the City & County of Honolulu Department of Planning & Permitting (DPP) Traffic Review Branch (TRB) and the Hawaii Depart of Transportation – Highways Division (HDOT). The operations of 14 existing key intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2016), as well as for Future (2029) conditions without and with the project.

The project's trip generation estimates were developed using MainStreet, a web application developed by Fehr & Peers that uses the Mixed-Use (MXD+) Trip Generation Model. This MXD model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain to the project site, as well as external transit, walk and vehicle mode splits. Based on this method, the proposed project is estimated to generate the following net new vehicle trips:

- <u>1,000 Senior Units:</u> a total of 2,869 daily trips, including 147 trips during the AM peak hour (47 inbound/100 outbound), and 227 trips during the PM peak hour (125 inbound/102 outbound)
- <u>600 Non-Age Restricted & 400 Senior Units:</u> a total of 4,305 daily trips, including 272 during the AM peak hour (54 inbound/215 outbound), and 372 trips during the PM peak hour (236 inbound/136 outbound)

Table 5-1 shows the intersection impacts and under which project scenario those impacts would be triggered, the type of project impact (i.e. cumulative or project specific), and the recommended mitigation measures to mitigate those impacts. All four (4) impacts would be triggered under both project scenarios.

Table 5-1: Project Intersection Impacts and Potential Mitigation Measures

Intersection	Future Plus 1,000 Senior	Future Plus 600 Non-Age Restricted & 400 Senior	Impact Type	Potential Traffic Mitigation Measures
1. N School Street/Kalihi Street	X	X	Cumulative	Optimize signal timings or change westbound left-turn phasing to "protected permitted" phasing
5. N School Street/HPHA Driveway	X	X	Project Specific	Install a traffic signal.
10. N School Street/Pālama Street – Alaneo Street	X	X	Cumulative	Restripe the northbound and southbound approaches on Pālama Street and Alaneo Street to include a separate left and shared through/right lane.
11. Vineyard Boulevard/Liliha Street	X	X	Cumulative	Add a second eastbound left-turn lane on N Vineyard Boulevard

Source: Fehr & Peers, 2017

All four (4) impacts would be triggered under both project scenarios. In addition to the potential traffic mitigation measures identified in Table 5-3 above, the Proposed Project could implement some transportation demand management (TDM) strategies (refer to Appendix M for a Draft TDM report) to reduce overall site-generated traffic volumes. Application of TDM strategies that could lead to vehicle trip reduction, use of alternative modes, and better traffic management at the site could include, but are not limited to:

- Implementation of a detailed TDM program for residents and retail employees, which would be managed by a TDM coordinator who would organize and coordinate monitoring efforts, parking and traffic management plans, and the implementation of TDM and recommendations and modifications.
- Provision of a transportation kiosk and on-line portal for information on ride-sharing, transit, bicycling, walking, and options for accessing the site without using a private automobile.
- Partial- or fully-subsidized transit passes for on-site employees and/or residents.
- Provision of bicycle racks adjacent to retail development, at communal open space, and multi-family residential buildings within the Project Site.
- Dedicating space on the property frontage to accommodate a future Biki bike share station.
- Unbundling parking from apartment units to reduce rental costs for some units and to incentivize use of non-auto travel modes.

Prior to the implementation of any TDM measures, the project team should coordinate with the City and County of Honolulu and/or transit service providers.

Short-term traffic impacts will result during construction for both onsite and offsite improvements. Traffic may be impacted when materials and equipment are transported to the site. Coordination with State and City roadway officials will be done in advance of any construction and will include a traffic management plan for each phase of construction. It will detail any road or lane closures and potential impacts to any of the bus stops should they be required and the construction team will work closely with the State and City on appropriate solutions to mitigate those impacts. Refer to Appendix N for draft Construction Management report.

Overall, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes, and the safety enhancements described above. The project is also expected to not conflict with any existing facilities and planned improvements.

5.8.2 Public Transit

"TheBus" is currently Oʻahu's primary provider of public transit. Transit ridership among residents in the area is significantly high, and the study area is well served by frequent bus services on North School Street, Houghtailing Street, Kalihi Street, Liliha Street, Vineyard Boulevard, and N King Street. The Project Site is surrounded by several nearby bus stops on North School Street that provide ewa-Diamond Head bound services. Bus shelters are present at all bus stops near the Project Site, except for the Diamond Head bound bus stop adjacent to the baseball field. There are currently four bus stops immediately adjacent to the Project Site:

- Ewa-bound stop serving routes 1L, 2, 2L, and W3
- Diamond Head-bound stop serving routes 1 , 2, 2L, 13, and W3

The Project Site is also located less than one mile from the planned Kapālama and Iwilei HART Stations that will provide access to the light rail transit system that is currently under construction and scheduled for completion by 2029. The Kapālama Station will be located Dillingham Boulevard immediately Diamond Head of Kokea Street, and the Iwilei Station will be located at the makai-Diamond Head corner of the Dillingham Boulevard/Kaʻaʻahi Street intersection. This system will provide more reliable and faster transit service from East Kapolei to Ala Moana Shopping Center, and will allow residents and employees of the Proposed Project to travel to and from the area without the need for a private vehicle.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the City and County of Honolulu Department of Planning and Permitting Transit Oriented Development (TOD) Division wrote:

> *"Please preserve the existing bus shelters and consider adding additional amenities such as additional lighting, shade, and seating, in the area where residents and office workers are waiting. The existing bus stop near the proposed HPHA offices do not have a bus shelter. Please consider integrating a bus shelter or waiting area with the redevelopment of that area."*

According to the TIAR (Appendix L), the Proposed Project would not significantly impact transit service within the study area. All bus stops in the study area provide covered shelters and benches for transit users. However, to enhance the transit and pedestrian facilities immediately adjacent to the site, the TIAR recommends that the bus shelters along the Project Site frontage be pushed back further from the curb of the sidewalk to remove obstructions from the pedestrian walkway and provide pedestrians a wider sidewalk. This would require that a small section (approximately 10 feet mauka of N School Street) of the Project Site is dedicated for the relocation of the bus shelters.

The site is well-serviced by both bus and future rail transit (via connection by bicycle and/or bus) and is generally not expected to substantially increase the transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the Proposed Project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes. The Proposed project is not expected to conflict with any existing facilities and planned improvements. Thus, the Proposed Project's impacts to transit facilities and services are therefore considered *less-than-significant.*

Short-term impacts to the bus stops directly adjacent to the site may occur during construction should there be any road or lane closures. Bus stops may have to be temporarily relocated away from construction activities impacting the Project Site frontage. The development team will work closely with City transit officials to provide safe and appropriate alternative in such an event, including safe pedestrian and ADA-accessible access to temporarily relocated bus stops and full replacement of the bus stop once construction is complete.

5.8.3 Pedestrian facilities, Bicycle Circulation and Complete Streets Program

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The project area has moderate pedestrian activity and is generally well-served by pedestrian infrastructure. All roadways in the immediate vicinity of the Project Site include sidewalks on both sides of the street. Portions of sidewalks on North School Street are relatively narrow (i.e. less than four feet wide), however, the sidewalks are in good condition and adequate to serve the pedestrian demand in the area. Sidewalks immediately adjacent to the Project Site are wide and in good condition, with some shade provided by trees. In addition, a raised crosswalk with a landscaped median is located immediately mauka of the main HPHA driveway on Lanakila Avenue.

All study intersections surrounding the Project Site includes marked crosswalks on at least three of the intersection approaches, with the exception of the North School Street & Kokea Street and North School Street & Makuahine Street, which only provide two marked crosswalks. Additionally, a mid-block pedestrian signal currently exists on North School Street, immediately adjacent to the Project Site, between Kokea Street and Lanakila Avenue. This signal is a two-phased signal and serves pedestrians crossing North School Street and the ewa-Diamond Head vehicle traffic on North School Street. This signal is only activated when a pedestrian pushes the pedestrian push-button.

Moderate pedestrian activity was observed on the major study corridors (i.e. North School Street, Houghtailing Street, Kalihi Street, and Liliha Street) during both peak hours. The study area is very dense with various land uses, such as schools, retail centers, residential units, industrial and office complexes, which is ideal from a walkability standpoint since a person can simply walk to their destination instead of drive because the distance is fairly close. Most pedestrians walking near the Project Site were observed to be coming from or walking to an adjacent transit stop. The TIAR (Appendix L) recommends pedestrian safety enhancements, which are currently required even without the Proposed Project, at two intersections.

No bicycle infrastructure is provided within the direct proximity of the Project Site, though existing bicycle facilities do serve adjacent community areas. Minimal bicycle activity on the study roadways was observed during the peak hours. Since no separate bicycle facilities are currently provided in the study area, the limited number of bicyclists traveling on the roadways was not unexpected. Most bicyclists were observed riding on the sidewalks on North School Street as they likely perceive that it provides a safer ride compared to riding on these roadways with high vehicle volumes.

Bicycle infrastructure will be expanded and developed as planned land uses are built and occupied. The O‘ahu Bike Plan calls for new bicycle routes on North School Street and Makuahine Street, and planned bicycle lanes on N. King Street and Liliha Street. Implementation of separate bicycle lanes (Class II facilities) will require roadway restriping and/or the elimination of parking and vehicle travel lanes. The City & County of Honolulu is currently conducting complete streets planning efforts to identify specific multi-modal improvements in this area including at the intersection of N. King Street and Liliha Street-Dillingham Boulevard.

DATE: 11/3/2017

LEGEND

Project Site	Bus Stop
Future Rail Station	Bus Route
1-mile radius from Future Rail Station	
Future Rail Line	

Figure 10:
Bus Routes and Future Rail Lines

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)
0 250 500 1,000

PBR HAWAII & ASSOCIATES, INC.

Source: City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

PDF: Q:\Oahu\HPHA\PDF\Bus Routes and Future Rail Lines.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Bus Routes and Future Rail Lines (revised).mxd

PDF: Q:\Oahu\HPHA\PDF\Bicycle Routes.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Bicycle Routes.mxd

DATE: 11/3/2017

LEGEND

Project Site

Existing Bicycle Routes

Proposed Bicycle Routes

Figure 11:
Bicycle Routes

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)
0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

The Complete Streets program under the City and County of Honolulu's Department of Transportation Services (DTS), aims to create an integrated, multimodal network of streets to improve transportation safety, promote public health, and strengthen community connectivity for people of all ages and abilities (City and County of Honolulu, 2017). The emphasis on multi-modal transportation is particularly relevant to the Lanakila area and the proposed Project Site property, where bus transportation and walking are predominant forms of transportation. Currently, the City is conducting Complete Streets planning efforts to identify specific multi-modal improvements in this area including at North School Street. In addition, the City is embarking on an Oʻahu Pedestrian Plan, which will take a closer look at pedestrian facilities throughout its entire street network and make comprehensive recommendations on improving safety and connectivity for pedestrians.

Potential Impacts and Mitigation Measures

During the EISPN public review period, the Department of Planning and Permitting wrote:

> *"The draft Environmental Impact Statement (DEIS) should include the following:*
>
> 3. *Evaluation of building design and siting alternatives that bring storefronts closer to the street to generate more street presence and pedestrian activity.*
>
> 4. *Description of improvements that are contemplated in the street right-of-ways to promote pedestrian access and walkability.*
>
> <u>*Transit Oriented Development (TOD) Division*</u>
>
> 4. *Walkability and connectivity is of great importance for a mixed-income development in a TOD area. Improvement to streets on and off site would be of great benefit to existing residents and the users of the project. Attention should be given to providing street trees along the sidewalk for shade and improving pedestrians' crossings of School Street and Lanakila Avenue. Improving connectivity for pedestrians and cyclists to Palama Street and Houghtailing Street will greatly enhance the project's accessibility to rail and bus corridors. Similarly, Ahiahi Street should be improved to be more pedestrian and cyclist friendly by providing shad and secure bicycle parking, so that internal circulation is easily accommodated on food or by bicycle.*
>
>   *Canopy trees and a planter strip should be located between the street curb and sidewalk to provide shade and pedestrian protection, as referenced in 3.2 of the TOD Plan. A reference photo is provided on the bottom of page 3-16 of the TOD Plan. Sidewalks should be widened to provide comfort along School Street and Lanakila Street.*
>
> 5. *The new HPHA offices proposed in the Conceptual Master Plan should be located close to the property line along School Street, creating an active frontage with "eyes on the street". If the height difference between the lot and sidewalk is unchanged, stairs should be provided so that pedestrians along School Street could easily access the offices from nearby bus stops. The parking in the front should be moved to the mauka side of the office building."*

According to the TIAR, the project would not cause any significant impact to the overall existing and planned external multi-modal transportation system in the study area. The project design will adhere to the policies and principles outlined in the City & County of Honolulu's Ordinance relating to Complete

Streets as it includes features to enhance mobility and access for all its residents and other users using all modes of transportation. The Nuuanu/Liliha Complete Streets Solutions Project plans to identify solutions to increase safety and accommodate all travel modes. The Liliha Complete Streets Project covers the segment of Liliha Street between Wyllie Street and N School Street. As the site plan is further refined, the project team will be consulting with the State and City & County of Honolulu to design the internal roadway networks, cross sections, and access driveways in a manner that embraces the principles of Complete Streets and correlates with the adjacent Liliha Complete Streets project.

One major adjacent intersection to the Project Site (North School Street & Lanakila Avenue) currently serves high pedestrian traffic and may serve a large portion of the Proposed Project's pedestrian traffic. This intersection is recommended to be enhanced from a pedestrian safety perspective by the TIAR to improve safety and serve existing and future pedestrian demand (Appendix L). The TIAR also recommends the following enhancements to improve pedestrian safety and serve existing and future pedestrian demand:

- *Relocate all pedestrian push buttons at adjacent signalized intersections so that they are within 10 feet from the curb ramp.* This intersection currently only provides one push button in each corner. To ensure that pedestrians can easily activate a pedestrian call for their crosswalk, a push-button should be provided within in close proximity to the curb ramp.

- *Install "Leading Pedestrian Intervals" (LPIs) at all crosswalks at adjacent signalized intersections.* LPIs give pedestrians a few seconds (typically 3 to 7 seconds) head start when entering an intersection with the corresponding green signal. According to the National Association of City Transportation Officials (NACTO), LPIs could reduce pedestrian-vehicle collision as much as 60 percent at treated intersections. This improvement would increase the visibility of pedestrians crossing as they would enter the intersection before the vehicle is given the green light to turn left or right. LPIs are a relatively low cost improvement as it would only require adjustments to the existing signals.

- *Sidewalks along the project frontage should be a minimum of six (6) feet wide.* The sidewalks should be clear of obstruction (e.g. no light poles, furniture, signal boxes, etc.).

The Proposed Project follows new urbanist design principles that include an emphasis on walkability and connectivity through the pedestrian networks within the Project Site and connecting to the rest of the Lanakila community. The site plan does not currently provide details on the external sidewalk widths, but it is assumed that the existing widths and quality will be maintained or enhanced and widened for the Proposed Project as required under City & County of Honolulu permitting and approvals .

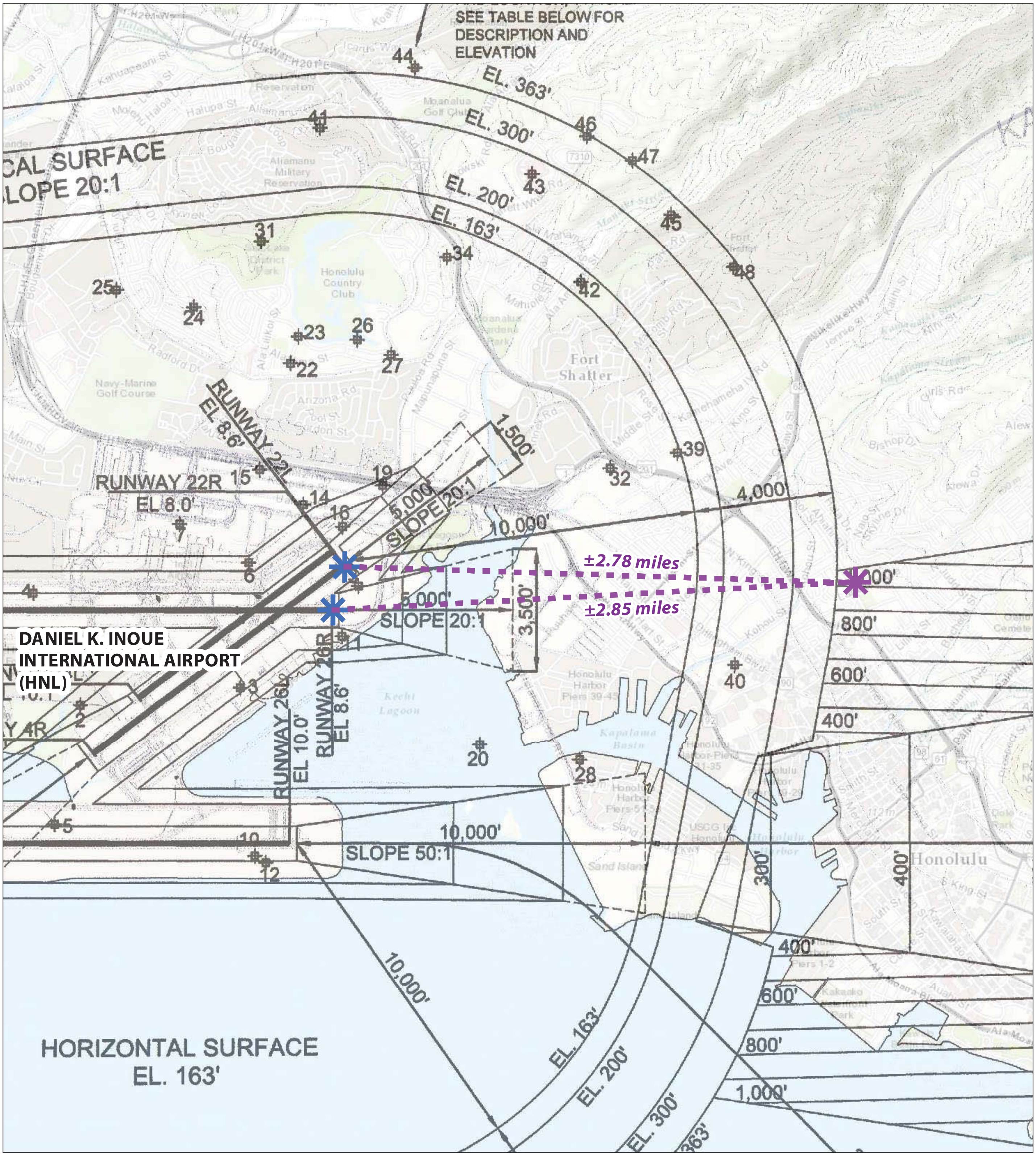
Enhancements to bike facilities planned by the City for the area surrounding the Proposed Project are included in Figure 11. The planned facilities that could serve the project site area and are relevant to the project location include the following:

- Bicycle route along North School Street (adjacent to the makai boundary of the site);
- Bicycle route along Makuahine Street (north-west of the site off of School Street);
- Bicycle lane on North King Street (major arterial road makai of the Project Site);

- Bicycle lane on Liliha Street from North King Street to Wyllie Street (east of the Project Site);
- Bicycle route on Kuakini Street from Liliha Street to Nuʻuanu Avenue (east of the Project Site, connecting two mauka-makai arterial roads);
- Bicycle path along Kapālama Canal on Kohou Street (from Halona Street to Houghtailing Street);
- Bicycle route on Dillingham Boulevard (from Puʻuhale Road to N King Street); and
- Bicycle path at the future Iwilei Transit Station (from Dillingham Boulevard to Nimitz Highway).

Evaluation of the feasibility and type of bike facilities adjacent to the Proposed Project will be carried out by DTS as part of their ongoing Complete Streets program. No additional designated bicycle paths or lanes are necessary for implementation of the Proposed. Internal streets are envisioned to be designed to support pedestrian and bicycle use throughout the site. In addition, a project access point may be designed to be exclusively used by bicyclists and pedestrians on North School Street if vehicle traffic is not permitted. This access would allow the most direct connection for pedestrians and cyclists to adjacent bus stops and proposed bicycle facilities on North School Street and Liliha Streets, the nearby Iwilei Transit Station, and to the surrounding communities.

Short-term temporary impacts to pedestrian and bicycle facilities may occur during construction such as sidewalk closures and rerouting of pedestrians and bicyclists away from any potentially unsafe conditions. The development team will work closely with City roadway officials to develop safe alternate routes and include appropriate signage during construction to direct pedestrians and bicyclists to appropriate detours. However, the Proposed Project is not expected to substantially increase the walking or biking demand to a level where it could not be accommodated by existing or planned facilities. In addition, the Proposed Project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes. The Proposed Project is also expected to not conflict with any existing facilities and planned improvements. Thus, the Proposed Project's impacts to pedestrian and bicycle facilities and services are therefore considered *less-than-significant.*



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DATE: 11/20/2017

LEGEND

Project Site

Nearest Airport Runway

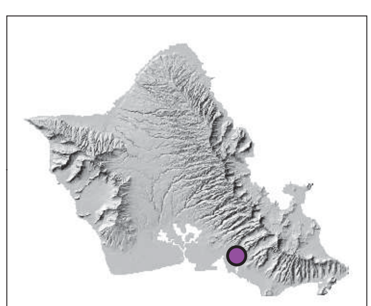

Figure 12:
Airport Distance and Airspace
HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)

0 1,000 2,000 4,000

PBR HAWAII & ASSOCIATES, INC.

Source: State DOT Airports Division Daniel K Inoue International Airport Airspace Drawing (4/7/17). City and County of Honolulu. ESRI Online Basemaps.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.9 INFRASTRUCTURE AND UTILITIES

5.9.1 Water System

Existing Conditions

The Honolulu Board of Water Supply (BWS) manages, controls, and operates the municipal water system on Oʻahu, which includes potable (drinking water) and fire protection water service to the Project Site property. The BWS Metro 180 system provides water to the existing Project Site and serves municipal water systems from Pearl City to East Honolulu. In the vicinity of the site, the BWS system includes 12-inch transmission mains along North School Street and Lanakila Avenue. 8-inch mains are located along Ahiahi Place. Fire hydrants are located along all adjacent streets to the Project Site as well as along Ahiahi Place, which bisects the property.

Average daily demand of potable water for the existing Project Site is estimated at 2,000 gallons per day (gpd) with a maximum daily demand of 3,000 gallons per day (gpd) and peak hour demand of 6,000 gpd.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Land and Natural Resources, Engineering Division wrote:

> *"The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage."*

Projected water demand was calculated for the Proposed Project based on design criteria provided by the BWS *Water System Standards (2002)*. These standards establish guidelines for water consumption based on county and zoning designation, which assume daily usage of and 300 gal/unit for Oʻahu multi-family high rise residential areas.

The Proposed Project is anticipated to be developed as shown below. Also shown is the expected water demand for each use:

Table 5-2: Expected Water Demand

Use	Year Use Completed	Average Daily Potable Water Demand	Maximum Daily Potable Water Demand	Peak Hour Potable Water Demand
New Administrative Offices	2023	2,000 gpd	3,000 gpd	6,000 gpd
250 Apartments	2025	75,000 gpd	112,500 gpd	225,000 gpd
250 Apartments	2027	75,000 gpd	112,500 gpd	225,000 gpd
500 Apartments	2029	150,000gpd	225,000 gpd	450,000 gpd
TOTALS*	Project in Full Operation in 2029	302,000 gpd	453,00 gpd	906,000 gpd

* Note the number of apartments shown in the table above represents 200 more apartments than currently being proposed, and represents the number of units under alternative scenarios.

During the EISPN Public Review period, the Honolulu Board of Water Supply wrote (on August 28, 2017):

> *"The existing water system is adequate to accommodate the proposed development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply 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.*
>
> *Water conservation measures are recommended for all proposed developments. These measures include utilization of non-potable 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.*
>
> *When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage."*

New water facilities are expected to include the project-specific water system features for domestic and fire prevention services such as water mains, laterals, fire hydrants, and booster pumps. New 8-inch waterlines are proposed within the site to distribute the water to the various development blocks.

In order to reduce the amount of drinking water required to serve the Proposed Project, as required by BWS, all efforts will be made to include water reducing design elements into the Proposed Project such as low flow and ultra-low flow fixtures, automated irrigation systems with moisture sensors to prevent overwatering, and water catchment and reuse for non-potable uses such as irrigation. Landscaping will incorporate native and hardy climate-adapted plants that do not require significant amounts of water wherever possible.

5.9.2 Wastewater System

Existing Conditions

The project area is serviced by the Sand Island Wastewater Treatment Plant (SIWWTP), which processes approximately 60 percent of O‘ahu's wastewater. The SIWWTP is designed to process an average of 90 million gallons per day (mgd) and 200 mgd for peak flows during wet weather. It processed an average of approximately 65.26 mgd in 2016. The existing Project Site generates an estimated design average flow of 0.0026 million gallons per day (mgd) with a design maximum (max) flow of 0.0086 mgd and a design peak flow of 0.0151 mgd

An existing 36-inch sewer main is located within North School Street. Existing six-inch diameter sewer mains are located within the Project Site and connect to both the six-inch sewer line on Lanakila Avenue and the 36-inch line on North School Street. Existing sewer flows from the Project Site are conveyed to the Awa Street pump station from sewer lines in Dillingham Boulevard and North King Street. The Awa Street pump station lifts sewer flow to the 54-inch sewer main located in Nimitz Highway, which conveys sewer to the existing Hart pump station, to be pumped to the Sand Island Wastewater Treatment Plant.

Potential Impacts and Mitigation Measures

The Proposed Project is anticipated to be developed as shown below. Also shown is the expected wastewater demand for each use:

Table 5-3: Expected Wastewater Demand

Use	Year Use Completed	Average Daily Wastewater Generated	Maximum Daily Wastewater Generated	Peak Hour Potable Water Demand
New Administrative Offices	2023	0.0026 mgd	0.0086 mgd	0.0151 mgd
250 Apartments	2025	0.0595 mgd	0.2985 mgd	0.3051 mgd
250 Apartments	2027	0.0595 mgd	0.2985 mgd	0.3051 mgd
300 Apartments	2029	0.1190 mgd	0.5950 mgd	0.6016 mgd
TOTALS*	Project in Full Operation in 2029	0.2406 mgd	1.2006 mgd	1.2269 mgd

* Note the number of apartments shown in the table above represent 200 more apartments than currently being proposed and represent the number of units under alternative scenarios.

The necessary on-site sewer system facilities will be installed to adequately service the Proposed Project, including gravity sewers and related appurtenances. Additional sewer connections are needed for the project, which will include 3 new sewer connections to the existing six-inch sewer line in Lanakila Avenue and the 36-inch main on North School Street. The sewer system will be designed in accordance with the City and County of Honolulu's *Design Standards of the Department of Wastewater Management (1993)*, and is proposed to be dedicated to the County.

During the EISPN Public Review period, the Department of Planning & Permitting Site Development Division wrote:

> *"…The municipal sewer system is not adequate to support the proposed 1,000-unit HPHA Administrative Offices (School Street) Redevelopment project. The Awa Street Wastewater Pump Station (WWPS) is unable to support the increase in sewer flows. The Awa Street WWPS Project will address this inadequacy and is tentatively scheduled for completion in June 2020."*[3]

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[3] A Global Consent Decree (GCD), entered between the City and County of Honolulu, U.S. Environmental Protection agency, and the State of Hawaiʻi Department of Health outlined improvements to be implemented to the City wastewater collection and treatment systems. The City has identified deficiencies at the Awa Street waste water pump station (WWPS).

The project team will maintain ongoing coordination with the City in order ensure adequate wastewater service can be provided to the Proposed Project. However, the timing of the City's improvements, the WWPS project, in particular, may impact the development schedule of the Proposed Project.

5.9.3 Drainage System

Existing Conditions

Existing runoff from the Project Site flows generally towards the middle of the Project Site frontage along School Street and conveyed to the City's storm drainage system through inlets, catch basins and culverts. Off-site runoff from adjacent streets is conveyed to the City's drainage system via concrete curb and gutter and catch basins. The Lanakila Avenue and School Street frontages of the Project Site contain a 10-foot by 5-foot box drain. Runoff ultimately discharges into the Kapālama Drainage Canal which is located west of the Project Site.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Health, Environmental Planning Office wrote:

> *"We suggest you review the requirements of the Clean Water Branch (Hawai'i Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.Hawai'i.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.Hawai'i.gov."*

During the EISPN Public Review period, the City and County of Honolulu Department of Facilities Management wrote:

> *"1. Once construction phase commence, install approved Best Management Practices (BMP) fronting all drainage facilities on North School Street, Lanakila Avenue, Ahiahi Street, Kuakini Street and Hala Drive."*

During the EISPN Public Review period, the City and County of Honolulu Department of Planning and Permitting Site Development Division wrote:

> *"The DEIS needs to include a narrative explaining the project's post-construction storm water quality management strategy pursuant to Section 20-3-50 of the Rules Relating to Water Quality. The project's compliance with the City's Storm Drainage Standards and Rules Relating to Water Quality will be verified at the time that the construction/grading plans are submitted to Department of Planning and Permitting for review."*

The Proposed Project will be designed to direct storm water runoff away from the buildings and structures toward open grassed or paved areas. The project will be designed to maintain existing drainage flow patterns and minimize adverse impacts to downstream improvements.

Any increase in runoff generated by the Proposed Project, which adversely impacts downstream improvements, will be mitigated by retaining the runoff on-site in accordance with the City and County of Honolulu's storm drainage standards. Runoff quantities for proposed conditions were calculated for the 10-year and a 50-year 1 hour storm events and compared to existing runoff quantities to determine the increase in runoff generated from the project. Updated analyses will be prepared during detailed design of the project as it is built out; however, based on initial analyses of the proposed conceptual plan, approximately 3 cubic feet per second of runoff would need to be retained on-site at full buildout.

The drainage system for the Proposed Project will consist of, various roof downspouts, raingardens and bioswales, concrete curb and gutter, inlets and an underground drainage system including onsite retention systems. Green roofs and pervious concrete or pavers will also be considered during detailed design of the Proposed Project and filtering and reuse of captured rainwater for non-potable uses such as irrigation will be explored to the maximum extent practicable in order to improve water quality and reduce the amount of runoff conveyed to the City's offsite systems. Storm water runoff from the project will discharge to the existing Lanakila Avenue and North School Street drainage systems but will be limited to pre-development runoff quantities.

The Proposed Project, as well as any intermediary phases involving land disturbing activities of one acre or more, is subject to the City & County of Honolulu Rules Relating to Water Quality as a “Priority A” project for post-construction. The requirements for “Priority A” projects include:

- Retain on-site as much of the Water Quality Volume (WQV) as feasible;
- Biofilter the remaining portion of the WQV that is not retained on-site as feasible;
- If infeasible to retain and/or biofilter the WQV, one of the following alternative compliance measures is required:
  - Treat and discharge any portion of the WQV that is not retained on-site or biofiltered; or
  - Retain or biofilter at an off-site location the equivalent volume of the WQV that is not retained on-site or biofiltered.
- Incorporate appropriate Low Impact Development (LID) Site Design Strategies;
- Incorporate Source Control BMPs;
- A Storm Water Quality Strategic Plan shall be submitted with or as a part of the Master Development Plan for Department review; and
- A Storm Water Quality Report shall be prepared by a Certified Water Pollution Preparer (CWPPP) and must be reviewed and approved prior to issuance of permits for development.
  Low Impact Development (LID) design methods will also be implemented wherever practicable, which will include Best Management Practices (BMP) for source control and treatment control. Under the City and County’s recently adopted guidelines within the Rules Relating to Water Quality (2016), effective August 16, 2017, Source Control is the practice of preventing storm water from contacting work areas, and preventing pollutants from contacting surfaces that come into contact with storm water.

Source controls for this project may include the following:

- Landscape areas – all areas that do not consist of concrete or asphalt will consist of grass and trees.
- Automatic Irrigation Systems – landscape areas will have an automatic irrigation system.
- Storm drain inlets – signs and/or stencils will be placed directly adjacent to all inlets.
- Loading Docks – loading areas will be paved with concrete and if necessary, an engineered infiltration system will be installed.
- Outdoor Trash Storage – Outdoor trash bins will be pages and covered and will not be located near storm drains.
- Parking Areas – pavement runoff will be directed towards vegetated/landscaped areas if possible.
- Other BMPs may include Treatment Control, which consists of engineered techniques for the removal of pollutants from stormwater prior to being discharged into a storm drain system or other receiving waters. Treatment Control BMPs for the project may include methods such as retention, biofiltration, or alternative compliance BMPs, which are then sized for volume, flow, or demand.

To mitigate construction runoff, the City and County of Honolulu recently adopted new guidelines for storm water quality under the Rules Relating to Water Quality (2016), which went into effect on August 16, 2017. According to these rules, the redevelopment is classified as a Category 5 project for erosion and sediment control, which is defined as a development requiring a grading, grubbing or stockpiling permit that involves a disturbed area greater than one acre and that requires a NPDES general or individual permit issued by the DOH. The requirements for Category 5 projects include:

- An Erosion and Sediment Control Plan (ESCP) must be prepared by an Engineer licensed in the State of Hawaiʻi;
- An ESCP Coordinator must be designated and shall be responsible for implementing the ESCP at the Project Site;
- A National Pollutant Discharge Elimination System (NPDES) General/Individual Permit Authorizing Discharges of Storm Water Associated with Construction shall be obtained from the Department of Health (DOH);
- Erosion Control BMPs;
- Sediment Control BMPs;
- Good Housekeeping BMPs; and
- Dewatering non-storm water.

5.9.4 Electrical and Telecommunications Systems

Existing Conditions

The sole electric utility serving the island of Oʻahu is Hawaiian Electric Company (HECO), which operates and is regulated under its tariff approved by the State Public Utilities Commission (State PUC). Similarly, Hawaiian Telcom (HTCO) operates and is regulated under a tariff approved by the State PUC and was the sole provider of telecommunications services until the advent of cable television. Subsequently, Spectrum (formerly Oceanic Time Warner Cable), which is not regulated by the State PUC but is a franchisee of the Department of Commerce and Consumer Affairs (DCCA), has become a competitor to HTCO and, similar to HTCO, can offer broadband, cable television and telephone signals.

HECO's existing generation system on the Island of Oʻahu is currently capable of providing approximately 1,215 Megawatts (MW) of power with independent power producers capable of providing an additional 456 MW of power for a total generating capacity of 1,671 MW (based on 30 January 2015 Availability of Supply letter). Current peak demand on the Island of Oʻahu, as of December 2014, was 1,170 MW.

HECO's, HTCO's, and Spectrum's existing facilities serving this area consist of aerial cables attached to joint overhead pole lines on the makai side of North School Street, the Mauka-Ewa corner of the North School Street and Lanakila street intersection, and the Diamond Head site of Lanakila Avenue. HECO's overhead facilities consist of a 12.47 kV distribution circuit and secondary street lighting circuits. In addition, along the School Street property frontage, HECO has an overhead pole line supporting its 138 kV and 46 kV transmission circuits. The latter HECO facility is utilized by HECO's Oʻahu Island grid and would not likely be used to serve the Project Site.

It should be noted that Spectrum is not a member of the joint pole committee whose function is to oversee the placement and maintenance of utility poles throughout Oʻahu and whose members consist of HECO, HTCO, the City (for City rights-of-ways) and the State (for State rights-of-ways). To obtain approval to attach to existing joint pole lines, Spectrum must lease space from HTCO, if HTCO has joint ownership of the poles, or apply to HECO for permission to attach to poles where HTCO does not have joint ownership.

Street lighting along North School Street and Lanakila Street consists of high pressure sodium street lights mounted on the joint utility poles located along those streets.

Potential Impacts and Mitigation Measures

The total anticipated electrical demand load is 3,100 kVA (or approximately 3.1 MW) and is based on a peak, coincidental load of between 3.0 and 3.5 kVA per residential unit, 14 VA per square foot for the proposed commercial uses, 9 VA per square foot for community spaces, and 1 VA per square foot for parking spaces. The Proposed Project will be designed to be as energy efficient as possible to reduce electrical demand and may include elements such as solar hot water heating, operable windows for natural ventilation, light and motion sensors in non-residential areas, energy efficient lighting, and Energy Star appliances. Onsite renewable energy such as solar photovoltaics (PV) will also be evaluated during the design process and coordinated with HECO if pursued. The PV panels could be installed on the upper parking decks as shade structures and on building rooftops. (Note, unless the parking structures are as high or higher than the apartment buildings, the apartment buildings will cast shadows on the parking structure roof/PV panels thereby decreasing the efficiency of the PV generation system.)

Based on current technologies, both HTCO and Spectrum would likely provide service to the project via fiber optic cable cables which would be terminated at hub equipment which would, in turn, provide the bundled telecommunications services to the individual residents and businesses. Both HTCO and Spectrum have yet to confirm that they would be able to provide service to the proposed redevelopment project by reinforcing their existing aerial facilities with additional fiber optic strands

The off- and on-site electrical and telecommunications utility lines will likely be placed underground and the design of the duct system will be in accordance with the specifications and standard practices of the respective utility companies utilizing the duct system and City & County of Honolulu building codes. In addition, a determination will need to be made during the design phase as to whether the State and the State’s lessee will own and maintain the electrical and telecommunications duct systems or whether this responsibility will be dedicated to the respective utility companies. (Note: the utility companies usually take over ownership of the underground infrastructure once they install their cables.)

The on-site electric and telecommunications systems would consist of concrete encased PVC conduits, typically installed within a common trench and located, where feasible, under the roadway sidewalk between the curb and the edge of the road shoulder. Manholes and handholes would be placed periodically to serve as pulling points for the utilities and as parcel/building service points.

In addition to transformer pads for each of the buildings, HECO will require several switchgear pads throughout the property. The HECO switchgear acts as a protective device and sectionalizer that is used by HECO to minimize outages to the affected building as well as protect their main circuits. Both HTCO and Spectrum may request hub equipment sites which are approximately 8’ x 8’ in size. HECO will also require continued access to the Project Site for continued maintenance of their on-site distributions as well as the 138 kV line along School Street. Ongoing coordination with HECO, HTCO, and Spectrum will be held throughout the design process to ensure adequate electrical and telecommunication services can be brought to the Project Site.

On-site emergency power generation will be required to provide emergency standby power for at least one elevator in each high-rise apartment building. In addition, the emergency generator power will also be used to power the emergency egress lighting. The emergency distribution equipment will consist of a diesel generator and automatic transfer switch located in each building. An above ground fuel tank will also be required for on-site fuel storage and will be sized to meet minimum City & County of Honolulu building code requirements.

During the EISPN Public Review period, the City and County of Honolulu Department of Planning and Permitting wrote:

> *“The Draft Environmental Impact Statement (DEIS) should include the following:*
>
> *9. Specifications of proposed exterior lighting, which should be full-cut-off to avoid light spillage on adjacent properties.”*

Illumination for at-grade roadways and parking spaces will be specified with conformance with Act 287 and be designed to minimize glare and provide illumination levels in conformance with the above stated criteria. Although the Hawaiian petrel and Newell's shearwater were not to found to currently inhabit the Project Site, all outdoor lighting will also be fully-shielded and downward facing as an additional precaution to minimize impacts to these endangered native birds.

5.9.5 Solid Waste

Existing Conditions

On Oʻahu, a waste-to-energy combustor, H-POWER (Honolulu Program of Waste Energy Recovery) located at the Campbell Industrial Park receives all residential and commercial packer truck wastes on the island and incinerates about 1,800 tons of combustible waste per day, or processes over 700,000 tons of waste annually, producing up to ten percent of Oʻahu's electricity. (City and County of Honolulu, Department of Environmental Services, 2017) The electricity generated is bought by HECO.

The Waimanalo Gulch Landfill ("WGL") is the City's primary solid waste disposal facility, located *mauka* of Farrington Highway near Kahe Point. WGL accepts residential, commercial and nonhazardous industrial solid wastes, demolition debris and ash and residue from the H-POWER waste-to-energy facility. Wastewater treatment sludge, septic tank wastes and cesspool contents are also accepted, provided such disposal is in accordance with WGL's operating guidelines. WGL site also handles special wastes such as spent lime, contaminated foods and asbestos.

PVT Land Company, Ltd. ("PVT") located in Nānākuli, is the only construction and demolition waste landfill on Oʻahu. PVT also receives asbestos and other contaminated materials but diverts up to 80 percent of the construction and demolition waste it collects (PVT Land Company, Ltd., 2016). There are other companies on O'ahu who recycle deconstructed materials in order to divert them from the landfills and others who mitigate hazardous construction waste.

Potential Impacts and Mitigation Measures

The City of Honolulu estimates that Oʻahu generates more than 2.2 million tons of waste annually from residential, commercial and industrial sources. About 15 percent of residential trash is recyclable newspaper, aluminum, glass and plastic; and 25–30 percent is compostable yard trimmings. Office wastes are estimated to be as much as 85 percent recyclable office paper. In retail operations, cardboard comprises a major proportion of solid wastes. Short-term impacts from the Proposed Project include waste generated at the Project Site during construction expected to consist of materials from demolition, construction, and grading activities. Solid waste will also be generated by households occupying the residential units once construction is completed. There will also be solid waste generated by the proposed commercial uses and green waste from the landscape maintained onsite.

During the EISPN Public Review period, the State Department of Health, Environmental Planning Office wrote:

> *"Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: http://health.Hawai'i.gov/shwb/files/2016/05/constdem16.pdf Additional information is accessible at: http://health.Hawai'i.gov/shwb. For specific questions call (808) 586-4226."*

Best management practices for waste disposal will be implemented during construction including every effort to divert materials from landfills that can be reused or recycled as well as minimizing the amount of waste generated. Post construction, the Proposed Project will support recycling as much as possible for both households and commercial uses as well as green wastes generated onsite. Detailed design will include but not limited to onsite facilities to support separating wastes into recyclable and non-recyclable materials and for central collection facilities within the buildings. Retirement Housing Foundation will also work with the City and contracted collection services to ensure as much recyclable materials are diverted from the waste stream from the project as they will be managing ongoing operations of the site once construction is complete.

5.10 PUBLIC SERVICES AND FACILITIES

The following sections describe the public services and facilities that serve the existing the Project Site and the potential impacts as a result of completion of the Proposed Project. Figure 13 shows the location of existing public facilities to the Project Site.

5.10.1 Public Schools

The Project Site is currently served by the State of Hawaiʻi Department of Education's (DOE) public school system. The Proposed Project area is currently served by Lanakila Elementary School, Kawananakoa Middle School, and McKinley High School.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the State Department of Education (DOE) wrote:

> *"The impact will depend on the type of units built. There is no school impact from senior units, so the total number of units and the mix between senior and family units will be critical in determining the project's impact…*
>
> *…The original plans for two thousand new units would strain the capacity of neighborhood schools. Revised ideas for fewer units and some significant portion of units dedicated to seniors would reduce the anticipated impact…*
>
> *…The DOE is clear that this project is outside of the Kalihi to Ala Moana School Impact Fee District."*

The Proposed Project is an age-restricted, all senior residential development. It will not include households with school-aged children, and therefore should not place any demand on DOE to provide additional classroom space.

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DATE: 11/3/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway
- Fire Station
- Health Center
- Private School
- Public School
- Public Park

Figure 13:
Public Facilities

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)

0 125 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: State Department of Education, 2015. Hawaii Association of Independent Schools and State Office of Planning, 2011. City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.10.2 Police, Fire, and Medical

The Proposed Project is located within the Honolulu Police Department's (HPD) District 5 (Kalihi), Sector 5. HPD maintains a Kalihi Substation on Kamehameha IV Road that is open 24 hours a day. The approximate response time from the Kalihi Substation to the Proposed Project is nine minutes. There is also a police substation in Chinatown, although in a different HPD District.

Municipal firefighting protection is provided by the Honolulu Fire Department's Central Fire Station on Beretania Street and Kalihi Fire Station located near the intersection of Kalihi Street and North School Street. The approximate response time from the Central Fire Station to the Proposed Project is four minutes and seven minutes from the Kalihi Fire Station. There are multiple fire hydrants along Vineyard Boulevard, Lanakila Avenue, North School Street, and Pua Lane, which border the Project Site. Fire hydrants are also located onsite along Ahiahi Place.

The closest hospitals to the Project Site with emergency health care services are the Queen's Medical Center, St. Francis Hospital, and Kuakini Medical Center. The approximate response time from these emergency health care providers to the Proposed Project is approximately five to six minutes by ambulance service.

Potential Impacts and Mitigation Measures

During the EISPN Public Review period, the Honolulu Board of Water Supply wrote:

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

During the EISPN Public Review period, the Honolulu Fire Department wrote:

> *"In response to your letter dated August 11, 2017, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and determined that there will be no significant impact to fire department services. In addition, HFD requires that the following be complied with:*
>
> *1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (46 m) from fi re department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; Uniform Fire Code [UFC]™, 2012 Edition, Section 18.2.3.2.2.)*
>
> *A fire department access road ·shall extend to within 50 feet (15m) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.2.1.)*
>
> *2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building. On-site fire hydrants and mains capable of supplying the required fire flow shall be provided*

when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; UFC™, 2012 Edition, Section 18.3.1, as amended.)

3. Submit civil drawings to the HFD for review and approval."

Project designers will continue to work closely with City Police, Fire, and other public service providers and the City and County of Honolulu DPP during the detailed design of the facilities to ensure the new structures at the Proposed Project will be easily accessible by emergency services and are constructed in compliance with all City and County building codes.

5.10.3 Recreational Facilities

The main recreational center accessible for the Proposed Project residents is located across Lanakila Avenue at Lanakila District Park. The City and County Department of Parks and Recreation, provides a comprehensive recreational program (through Lanakila District Park) in the community. Facilities include a multi-purpose building and a field. There are three program periods throughout the year: fall, spring and summer. Activities are geared for all ages, including classes in arts and crafts, Hawaiiana, games and sports, music, seasonal activities and crafts, and excursions. A number of other public parks and outdoor areas are also located in the Lanakila neighborhood, many within walking distance of the Proposed Project. There are no beach parks or beach access areas in the vicinity of the site.

The Lanakila Multi-Purpose Senior Center (LMPSC) serving the Senior Community is located directly adjacent to the Project Site and offers a place for seniors to go for recreation, education, and social interaction. Many seniors go to LMPSC to get away from home for a few hours a week; others think of it as their second home. Every day at the center, senior citizens come, they play, and they give back to their peers as volunteers. LMPSC is the largest senior center in the state and is available to seniors 60 years and older. Its target population lives in the area from Fort Shafter to Ward Avenue but is also open to those who live outside LMPSC's defined population area when there are no comparable services in their community.

Potential Impacts and Mitigation Measures

During the EISPN public review period, the City and County of Honolulu Department of Planning and Permitting wrote:

Site Development Division

"1. The City's park dedication ordinance applies to this project. The Applicant should include in the DEIS a description of the onsite private parks and recreational facilities to serve the residents of the proposed housing project."

Transit Oriented Development (TOD) Division

"6. While we understand that there are existing trees to be preserved, every effort should be made to locate the apartments close to the property line along School Street. This will help create a more active School Street, get rid of any unusable open space, and possibly create more courtyard space in the proposed Conceptual Master Plan."

Retirement Housing Foundation is currently coordinating with the City and County of Honolulu Department of Parks and Recreation to discuss park dedication requirements and how they may be satisfied by the Proposed Project. The Proposed Project will attempt to meet the requirements of the City's Park Dedication Ordinance with the provision of open spaces, community gardens, and rooftop recreational decks in balance with the need to provide as many affordable apartment units as possible within the Proposed Project in order to meet the critical demand for affordable housing by the State of Hawai'i.

5.10.4 O'ahu Community Correctional Center

The O'ahu Community Correctional Center (OCCC) serves as the Honolulu county jail. It was renovated in 1975, with a design capacity of 628 beds. It currently has some 950 beds and houses approximately 1,200 inmates. Its sixteen-acre campus is located on Dillingham Boulevard and Kamehameha Highway, about 1.2 miles west of the Proposed Project. Four sites, including the OCCC campus, are being considered for a facility to replace the current low-rise facility. In a ranking system shared with the public in April 2017, the Animal Quarantine site in Hālawa Valley received the highest score (79 points), and the OCCC campus had a score of 76 points.

If the current campus is selected, it is believed that a new facility would be developed occupy only about half the site and the remainder of the site could be redeveloped into other uses. The Office of Planning recently completed a vision plan where community leaders, legislators, business and community service representatives collaborated in its development as part a vision team. Affordable housing and economic development were prioritized as well as supporting and celebrating Kalihi's diverse community. The vision plan is intended to help inform the future of the OCCC site as well as other State-owned properties in Kalihi (PBR Hawaii & Associates, Inc., 2017).

5.10.5 Community and Social Services

The Lanakila area is well-served by a variety of community and social service providers. The following highlight nearby service providers.

- As discussed in Section 5.10.3, the Lanakila Multi-Purpose Senior Center (LMPSC) offers a place for seniors to go for recreation, education, and social interaction. Many seniors go to LMPSC to get away from home for a few hours a week; others think of it as their second home. Every day at the center, senior citizens come, they play, and they give back to their peers as volunteers. LMPSC is the largest senior center in the state and is available to seniors 60 years and older. Its target population lives in the area from Fort Shafter to Ward Avenue but is also open to those who live outside LMPSC's defined population area when there are no comparable services in their community.

- Lanakila Meals on Wheels is Hawai'i's largest and only island-wide meal service for seniors. Bringing more than a nutritious meal, its team of volunteers also serves as a connection to other local services, helping seniors maintain their independence, in their own homes, with dignity. All Lanakila Meals on Wheels meals are analyzed for nutritional content by a registered dietitian. Modified meals, which are low in sodium and low in fat, are provided. Pureed and chopped meals are also available. Although participants have an opportunity to make a contribution, no one is turned away for inability to do so.

- Lanakila Health Center is a hospital that houses the Tuberculosis (TB) Control Center for the State of Hawai'i Department of Health (DOH) and serves a majority of O'ahu's population for TB testing.

Potential Impacts and Mitigation Measures

With the increased senior population onsite, there may be a demand for services that would not be provided by Retirement Housing Foundation. Retirement Housing Foundation will continue working with Lanakila and Kalihi area service providers to determine appropriate services for the Proposed Project and develop programs to support that need in order to effectively serve future populations at the Proposed Project.

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6 RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES AND CONTROLS FOR THE AREA

The relationships of the proposed action[4] to relevant Federal, State and County land use plans, policies, and controls are discussed below.

6.1 FEDERAL

6.1.1 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 (42 USC 4321 *et seq*.) requires that federal agencies assess the environmental effects of their proposed actions before making decisions. The NEPA process applies to a broad range of federal actions and also requires evaluation of corresponding social and economic effects of the proposed actions in addition to providing opportunities for public review and comments.

Discussion: In situations where federal programs provide funds for proposed actions by State or local agencies, the proposed action must be reviewed under NEPA for environmental review requirements. The Proposed Project will not be seeking federal funding through federal agencies. The Proposed Project, therefore, is not subject to environmental review under a NEPA Environmental Impact Statement.

6.1.2 Americans with Disabilities Act (ADA) of 1990, as Amended

The Americans with Disabilities Act of 1990, as amended (ADA) is a civil rights law that prohibits discrimination on the basis of disability. The ADA requires that all buildings, facilities, and sites shall conform to all applicable Federal, State, and County accessibility guidelines and standards. Section 103-50, HRS, requires that all State of Hawaiʻi or County government buildings, facilities, and sites to be designed and constructed to conform to the ADA Accessibility Guidelines, the Federal Fair Housing Amendments Act, and other applicable design standards, as adopted and amended by the State Disability and Communication Access Board (DCAB). Title II of the ADA requires that State and local government do not discriminate against persons with disabilities in the provision of government services.

Discussion: The Proposed Project will comply with requirements of the Americans with Disabilities Act of 1990, as amended (ADA). All plans and specifications prepared for the construction of State of Hawaiʻi or County government buildings, facilities, and sites are to be reviewed by the DCAB for conformance to

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[4] According HRS Chapter 343-2, "Action" is defined as "any program or project to be initiated by any agency or applicant."

the ADA guidelines and standards. Further, it is the policy of HPHA to pursue all reasonable efforts to ensure that its facilities, programs, and services are accessible to persons with disabilities, as required under the law.

6.1.3 Endangered Species Act

The Endangered Species Act of 1973 provides a program for the conservation of threatened and endangered plants and animals and their habitats. The lead federal agencies for implementing the Act are the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration Fisheries Service.

Discussion: As discussed in Sections 4.6 and 4.7 (Flora and Fauna) no impact to threatened, endangered, or candidate plants, birds, animals, or other species is anticipated as none are known to currently inhabit the Project Site, and the Project Site does not provide a suitable habitat for these species. As a further preventative measure, and to minimize impacts to endangered native birds such as the Hawaiian petrel and Newell's shearwater, all outdoor lighting will be fully-shielded and downward facing. Hawai'i

6.2 STATE OF HAWAIʻI

6.2.1 State Environmental Review Law (Chapter 343, HRS and Section 11-200, HAR)

The State Environmental Review Law (Chapter 343, HRS, Environmental Impact Statement Law and Chapter 11-200, HAR, Environmental Impact Statement Rules) requires an environmental review for any action that proposes the use of State or County lands and/or funds.

Discussion: The Proposed Project is located on State lands and will use State funds; therefore the proposed action triggers Chapter 343, HRS, and environmental review. It will also include improvements and/or connections to, and/or easements across, State or County facilities and lands in relation to infrastructure improvements for public facilities, roadways, water, sewer, utility, drainage or other facilities. While the specific nature of each improvement is not known at this time, this EIS is intended to address all current and future instances involving the use of State and/or County lands and funds relating to the Proposed Project.

As stated in Section 2.8 this Draft EIS was preceded by the *Hawai'i Public Housing Authority Administrative Offices (School Street) Redevelopment Environmental Impact Statement Preparation Notice* (EISPN). HPHA submitted the EISPN to the State of Hawaiʻi Office of Environmental Quality Control (OEQC) on August 10, 2017. Notice of the availability of the EISPN was published in the August 23, 2017 edition of the OEQC's *The Environmental Notice*, and was also posted on the OEQC website. A public scoping meeting was held on September 12, 2017. Comments received on the EISPN during the public comment period and the responses are incorporated throughout this EIS and attached in Section 9.2 (EIS Consultation).

6.2.2 State Land Use Law (Chapter 205, HRS)

The State Land Use Law (Chapter 205, HRS), establishes the State Land Use Commission (LUC) and authorizes this body to designate all lands in the State into one of four districts: Urban, Rural, Agriculture, or Conservation.

The Proposed Project is located entirely within the State Land Use Urban District. The Proposed Project is consistent with the Urban designation, and no reclassification is required to implement the Proposed Project.

The relevant objectives and policies of the State Land Use Law, Chapter 205, HRS, along with a detailed discussion of how the Proposed Project's improvements conform to these objectives and policies, is included below.

State Land Use Law Chapter 205, Hawaiʻi Revised Statutes **Section 15-15-77, Hawaiʻi Administrative Rules** **(**Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
Land Use Commission Decision Making Criteria			
HRS §205-17 Land use commission decision making criteria. In its review of any petition for reclassification of district boundaries pursuant to this chapter, the commission shall specifically consider the following:			X
(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaiʻi state plan and relates to the applicable priority guidelines of the Hawaiʻi state plan and the adopted functional plans;			X
(2) The extent to which the proposed reclassification conforms to the applicable district standards;			X
(3) The impact of the proposed reclassification on the following areas of state concern:			X
(A) Preservation or maintenance of important natural systems of habitats;			X
(B) Maintenance of valued cultural, historical, or natural resources;			X
(C) Maintenance of other natural resources relevant to Hawaiʻi's economy, including agricultural resources;			X
(D) Commitment of state funds and resources;			X
(E) Provision for employment opportunities and economic development; and			X
(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;			X
(4) The standards and criteria for the reclassification or rezoning of important agricultural lands in section 205-50;			X
(5) The county general plan and all community, development, or community development plans adopted pursuant to the county general plan, as they relate to the land that is the subject of the reclassification petition; and			X
(6) The representations and commitments made by the petitioner in securing a boundary change.			X
Discussion: The section is not applicable as the project is currently within the State Land Use Urban District and is consistent with the Urban designation.			
HAR §15-15-77 Decision-making criteria for boundary amendments.			X
(a) The commission shall not approve an amendment of a land use district boundary unless the commission finds upon the clear preponderance of the evidence that the proposed boundary amendment is reasonable, not violative of section 205-2, HRS, and consistent with the policies and criteria established pursuant to sections 205-16, 205-17, and 205A-2, HRS.			X
(b) In its review of any petition for reclassification of district boundaries pursuant to this chapter, the commission shall specifically consider the following:			X

State Land Use Law Chapter 205, Hawaiʻi Revised Statutes Section 15-15-77, Hawaiʻi Administrative Rules (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaiʻi state plan and relates to the applicable priority guidelines of the Hawaiʻi state plan and the adopted functional plans;			X
(2) The extent to which the proposed boundary amendment conforms to the applicable district standards;			X
(3) The impact of the proposed reclassification on the following areas of state concern;			X
(A) Preservation or maintenance of important natural systems or habitats;			X
(B) Maintenance of valued cultural, historical, or natural resources;			X
(C) Maintenance or other natural resources relevant to Hawaiʻi's economy including, but not limited to agricultural resources;			X
(D) Commitment of state funds and resources;			X
(E) Provision for employment opportunities and economic development; and			X
(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;			X
(4) In establishing the boundaries of the districts in each county, the commission shall give consideration to the general plan, and community, development, or community development plans of the county in which the land is located;			X
(5) The representations and commitments made by the petitioner in securing a boundary amendment, including a finding that the petitioner has the necessary economic ability to carry out the representations and commitments relating to the proposed use or development; and			X
(6) Lands in intensive agricultural use for two years prior to date of filing of a petition or lands with a high capacity for intensive agricultural use shall not be taken out of the agricultural district unless the commission finds either that the action:			X
(A) Will not substantially impair actual or potential agricultural production in the vicinity of the subject property or in the county or State; or			X
(B) Is reasonably necessary for urban growth; and			X
(7) In considering boundary amendments for lands designated important agricultural lands pursuant to part III, chapter 205, HRS, the commission shall specifically consider the standards and criteria set forth in section 205-50, HRS.			X
(c) Amendments of a land use district boundary in conservation districts involving land areas fifteen acres or less shall be determined by the commission pursuant to this subsection and section 205-3.1, HRS.			X
(d) Amendments of land use district boundary in other than conservation districts involving land areas fifteen acres or less shall be determined by the appropriate county land use decision-making authority for the district.			X
(e) Amendments of a land use district boundary involving land areas greater than fifteen acres shall be determined by the commission, pursuant to this subsection and section 205-3.1, HRS.			X
Discussion: The section is not applicable as the project is currently within the State Land Use Urban District and is consistent with the Urban designation.			

State Land Use Law Chapter 205, Hawaiʻi Revised Statutes Section 15-15-77, Hawaiʻi Administrative Rules (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
Standards for Determining Urban District Boundaries			
HAR §15-15-18 Standards for determining "U" urban district boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "U" urban district, the following standards shall be used:			
(1) It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses;	X		
(2) It shall take into consideration the following specific factors:			
(A) Proximity to centers of trading and employment except where the development would generate new centers of trading and employment;	X		
(B) Availability of basic services such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection; and	X		
(C) Sufficient reserve areas for foreseeable urban growth;	X		
(3) It shall include lands with satisfactory topography, drainage, and reasonably free from the danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects;	X		
(4) Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans or county community plans or development plans;	X		
(5) It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans or county community plans or development plans;	X		
(6) It may include lands which do not conform to the standards in paragraphs (1) to (5):			X
(A) When surrounded by or adjacent to existing urban development; and			X
(B) Only when those lands represent a minor portion of this district;			X
(7) It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services; and	X		
(8) It may include lands with a general slope of twenty per cent or more if the commission finds that those lands are desirable and suitable for urban purposes and that the design and construction controls, as adopted by any federal, state, or county agency, are adequate to protect the public health, welfare and safety, and the public's interests in the aesthetic quality of the landscape.			X
Discussion: The HPHA Administrative Offices Project Site is located within the State Land Use Urban District and is consistent with the above standards for the Urban designation. The project property is located in the urban core of Honolulu, an area with a very "city like" character. It is in close proximity to Downtown Honolulu, a concentration of medical providers, commercial uses and community services in Lanakila, Liliha and Kapālama.			
Standards for Determining Agricultural District Boundaries			
HAR §15-15-19 Standards for determining "A" agricultural district boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "A" agricultural district, the following standards shall apply:			X
(1) It shall include lands with a high capacity for agricultural production;			X
(2) It may include lands with significant potential for grazing or for other agricultural uses; and			X

State Land Use Law Chapter 205, Hawaiʻi Revised Statutes Section 15-15-77, Hawaiʻi Administrative Rules **(**Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(3) It may include lands surrounded by or contiguous to agricultural lands or which are not suited to agricultural and ancillary activities by reason of topography, soils, and other related characteristics; and			X
(4) It shall include all lands designated important agricultural lands pursuant to part III of chapter 205, HRS.			X
Discussion: The section is not applicable as the project is located within the State Land Use Urban District and is consistent with the Urban designation.			
Standards for Determining Rural District Boundaries			
HAR §15-15-21 Standards for determining "R" rural boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "R" rural district, the following standards shall apply:			X
(1) Areas consisting of small farms; provided that the areas need not be included in this district if their inclusion will alter the general characteristics of the areas;			X
(2) Activities or uses as characterized by low-density residential lots of not less than one-half acre and a density of not more than one single-family dwelling per one-half acre in areas where "city-like" concentrations of people, structures, streets, and urban level of services are absent, and where small farms are intermixed with the low-density residential lots; and			X
(3) It may also include parcels of land which are surrounded by, or contiguous to this district, and are not suited to low-density residential uses for small farm or agricultural uses.			X
Discussion: The section is not applicable, as the project is located within the State Land Use Urban District and is consistent with the Urban designation.			
Standards for Determining Conservation District Boundaries			
HAR §15-15-20 Standards for determining "C" conservation district boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "C" conservation district, the following standards shall apply:			X
(1) It shall include lands necessary for protecting watersheds, water resources, and water supplies;			X
(2) It may include lands susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention by the state and federal government, and lands necessary for the protection of the health and welfare of the public by reason of the land's susceptibility to inundation by tsunami and flooding, to volcanic activity, and landslides;			X
(3) It may include lands used for national or state parks;			X
(4) It shall include lands necessary for the conservation, preservation, and enhancement of scenic, cultural, historic, or archaeologic sites and sites of unique physiographic or ecologic significance;			X
(5) It shall include lands necessary for providing and preserving parklands, wilderness and beach reserves, for conserving natural ecosystems of indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered, and for forestry and other related activities to these uses;			X
(6) It shall include lands having an elevation below the shoreline as stated by section 205A-1, HRS, marine waters, fish ponds, and tidepools of the State, and accreted portions of lands pursuant to sections 501-33 and 669-1, HRS,			X

State Land Use Law Chapter 205, Hawaiʻi Revised Statutes Section 15-15-77, Hawaiʻi Administrative Rules (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
unless otherwise designated on the land use district maps. All offshore and outlying islands of the State are classified conservation unless otherwise designated on the land use district maps;			
(7) It shall include lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use, except when those lands constitute areas not contiguous to the conservation district;			X
(8) It may include lands with a general slope of twenty per cent or more which provide for open space amenities or scenic values; and			X
(9) It may include lands suitable for farming, flower gardening, operation of nurseries or orchards, growing of commercial timber, grazing, hunting, and recreational uses including facilities accessory to those uses when the facilities are compatible natural physical environment.			X
Discussion: The section is not applicable as the project is located within the State Land Use Urban District and is consistent with the Urban designation**.**			

6.2.3 Coastal Zone Management (Chapter 205A-2, HRS)

The National Coastal Zone Management (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawaiʻi's CZM Program, adopted as Chapter 205A, HRS, provides a basis for protecting, restoring and responsibly developing coastal communities and resources. The objectives and policies of the CZM Program encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. The CZM Area as defined in Chapter 205A, HRS, includes all the lands of the State. As such, the Proposed Project lies within the CZM Area.

Relevant objectives and policies of the Hawaiʻi CZM Program along with discussion of how the Proposed Project conforms to these objectives and policies are discussed below.

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
Recreational Resources			
(b) Objective: (A) Provide coastal recreational opportunities accessible to the public.			X
(c) Policies:			
(A) Improve coordination and funding of coastal recreational planning and management; and			X
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			X
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			X
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			X

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			X
(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;			X
(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;			X
(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and			X
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.			X
Discussion: The Proposed Project is not a coastal dependent development, is not located on the coastline, and is not in the SMA. Therefore, policies regarding shoreline recreation resources are not applicable. However, to protect nearshore water quality, the Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu's grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program. An integral component of the Proposed Project recreational uses will be its landscaped open spaces and gathering areas. Residential buildings will also include dedicated recreation areas and facilities**.**			
Historic Resources			
(b) Objective: (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.	X		
(c) Policies:			
(A) Identify and analyze significant archaeological resources;	X		
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and	X		
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.	X		
Discussion: As discussed in Section 5.1 (Archaeological and Historic Resources), an archaeological inventory survey (AIS) and a reconnaissance level survey (RLS) of architectural historic resources were conducted for the Proposed Project property. Both the AIS and RLS were prepared in consultation with the State Historic Preservation Division (SHPD) for HRS 6E determination. The AIS, which included subsurface testing, identified four historic properties which were evaluated, documented and reported to the SHPD. The AIS recommends no further work is necessary for the sites. As noted in Section 5.1.2 (Historic Architectural Resources), a RLS was undertaken for buildings within the Project Site and the surrounding area. The RLS identified thirteen buildings in the Project Site (see "Survey Coverage Map" on following page). Of this number, only five were over fifty years of age: 1) the 1955 administration building (Building A); 2 and 3) a maintenance shop and semi-attached central store room (together referred to within this survey as Building D); 4) a set of garages; and 5) a facilities office building (Building C). The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz. The five buildings over fifty years of age identified in the course of the RLS appear to meet criterion C for listing in the Hawai'i and National Registers of Historic Places. Although significant, the 1955 HHA administration			

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
building and the buildings associated with the authority's maintenance efforts, do not appear to have high preservation value. The former administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, these five buildings do not appear to be of high preservation value.			
Scenic and Open Space Resources			
(b) Objective: (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.			X
(c) Policies:			
(A) Identify valued scenic resources in the coastal zone management area;			X
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;	X		
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			X
(D) Encourage those developments that are not coastal dependent to locate in inland areas.	X		
Discussion: The Proposed Project will be located inland, away from the shoreline; therefore, it is anticipated that there will be no direct effect on the quality of the coastal scenic resources. In addition, the property is within a highly urban environment and that has been successively altered for residential uses. The site and the surrounding area do not represent a natural setting and the project is an urban redevelopment on a previously developed site that is complementary to the existing urban environment. Three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Project Site should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Primary Urban Center, Map A.1, Significant Panoramic Views). The visual impacts from the project, however, must take into consideration: - the existing multi-family and single-family development of this area; - existing buildings such as Maluhia Health Center, Kapuna Hale, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center; - overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and - the tall field lights at Lanakila District Park. The current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. It breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by: • Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views; • Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets; • Creating a more interesting skyline by varying building heights; • Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and			

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
• Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.			
Coastal Ecosystems			
(b) Objective: (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.			X
(c) Policies:			
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			X
(B) Improve the technical basis for natural resource management;			X
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			X
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			X
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.	X		
Discussion: The Proposed Project is not a coastal dependent development, is not located on the coastline, and does not contain any coastal ecosystems. There are no streams adjoining the property, nor does the proposed action involve alterations to any streams. To protect coastal ecosystems and marine water quality, the Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu's grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program. No increase in runoff is expected as a result once all of the proposed improvements are implemented.			
Economic Uses			
(b) Objective: (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.	X		
(c) Policies:			
(A) Concentrate coastal dependent development in appropriate areas;			X
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and			X
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:			X
(i) Use of presently designated locations is not feasible;			
(ii) Adverse environmental effects are minimized; and			
(iii) The development is important to the State's economy.			
Discussion: The Proposed Project is not a coastal dependent development, is not located on the coastline, and is not in the SMA. The proposed action, which includes siting much needed affordable senior apartments on State land and replacing existing State offices with new offices, is located in an appropriate location within the urban core of Honolulu.			

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
Coastal Hazards			
(b) Objective: (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.			
(c) Policies:			
(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;	X		
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;	X		
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	X		
(D) Prevent coastal flooding from inland projects.	X		
Discussion: The Proposed Project sits inland from the coastline. As discussed in Section 4.5 (Natural Hazards), the property is not in an area prone to erosion, flooding, hurricanes, earthquakes, or volcanic eruptions, or other hazards. According to the FIRM prepared by FEMA, National Flood Insurance Program, the site is located within Zone X, an area that is outside of the 0.2 percent annual chance flood (or 500-year floodplain). All structures will be designed in compliance with the International Building Code.			
Managing Development			
(b) Objective: (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			X
(c) Policies:			
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			X
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			X
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.			X
Discussion: The Proposed Project is not a coastal development, is not located on the coastline, and is not in the SMA; however as noted in Section 9.1 (Public Engagement Through the Conceptual Master Plan Process), the HPHA and project team have participated in numerous community meetings, and met with many stakeholders, private groups, and government agencies in the course of preparing the Master Plan for the Proposed Project. The inclusive planning process has resulted in a plan that allowed for extensive public participation in the planning process, incorporates community input, and is responsive to community concerns. In addition, this Draft EIS discusses potential impacts and mitigation measures of the Proposed Project. Public comments will be received on this Draft EIS and public comments were received on the EISPN that was circulated in advance of this Draft EIS and a public scoping meeting was held on September 12, 2017 to allow additional input on the scope of the EIS. The public comments received were included in the Draft EIS.			
Public Participation			
(b) Objective: (A) Stimulate public awareness, education, and participation in coastal management.			X
(c) Policies:			
(A) Promote public involvement in coastal zone management processes;			X
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and			X

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			X
Discussion: The Proposed Project is not a coastal development, is not located on the coastline, and is not in the SMA; however, the HPHA and Proposed Project team representatives have participated in numerous Neighborhood Board meetings, held resident, stakeholder (including community service providers and governmental agencies) and community meetings, during the preparation of the conceptual master plan for the Proposed Project (see Section9).			
Beach Protection			
(b) Objective: (A) Protect beaches for public use and recreation.			X
(c) Policies:			
(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			X
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			X
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.			X
(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner’s vegetation in a beach transit corridor; and			X
(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner’s unmaintained vegetation to interfere or encroach upon a beach transit corridor.			X
Discussion: The Proposed Project is not a coastal dependent development, is not located on the coastline, and is not in the SMA; therefore, these policies are not applicable.			
Marine Resources			
(b) Objective: (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.			X
(c) Policies:			
(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			X
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			X
(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			X
(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and			X
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			X
Discussion: The Proposed Project is not a coastal dependent development, is not located on the coastline, and is not in the SMA; therefore, these policies are not applicable. However, to protect coastal ecosystems and marine water quality the Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu’s grading			

COASTAL ZONE MANAGEMENT ACT, SECTION 205A-2, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program.			

6.2.4 Hawaiʻi State Environmental Policy and Guidelines, Chapter 344-3 & 344-4, HRS

The State Environmental Policy provides guidelines for agencies to create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawai'i. The environmental Guidelines (§344-4, HRS) suggest that insofar as practical, in the development of programs consider: population; land, water, mineral, visual, air, and other natural resources; flora and fauna; parks, recreation, and open space; economic development; transportation; energy; community life and housing; education and culture; and, citizen participation.

State Environmental Policy, Chapter 344, Hawaiʻi Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
State Environmental Policy			
§344-3 Environmental policy. It shall be the policy of the State, through its programs, authorities, and resources to:			
(1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaiʻi.	X		
(2) Enhance the quality of life by:			
(A) Setting population limits so that the interaction between the natural and artificial environments and the population is mutually beneficial;			x
(B) Creating opportunities for the residents of Hawaiʻi to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments;	X		
(C) Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and	X		
(D) Establishing a commitment on the part of each person to protect and enhance Hawaiʻi's environment and reduce the drain on nonrenewable resources.	X		
Discussion: The Proposed Project site does not contain any naturally occurring environments or resources. However, by increasing the number of affordable apartments in the urban core, it allows rural areas outside of the PUC to remain rural. The Proposed Project complies with the goals of the State and the Oʻahu General Plan to ensure the most beneficial use of the land. Best Management Practices (BMPs) and Low Impact Development (LID) will be integrated into the project design where possible to properly and efficiently manage storm water and solid wastes generated from the site. The Proposed Project will provide a total of approximately 10,000 square feet of neighborhood commercial space that may be leased by a variety of retail, offices and services. As discussed in Section 5.7 (Socio-Economic Impacts), approximately 72 new direct permanent jobs, generating approximately $2.8 million in employee wages, will be created after build-out.			

State Environmental Policy, Chapter 344, Hawaiʻi Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
The Proposed Project is a compact mixed-use redevelopment project that will provide residential, commercial and public services in a manner that efficiently utilizes urban lands. Redevelopment of the HPHA Administrative Offices property also implements major components of the Primary Urban Center Development Plan, which calls for higher density development near the urban core. As discussed in Section 3.3.4, sustainable design and construction practices such as implementing energy and water conserving measures, reusing captured rainwater, encouraging construction waste and community recycling, and reducing automobile dependence will be implemented as much as practicable. Safety is a key concern for residents of the Proposed Project. The Master Plan for Proposed Project was prepared with considerations for incorporating Crime Prevention Through Environmental Design (CPTED) principles such as natural surveillance, maintenance of proper sightlines, natural access control, and on-going maintenance and management into the project.			
Guidelines			
§344-4 Guidelines. In pursuance of the state policy to conserve the natural resources and enhance the quality of life, all agencies, in the development of programs, shall, insofar as practicable, consider the following guidelines:			
(1) Population.			
(A) Recognize population impact as a major factor in environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation;	X		
(B) Recognize optimum population levels for counties and districts within the State, keeping in mind that these will change with technology and circumstance, and adopt guidelines to limit population to the levels determined.			x
Discussion: The Proposed Project will not directly generate future population levels at the County scale but addresses the need for affordable senior apartments within the urban core of Honolulu.			
(2) Land, water, mineral, visual, air, and other natural resources.			
(A) Encourage management practices which conserve and fully utilize all-natural resources;			X
(B) Promote irrigation and waste water management practices which conserve and fully utilize vital water resources;	X		
(C) Promote the recycling of waste water;	X		
(D) Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas;			X
(E) Establish and maintain natural area preserves, wildlife preserves, forest reserves, marine preserves, and unique ecological preserves;			X
(F) Maintain an integrated system of state land use planning which coordinates the state and county general plans;			X
(G) Promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling so that all our wastes become utilized.	X		
Discussion: In design, construction, and operation, the Proposed Project will incorporate as many sustainable design elements as financially feasible and will implement best practices such as energy conservation and environmental stewardship. Retirement Housing Foundation employs an integrated design process to research the latest in green materials and technologies to help lower construction, maintenance, and operating costs while reducing the development's impact on the environment.			

State Environmental Policy, Chapter 344, Hawaiʻi Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
The Proposed Project complies with the goals of the State and the Oʻahu General Plan to ensure the most beneficial use of the land. Best Management Practices (BMPs) and Low Impact Development (LID) will be integrated into the project design where possible to properly and efficiently manage storm water and solid wastes generated from the site. Sustainable design and construction practices, such as implementing energy and water conserving measures, reusing captured rainwater, encouraging construction waste and community recycling, and reducing automobile dependence will be implemented as much as practicable.			
(3) Flora and fauna.			
(A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard;	X		
(B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.	X		
Discussion: As discussed in Sections 4.6 and 4.7 (Flora and Fauna) no impact to threatened, endangered, or candidate plants, birds, animals, or other species is anticipated as none are known to currently inhabit the property, and the property does not provide a suitable habitat for these species. All outdoor lighting will also be fully-shielded and downward facing to minimize impacts to endangered native birds such as the Hawaiian petrel and Newell's shearwater. Where appropriate, the use of native, Polynesian introduced, and climatically appropriate plant material will be incorporated into the project design.			
(4) Parks, recreation, and open space.			
(A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses;	X		
(B) Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities;			X
(C) Promote open space in view of its natural beauty not only as a natural resource but as an ennobling, living environment for its people.	X		
Discussion: The Proposed Project also is envisioned to include recreational decks with landscaping and recreational facilities on top of building podiums, and landscaped spaces throughout the new community to provide comfortable places for people to gather and walk. These facilities will provide a place of recreation and leisure for residents and their visitors.			
(5) Economic development.			
(A) Encourage industries in Hawaiʻi which would be in harmony with our environment;			X
(B) Promote and foster the agricultural industry of the State; and preserve and conserve productive agricultural lands;			X
(C) Encourage federal activities in Hawaiʻi to protect the environment;			X
(D) Encourage all industries including the fishing, aquaculture, oceanography, recreation, and forest products industries to protect the environment;			X
(E) Establish visitor destination areas with planning controls which shall include but not be limited to the number of rooms;			X
(F) Promote and foster the aquaculture industry of the State; and preserve and conserve productive aqua cultural lands.			X
Discussion: Located in an existing urbanized site, the Proposed Project does not impact productive agricultural lands.			
(6) Transportation.			
(A) Encourage transportation systems in harmony with the lifestyle of the people and environment of the State;	X		

State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(B) Adopt guidelines to alleviate environmental degradation caused by motor vehicles;	X		
(C) Encourage public and private vehicles and transportation systems to conserve energy, reduce pollution emission, including noise, and provide safe and convenient accommodations for their users.	X		
Discussion: Section 3.5 of the Primary Urban Center Development Plan addresses the need to "'develop a balanced transportation system that reduces reliance on cars and improves alternate modes connecting neighborhoods and activity centers." Full development of the Primary Urban Center, as called for in the O'ahu General Plan, can only be achieved with the support of a well-conceived transportation system that is tightly integrated with land use policies and regulations." Implementation of a balanced transportation system will result in: 1) reducing dependency on motor vehicles, which contribute to gasoline consumption, pollution, emissions, and noise impacts; and 2) encouraging walking, bicycling, and transit use which minimize energy consumption. The new internal network of streets is envisioned to be designed as complete streets, providing safe, comfortable, and convenient access to area public transit.			
(7) Energy.			
(A) Encourage the efficient use of energy resources.	X		
Discussion: As discussed in Section 3.3.4 (Environmental Characteristics), the Proposed Project will be designed to be as energy efficient as possible to reduce electrical demand and include solar hot water heating and Energy Star appliances. Onsite renewable energy such as solar photovoltaics (PV) will also be reviewed during the design process and coordinated with HECO. The PV panels could be installed on the upper parking decks as shade structures and on building rooftops.			
(8) Community life and housing.			
(A) Foster lifestyles compatible with the environment; preserve the variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods which reflect the culture and mores of the community;	X		
(B) Develop communities which provide a sense of identity and social satisfaction in harmony with the environment and provide internal opportunities for shopping, employment, education, and recreation;	X		
(C) Encourage the reduction of environmental pollution which may degrade a community;	X		
(D) Foster safe, sanitary, and decent homes;	X		
(E) Recognize community appearances as major economic and aesthetic assets of the counties and the State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote mountain-to-ocean vistas.	X		
Discussion: The Proposed Project will convert existing low-rise, single-use HPHA administrative offices into a mixed-use community that will provide high quality senior rental housing options in the urban core of Honolulu. It will include a mix of retail, and resident services to support the new residents (and their visitors) and complement the surrounding neighborhood. A series of open spaces are envisioned throughout. New internal roadways will be designed as complete streets to support safe pedestrian and bicycle circulation and will also include traffic calming measures to slow vehicle traffic through the site. Convenient pedestrian and bicycle access will also be provided to the surrounding bus transit line to encourage non-vehicle modes of transportation which will help reduce pollution from automobile emissions.			
(9) Education and culture.			
(A) Foster culture and the arts and promote their linkage to the enhancement of the environment;	X		

State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(B) Encourage both formal and informal environmental education to all age groups.			X
Discussion: While it is too early to determine what specific programs Retirement Housing Foundation may offer to its residents, based on its offerings at other properties it operates around the Country, programs include: education, cultural performances, artistic displays, recreation and leisure.			
(10) Citizen participation.			
(A) Encourage all individuals in the State to adopt a moral ethic to respect the natural environment; to reduce waste and excessive consumption; and to fulfill the responsibility as trustees of the environment for the present and succeeding generations; and	X		
(B) Provide for expanding citizen participation in the decision-making process so it continually embraces more citizens and more issues.	X		
Discussion: The HPHA and project team representatives have participated in numerous community meetings, and met with many private groups and government agencies in the course of preparing the conceptual Master Plan for the Proposed Project (see Section 9.1, Public Engagement through the Conceptual Master Plan Process). This extensive outreach has allowed all generations of the Proposed Project residents and area community members and stakeholders to participate in the development of the proposed conceptual Master Plan, which incorporates many of their concerns.			

6.2.5 Hawaiʻi State Plan (Chapter 226, HRS)

The Hawaiʻi State Plan (Chapter 226, HRS) sets forth the goals, objectives, policies, and priority guidelines for growth, development, and allocation of limited resources throughout the State. It contains diverse policies and objectives on topics of state interest including but not limited to, the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, and sustainability. Conformity with applicable provisions of the State Plan is discussed below. The State Plan is divided into three parts, Part I (Overall Theme, Goals and Policies); Part II (Planning, Coordination and Implementation); and Part III (Priority Guidelines). Part II elements of the State Plan pertain primarily to the administrative structure and implementation process of the Plan. As such, comments regarding the applicability of Part II to the Proposed Project are not appropriate and are therefore not included. Parts I and III are provided in matrix format below and the checked boxes indicate whether the individual objectives and policies are supported, not supported, or not applicable. Applicable goals and policies of the Hawaiʻi State Plan are discussed below.

6.2.5.1 Part I: Overall Theme, Goals, Objectives and Policies

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-1: Findings and Purpose			
HRS § 226-2: Definitions			
HRS § 226-3: Overall Theme.			
Hawaiʻi's people, as both individuals and groups, generally accept and live by a number of principles or values which are an integral part of society. This concept is the unifying theme of the State Plan. The following principles or values are established as the overall theme of the Hawaiʻi State Plan:			
(1) Individual and family self-sufficiency refers to the rights of people to maintain as much self-reliance as possible. It is an expression of the value of independence, in other words, being able to freely pursue personal interests and goals. Self-sufficiency means that individuals and families can express and maintain their own self-interest so long as that self-interest does not adversely affect the general welfare. Individual freedom and individual achievement are possible only by reason of other people in society, the institutions, arrangements and customs that they maintain, and the rights and responsibilities that they sanction.	X		
(2) Social and economic mobility refers to the right of individuals to choose and to have the opportunities for choice available to them. It is a corollary to self-sufficiency. Social and economic mobility means that opportunities and incentives are available for people to seek out their own levels of social and economic fulfillment.	X		
(3) Community or social well-being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept. It further implies the aloha spirit--attitudes of tolerance, respect, cooperation and unselfish giving, within which Hawaiʻi's society can progress.	X		

One of the basic functions of our society is to enhance the ability of individuals and groups to pursue their goals freely, to satisfy basic needs and to secure desired socio-economic levels. The elements of choice and mobility within society's legal framework are fundamental rights. Society's role is to encourage conditions within which individuals and groups can approach their desired levels of self-reliance and self-determination. This enables people to gain confidence and self-esteem; citizens contribute more when they possess such qualities in a free and open society. Government promotes citizen freedom, self-reliance, self-determination, social and civic responsibility and goals achievement by keeping order, by increasing cooperation among many diverse individuals and groups, and by fostering social and civic responsibilities that affect the general welfare. The greater the number and activities of individuals and groups, the more complex government's role becomes. The function of government, however, is to assist citizens in attaining their goals. Government provides for meaningful participation by the people in decision-making and for effective access to authority as well as an equitable sharing of benefits. Citizens have a responsibility to work with their government to contribute to society's improvement. They must also conduct their activities within an agreed-upon legal system that protects human rights.	X		

Discussion: As discussed in Section 9.1 (Public Engagement Through the Master Plan Process), the Proposed Project Master Plan was prepared through a community outreach and engagement process. The resultant plan implements the unifying theme, principles and values of the Hawaiʻi State Plan as follows:

- Affordable housing is a key element in assuring individual and family self-sufficiency. The Proposed Project will provide 800 senior rental apartments units, increasing the availability of housing to a larger range of income groups (about four-fifths of which will be affordable).
- Social and economic mobility will be enhanced through the addition of approximately 10,000 square feet of neighborhood commercial and community space that may be leased by a variety of retail, offices and community services. As discussed in Section 5.7 (Socio-Economic Impacts), approximately 72 new direct permanent jobs, generating approximately $2.8 million in employee wages, will be created after build-out. The project will also generate short-term construction employment.
- The Proposed Project's open spaces will provide access to social services, gathering and recreation areas for residents and their guests. These areas will be used for cultural performances, artistic displays, and other community activities. Finally, the pedestrian-oriented design will promote a physically active, healthy lifestyle.

In summary, the project will support healthy social, economic, and physical environments that benefit the future residents and employees of the Proposed Project and the community as a whole.

HRS § 226-4: State Goals.

In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:

(1) A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawaiʻi's present and future generations.
(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
(3) Physical, social and economic well-being, for individuals and families in Hawaiʻi, that nourishes a sense of community responsibility, of caring and of participation in community life.

Discussion: The Proposed Project supports these three goals by 1) providing employment opportunities to Oʻahu residents as well as new opportunities for retail/commercial tenants; 2) providing new affordable senior apartments to address existing and future demand; and 3) providing experienced management of senior communities (by Retirement Housing Foundation).

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-5: Objectives and policies for population.			
(a) Objective: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.			
(b) Policies:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaiʻi's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.	X		
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.			X
(3) Promote increased opportunities for Hawaiʻi's people to pursue their socio-economic aspirations throughout the islands.	X		
(4) Encourage research activities and public awareness programs to foster an understanding of Hawaiʻi's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaiʻi's population.			X
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			X
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			X
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.	X		
Discussion: The Proposed Project is consistent with the pattern of population distribution sought by the Oʻahu General Plan. The Proposed Project will positively impact Oʻahu's population distribution by providing additional housing opportunities in the Primary Urban Center, which is in accordance with the Oʻahu General Plan's directed growth policy. This policy seeks a population distribution of 46 percent of Oʻahu's population in the Primary Urban Center. According to DPP population data for 2010, approximately 46 percent of Oʻahu's population resides in the Primary Urban Center. Considering this directed growth policy and DPP's 2025 population projections, about 450,000 will reside in the Primary Urban Center by 2025, an increase of 14,900 residents or 43.7 percent of the island-wide population; this is shy of DPP's target of 46 percent by about 24,000 residents (Department of Planning and Permitting, June 2016). Thus, the Proposed Project is consistent with the pattern of population distribution sought by the Oʻahu General Plan, by contributing 800 additional senior rental apartment units to the Primary Urban Center. 800The project will also provide new housing opportunities for Oʻahu senior residents from other communities wishing to relocate closer to more medical care options and mix of uses in the urban core of Honolulu. The Proposed Project will provide increased opportunities for Hawaiʻi's people to pursue their socio-economic aspirations by providing both short-term (construction) and long-term (facility management and commercial) employment opportunities. While construction jobs may fluctuate, it is anticipated that construction will generate a peak of 166 jobs each year with about 382 induced and indirect jobs each year. Once construction is complete, the Proposed Project is estimated to create about 72 permanent jobs as well as 37 induced and indirect jobs. The jobs created, both during construction and after, will encompass a diversity of skill levels from entry-level to professional. As discussed in Section 5.9.1 (Water System), initial consultation with the Board of Water Supply confirmed that the existing Oʻahu municipal water system is presently adequate to accommodate the proposed 1,000 residential units and up to 10,000 SF of commercial.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-6: Objectives and policies for the economy in general.			
(a) Objectives: Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaiʻi's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.	X		
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	X		
(b) Policies:			
(1) Promote and encourage entrepreneurship within Hawaiʻi by residents and nonresidents of the State.	X		
(2) Expand Hawaiʻi's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			X
(3) Promote Hawaiʻi as an attractive market for environmentally and socially sound investment activities that benefit Hawaiʻi's people.			X
(4) Transform and maintain Hawaiʻi as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.			X
(5) Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawaiʻi.			X
(6) Seek broader outlets for new or expanded Hawaiʻi business investments.			X
(7) Expand existing markets and penetrate new markets for Hawaiʻi's products and services.			X
(8) Assure that the basic economic needs of Hawaiʻi's people are maintained in the event of disruptions in overseas transportation.			X
(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	X		
(10) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaiʻi's small-scale producers, manufacturers, and distributors.			X
(11) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.			X
(12) Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawaiʻi.			X
(13) Foster greater cooperation and coordination between the government and private sectors in developing Hawaiʻi's employment and economic growth opportunities.	X		
(14) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			X
(15) Maintain acceptable working conditions and standards for Hawaiʻi's workers.	X		
(16) Provide equal employment opportunities for all segments of Hawaiʻi's population through affirmative action and nondiscrimination measures.	X		
(17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(18) Encourage businesses that have favorable financial multiplier effects within Hawaiʻi's economy, particularly with respect to emerging industries in science and technology.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(19) Promote and protect intangible resources in Hawaiʻi, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			X
(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			X
(21) Foster a business climate in Hawaiʻi--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			X
Discussion: The Proposed Project will support small-scale economic activity through project construction and the addition of commercial space. As discussed in Section 5.7 (Socio-Economic Impacts), the Proposed Project will provide increased opportunities for Hawaiʻi's people to pursue their socio-economic aspirations by providing both short-term (construction) and long-term (facility management and commercial) employment opportunities. While construction jobs may fluctuate, it is anticipated that construction will generate a peak of 166 jobs each year with about 382 induced and indirect jobs each year. Once construction is complete, the Proposed Project is estimated to create about 72 permanent jobs as well as 37 induced and indirect jobs. The jobs created, both during construction and after, will encompass a diversity of skill levels from entry-level to professional.			
HRS § 226-7: Objectives and policies for the economy – agriculture			
(a) Objectives: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawaiʻi's sugar and pineapple industries.			X
(2) Growth and development of diversified agriculture throughout the State.			X
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaiʻi's strategic, economic, and social well-being.			X
(b) Policies:			
(1) Establish a clear direction for Hawaiʻi's agriculture through stakeholder commitment and advocacy.			X
(2) Encourage agriculture by making best use of natural resources.			X
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			X
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			X
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaiʻi's economy.			X
(6) Seek the enactment and retention of federal and state legislation that benefits Hawaiʻi's agricultural industries.			X
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaiʻi's food producers and consumers in the State, nation, and world.			X
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.			X
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(12) In addition to the State's priority on food, expand Hawaiʻi's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			X
(13) Promote economically competitive activities that increase Hawaiʻi's agricultural self-sufficiency, including the increased purchase and use of Hawaiʻi-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			X
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.			X
Discussion: The objectives and policies relating to agriculture are not applicable as the property is within a highly urbanized area and is zoned for urban use. The project may include community gardens, however, to support local self-sustaining urban farming pursuits by residents.			
HRS § 226-8: Objectives and policies for the economy – visitor industry			
(a) Objectives: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaiʻi's economy.			
(b) Policies:			
(1) Support and assist in the promotion of Hawaiʻi's visitor attractions and facilities.			X
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaiʻi's people.			X
(3) Improve the quality of existing visitor destination areas by utilizing Hawaiʻi's strengths in science and technology.			X
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			X
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaiʻi's people.			X
(6) Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the visitor industry.			X
(7) Foster a recognition of the contribution of the visitor industry to Hawaiʻi's economy and the need to perpetuate the aloha spirit.			X
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaiʻi's cultures and values.			X
Discussion: The objectives and policies relating to the visitor industry are not applicable as the Proposed Project is a mixed-use residential community and is not planned as a visitor attraction nor does it anticipate to include visitor accommodations or businesses.			
HRS § 226-9: Objective and policies for the economy – federal expenditures			
(a) Objective: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaiʻi's economy.			
(b) Policies:			
(1) Encourage the sustained flow of federal expenditures in Hawaiʻi that generates long-term government civilian employment.			X

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(2) Promote Hawaiʻi's supportive role in national defense, in a manner consistent with Hawaiʻi's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaiʻi's economy.			X
(3) Promote the development of federally supported activities in Hawaiʻi that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaiʻi's environment.			X
(4) Increase opportunities for entry and advancement of Hawaiʻi's people into federal government service.			X
(5) Promote federal use of local commodities, services, and facilities available in Hawaiʻi.			X
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaiʻi.			X
(7) Pursue the return of federally controlled lands in Hawaiʻi that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			X
Discussion: The Proposed Project will not require federal expenditures.			
HRS § 226-10: Objectives and policies for the economy – potential growth and innovative activities.			
(a) Objective: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawaiʻi's economic base.			
(b) Policies:			
(1) Facilitate investment and employment in economic activities that have the potential to expand and diversify Hawaiʻi's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.			X
(2) Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawaiʻi through the export of services or products or substitution of imported services or products.			X
(3) Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements.			X
(4) Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity.			X
(5) Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus.			X
(6) Expand Hawaiʻi's capacity to attract and service international programs and activities that generate employment for Hawaiʻi's people.			X
(7) Enhance and promote Hawaiʻi's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.			X
(8) Accelerate research and development of new energy- related industries based on wind, solar, ocean, and underground resources and solid waste.			X
(9) Promote Hawaiʻi's geographic, environmental, social, and technological advantages to attract new economic activities into the State.			X

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(10) Provide public incentives and encourage private initiative to attract new industries that best support Hawaiʻi's social, economic, physical, and environmental objectives.			X
(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.			X
(12) Develop, promote, and support research and educational and training programs that will enhance Hawaiʻi's ability to attract and develop economic activities of benefit to Hawaiʻi.			X
(13) Foster a broader public recognition and understanding of the potential benefits of new, or innovative growth-oriented industry in Hawaiʻi.			X
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaiʻi's social, economic, physical, and environmental objectives.			X
(15) Increase research and development of businesses and services in the telecommunications and information industries.			X
(16) Foster the research and development of non-fossil fuel and energy efficient modes of transportation.			X
(17) Recognize and promote health care and health care information technology as growth industries.			X
Discussion: The Proposed Project is not aimed specifically at increasing the State's potential growth activities that serve to increase and diversify Hawaiʻi's economic base (although the project will provide significant positive economic benefits); therefore, this objective and many of these policies are not applicable.			
HRS § 226-10.5: Objectives and policies for the economy – information industry			
(a) Objective: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawaiʻi as a leader in broadband and wireless communications and applications in the Pacific Region.			
(b) Policies:			
(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawaiʻi and between Hawaiʻi and the world, and make high speed communication available to all residents and businesses in Hawaiʻi.			X
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaiʻi to accommodate future growth and innovation in Hawaiʻi's economy.			X
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawaiʻi.			X
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawaiʻi, using technology to communicate with their headquarters, offices, or customers located out-of-state.			X
(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry.			X
(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaiʻi's people.			X
(7) Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the information industry.			X

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(8) Foster a recognition of the contribution of the information industry to Hawaiʻi's economy.			X
(9) Assist in the promotion of Hawaiʻi as a broker, creator, and processor of information in the Pacific.			X
Discussion: The Proposed Project is not related to the information industry; therefore, this objective and these policies are not applicable.			
HRS § 226-11: Objectives and policies for the physical environment – land-based, shoreline, and marine resources.			
(a) Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:			
(1) Prudent use of Hawaiʻi's land-based, shoreline, and marine resources.	X		
(2) Effective protection of Hawaiʻi's unique and fragile environmental resources.			X
(b) Policies:			
(1) Exercise an overall conservation ethic in the use of Hawaiʻi's natural resources.			X
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.			X
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.	X		
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.			X
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaiʻi.			X
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			X
(8) Pursue compatible relationships among activities, facilities, and natural resources.			X
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.			X
Discussion: The Proposed Project is not located near the shoreline and will not use marine resources. The Proposed Project site does not contain any naturally occurring environments or resources. However, by increasing the number of affordable apartments in the urban core, it allows rural areas outside of the PUC to remain rural. The Proposed Project complies with the goals of the State and the Oʻahu General Plan to ensure the most beneficial use of the land. Best Management Practices (BMPs) and Low Impact Development (LID) will be integrated into the project design where possible to properly and efficiently manage storm water and solid wastes generated from the site. In addition, as discussed in Sections 4.6 and 4.7 (Flora and Fauna) no impact to threatened, endangered, or candidate plants, birds, animals, or other species is anticipated as none are known to currently inhabit the property, and the property does not provide a suitable habitat for these species. All outdoor lighting will also be fully-shielded and downward facing to minimize impacts to endangered native birds such as the Hawaiian petrel and Newell's shearwater. To protect marine water quality, the Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu's grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program. Where applicable, the Proposed Project will incorporate low impact development strategies into the design of the project.			

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HRS § 226-12: Objective and policies for the physical environment – scenic, natural beauty, and historic resources.			
(a) Objective: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaiʻi's scenic assets, natural beauty, and multi-cultural/historical resources.			
(b) Policies:			
(1) Promote the preservation and restoration of significant natural and historic resources.			X
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			X
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	X		
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaiʻi's ethnic and cultural heritage.			X
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.			X

Discussion: As discussed in Section 5.1 (Archaeological and Historic Resources), an archaeological inventory survey (AIS) and a reconnaissance level survey (RLS) of architectural historic resources were conducted for the Proposed Project property. Both the AIS and RLS were prepared in consultation with the State Historic Preservation Division (SHPD) for HRS 6E determination. The AIS, which included subsurface testing, identified four historic properties which were evaluated, documented and reported to the SHPD. The AIS recommends no further work is necessary for the sites.

As noted in Section 5.1.2 (Historic Architectural Resources), a RLS was undertaken for buildings within the Project Site and the surrounding area. The RLS identified thirteen buildings in the Project Site (see "Survey Coverage Map" on following page). Of this number, only five were over fifty years of age: 1) the 1955 administration building (Building A); 2 and 3) a maintenance shop and semi-attached central store room (together referred to within this survey as Building D); 4) a set of garages; and 5) a facilities office building (Building C). The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz.

The five buildings over fifty years of age identified in the course of the RLS appear to meet criterion C for listing in the Hawai'i and National Registers of Historic Places. Although significant, the 1955 HHA administration building and the buildings associated with the authority's maintenance efforts, do not appear to have high preservation value. The former administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, these five buildings do not appear to be of high preservation value.

The Proposed Project will be located inland, away from the shoreline; therefore, it is anticipated that there will be no direct effect on the quality of the coastal scenic resources. In addition, the property is within a highly urban environment and that has been successively altered for residential uses. The site and the surrounding area do not represent a natural setting and the project is an urban redevelopment on a previously developed site that is complementary to the existing urban environment.

Three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Proposed Project should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Primary Urban Center, Map A.1, Significant Panoramic Views). The visual impacts from the project, however, must take into consideration:

- the existing multi-family and single-family development of this area;
- existing buildings such as Maluhia Health Center, Kapuna Hale, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center;

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- overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and - the tall field lights at Lanakila District Park. The current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. It breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by: • Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views; • Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets; • Creating a more interesting skyline by varying building heights; • Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.			
HRS § 226-13: Objectives and policies for the physical environment – land, air, and water quality.			
(a) Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:			
(1) Maintenance and pursuit of improved quality in Hawaiʻi's land, air, and water resources.			X
(2) Greater public awareness and appreciation of Hawaiʻi's environmental resources.			X
(b) Policies:			
(1) Foster educational activities that promote a better understanding of Hawaiʻi's limited environmental resources.			X
(2) Promote the proper management of Hawaiʻi's land and water resources.			X
(3) Promote effective measures to achieve desired quality in Hawaiʻi's surface, ground, and coastal waters.	X		
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaiʻi's people.	X		
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	X		
(6) Encourage design and construction practices that enhance the physical qualities of Hawaiʻi's communities.	X		
(7) Encourage urban developments in close proximity to existing services and facilities.	X		
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaiʻi's people, their cultures and visitors.			X
Discussion: The Proposed Project supports the City's urban design efforts, which encourage higher intensity mixed-use developments in the urban core in order to reduce dependency on motor vehicles, which contribute to pollution, emissions, and noise impacts, and to encourage walking, bicycling, and transit use particularly in the urban core of Honolulu. The new internal network of streets is envisioned to be designed as complete streets, providing safe, comfortable, and convenient access to area public transit. As discussed in Section 4.4 (Groundwater and Surface Water Resources) no uses that could contaminate ground			

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water are expected to be developed as part of the Proposed Project. In addition, the Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu's grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program to reduce potential impacts to surface waters. As discussed in Section 5.5 (Air Quality) the air quality study conducted for the Proposed Project concludes that: 1) short-term construction-related air impacts can be mitigated; 2) ambient concentrations of carbon monoxide from motor vehicle traffic will remain well within state and national ambient air quality standards; and 3) long-term impacts on air quality are likely to be negligible due to indirect emissions associated with the Proposed Project's electrical power and solid waste disposal requirements as the State is committed to 100 percent renewable sources for electricity production by the year 2045. As discussed in Section 4.5 (Natural Hazards), the property is not in an area prone to tsunamis, erosion, flooding, hurricanes, earthquakes, or volcanic eruptions, or other hazards and the Proposed Project will not exacerbate any natural hazard conditions. According to the FIRM prepared by FEMA, National Flood Insurance Program, the site is located within Zone X, an area that has been deemed outside of the 0.2% annual chance flood (or 500-year floodplain). Impacts from natural hazards can be further mitigated by adherence to appropriate civil defense evacuation procedures. All structures will be designed in compliance with the International Building Code. As discussed in Section 3.3.4 (Environmental Characteristics) sustainable design and construction practices, such as implementing energy and water conserving measures, encouraging construction waste and community recycling, and reducing automobile dependence will be implemented as practicable.			
HRS § 226-14: Objective and policies for facility systems – in general.			
(a) Objective: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.			
(b) Policies:			
(1) Accommodate the needs of Hawaiʻi's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.			X
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.			X
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.			X
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.			X
Discussion: The Proposed Project does not involve planning for the State's facility systems; therefore, this objective and these policies are not applicable.			
HRS § 226-15: Objectives and policies for facility systems – solid and liquid wastes.			
(a) Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	X		
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	X		

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(b) Policies:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.	X		
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	X		
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
Discussion: As discussed in Section 5.9.2 (Wastewater System) all proposed wastewater facilities will be designed to manage onsite generation and will connect to the City's municipal system for appropriate treatment and disposal. Coordination is ongoing with the City to ensure each phase has the capacity available to support the project. In addition, detailed project design will incorporate green design such as low-flow and ultra-low flow fixtures to help reduce the amount of wastewater generated by the Proposed Project. As discussed in Section 5.9.5 (Solid Waste) the Proposed Project will include provisions for recycling, such as collection systems and space for bins for recyclables. Waste that cannot be recycled will be combusted at H-POWER or sent to appropriate facilities. Best management practices during construction will also be implemented including every effort to divert materials that can be reused or recycled from landfills as well as minimizing the amount of waste generated.			
HRS § 226-16: Objective and policies for facility systems – water.			
(a) Objective: Planning for the State’s facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.			
(b) Policies:			
(1) Coordinate development of land use activities with existing and potential water supply.	X		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.	X		
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.			X
(5) Support water supply services to areas experiencing critical water problems.			X
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	X		
Discussion: As discussed in Section 5.9.1 (Water System), initial consultation with the Board of Water Supply confirmed that the existing Oʻahu municipal water system is presently adequate to accommodate the proposed 1,000 residential units and up to 10,000 SF of commercial. In addition, water conservation strategies to reduce consumption, conserve resources, and minimize water demands within the Proposed Project could include: utilization of non-potable water for irrigation, rainwater catchment and reuse, drought tolerant and climate-adapted plants, xeriscaping landscaping, efficient irrigation systems (such as drip and moisture sensors), and installing low-flow and ultra-low flow fixtures and toilets.			
HRS § 226-17: Objectives and policies for facility systems – transportation.			
(a) Objective: Planning for the State’s facility systems with regard to energy shall be directed toward the achievement of the following objectives:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.	X		
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			X

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(b) Policies:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	X		
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;	X		
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			X
(4) Provide for improved accessibility to shipping, docking, and storage facilities;	X		
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;	X		
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;	X		
(7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			X
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaiʻi's natural environment;	X		
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;	X		
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and			X
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	X		
Discussion: The Proposed Project will support the use of existing transit systems through integration of multimodal facilities such as bicycle parking and sidewalks in the site design to improve accessibility to public transit systems. The Proposed Project will also incorporate design principles that include an emphasis on walkability and connectivity through the pedestrian and bicycle networks within the Project Site and connections to the surrounding community, and the City's Complete Streets treatment of School Street. Parking may also be decoupled from the apartment units in order to encourage use of alternate means of transportation and increase housing affordability.			
HRS § 226-18: Objectives and policies for facility systems – energy.			
(a) Objectives: Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			X
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaiʻi's dependence on imported fuels for electrical generation and ground transportation;	X		
(3) Greater diversification of energy generation in the face of threats to Hawaiʻi's energy supplies and systems;	X		
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and			X
(5) Utility models that make the social and financial interests of Hawaiʻi's utility customers a priority.	X		

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(b) To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably priced, and dependable energy services to accommodate demand.			
(c) Other Policies:			
(1) Support research and development as well as promote the use of renewable energy sources;			X
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			X
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			X
(4) Promote all cost-effective conservation of power and fuel supplies through measures including:			
(A) Development of cost-effective demand-side management programs;	X		
(B) Education;	X		
(C) Adoption of energy-efficient practices and technologies; and	X		
(D) Increasing energy efficiency and decreasing energy use in public infrastructure;			X
(5) Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;			X
(6) Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			X
(7) Promote alternate fuels and transportation energy efficiency;			X
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications;			X
(9) Support actions that reduce, avoid, or sequester Hawaiʻi's greenhouse gas emissions through agriculture and forestry initiatives.			X
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects;			X
(11) Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources; and			X
(12) Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawaiʻi.			X
Discussion: As discussed in Section 3.3.4, the Proposed Project will be designed to be as energy efficient as possible to reduce electrical demand and may include elements such as solar hot water heating, operable windows for natural ventilation, light and motion sensors in non-residential areas, energy efficient lighting, and Energy Star appliances. Onsite renewable energy such as solar photovoltaics (PV) will also be evaluated during the design process and coordinated with HECO if pursued. The PV panels could be installed on the upper parking decks as shade structures and on building rooftops. The Proposed Project supports the City's urban design efforts, which encourage higher intensity mixed-use developments in the urban core in order to reduce dependency on motor vehicles, which contribute to fuel consumption, pollution, emissions, and noise impacts, and to encourage walking, bicycling, and transit use particularly in the urban core of Honolulu. The new internal network of streets is envisioned to be designed as complete streets, providing safe, comfortable, and convenient access to area public transit, reducing congestion			

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and resulting in energy conservation. The proposed senior apartments will also provide homes near medical facilities and a concentration of financial and social services, further decreasing commuting and increasing energy conservation.			
HRS § 226-18.5: Objectives and policies for facility systems – telecommunications.			
(a) Objective: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			
(b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.			
(c) Other Policies:			
(1) Facilitate research and development of telecommunications systems and resources;			X
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;	X		
(3) Promote efficient management and use of existing telecommunications systems and services; and	X		
(4) Facilitate the development of education and training of telecommunications personnel.			X
Discussion: As discussed in Section 5.9.4, the Proposed Project will be designed in coordination with the various telecommunication companies to service the Proposed Project. However it is not involved with the planning of the State's telecommunications facility systems.			
HRS § 226-19: Objectives and policies for socio-cultural advancement – housing.			
(a) Objectives: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			
(1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.	X		
(2) The orderly development of residential areas sensitive to community needs and other land uses.	X		
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.	X		
(b) Policies:			
(1) Effectively accommodate the housing needs of Hawai'i's people.	X		
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.	X		
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.	X		
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			X
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	X		
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.	X		
(7) Foster a variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods that reflect the culture and values of the community.	X		

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(8) Promote research and development of methods to reduce the cost of housing construction in Hawaiʻi.			X
Discussion: The Proposed Project will create a new mixed-income, mixed-use community in the urban core of Honolulu, on a bus line near an existing concentration of medical providers and retail centers. It will provide 800 rental apartment units. It will be designed to accommodate seniors, with all of the residential units proposed as affordable (currently proposed to be affordable to those households earning 30% of the area median income (AMI) through 60% of the AMI). Up to 10,000 square feet (SF) of commercial space is also proposed as part of the redevelopment and may include a mix of retail, office space, and services to support the new residential uses and complement the surrounding neighborhood. A series of open spaces are envisioned throughout the project. New internal streets will be designed as complete streets to support safe pedestrian and bicycle circulation and will also include traffic calming measures to slow vehicle traffic through the site. Convenient pedestrian and bicycle access will also be provided to the surrounding transit facilities to promote alternative modes of transportation. The Proposed Project is highly supportive of the above housing objectives and policies.			
HRS § 226-20: Objectives and policies for socio-cultural advancement – health			
(a) Objectives: Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.			X
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaiʻi's communities.	X		
(3) Elimination of health disparities by identifying and addressing social determinants of health.			X
(b) Policies:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			X
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			X
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			X
(7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.			X
Discussion: The Proposed Project does not specifically plan for the State's socio-cultural advancement with regard to health; therefore, these objectives and policies are not specifically applicable. However, the Proposed Project's commercial areas and community center may provide an opportunity for community health services, such as urgent care and/or doctors' offices, to serve the community and neighboring areas. This proposed mixed-use community is uniquely situated to support multimodal transportation alternatives such as walking, biking,			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
and riding transit, which in turn would support healthier lifestyles. Community gardens are also envisioned as part of the project where residents can grow fresh produce.			
HRS § 226-21: Objective and policies for socio-cultural advancement – education.			
(a) Objectives: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.			
(b) Policies:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	X		
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	X		
(3) Provide appropriate educational opportunities for groups with special needs.	X		
(4) Promote educational programs which enhance understanding of Hawaiʻi's cultural heritage.	X		
(5) Provide higher educational opportunities that enable Hawaiʻi's people to adapt to changing employment demands.			X
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.	X		
(8) Emphasize quality educational programs in Hawaiʻi's institutions to promote academic excellence.			X
(9) Support research programs and activities that enhance the education programs of the State.			X
Discussion: Retirement Housing Foundation is committed to providing onsite recreational, educational and cultural programs to support future residents as well as partner with neighboring service providers to complement the services already available in the larger community. These may include and are not limited to elder care and support, physical fitness and social activities. Also, educational information or materials can be installed throughout the design of the project highlighting the interesting history of the site s.			
HRS § 226-22: Objective and policies for socio-cultural advancement – social services.			
(a) Objective: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.			
(b) Policies:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			X
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaiʻi's communities.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			X
Discussion: The Proposed Project does not specifically plan for the State's socio-cultural advancement with regard to social services; therefore, these objectives and policies are not specifically applicable. While it is still too early to identify specific programs to be provided, Retirement Housing Foundation is committed to providing onsite community and social services to support future residents as well as partner with neighboring service providers to complement the services already available in the larger community.			
HRS § 226-23: Objective and policies for socio-cultural advancement – leisure.			
(a) Objective: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			
(b) Policies:			
(1) Foster and preserve Hawaiʻi's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.	X		
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			X
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	X		
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			X
(5) Ensure opportunities for everyone to use and enjoy Hawaiʻi's recreational resources.			X
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			X
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawaiʻi's people.	X		
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.	X		
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaiʻi's population to participate in the creative arts.			X
(10) Assure adequate access to significant natural and cultural resources in public ownership.			X
Discussion: The Proposed Project's open spaces will provide access to gathering and recreation areas for residents and their guests. Residents will also have access to recreational facilities within each of the buildings. While it is still too early to identify specific programs to be provided, it is anticipated that meeting rooms may be used for social and educational services, cultural performances, artistic displays, and other community activities, thus providing places for recreation and leisure for residents and visitors. Retirement Housing Foundation is committed to providing onsite social services to support future residents as well as partner with neighboring service providers to complement the services already available in the larger community.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-24: Objective and policies for socio-cultural advancement – individual rights and personal well-being.			
(a) Objective: Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.			
(b) Policies:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.	X		
(2) Uphold and protect the national and state constitutional rights of every individual.	X		
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4) Ensure equal opportunities for individual participation in society.			X
Discussion: it is Retirement Housing Foundation's policy to protect its residents from criminal acts while upholding their constitutional rights.			
HRS § 226-25: Objective and policies for socio-cultural advancement – culture.			
(a) Objective: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaiʻi's people.			
(b) Policies:			
(1) Foster increased knowledge and understanding of Hawaiʻi's ethnic and cultural heritages and the history of Hawaiʻi.	X		
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawaiʻi's people and which are sensitive and responsive to family and community needs.	X		
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawaiʻi.			X
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaiʻi's people and visitors.	X		
Discussion: The residential component of the Proposed Project will include gathering and recreation areas for residents and their guests. While it is still too early to identify specific programs to be provided, it is anticipated that meeting rooms may be used for social and educational services, cultural performances, artistic displays, and other community activities, thus providing places for culture for residents and visitors.			
HRS § 226-26: Objectives and policies for socio-cultural advancement – public safety.			
Objectives: Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1) Assurance of public safety and adequate protection of life and property for all people.			X
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			X
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawaiʻi's people.			X
(b) Policies related to public safety:			
(1) Ensure that public safety programs are effective and responsive to community needs.			X
(2) Encourage increased community awareness and participation in public safety programs.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(c) Policies related to criminal justice:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
(d) Policies related to emergency management:			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			X
(2) Enhance the coordination between emergency management programs throughout the State.			X
Discussion: The Proposed Project does not include State public safety programs; therefore, these objectives and policies are not applicable. However, the Proposed Project will incorporate safety considerations including Crime Prevention Through Environmental Design (CPTED) principles and will comply with appropriate civil defense evacuation procedures.			
HRS § 226-27: Objectives and policies for socio-cultural advancement – government.			
(a) Objectives: Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1) Efficient, effective, and responsive government services at all levels in the State.			X
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.			X
(b) Policies:			
(1) Provide for necessary public goods and services not assumed by the private sector.			X
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			X
(3) Minimize the size of government to that necessary to be effective.			X
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawaiʻi.			X
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.			X
(6) Provide for a balanced fiscal budget.			X
(7) Improve the fiscal budgeting and management system of the State.			X
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			X
Discussion: The Proposed Project does not specifically plan for the State's socio-cultural advancement with regard to government, however, the partnership between HPHA and Retirement Housing Foundation to redevelop HPHA Administrative Offices site is an example of fiscal responsibility in seeking public-private relationship to maximize potential funding sources to support the construction of affordable apartments for the betterment of Hawaiʻi's peoples. This public-private partnership will help to provide a more efficient, timely, and cost-effective delivery of affordable apartments as well as long-term management of the site by the non-profit Retirement Housing Foundation. In addition, the HPHA and project team representatives have participated in numerous Neighborhood Board meetings, community meetings, and met with many stakeholders, community leaders, private groups and government agencies in the course of preparing the Master Plan for the Proposed Project (see Section 9.1, Public Engagement through the Conceptual Master Plan Process). This outreach has allowed area community members and stakeholders to participate in the development of the proposed conceptual Master Plan, which addresses many of their concerns.			

6.2.5.2 Part III: Priority Guidelines

The purpose of this part of the Hawaiʻi State Plan is to establish overall priority guidelines to address areas of statewide concern. The Hawaiʻi State Plan notes that the State shall strive to improve the quality of life for Hawaiʻi's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: 1) economic development; 2) population growth and land resource management; 3) affordable housing; 4) crime and criminal justice; and 5) quality education (§226-102). The priority guidelines applicable to the Proposed Project are discussed below:

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-101: Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
HRS § 226-102: Overall direction. The State shall strive to improve the quality of life for Hawaiʻi's present and future present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation.			
HRS § 226-103: Economic priority guidelines.			
(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaiʻi's people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.			
(A) Encourage investments which:			
(i) Reflect long term commitments to the State;			X
(ii) Rely on economic linkages within the local economy;			X
(iii) Diversify the economy;			X
(iv) Reinvest in the local economy;			X
(v) Are sensitive to community needs and priorities; and			X
(vi) Demonstrate a commitment to provide management opportunities to Hawaiʻi residents; and			X
(B) Encourage investments in innovative activities that have a nexus to the State, such as:			
(i) Present or former residents acting as entrepreneurs or principals;			X
(ii) Academic support from an institution of higher education in Hawaiʻi;			X
(iii) Investment interest from Hawaiʻi residents;			X
(iv) Resources unique to Hawaiʻi that are required for innovative activity; and			X
(v) Complementary or supportive industries or government programs or projects.			X
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			X
(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			X
(5) Streamline the processes for building and development permit and review and telecommunication infrastructure installation approval and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business,			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
where scientific evidence indicates that public health, safety, and welfare would not be adversely affected.			
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaiʻi's small-scale producers, manufacturers, and distributors.			X
(7) Continue to seek legislation to protect Hawaiʻi from transportation interruptions between Hawaiʻi and the continental United States.			X
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			
(A) An industry that can take advantage of Hawaiʻi's unique location and available physical and human resources.			X
(B) A clean industry that would have minimal adverse effects on Hawaiʻi's environment.			X
(C) An industry that is willing to hire and train Hawaiʻi's people to meet the industry's labor needs at all levels of employment.			X
(D) An industry that would provide reasonable income and steady employment.			X
(1) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawaiʻi business.			X
(2) Enhance the quality of Hawaiʻi's labor force and develop and maintain career opportunities for Hawaiʻi's people through the following actions:			
(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.			X
(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			X
(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			X
(D) Promote career opportunities in all industries for Hawaiʻi's people by encouraging firms doing business in the State to hire residents.			X
(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on-the-job training opportunities.			X
(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			X
Discussion: The Proposed Project does not specifically plan for the State's economic priority guidelines; however, the Proposed Project represents a substantial, long-term investment of capital in the State's and City's economy.			
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaiʻi's residents and visitors.			X
(2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			X
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawaiʻi's significant natural, scenic, historic, and cultural resources.			X
(5) Develop and maintain career opportunities in the visitor industry for Hawaiʻi's people, with emphasis on managerial positions.			X
(6) Support and coordinate tourism promotion abroad to enhance Hawaiʻi's share of existing and potential visitor markets.			X
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			X
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			X
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			X
Discussion: The above priority guidelines regarding the visitor industry are not applicable to the Proposed Project.			
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawaiʻi.			X
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
Discussion: The above priority guidelines regarding the sugar and pineapple industries are not applicable to the Proposed Project.			
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aqua cultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aqua cultural uses of such lands.			X
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawaiʻi's agricultural community.			X
(6) Seek favorable freight rates for Hawaiʻi's agricultural products from interisland and overseas transportation operators.			X
(7) Encourage the development and expansion of agricultural and aqua cultural activities which offer long-term economic growth potential and employment opportunities.			X
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(10) Support the continuation of land currently in use for diversified agriculture.			X
(11) Encourage residents and visitors to support Hawaiʻi's farmers by purchasing locally grown food and food products.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
Discussion: The above priority guidelines regarding diversified agriculture and aquaculture are not applicable to the Proposed Project.			
(e) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.	X		
(2) Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes.	X		
(3) Increase the support for research and development of economically feasible alternative water sources.			X
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
Discussion: Water conservation measures will be implemented wherever possible as a part of the project's sustainable design priorities including potential installation of low flow or ultra-low flow faucets and fixtures, rainwater catchment and reuse, use of non-potable water for landscape irrigation, and automated irrigation systems with moisture sensors to prevent overwatering. Wherever possible, landscaping will incorporate native and hardy climate-adapted plants that do not require significant amounts of water.			
(f) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.	X		
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	X		
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.	X		
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.	X		
Discussion: The Proposed Project will be designed to be as energy efficient as possible to reduce electrical demand and may include elements such as solar hot water heating, operable windows for natural ventilation, light and motion sensors in non-residential areas, energy efficient lighting, and Energy Star appliances. Onsite renewable energy such as solar photovoltaics (PV) will also be evaluated during the design process and coordinated with HECO if pursued. The PV panels could be installed on the upper parking decks as shade structures and on building rooftops.			
(g) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network, with an emphasis on broadband and wireless infrastructure and capability, that will serve as the foundation of and catalyst for overall economic growth and diversification in Hawaiʻi.			X
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3) Encourage the development of small businesses in the information field such as software development, the development of new information systems, peripherals, and applications; data conversion and data entry services; and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			X
(5) Encourage research activities, including legal research in the information and telecommunications fields.			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(6) Support promotional activities to market Hawaiʻi's information industry services.			X
(7) Encourage the location or co-location of telecommunication or wireless information relay facilities in the community, including public areas, where scientific evidence indicates that the public health, safety, and welfare would not be adversely affected.			X
Discussion: The above priority guidelines regarding the information industry are not applicable to the Proposed Project.			
HRS § 226-104: Population growth and land resources priority guidelines.			
(a) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to ensure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaiʻi's people.			X
(2) Manage a growth rate for Hawaiʻi's economy that will parallel future employment needs for Hawaiʻi's people.			X
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.			X
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			X
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			X
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			X
(7) Support the development of high technology parks on the neighbor islands.			X
(b) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	X		
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.			X
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			X
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.	X		
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.			X
(7) Pursue rehabilitation of appropriate urban areas.	X		
(8) Support the redevelopment of Kakaʻako into a viable residential, industrial, and commercial community.			X
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(10) Identify critical environmental areas in Hawaiʻi to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			X
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			X
(12) Utilize Hawaiʻi's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13) Protect and enhance Hawaiʻi's shoreline, open spaces, and scenic resources.			X
Discussion: The Proposed Project supports implementation of the City's urban design initiatives by locating higher density housing in the urban core of Honolulu, away from natural resources, sensitive habitats, and rural communities thereby reducing the pressure to develop lands elsewhere on Oʻahu to accommodate population growth. It provides new affordable rental apartments, near existing medical facilities, retail and commercial uses, and recreational facilities. Given its proximity to downtown Honolulu, it allows future residents to walk, bike, or travel via public transit to a concentration of medical services and to commercial establishments. The Site is well suited for its intended use as it is surrounded by urban uses, and is within the service area of existing infrastructure systems and utilities. The higher-density residential nature of the Proposed Project accommodates a greater number of Oʻahu's affordable rental apartment needs than currently exists onsite, thereby helping to reduce the need to develop lands outside of the urban core of Honolulu.			
HRS § 226-105: Crime and criminal justice.			
Priority guidelines in the area of crime and criminal justice:			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			X
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			X
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.	X		
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			X
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			X
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			X
Discussion: The Master Plan for Proposed Project was prepared with considerations for incorporating Crime Prevention Through Environmental Design (CPTED) principles such as natural surveillance, maintenance of proper sightlines, natural access control, and on-going maintenance and management into the project. More specifically, these principles serve to create a safer environment for residents and visitors by promoting an active streetscape where more people will frequent and provide natural surveillance of the area, providing appropriate lighting and landscaping, minimizing hiding places onsite, and providing security, as needed. The improved roadway connections will also provide easier access by police and emergency responders.			

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-106: Affordable housing.			
Priority guidelines for the provision of affordable housing:			
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.			X
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.	X		
(3) Improve information and analysis relative to land availability and suitability for housing.			X
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawaiʻi's low- and moderate-income households, gap-group households, and residents with special needs.	X		
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaiʻi's people for the purchase of initial owner-occupied housing.	X		
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.	X		
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.	X		
(8) Give higher priority to the provision of quality housing that is affordable for Hawaiʻi's residents and less priority to development of housing intended primarily for individuals outside of Hawaiʻi.	X		
Discussion: Eight hundred residential rental units are proposed as part of the Proposed Project. Residential units are targeted to seniors in studio and one-bedroom apartments, with all of the residential units proposed as affordable (currently proposed to be affordable to those households earning 30% of the area median income (AMI) through 60% of the AMI). The project is an example of a public-private partnership with HPHA teaming with Retirement Housing Foundation to increase the supply of rental apartments in Honolulu for local residents.			
HRS § 226-107: Quality education.			
Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;			X
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			X
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;			X
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities;			X
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			
(A) The electronic exchange of information;			X
(B) Statewide electronic mail; and			X
(C) Access to the Internet.			X
Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			X
(6) Pursue the establishment of Hawaiʻi's public and private universities and colleges as research and training centers of the Pacific;			X
(7) Develop resources and programs for early childhood education;			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(8) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			X
(9) Strengthen and expand educational programs and services for students with special needs.			X
Discussion: The above priority guidelines regarding quality education are not applicable to the Proposed Project.			
HRS § 226-108: Sustainability.			
Priority guidelines and principles to promote sustainability shall include:			
(1) Encouraging balanced economic, social, community, and environmental priorities;	X		
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;	X		
(3) Promoting a diversified and dynamic economy;			X
(4) Encouraging respect for the host culture;	X		
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations	X		
(6) Considering the principles of the ahupuaʻa system; and	X		
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawaiʻi.	X		
Discussion: The Proposed Project is a compact mixed-use redevelopment project that will provide residential, commercial, recreational, and public services (HPHA replacement offices) in a manner that efficiently utilizes urban lands. The project is located within the existing urban core of Honolulu, near existing medical services and commercial centers, transportation and transit networks, and infrastructure. The Proposed Project site does not contain any naturally occurring environments or resources, however, it will comply with the goals of the State and County general plans to ensure the most beneficial use of the land. Best Management Practices (BMPs) and Low Impact Design (LID) will be integrated into the project design where possible to properly and efficiently manage storm water and solid wastes generated from the site. As discussed in Section 3.3.4 (Environmental Characteristics), sustainable design and construction practices, such as implementing energy and water conserving measures, encouraging construction waste and community recycling, and reducing automobile dependence will be implemented as practicable.			
HRS § 226-109: Climate change adaptation priority guidelines.			
Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall:			
(1) Ensure that Hawaiʻi's people are educated, informed, and aware of the impacts climate change may have on their communities;			X
(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;			X
(3) Invest in continued monitoring and research of Hawaiʻi's climate and the impacts of climate change on the State;			X
(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;			X
(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;			X

HAWAIʻI STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;	X		
(7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;			X
(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities;			X
(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and			X
(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.	X		
Discussion: As indicated in Section 4.5.3 (Sea Level Rise and Climate Adaptation), climate change and sea level rise (SLR) of one meter is not anticipated to have significant, immediate impacts to flooding at the Project Site. However, adaptation and resiliency measures should be considered for improving the safety of future residents and longevity of the proposed facilities, landscaped areas, and essential infrastructure serving the project such as water, sewer, electrical, drainage, and roadways as secondary impacts from global climate change such as extreme weather events or worsening SLR may still impact the project. The Proposed Project is most at risk of damage from extreme weather events and the loss of service of critical infrastructure. The project including all structures, landscaping, and vital infrastructure should be designed to withstand extreme weather events wherever feasible. The U.S. Army Corps of Engineers (USACE) has developed strategies for adaptation and resilience for changes in sea level, which can be applied to projects based on specific types of risks anticipated from changes in sea level (USACE, 2014).			

6.2.6 State Functional Plans

The Hawaiʻi State Plan directs State agencies to prepare functional plans for their respective program areas. There are 14 state functional plans that serve as the primary implementing vehicle for the goals, objectives, and policies of the Hawaiʻi State Plan. The functional plans applicability to the Proposed Project, along with each plan's applicable objectives, policies, and actions, are discussed in the matrix below.

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
Agriculture Functional Plan				
Objective A:	Achievement of increased agricultural production and growth through cultural and management practices.			X
Objective B:	Achievement of an orderly agricultural marketing system through product promotion and industry organization.			X
Objective C:	Achievement of increased consumption of and demand for Hawaiʻi's agricultural products through consumer education and product quality.			X
Objective D:	Achievement of optimal contribution by agriculture to the State's economy.			X
Objective E:	Achievement of adequate capital, and knowledge of its proper management, for agricultural development.			X
Objective F:	Achievement of increased agricultural production and growth through pest and disease controls.			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
Objective G:	Achievement of effective protection and improved quality of Hawaiʻi's land, water, and air.			X
Objective H:	Achievement of productive agricultural use of lands most suitable and needed for agriculture.			X
Objective I:	Achievement of efficient and equitable provision of adequate water for agricultural use.			X
Objective J:	Achievement of maximum degree of public understanding and support of agriculture in Hawaiʻi.			X
Objective K:	Achievement of adequate supply of properly trained labor for agricultural needs.			X
Objective L:	Achievement of adequate transportation services and facilities to meet agricultural needs.			X
Objective M:	Achievement of adequate support services and infrastructure to meet agricultural needs.			X
Discussion: The objectives of the Agriculture Functional Plan are not applicable as the property is within a highly urbanized area and is zoned for urban use.				
Conservation Lands Functional Plan				
Objective IA:	Establishment of data bases for inventories of existing lands and resources.			X
Objective IB:	Establishment of criteria for management of land and natural resources.			X
Objective IIA:	Establishment of plans for natural resources and land management.			X
Objective IIB:	Protection of fragile or rare natural resources.			X
Objective IIC:	Enhancement of natural resources.			X
Objective IID:	Appropriate development of natural resources.			X
Objective IIE:	Promotion and marketing of appropriate natural resources designated for commercial development.			X
Objective IIF:	Increase enforcement of land and natural resource use laws and regulations.			X
Objective IIIA:	Develop and implement conservation education programs for the general public and visitors.			X
Objective IIIB:	Increase access to land and natural resource data by the public and increase cooperation between agencies by making access to land and natural resource information more efficient.			X
Discussion: The objectives of the Conservation Lands Functional Plan are not applicable as the property is not within the Conservation District and is zoned for urban use.				
Education Functional Plan				
Objective A (1):	**Academic Excellence.** Emphasize quality educational programs in Hawaiʻi's institutions to promote academic excellence.			X
Objective A (2):	**Basic Skills.** Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning. Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement.			X
Objective A (3):	**Education Workforce.** Initiate efforts to improve the quality of education by improving the capabilities of the education workforce.			X
Objective A (4):	**Services and Facilities.** Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
Objective B (1):	**Alternatives for Funding and Delivery.** Explore alternatives for funding and delivery of educational services to improve the overall quality of education.			X
Objective B (2):	**Autonomy and flexibility.** Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities.			X
Objective B (3):	**Increased Use of Technology.** Increase and improve the use information technology in education and encourage programs which increase the public's awareness and understanding of the impact of information technologies on our lives.			X
Objective B (4):	**Personal Development.** Support education programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	X		
Objective B (5):	**Students with Special Needs.** Provide appropriate educational opportunities for groups with special needs.			X
Objective C (1):	**Early Childhood Education.** Develop resources and programs for early childhood education.			
Objective C (2):	**Hawaiʻi's Cultural Heritage.** Promote educational programs which enhance understanding of Hawaiʻi's cultural heritage.	X		
Objective C (3):	**Research Programs and [Communication] Activities.** Support research programs and activities that enhance the education programs of the State.			X
Discussion: Retirement Housing Foundation is committed to providing onsite cultural, educational and recreational services to support future residents as well as partner with neighboring service providers to complement the services already available in the larger community. These may include and are not limited to elder care and support. Also, community festivals and celebrations may be held to commemorate the holidays and provide opportunities where the different ethnic groups can share their cultural traditions with other residents in the community.				
Employment Functional Plan				
Objective A:	Improve the qualifications of entry-level workers and their transition to employment.			X
Objective B:	Develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce.			X
Objective C:	Improve labor exchange.			X
Objective D:	Improve the quality of life for workers and families.			X
Objective E:	Improve planning of economic development, employment and training activities.			X
Discussion: The above objectives of the Employment Functional Plan are not applicable to the Proposed Project.				
Energy Functional Plan				
Objective A:	Moderate the growth in energy demand through conservation and energy efficiency.	X		
Objective B:	Displace oil and fossil fuels through alternate and renewable energy resources.	X		
Objective C:	Promote energy education and legislation.			X
Objective D:	Support and develop an integrated approach to energy development and management.			X
Objective E:	Ensure State's abilities to implement energy emergency actions immediately in event of fuel supply disruptions. Ensure essential public			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
	services are maintained and provisions are made to alleviate economic and personal hardships which may arise.			
Discussion: The Proposed Project will be designed to be as energy efficient as possible to reduce electrical demand and may include elements such as solar hot water heating, operable windows for natural ventilation, light and motion sensors in non-residential areas, energy efficient lighting, and Energy Star appliances. Onsite renewable energy such as solar photovoltaics (PV) will also be evaluated during the design process and coordinated with HECO if pursued. The PV panels could be installed on the upper parking decks as shade structures and on building rooftops. New internal streets will be designed as complete streets to support safe pedestrian and bicycle circulation with convenient access to the surrounding transit facilities to promote the use of alternative modes of transportation and reduce individual car trips and fossil fuel consumption.				
Health Functional Plan				
Objective 1:	Health promotion and disease prevention. Reduction in the incidence, morbidity and mortality associated with preventable and controllable conditions.			X
Objective 2:	Prevention and control of communicable diseases. Reduction in the incidence, morbidity, and mortality associated with infectious and communicable diseases.			X
Objective 3:	Health needs of special populations with impaired access to health care. Increased availability and accessibility of health services for groups with impaired access to health care programs.			X
Objective 4:	Community hospitals system. Development of a community hospital system which is innovative, responsive and supplies high quality care to the constituencies it serves.			X
Objective 5:	Environmental programs to protect and enhance the environment. Continued development of new environmental protection and health services programs to protect, monitor, and enhance the quality of life in Hawaiʻi.			X
Objective 6:	DOH leadership. To improve the Department of Health's ability to meet the public health need of the State of Hawaiʻi in the most appropriate, beneficial and economical way possible.			X
Discussion: While the objectives of the Health Functional Plan are not directly applicable, the Proposed Project will encourage healthier lifestyles by creating a walkable, bicycle-friendly mixed-use community in the urban core of Honolulu, near existing medical services and public transit. It may also include community gardens where residents can grow their own fresh produce.				
Higher Education Functional Plan				
Objective A:	A number and variety of postsecondary education institutions sufficient to provide the diverse range of programs required to satisfy individual and societal needs and interests.			X
Objective B:	The highest level of quality, commensurate with its mission and objectives, of each educational, research, and public service program offered in Hawaiʻi by an institution of higher education.			X
Objective C:	Provide appropriate educational opportunities for all who are willing and able to benefit from postsecondary education.			X
Objective D:	Provide financing for postsecondary education programs sufficient to ensure adequate diversity, high quality, and wide accessibility.			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
Objective E:	Increase program effectiveness and efficiency through better coordination of educational resources.			X
Discussion: The objectives of the Higher Education Functional Plan are not applicable to the Proposed Project.				
Historic Preservation Functional Plan				
Objective A:	Identification of historic properties.	X		
Objective B:	Protection of historic properties.	X		
Objective C:	Management and treatment of historic properties.	X		
Objective D:	Provision of adequate facilities to preserve historic resources.			X
Objective E:	The establishment of programs to collect and conserve historic records, artifacts, and oral histories and to document and perpetuate traditional arts, skills, and culture.	X		
Objective F:	Provision of better access to historic information.	X		
Objective G:	Enhancement of skills and knowledge needed to preserve historical resources.			X
Discussion: As discussed in Section 5.1 (Archaeological and Historic Resources), an archaeological inventory survey (AIS) and a reconnaissance level survey (RLS) of architectural historic resources were conducted for the Proposed Project property. Both the AIS and RLS were prepared in consultation with the State Historic Preservation Division (SHPD) for HRS 6E determination. The AIS, which included subsurface testing, identified four historic properties which were evaluated, documented and reported to the SHPD. The AIS recommends no further work is necessary for the sites. As noted in Section 5.1.2 (Historic Architectural Resources), a RLS was undertaken for buildings within the Project Site and the surrounding area. The RLS identified thirteen buildings in the Project Site (see "Survey Coverage Map" on following page). Of this number, only five were over fifty years of age: 1) the 1955 administration building (Building A); 2 and 3) a maintenance shop and semi-attached central store room (together referred to within this survey as Building D); 4) a set of garages; and 5) a facilities office building (Building C). The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz. The five buildings over fifty years of age identified in the course of the RLS appear to meet criterion C for listing in the Hawaiʻi and National Registers of Historic Places. Although significant, the 1955 HHA administration building and the buildings associated with the authority's maintenance efforts, do not appear to have high preservation value. The former administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, these five buildings do not appear to be of high preservation value.				
Housing Functional Plan				
Objective A:	Increase and sustain the supply of permanent rental housing that is affordable and accessible to Hawaiʻi residents, particularly those with incomes at or below 80% AMI. Attain the legislative goal of 22,500 rental housing units by 2026.	X		
Objective B:	Increase the homeownership rate.			X
Objective C:	Address barriers to residential development			X
Objective D:	Maintain a statewide housing data system for use by public and private agencies engaged in the provision of housing.			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
Discussion: Eight hundred residential rental units are proposed as part of the Proposed Project. Residential units are targeted to seniors in studio and one-bedroom apartments, with all of the residential units proposed as affordable (currently proposed to be affordable to those households earning 30% of the area median income (AMI) through 60% of the AMI).				
Human Services Functional Plan				
Objective A:	To sustain and improve current elder abuse and neglect services.			X
Objective B:	To increase cost-effective, high quality home and community based services.			X
Objective C:	To increase home-based services to keep children in their homes and to increase placement resources for those children who must be temporarily or permanently removed from their homes, due to abuse or neglect.			X
Objective D:	To address factors that contribute to child abuse and other forms of family violence.			X
Objective E:	To provide affordable, accessible, and quality child care.			X
Objective G:	To provide AFDC recipients with a viable opportunity to become independent of the welfare system.			X
Objective H:	To facilitate client access to human services.			X
Objective I:	To eliminate organizational barriers which limit client access to human services.			X
Discussion: While the objectives of the Health Functional Plan are not directly applicable the Proposed Project, Retirement Housing Foundation has a proven track record of providing safe communities for seniors nationwide.				
Recreation Functional Plan				
Objective I.A:	Address the problem of saturation of the capacity of beach parks and nearshore waters.			X
Objective I.B:	Reduce the incidence of ocean recreation accidents.			X
Objective I.C:	Resolve conflicts between different activities at heavily used ocean recreation areas.			X
Objective I.D:	Provide adequate boating facilities. Balance the demand for boating facilities against the need to protect the marine environment from potential adverse impacts.			X
Objective II.A:	Plan, develop, and promote recreational activities and facilities in mauka and other areas to provide a wide range of alternatives.			X
Objective II.B:	Meet special recreation needs of the elderly, the disabled, woman, single-parent families, immigrants, and other groups.	X		
Objective II.C:	Improve and expand the provision of recreation facilities in urban areas and local communities.	X		
Objective III.A:	Prevent the loss of access to shoreline and upland recreation areas due to new developments.			X
Objective III.B:	Resolve the problem of landowner liability that seriously hampers public access over private lands.			X
Objective III.C:	Increase access to State Forest Reserve lands over federal property, leased State lands, and other government lands.			X
Objective III.D:	Acquire, develop, and manage additional public access ways.			X
Objective IV.A:	Promote a conservation ethic in the use of Hawaiʻi's recreational resources.			X
Objective IV.B:	Prevent degradation of the marine environment.			X
Objective IV.C:	Improve the State's enforcement capabilities.			X

HAWAIʻI STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		S	N/S	N/A
Objective IV.D:	Mitigate adverse impacts of tour helicopters on the quality of recreational experiences in wilderness areas.			X
Objective V.A:	Properly maintain existing parks and recreation areas.			X
Objective V.B:	Promote interagency coordination and cooperation to facilitate sharing of resources, joint development efforts, clarification of responsibilities and jurisdictions, and improvements in enforcement capabilities.			X
Objective V.C:	Assure adequate support for priority outdoor recreation programs and facilities.			X
Objective VI.A:	Increase recreational access and opportunities in Hawaiʻi's wetlands.			X
Objective VI.B:	Develop an adequate information base to assist the County planning departments and other regulatory agencies in make decisions regarding wetlands.			X
Objective VI.C:	Assure the protection of the most valuable wetlands in the state.			X
Discussion: The Proposed Project will provide= open spaces and recreational facilities to residents of the Project and their guests.				
Tourism Functional Plan				
Objective I.A:	Development, implementation and maintenance of policies and actions which support the steady and balanced growth of the visitor industry.			X
Objective II.A:	Development and maintenance of well-designed visitor facilities and related developments which are sensitive to the environment, sensitive to neighboring communities and activities, and adequately serviced by infrastructure and support services.			X
Objective III.A:	Enhancement of respect and regard for the fragile resources which comprise Hawaiʻi's natural and cultural environment. Increased preservation and maintenance efforts.			X
Objective IV.A:	Support of Hawaiʻi's diverse range of lifestyles and natural environment.			X
Objective IV.B:	Achievement of mutual appreciation among residents, visitors, and the visitor industry.			X
Objective V.A:	Development of a productive workforce to maintain a high-quality visitor industry.			X
Objective V.B:	Enhancement of career and employment opportunities in the visitor industry.			X
Objective VI.A:	Maintenance of a high customer awareness of Hawaiʻi as a visitor destination in specific desired market segments.			X
Discussion: The objectives of the Tourism Functional Plan are not applicable to the Proposed Project.				
Transportation Functional Plan				
Objective I.A:	Expansion of the transportation system.			X
Objective I.B:	Reduction of travel demand through zoning and decentralization initiatives.			X
Objective I.C:	Management of existing transportation systems through a program of transportation systems management (TSM).			X
Objective I.D:	Identification and reservation of lands and rights-of-way required for future transportation improvements.			X
Objective I.E:	Planning and designing State highways to enhance inter-regional mobility.			X
Objective I.F:	Improving and enhancing transportation safety.	X		
Objective I.G:	Improved transportation maintenance programs.			X

HAWAI‘I STATE FUNCTIONAL PLANS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)		**S**	**N/S**	**N/A**
Objective I.H:	Ensure that transportation facilities are accessible to people with disabilities.	X		
Objective II.A:	Development of a transportation infrastructure that supports economic development initiatives.			X
Objective III.B:	Expansion of revenue bases for transportation improvements.			X
Objective IV.A:	Providing educational programs.			X
Discussion: The Proposed Project's new internal roadways are envisioned to be designed as complete streets, providing safe, comfortable, and convenient access to area public transit. This improves accessibility for the seniors and disabled individuals who are not able to drive. The Proposed Project will also provide affordable homes near commercial and medical services centers in Downtown, Kapālama, Kalihi and Liliha.				
Water Resources Development Functional Plan				
Objective A:	Enunciate State water policy and improve management framework.			X
Objective B:	Maintain the long-term availability of freshwater supplies, giving consideration to the accommodation of important environmental values.			X
Objective C:	Improve management of floodplains.			X
Objective D:	Assure adequate municipal water supplies for planned urban growth.	X		
Objective E:	Assure the availability of adequate water for agriculture.			X
Objective F:	Encourage and coordinate with other water programs the development of self-supplied industrial water and the production of water-based energy.			X
Objective G:	Provide for the protection and enhancement of Hawai‘i's freshwater and estuarine environment.			X
Objective H:	Improve State grant and loan procedures for water program and projects.			X
Objective I:	Pursue water resources data collection and research to meet changing needs.			X
Discussion: As discussed in Section 4.4 (Groundwater Resources) no uses that could contaminate ground water are expected to be developed as part of the Proposed Project. Also, as discussed in Section 5.9.1 (Water System), initial consultation with the Board of Water Supply confirmed that the existing O‘ahu municipal water system is presently adequate to accommodate the proposed 800 residential units and up to 10,000 SF of commercial.				

6.2.7 State Department of Transportation Daniel K. Inouye International Airport Requirements

The Daniel K. Inouye International Airport (HNL) is located approximately 2.6 miles from the Project Site. The State Department of Transportation (DOT) maintains airport airspace clearances around HNL in order to provide safe and clear approaches for inbound and outbound aircraft. Figure 12 illustrates the July 2013 Airport Airspace Drawing and the building height limits required for the Project Site. The map is only to be used for planning purposes and has not been approved by the Federal Aviation Administration (FAA).

In addition, in its EISPN comment letter, the DOT recommended that the Proposed Project facilities and landscaping be designed and operated to meet the requirements of the FAA Advisory Circular on *Hazardous Wildlife Attractants on or near Airports* 150/5200-33B and that any photovoltaic (PV) systems be designed with the highest-rated non-glare material to mitigate potential glint and glare hazard. DOT recommends a reflectivity analysis be performed prior to installation of any PV system.

Potential Impacts and Mitigation Measures

Based on the Airport Airspace Map, the Proposed Project would be limited to buildings no taller than 1,000 feet above mean sea level at the corner of North School Street and Lanakila Avenue. The proposed structures will be no taller than 153 feet above grade; consequently, as the Project Site is located approximately 50 feet above mean sea level, the proposed structures will not impact the HNL Airport's airspace.

Landscaping for the Proposed Project will be designed and operated to meet the requirements of the FAA Advisory Circular on *Hazardous Wildlife Attractants on or near Airports* 150/5200-33B to reduce wildlife attractants that may impact airport operations at the Project Site. For example, no large-seed producing grasses will be planted at the Project Site. Also, any PV system installed at the site will be designed with the highest-rated non-glare material to mitigate potential glint and glare hazard. A reflectivity analysis will be completed prior to the design and installation to mitigate any potentially hazardous glint and glare condition prior to PV system installation.

6.2.8 Use of State Land

As previously noted, the land under the Project Site is owned by the State of Hawaiʻi and is “leased to” HPHA per Executive Order No. 1274. During the EISPN Public Review period, the State Department of Land and Natural Resources, Land Division wrote:

> *“We would like to comment that the project area is a portion of State land encumbered by Governor's Executive Order No. 1274 setting aside land to the Hawaiʼi Housing Authority for Lanikila Emergency Homes purposes. In view of the proposed uses, including administrative offices, affordable housing, and commercial facilities, we believe the above mentioned Executive Order document needs to be amended to document the actual uses on the subject lands.”*

Discussion: Implementation of the Proposed Project will require an amendment to Executive Order No. 1274.

6.2.9 Act 127, Session Laws of Hawai'i 2016

Pursuant to Act 127, Session Laws of Hawai'i 2016, a Special Action Team on affordable housing was established in 2016 to make recommendations on actions to promote affordable rental apartments (see Appendix B). One of the key goals of Act 127 is to achieve 22,500 completed affordable rental apartments units by December 31, 2026.

Discussion: As the Proposed Project involves the delivery of 800 affordable rental housing units, this project aligns with and supports a key goal of Act 127.

6.2.10 State Register of Historic Places

The National Register of Historic Places identifies those places over fifty years old that have the integrity and significance to be recognized nationally for preservation. Authorized by the National Historic Preservation Act of 1966, the National Register of Historic Places Program is administered by the National Park Service and is regulated by Title 36, Chapter 1, Section 60 of the Code of Federal Regulations (CFR). The State of Hawaiʻi also maintains a state register called the Hawaiʻi Register of Historic Places. It is authorized by Chapter 6E, HRS. The SHPD of the DLNR is charged with implementing the provisions of Chapter 6E, HRS.

Discussion: As discussed in Section 5.1 (Archaeological and Historic Resources), an archaeological inventory survey (AIS) and a reconnaissance level survey (RLS) of architectural historic resources were conducted for the Proposed Project property. Both the AIS and RLS were prepared in consultation with the State Historic Preservation Division (SHPD) for HRS 6E determination. The AIS, which included subsurface testing, identified four historic properties which were evaluated, documented and reported to the SHPD. The AIS recommends no further work is necessary for the sites.

As noted in Section 5.1.2 (Historic Architectural Resources), a RLS was undertaken for buildings within the Project Site and the surrounding area. The RLS identified thirteen buildings in the Project Site (see "Survey Coverage Map" on following page). Of this number, only five were over fifty years of age: 1) the former 1955 administration building (Building A); 2 and 3) a maintenance shop and semi-attached central store room (together referred to within this survey as Building D); 4) a set of garages; and 5) a facilities office building (Building C). The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz.

The five buildings over fifty years of age identified in the course of the RLS appear to meet criterion C for listing in the Hawai'i and National Registers of Historic Places. Although significant, the 1955 HHA administration building and the buildings associated with the authority's maintenance efforts, do not appear to have high preservation value. The former administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, these five buildings do not appear to be of high preservation value.

6.3 CITY AND COUNTY OF HONOLULU

6.3.1 Oʻahu General Plan

The O'ahu General Plan ("General Plan") is a comprehensive statement of objectives and policies which sets forth the long-range aspirations of Oʻahu's residents and the strategies of actions to achieve them. Prepared by the City and County of Honolulu, the General Plan lays the foundation for the City's comprehensive planning process that addresses physical, social, cultural, and economic and environmental concerns affecting the City and County of Honolulu. Originally adopted in 1977, the General Plan was most recently amended in 2002.

The General Plan serves a dual purpose. First, it is a statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of Oʻahu. These objectives contain both statements of desirable conditions to be sought over the long term and statements of desirable conditions which can be achieved within an approximate twenty-year time horizon. Second, the General Plan is a statement of broad policies which facilitate the attainment of the objectives of the plan.

The City and County of Honolulu is currently in the process of updating the General Plan. To date, there have been two public review drafts of the updated document, which were made available for public comments. The comment period on the second draft ended on May 8, 2017. As the City is currently in the process of preparing a revised General Plan that will be submitted to the Planning Commission and City Council for adoption, the Project's consistency with relevant objectives and policies of the adopted 2002 General Plan is discussed below.

I. Population

> ***Objective A: To control the growth of Oʻahu's resident and visitor populations in order to avoid social, economic, and environmental disruption.***
>
> ***Policy 4: Seek to maintain a desirable pace of physical development through City and County regulations.***

Discussion: The Proposed Project contributes toward addressing the existing housing crisis on Oʻahu, particularly affordable housing, as discussed in Section 1.1.1. The 800 affordable rental apartment units proposed for the Proposed Project are within the PUC and help to reduce the pressure to develop lands elsewhere on Oʻahu to address the existing housing shortage and accommodate anticipated future population growth. The Proposed Project helps to advance the City & County of Honolulu and State of Hawai'i strategic initiatives to reduce development pressures in rural areas by offering an "in-town", affordable housing choice for seniors earning 30%-60% of AMI who are seeking apartments near the urban core of Honolulu, near existing concentrations of medical providers, near retail and commercial facilities, and within one mile from two planned HART Transit stations.

> ***Objective C: To establish a pattern of population distribution that will allow the people of Oʻahu to live and work in harmony.***
>
> ***Policy 1: Facilitate the full development of the primary urban center.***

Policy 4 (as amended by Resolution 02-205, CD1): Direct growth according to Policies 1, 2, and 3 above by providing land development capacity and needed infrastructure to seek a 2025 distribution of Oʻahu's residential population as follows:

Table 6-1:Oʻahu General Plan Distribution of Residential Population

LOCATION	% SHARE OF 2025 ISLANDWIDE POPULATION
Primary Urban Center	46%
ʻEwa	13%
Central Oʻahu	17%
East Honolulu	5.3%
Koʻolaupoko	11.6%
Koʻolauloa	1.4%
North Shore	1.7%
Waiʻanae	4.0%
	100%

Discussion: The Proposed Project will positively impact Oʻahu's population distribution by providing additional housing opportunities in the PUC, in accordance with the directed growth policy of the General Plan. As indicated above, this policy seeks a population distribution of 46 percent of Oʻahu's population in the PUC. According to DPP population data for 2010, approximately 46 percent of Oʻahu's population resides in the Primary Urban Center. Considering this directed growth policy and DPP's 2025 population projections, about 450,000 people will reside in the Primary Urban Center by 2025, an increase of 14,900butslightly less than DPP's target of 46 percent (Department of Planning and Permitting, June 2016). As the Proposed Project is located in the urban core of Honolulu, the Proposed Project is consistent with the pattern of population distribution sought by the General Plan.

II. Economic Activity

Objective A: To promote employment opportunities that will enable all the people of Oʻahu to attain a decent standard of living.

Discussion: The Proposed Project will promote increased opportunities for Hawaiʻi's people to pursue their socio-economic aspirations by providing both short-term (construction) and long-term (facility management and commercial) employment opportunities.

Construction will occur over approximately nine years, with timing subject to the availability of funds for affordable housing construction. A total of approximately 847 person-years of direct construction employment is expected, supporting another 1,102 person-years of indirect and induced employment in the Hawaiʻi economy. (These figures cover nine years' time, so the annual average would be about 94 direct jobs and 122 indirect and induced jobs.)

Operations jobs in the new buildings operated by Retirement Housing Foundation would increase as each phase is built, and could amount to approximately 72 annual jobs after the project is completed.

The Proposed Project will transform a campus of older office buildings and maintenance workshops, replacing it with new offices for HPHA and, in time, some 800 senior housing units. When built, the project will provide housing for approximately 1,000 senior residents. Thus, residents of the future redevelopment will be able to afford a comfortable place to live in the urban core of Honolulu, near existing recreational facilities, medical centers, retail and commercial establishments, helping to reduce both housing and transportation costs and improving their overall economic wellbeing.

Policy 1: Encourage the growth and diversification of O'ahu's economic base.

Discussion: As discussed in Section 5.7.3, fiscal impacts would consist of tax revenues for the State of Hawai'i and the City and County of Honolulu. These are estimated as totaling about $9.5 million from 2020 through 2032, and approximately $500,000 dollars annually thereafter.

Policy 2: Encourage the development of small business and larger industries which will contribute to the economic and social well-being of O'ahu residents.

Discussion: The Proposed Project will provide up to 10,000 square feet of neighborhood commercial space that may be leased by a variety of retail, offices and personal services. An estimated 72 new direct jobs will be created by full buildout. The increase in annual wages onsite will be approximately $2.8 million (in constant dollars, controlling for inflation). In addition, the number of induced and indirect jobs created by the ongoing operations of redevelopment is estimated at 37 with a total of $4.7 million in wages.

Objective G: To bring about orderly economic growth on O'ahu.

Policy 1: Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.

Discussion: The Proposed Project supports the role of the PUC in O'ahu's development pattern. The Proposed Project is located within the PUC and reduces pressure to develop sensitive and rural lands elsewhere on O'ahu to accommodate population growth and furthers the City's strategy to reduce development pressures in rural areas. The Proposed Project offers affordable senior rental apartments near existing concentration of medical service providers, retail/commercial establishments, and the future HART transit stations.

III. Natural Environment

Objective A: To protect and preserve the natural environment.

Policy 1: Protect O'ahu's natural environment, especially the shoreline, valleys, and ridges from incompatible development.

Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation.

Discussion: The Proposed Project supports the role of the PUC in O'ahu's development pattern. The Proposed Project is located within the PUC and reduces pressure to develop sensitive and rural lands elsewhere on O'ahu to accommodate population growth and furthers the City's strategy to reduce development pressures in rural areas. The Proposed Project offers affordable senior rental apartments near existing concentration of medical service providers, retail/commercial establishments, and the future HART transit stations.

The Site is well suited for its intended use as it has previously been developed, is surrounded by urban uses, and is within the service area of existing infrastructure and utilities. The higher-density nature of the Proposed Project accommodates a greater percentage of O‘ahu’s critical housing shortage, thereby reducing the need to develop lands outside of existing urban areas.

Policy 6: Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.

Discussion: The Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu’s grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program. To prevent indirect or cumulative impacts on nearshore resources, BMPs will be implemented during and after construction to prevent erosion from the project into storm drains and the long-term build-up of sediments. Compliance with City's newly adopted "Rules Relating to Water Quality" and LID measures will also mitigate any potential impacts to nearshore resources. Additional measures may include garbage enclosures to prevent leakage or runoff into stormwater drainage areas and the installation of rain gardens and bioswales within landscaped areas to help capture potential pollutants prior to entering the projects drainage system. Onsite catchment and reuse of filtered runoff will also be considered as much as feasible as part of the design of the project.

Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution.

Discussion: The Proposed Project is not anticipated to have long-term damaging levels of air, water and noise pollution impacts related to the ongoing operations of the project. However, there will be temporary impacts related to construction, which are discussed in detail along with proposed mitigation in Section 5.5 for air quality, Sections 4.4 and 5.9.3 for water, and 5.3 for noise.

Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawai‘i and the Island of O‘ahu.

Discussion: As discussed in Sections 4.6 and 4.7 (Flora and Fauna) no impact to threatened, endangered, or candidate plants, birds, animals, or other species is anticipated as none are known to currently inhabit the property, and the property does not provide a suitable habitat for these species. Additionally, the property is located in an urban and highly developed area that is far from any natural or critical habitats. All outdoor lighting will also be fully-shielded and downward facing to minimize impacts to endangered native birds such as the Hawaiian petrel and Newell's shearwater.

Objective B: To preserve and enhance the natural monuments and scenic views of O‘ahu for the benefit of both residents and visitors.

Policy 2: Protect O‘ahu’s scenic views, especially those seen from highly developed and heavily traveled areas.

Discussion: As discussed in Section 5.6 (Visual Resources), three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Project Site should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Primary Urban Center, Map A.1, Significant Panoramic Views). The visual impacts from the project, however, must take into consideration:

- the existing multi-family and single-family development of this area;
- existing buildings such as Maluhia Health Center, Kapuna I, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center;
- overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and
- the tall field lights at Lanakila District Park.

The Proposed Project's current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. The current design plan breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The current design plan also attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the Proposed Project by:

- Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views;
- Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets;
- Creating a more interesting skyline by varying building heights;
- Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and
- Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.

IV. Housing

Objective A: To provide decent housing for all the people of Oʻahu at prices they can afford.

Policy 3: Encourage innovative residential development which will result in lower costs, added convenience and privacy, and more efficient use of streets and utilities.

Policy 4: Establish public, and encourage private, programs to maintain and improve the condition of existing housing.

Policy 5: Make full use of State and Federal programs that provide financial assistance for low-and moderate-income homebuyers.

Policy 8: Encourage and participate in joint public-private development of low- and moderate-income housing.

Policy 12: Encourage the production and maintenance of affordable rental housing.

Policy 13: Encourage the provision of affordable housing designed for the elderly and the handicapped.

Discussion:
Eight hundred rental units are proposed as part of the Proposed Project. Residential units are targeted to seniors in studio and one-bedroom apartments, with all of the residential units proposed as affordable (currently proposed to be affordable to those households earning 30% to 60% of AMI.

It is anticipated that residents of the Proposed Project will include seniors and individuals with disabilities, provided they meet the income and other housing qualification requirements. Provisions for seniors and individuals with disabilities will be provided as required by federal and state regulations.

The project is an example of a public-private partnership with HPHA teaming with Retirement Housing Foundation to increase the supply of rental apartments in Honolulu for local residents. This public-private partnership will help to provide a more efficient, timely, and cost-effective delivery of affordable apartments as well as long-term management of the site by the non-profit Retirement Housing Foundation.

Objective B: To reduce speculation in land and housing.

Policy 4: Require government-subsidized housing to be delivered to appropriate purchasers and renters.

Objective C: To provide the people of O'ahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.

Policy 1: Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.

Policy 2: Encourage the fair distribution of low- and moderate-income housing throughout the island.

Policy 3: Encourage residential development near employment centers.

Policy 4: Encourage residential development in areas where existing roads, utilities, and other community facilities are not being used to capacity.

Discussion: The Proposed Project will create a new affordable senior rental apartment community, with mixed-use, in a bus-based, transit oriented development, in the urban core of Honolulu near an existing concentration of medical service providers, retail/commercial centers, transit, and infrastructure.

Eight hundred residential rental units are proposed as part of the Proposed Project. Residential units are targeted to seniors in studio and one-bedroom apartments, with all of the residential units proposed as affordable and targeted to households earning 30% to 60% of AMI.

V. Transportation & Utilities

Objective A: To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.

Policy 1: Develop and maintain an integrated ground-transportation system consisting of the following elements: a. Public transportation-for travel to and from work, and travel within Central Honolulu; b. Roads and highways-for commercial traffic and travel in nonurban areas; c. Bikeways

for recreational activities and trips to work, schools, shopping centers, and community facilities; and d. Pedestrian walkways-for getting around Downtown and Waikiki, and for trips to schools, parks, and shopping centers.

Policy 5: Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.

Policy 7: Promote the use of public transportation as a means of moving people quickly and efficiently, of conserving energy, and of guiding urban development.

Policy 8: Make available transportation services to people with limited mobility: the young, the elderly, the handicapped, and the poor.

Policy 9: Promote programs to reduce dependence on the use of automobiles.

Policy 10: Discourage the inefficient use of the private automobile, especially in congested corridors and during peak-hours.

Discussion: The Proposed Project is located in the urban core of Honolulu and is within walking and biking distance of an existing concentration of medical service providers, retail and commercial establishments, bus stops, and two future HART Transit Stations. Its convenient location helps reduce dependency on motor vehicles, which contribute to traffic congestion, fossil fuel consumption, air pollution, and noise impacts. The new internal roadway system will be designed as complete streets, providing safer, more comfortable streets on which to walk and ride bicycles. This supports convenient access to area public transit for seniors and disabled individuals who are not able to drive. It is also recommended that area lighting be provided around the adjacent bus stops to improve nighttime safety.

Objective B: To meet the needs of the people of O'ahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 1: Develop and maintain an adequate supply of water for both residents and visitors.

Policy 4: Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.

Discussion: As discussed in Section 5.9.1 (Water System), initial consultation with the Board of Water Supply confirmed that the existing O'ahu municipal water system is presently adequate to accommodate the proposed 800 residential units and up to 10,000 SF of commercial.

During construction, every effort will be made to divert materials that can be reused or recycled from landfills, as well as minimizing the amount of construction waste generated. Once construction is completed, the Proposed Project will support recycling for both households and commercial uses as well as green wastes generated onsite by landscaping maintenance. Detailed design will include onsite facilities to support separating wastes into recyclable and non-recyclable materials and for central collection facilities within the buildings.

In order to reduce the amount of potable water required to serve the Proposed Project, all efforts will be made to include water reducing design elements into the overall design such as low flow and ultra-low flow fixtures, automated irrigation systems with moisture sensors to prevent overwatering, and water catchment and reuse for non-potable uses such as irrigation. Wherever possible, landscaping will incorporate native and hardy climate-adapted plants that do not require significant amounts of water.

Objective C: To maintain a high level of service for all utilities.

Policy 3: Plan for the timely and orderly expansion of utility systems.

Policy 4: Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day.

Discussion: Initial coordination with utility providers and City agencies have begun and all onsite infrastructure and utility systems necessary to support the project will be included in the Proposed Project. The proposed onsite office, commercial and retail areas are anticipated to be primarily daytime uses with daytime demand on infrastructure compared with the residential uses which are typically evening and nighttime uses.

Objective D: To maintain transportation and utility systems which will help Oʻahu continue to be a desirable place to live and visit.

Policy 2: Use the transportation and utility systems as a means of guiding growth and the pattern of land use on Oʻahu.

Discussion: The Proposed Project is a mixed-use, bus-based, TOD project, consistent with the City's objective of utilizing transportation and utility systems as a means of guiding future growth and the pattern of land use on Oʻahu.

VII. Physical Development and Urban Design

Objective A: To coordinate changes in the physical environment of Oʻahu to ensure that all new developments are timely, well-designed and appropriate for the areas in which they will be located.

Policy 2: Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

Policy 3: Phase the construction of new developments so that they do not require more regional supporting services than are available.

Policy 4: Require new developments to provide or pay the cost of all essential community services, including roads, utilities, schools, parks, and emergency facilities that are intended to directly serve the development.

Discussion: The Proposed Project is appropriately located within the service area of existing water, wastewater, drainage, transportation, and public safety facilities as discussed in Section 5.9 and 5.10. Initial coordination with utility providers and City and State agencies has begun and all onsite infrastructure and utility systems necessary to support the project will be included in the Proposed Project.

Policy 5: Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.

Policy 6: Encourage the clustering of developments to reduce the cost of providing utilities and other public services.

Policy 7: Locate new industries and new commercial areas so that they will be related to their markets and suppliers, and to residential areas and transportation facilities.

Discussion: The Proposed Project is a compact, mixed-use redevelopment project that will provide residential, commercial/retail, and recreational uses in a manner that efficiently utilizes urban lands, which includes existing urban development. It is near existing infrastructure and utilities, roadways, public transit, and two proposed HART Transit Stations as well as medical providers and retail/commercial areas in Downtown Honolulu, Liliha, Kapālama and Kalihi areas. The Proposed Project also implements major components of the PUC Development Plan, which calls for higher density development near the urban core. The Proposed Project also includes approximately 10,000 square feet of commercial space.

Policy 9: Exclude from residential areas, uses which are major sources of noise and air pollution.

Discussion: All uses proposed for the Project Site are complimentary to, and serve to support and enhance the residential component of the project. Uses which are major sources of noise and air pollution are not proposed for the Project Site. The Proposed Project is not anticipated to ongoing damaging levels of air, water and noise pollution impacts. Temporary impacts will occur during construction and will be mitigated as noted in Section 5.3 (Noise) and Section 5.5 (Air Quality).

Objective B: To develop Honolulu (Waiʻalae-Kāhala to Hālawa), Aiea, and Pearl City as the Island's primary urban center.

Policy 1: Stimulate development in the primary urban center by means of the City and County's capital-improvement program and State and Federal grant and loans.

Policy 3: Encourage the establishment of mixed-use districts with appropriate design and development controls to insure an attractive living environment and compatibility with surrounding land uses.

Policy 5: Encourage the development of attractive residential communities in downtown and other business centers.

Discussion: The Proposed Project, as a mixed-use, bus-based, TOD community, supports the build-out of the core of urban Honolulu as Oʻahu's Primary Urban Center. It is envisioned as providing 800 affordable rental apartment units in the urban core of Honolulu near transit.

The Proposed Project is being developed by the HPHA in partnership with Retirement Housing Foundation. It is anticipated that the Proposed Project will not pursue federal funding.

Although the Proposed Project will include taller building heights than ordinarily found in the neighborhood, there is an existing high-rise building on North School Street, as well overhead utility lines (including a 138kV line on metal poles). In order to reduce the impact of the proposed development to surrounding neighborhood, the current Master Plan includes three apartment buildings with lower- and mid-rise podiums facing North School Street with pedestrian-scaled uses. This design creates a more appealing urban form while breaking up the vertical mass of the buildings by:

- Providing wider view corridors between buildings due to the narrower tower profiles;
- Creating a more interesting skyline with different building heights; and
- Setting the multi-family residential buildings back from the street frontage and edge of the podium deck to allow for a more pedestrian-scaled street frontage.

Objective E: To create and maintain attractive, meaningful, and stimulating environments throughout Oʻahu.

Policy 3: Encourage distinctive community identities for both new and existing districts and neighborhoods.

Policy 4: Require the consideration of urban-design principles in all development projects.

Policy 6: Provide special design standards and controls that will allow more compact development and intensive use of lands in the primary urban center.

Discussion: The Proposed Project is envisioned to be a cohesive community that combines a mix of residential, retail, commercial, and public office spaces in a compact, bus and TOD oriented project located in the PUC. The project's unique mixed-use character and high-quality design will create a community with comfortable streets for walking or biking, and a mix of uses complementary to the surrounding neighborhood. Sustainable building design principles will be implemented to minimize the environmental footprint.

Objective F: To promote and enhance the social and physical character of Oʻahu's older towns and neighborhoods.

Policy 1: Encourage new construction to complement the ethnic qualities of the older communities of Oʻahu.

Policy 4: Seek the satisfactory relocation of residents before permitting their displacement by new development, redevelopment, or neighborhood rehabilitation.

Discussion: Eight hundred affordable residential rental units are proposed as part of the Proposed Project. The residential housing units, consisting of studio and one-bedroom apartments, are targeted to seniors earning 30% to 60% of AMI.

VII. Public Safety

Objective A: To prevent and control crime and maintain public order.

Policy 1: Provide a safe environment for residents and visitors on Oʻahu.

Discussion: The design of the Proposed Project will incorporate Crime Prevention through Environmental Design (CPTED) principles such as natural surveillance, maintenance of proper sightlines, natural access control, and on-going maintenance and management into the project. More specifically, these principles will help to create a safer environment for residents and visitors by promoting an active streetscape where more people will frequent and provide natural surveillance of the area, providing appropriate lighting and landscaping, minimizing potential hiding places for criminals onsite, and providing security, as needed, both during construction and after completion. The improved roadway connections will also provide easier access to the project site for police and emergency responders.

Objective B: To protect the people of Oʻahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.

Policy 2: Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard.

Policy 6: Reduce hazardous traffic conditions.

Policy 7: Provide adequate fire protection and effective fire prevention programs.

Policy 9: Design safe and secure public buildings.

Discussion: As discussed in Section 4.5 (Natural Hazards), the property is located in Zone X, or outside of the 500-year (0.2 percent annual chance) floodplain. Impacts from natural hazards can be further mitigated by adherence to appropriate civil defense evacuation procedures. All structures will be designed in compliance with the International Building Code and Uniform Fire Code, as adapted for use in Honolulu by the Honolulu Fire Department.

To minimize and reduce hazardous traffic conditions within the Proposed Project and to create a more walkable and bicycle friendly environment, new internal streets will be designed as complete streets to support safe pedestrian and bicycle circulation and will also include traffic calming measures to slow vehicle traffic through the site.

X. Culture and Recreation

Objective A: To foster the multiethnic culture of Hawai'i

Policy 3: Encourage opportunities for better interaction among people with different ethnic, social, and cultural backgrounds.

Discussion: The future residents of the Proposed Project will likely be comprised of a diverse mix of individuals with different ethnic, social and cultural backgrounds.

Objective D: To provide a wide range of recreational facilities and services that are readily available to all residents of O'ahu.

Policy 3: Develop and maintain urban parks, squares, and beautification areas in high density urban places.

Policy 9: Require all new developments to provide their residents with adequate recreation space.

Policy 10: Encourage the private provision of recreation and leisure-time facilities and services.

Discussion: To provide future residents of the project with adequate recreation space and leisure time facilities and services, the Proposed Project will include a mix of recreational spaces such as community gardens, recreational decks, and landscaped open spaces. These areas may be used for cultural performances, artistic displays, and other community activities, thus providing a place of recreation and leisure for residents and their visitors. In addition, the pedestrian-oriented design will promote a physically active, healthy lifestyle. In addition to access to onsite recreational facilities, residents will be within convenient walking distance to Lanakila District Park and the Lanakila Multi-Purpose Senior Center (LMPSC), the largest facility in the state serving the Senior Community, which is located directly adjacent to the Project Site.

XI. Government Operations and Fiscal Management

Objective A: to promote increased efficiency, effectiveness, and responsiveness in the provision of government services by the City and County of Honolulu.

Policy 3: Ensure that government attitudes, actions, and services are sensitive to community needs and concerns.

Discussion: The partnership between HPHA and Retirement Housing Foundation is an example of fiscal responsibility in seeking public-private partnership to deliver affordable senior rental apartments. This public-private partnership will continue with the long-term management of the site by the Retirement Housing Foundation.

HPHA staff and the project team have participated in numerous Neighborhood Board meetings, resident and community meetings, and met with many stakeholders, private groups, and government agencies in the course of preparing the conceptual Master Plan for the Proposed Project. The inclusive planning process has resulted in a plan that has allowed for extensive public participation in the planning process, incorporates community input, and has been and continues to be responsive to community concerns.

6.3.2 Primary Urban Center Development Plan

The City & County of Honolulu Development Plan sets forth conceptual schemes for implementing and accomplishing the objectives and policies of the Oʻahu General Plan. Extending from Waiʻalae Kāhala and west to Pearl City, the PUC Development Plan (DP) area is one of eight geographical DP areas that have been established on Oʻahu. Only the plans for the PUC and ʻEwa are called "Development Plans," with the remaining six are designated as "Sustainable Communities Plans." These specific titles reflect the role of the PUC and ʻEwa DP areas as the key locations to accommodate the majority of Oʻahu's future urban growth.

Adopted in June 2004, the PUC DP is intended to shape the growth and development of the PUC over a 20-year time period. The PUC DP presents a vision for the region's future development, presenting policies, guidelines and conceptual schemes intended to guide policy for the preparation of more detailed zoning maps, land use regulations, and public and private sector investment decisions.

The following provides an overview of the Proposed Project's relationship with the vision and guidelines of the PUC DP.

6.3.2.1 The Role of the PUC in Oʻahu's Development Pattern

The PUC DP states, "As part of the City's overall strategy to reduce development pressures in rural areas and to maintain a compact urban core," the PUC, along with the ʻEwa region, is expected to accommodate the majority of Oʻahu's future population and job growth. The PUC is envisioned to be "a lively metropolitan city that is home to almost half of Oʻahu's population and three-quarters of all jobs."

Discussion: The Proposed Project supports the role of the PUC in Oʻahu's Development Pattern. The provision of affordable apartments units in the PUC, as proposed, reduces pressure to develop lands elsewhere on Oʻahu to accommodate population growth and furthers the strategy to reduce development pressures in rural areas. The Proposed Project is appropriately sited on a previously developed site, in a highly urbanized area, and within the existing service areas of utilities and infrastructure, and within convenient walking and biking distance of a concentration of medical providers, area commercial and retail, and an established bus line and two planned HART rail stations.

6.3.2.2 Key Elements of the Vision for the PUC's Future

The vision for the future of the PUC looks forward to the Honolulu of 2025. The following are key elements of the City's vision from Section 2 of the PUC DP. The italicized excerpts below are direct quotes from the PUC DP.

> ***Section 2.1: Honolulu's Natural, Cultural and Scenic Resources are Protected and Enhanced***
>
> *Within the city, the open space network links mauka lands and shorelines to parks and open spaces within the urban area…. Stream greenbelts, numerous bikeways and pedestrian friendly streets connect major parks and open spaces.*
>
> *Culturally- and historically-important sites, landforms and structures continue to be preserved and enhanced. Historic and cultural districts are improved and interpreted for visitors.*

People enjoy the panoramic views of Honolulu's mountain ridges, craters and coastlines from key vantage points. Within the city, view corridors are preserved through careful planning and design.

Discussion: The Proposed Project will provide a system of walkways that provides better connectivity to the surrounding community and street network. The internal streets will be designed as complete streets, supporting easy and convenient access for residents on foot or by bicycle. A mix of other open spaces such as recreational decks, community gardens, mini parks and landscaped courtyards will encourage active outdoor living within an urban setting.

The five buildings over fifty years of age identified in the course of the RLS appear to meet criterion C for listing in the Hawai'i and National Registers of Historic Places. Although significant, the 1955 HHA administration building and the buildings associated with the authority's maintenance efforts, do not appear to have high preservation value. The former administration building's lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. According to FAI, these five buildings do not appear to be of high preservation value.

SHPD wrote that it accepts the RLS for the Proposed Project. Both HPHA and Retirement Housing Foundation are prepared to honor the history of the Project Site and the diverse cultures and peoples who inhabited it and will continue to work with SHPD on appropriate mitigation of the anticipated impacts.

With regard to potential impacts to surrounding historic properties and the experience of passersby within the neighborhood, the proposed Master Plan sets back the proposed apartment buildings from the North School Street — the intent is the new design will be compatible with the existing frontage along North School Street and will help mitigate impact to historic properties in the vicinity of the project. Consultation with the SHPD on the appropriate mitigation measures required for architecturally historic properties are ongoing. Therefore, historic architectural resources are also identified as an unresolved issue that will continue to be mitigated with design and implementation of the Proposed Project.

Section 2.2: Livable Neighborhoods have Business Districts, Parks and Plazas, and Walkable Streets

The PUC is an interconnected network of vibrant, distinct neighborhoods. Each has qualities that make it a livable and enjoyable place to live, work or play. The City and County of Honolulu supports an ongoing program of neighborhood planning and improvement.

Livable neighborhoods include business and community services as well as residences. Key to livability is convenient access to work and to the many services and attractions Found in an urban center. Rather than segregate residential from commercial uses, the goal is to integrate them in ways that provide greater convenience and bring activity to neighborhood streets.

Livable neighborhoods have centers where people meet. In sonic neighborhoods, the center is a business district. In others, it is a popular park that has sports activities. Some neighborhoods have more than one center. In neighborhood business districts, shaded sidewalks and district parking Support small shops open to the street.

In-town residential neighborhoods offer the greatest amenities for urban living. Consisting mostly of apartment dwellings. These neighborhoods are closest to employment centers, universities and cultural institutions. They are also close to grocery stores, shopping districts, and other government, health and commercial services. Proximity to rapid transit lines gives residents mobility and makes it possible to live with fewer automobiles. Newer apartment buildings are typically four to six stories tall, with shops and services on the ground floor. Small parks, plazas and "green streets" provide places for people to meet and for small children to play.

Discussion: The Proposed Project will be a mixed-use community incorporating residential, commercial/retail and recreational uses. It is within walking and biking distance of a concentration of medical providers, retail and commercial establishments, promoting the development of a livable neighborhood and providing affordable senior rental housing in the urban core of Honolulu. The Proposed Project's livability will be further enhanced by its proximity to both on-and off-site commercial uses found along Liliha and School Streets, recreational facilities including Lanakila District Park; and social services including Lanakila Health Center and Lanakila Multi-Purpose Senior Center, and convenient access to public transit. The proposed mix of open spaces including recreational decks and community gardens will provide gathering and recreation areas for residents and their guests. While the proposed buildings will be taller than those currently onsite, the proposed buildings will step back from North School Street, with the taller multi-family residential buildings located interior to the development block, set back from the street front, to reduce their visual impact and allow for distant ewa and Diamond Head views Further, Street frontage on the ground floor will be activated by commercial uses and residences and shaded by street trees and awnings to enhance the street character for pedestrians..

Section 2.3: The PUC Offers In-Town Housing Choices for People of All Ages and Income

More and more households are attracted to in-town residential neighborhoods because of the convenience and amenities of the urban lifestyle. They include a growing number of elderly moving to smaller quarters but wanting to remain near their home neighborhoods. Young families are drawn to in-town neighborhoods with convenient elementary schools and parks. Living close to work is more popular than ever.

Discussion: The Proposed Project will create 800 "in-town" affordable rental studio and one-bedroom apartments targeted to senior households earning 30% to 60% of AMI. In addition, up to 10,000 square feet of retail and commercial area will be provided onsite as well as open spaces and parking.

The Proposed Project will include up to three higher-density multi-family residential buildings. The proposed buildings setback from and step up from North School Street, and will be lined by commercial/retail storefronts along the ground floor to enhance the street character for pedestrians. In addition, the taller multi-family residential buildings will be located interior to the development block, set back from the street front, to reduce their visual impact and allow for distant ewa and Diamond Head views.

Section 2.4: Honolulu is the Pacific's Leading City and Travel Destination

The Primary Urban Center continues to be Oʻahu's primary employment center and the center for many commercial, industrial, transportation and government functions essential to the State of Hawaiʻi.

Discussion: While the Proposed Project is not focused on business or travel related development, it will include up to 10,000 SF of commercial, retail and personal service businesses that are envisioned to support future residents and the surrounding community.

Section 2.5: A Balanced Transportation System Provides Mobility

Honolulu's balanced transportation system provides excellent mobility for residents, workers and visitors traveling throughout the Primary Urban Center. Streets are engineered to accommodate automobiles along with transit vehicles, bicycles and pedestrians.

Discussion: The Proposed Project is envisioned to create a more walkable and bicycle friendly environment with new internal streets that will be designed as complete streets. They will also meander through the site to discourage speeding and cut-through traffic. Additional traffic calming measures may also be installed to slow vehicle traffic through the site. The location of the Proposed Project in proximity to existing commercial, medical providers, recreational, and social services in addition to sidewalks and roads, bus lines, and the planned HART rail transit project make it an ideal development to contribute to the vision of a multi-modal PUC.

6.3.2.3 Land Use and Transportation

Chapter 3 of the PUC DP describes the policies and guidelines as they relate to the key vision statements in Chapter 2.

Section 3.1: Protecting and Enhancing Natural, Cultural and Scenic Resources

According to the Primary Urban Center Development Plan, natural, cultural and scenic resources provide the context for the PUC and provide its unique identity as a world-class city in a spectacular Pacific island setting. They create the city's scenic backdrop, provide a balance to its buildings and homes, and define the unique settings for the PUC's many neighborhoods and districts. This includes preserving historic or cultural sites with high preservation value and important vistas and focused views of significant natural and urban features and skyline profiles that make up or frame the PUC from publicly accessible places.

Scenic Views, Section 3.1.1.2 of the Primary Urban Center Development Plan, discusses the panoramic views of the urban skyline. Map A.1, Significant Panoramic Views depicts vantage points and orientation of major panoramic views within the Primary Urban Center. View objects identified in this section which may be impacted by the Proposed Project include the Koʻolau Mountain Range, Lēʻahi Crater (Diamond Head) and Pūowaina Crater (Punchbowl). This section also discusses panoramic views of the urban skyline from arrival points by air and sea, from above the Koʻolau and from outlying areas to the east and west as an important aspect of the city's image, as it establishes a distinctive identity for Honolulu, defines sub-districts within it, and provides directional orientation.

This section also notes that the lateral extent of Honolulu's skyline is defined by Nuʻuanu Stream on the west and Kapiʻolani Park and Diamond Head on the east. At present, Downtown, with its taller profile and denser clustering of building emphasized by the low-rise profiles of the Chinatown and Hawaiʻi Capitol Districts, is a visually prominent element of the skyline in the western portion of the Primary Urban Center is less pronounced than in Honolulu. The plan notes that recent high-rise developments in Kakaʻako have begun to weaken this prominence, resulting in a high-rise "picket fence" emerging on the Kakaʻako skyline.

The plan also discusses scenic views, or view "corridors," in the DP's Section 3.1.1.2 of mountains and the shoreline along streets that are aligned in the mauka-makai orientation. All of the streets are east of the Project Site, with the view corridor furthest west along Bishop Street; therefore none of the identified View Corridors are impacted by the Proposed Project.

Section 3.1.3.6, Parks and Recreational Open Spaces, recognizes the difficulty in acquiring land in the PUC for additional park land and recommends developing innovative approaches to make optimum use of existing parks and recreational resources such as building partnerships between public agencies and nonprofit organizations for joint use of facilities and complimentary recreation programs, optimizing private sector contributions to open space through park dedication as properties are redeveloped, reassessing and reassigning the use of existing park land, and promoting linear connections in the recreational open space network by using existing public lands and right-of-way, where possible.

Discussion: As discussed in Section 5.6 (Visual Resources), three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Project Site should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Figure 8). The visual impacts from the project, however, must take into consideration:

- the existing multi-family and single-family development of this area;
- existing buildings such as Maluhia Health Center, Kapuna I, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center;
- overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and
- the tall field lights at Lanakila District Park. (See Figure 9.)

The current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. It breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by:

- Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views;
- Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets;
- Creating a more interesting skyline by varying building heights;

- Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and
- Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.

In terms of parks and recreational open spaces, there are several parks within walking distance of the project including Lanakila District Park. Smaller open spaces, community gardens, and recreational decks with landscaping and recreational facilities are envisioned to be dispersed throughout the site creating a hierarchy of well-organized outdoor open spaces that bridge the interior and exterior elements.

6.3.2.4 Neighborhood Planning and Improvement

Section 3.2 of the PUC DP identifies the key components of livability to include residences within close proximity to employment, business, community services and recreational amenities with facilities integrated in a manner that enhances accessibility and convenience, encourages walking and bicycling as alternative forms of mobility and promotes sidewalk activity. To cultivate livable neighborhoods, the PUC DP describes the different types of neighborhoods and “sets forth general land use policy for residential neighborhoods and the commercial districts that serve them” in Section 3.2. The following apply to the Proposed Project.

Section 3.2.1.3: In-Town Residential Neighborhoods

According to the Primary Urban Center Development Plan, “in-town residential neighborhoods” refer to “areas on the centrally-located coastal plains of Honolulu and ‘Aiea-Pearl City that are planned for higher-density residential use, ranging from older two- to four-story walk-up buildings to 40-story multi-family residential buildings.” These higher density multi-family residential buildings can “take on a variety of forms and are often mixed with or located near office and retail uses.”

“In-town housing is near jobs, shopping districts, hospitals, parks, and entertainment. Residents of these areas enjoy excellent access to all of the opportunities of the city, without having to rely exclusively on costly automobile transportation. Mixed-use is an essential component of the most livable in-town neighborhoods, and residents of these neighborhoods find parks and shopping in easy walking distance. Bicycling on the flat coastal plain is a practical mode of transportation, and transit provides a comfortable ride with fast connections.”

Discussion: The Proposed Project directly addresses the key issues related to cultivating livable neighborhoods by integrating complementary land uses, creating functional relationships between buildings and uses and the street, and reducing automobile dependence. In addition, the project provides recreational decks and landscaped open spaces for its residents and their guests.

Section 3.2.2.3: Policies for In-Town Residential Neighborhoods

Applicable policies of the Primary Urban Center Development Plan’s for cultivating livable neighborhoods include the following:

- ***Density.*** *Areas close to transit lines and major east-west arterials should be zoned for medium-density residential, which may range from 13 to 90 units per acre, or high-density residential mixed use, which may range up to 140 units per acre. Neighborhoods in these zones would also include reinforcing uses which support resident lifestyle and livelihood* *choices, such as convenience or neighborhood stores, dining establishments, professional and/or business services, or other similar activities.*

- ***Building Heights.*** *Establish maximum building heights in apartment districts on the basis of view plane studies to preserve views of natural landmarks as indicated in Section 3.1.*

- ***Building design and streetscape environment****. Along principal streets, buildings should be designed to reflect human scale, to create pleasant walking conditions, and to provide attractive front entrances. Monolithic building facades and blank walls should be avoided. A generally consistent building line (i.e. "build-to line) should govern the street front placement of building faces. Courtyards or other recessed open spaces may be placed along the street in order to provide strategic open space relief and opportunities for social activity or respite. … Utilitarian elements such as service yards, parking lots, or utilities should he located on nonprincipal streets in ways that support efficient patterns of circulation.*

Discussion: The Proposed Project is consistent with PUC DP's policies for cultivating livable in-town neighborhoods. The Proposed Project will provide a convenient and efficient mix of residential, commercial, retail and personal services, all within walking distance from an established bus line and within one mile of two future HART rail stations.

Much attention will be given to creating pedestrian-friendly streets with ground floor commercial activating the street further enhanced by landscaping, and nighttime lighting for safety. The new internal street network will be designed as complete streets to support pedestrian and bicycle circulation and will also include traffic calming measures to slow vehicle traffic through the site. The project walkways will provide more connections to the surrounding neighborhood.

The Proposed Project's 800 units – targeted to senior households earning 30% to 60% of AMI – result in an overall density of the Project Site of about 133 units per acre. This is lower than the PUC DP's maximum density of about 140 units per acre, and the proposed density and height are required in order to increase the number of residential units provided on a State-owned parcel to help alleviate the state's affordable housing crisis.

The Proposed Project is located in the urban core of Honolulu, near public transit, in an existing urban environment in close proximity to existing apartment buildings.

The current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape, breaking up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by:

- Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views;
- Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets;
- Creating a more interesting skyline by varying building heights;

- Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and
- Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.

Section 3.3: In-Town Housing Choices

The PUC of the future "offers in-town housing choices for people of all ages and incomes." This third element of the Vision addresses the need for affordable housing, both rental and for sale, in the PUC to serve families with young children as well as young adults, elderly residents, and multigenerational households.

The PUC DP cites the GP, which calls for the PUC to accommodate 47 percent of Oʻahu's population— an increase of 67,000 people by the year 2025. Also, in 2000, the PUC had a higher percentage of renters (almost 50 percent) and older units in comparison to the rest of Oʻahu. The plan also notes that renters occupy more than 55 percent of the available housing units in Kalihi-Pālama, Downtown Honolulu, and Ala Moana-McCully, and these neighborhoods also had a high proportion of low- and moderate-income households. Pre-1969 walk-up apartments located in these neighborhoods comprise an important reservoir of affordable, in-town housing units.

While there have been attempts to build more affordable housing in the 1980s and 90s, the PUC DP notes that "most of the government-owned in-town sites were developed" by 2000 and "funding for new housing has been drastically reduced, making preservation and retention of existing affordable housing units an integral part and essential component of fulfilling housing needs of the PUC residents."

"The PUC is essentially built-out – i.e., there is no reservoir of vacant land designated for future urban use. New housing is developed on lands which are underutilized or where it is not economical to maintain the existing uses or structures. This occurs primarily in older in-town districts where land values are relatively high, and there is a strong demand for higher use."

Quoting the PUC DP, some of the existing key issues identified that hinder the development of new residences, especially new multi-family dwellings, include the following:

- ***Higher Prices****. Prices for all types of housing both sale and rental prices — are extremely high in the PUC. Higher prices for land and construction costs for high-rise structures make development of affordably priced housing units challenging.*

- ***Housing Preferences****. Due to the high price of real estate in the PUC, homebuyers seeking affordable housing are typically limited to apartment dwellings in the PUC. Living in multifamily housing in the PUC is readily accepted by elderly and other households without children but is viewed as less desirable by families who can afford to buy. In addition, families are also concerned about lack of schools and parks in PUC apartment neighborhoods.*

- ***Rental Unit Development****. Market conditions discourage the development of rental units. For many years, pure rental projects were developed only when heavily subsidized by* *government. Indirectly, rental units have become available as investors purchased individual condominium units and then rented them out.*

- ***Higher Risks**. Development of high-rise structures carries more developer risk since the structure must be completed, and investors fully extended, before any sales are closed. In addition, "Type 1" construction required for high rises is very expensive.*

- ***Infrastructure Deficiencies**. Infrastructure deficiencies are found in most of the older, in-town neighborhoods. Some affect broad areas and are costly to correct, such as insufficient capacity of a sewer trunk line or a pump station. In such cases, development cannot occur until the City makes improvements to expand capacity. For upgrading local water, sewer, or drainage lines, the developer typically bears the full cost of the required improvement (even though other properties may benefit as well). The cost of required infrastructure improvements can make a project infeasible.*

- ***Zoning Regulations**. Zoning regulations strictly limit the floor area and the lot coverage of apartment buildings. High minimum parking requirements, combined with limitations on lot coverage, force the development of costly structured parking. In addition to substantially increasing project design and construction costs, existing regulations force apartment buildings into a tower configuration with a parking pedestal.*

The PUC DP further states that, "these factors limit the availability of affordable housing for middle- and lower-income families in the PUC. While the City and County of Honolulu cannot directly affect market factors, it can support new housing development by modifying zoning and building regulations, and upgrading infrastructure."

Discussion: The issues detailed above continue to affect development and highlight the difficulties faced by developers attempting to build high-density affordable housing in the PUC. The Proposed Project is one of the few major new affordable senior communities proposed within the PUC in many years. All of the residential units are proposed as affordable targeted to senior households earning 30% to 60% of AMI). Similar to older, multifamily developments in the PUC, the Proposed Project will require substantial public investment to complete, but will be designed in substantial conformance with the desired pattern of development stated in earlier vision statements and policies of the PUC DP. The City is also working on improvements to the wastewater system in the area and the development team will continue to work closely with the City and other utilities to provide adequate infrastructure to the project.

Section 3.3.2: Policies related to In-Town Housing Choices

The following policies are intended to promote housing choices in livable in-town neighborhoods that are planned for higher-density residential and mixed uses.

- ***Promote people-scaled apartment and townhouse dwellings in low-or mid-rise buildings oriented to the street.** Promote buildings that are modest in height and have a pedestrian entrance facing the street. Encourage the use of ground-floor space for shops that will serve residents and contribute to a pedestrian-oriented neighborhood.*

- ***Reduce costs for apartment homes.*** *Reduce construction costs and promote low-rise buildings by allowing less expensive building construction types while maintaining health and safety. Reduce land costs by allowing greater dwelling unit density while limiting building volume consistent with promoting livable neighborhoods.*
- ***Provide adequate parks and schools for in-town neighborhoods.*** *Community parks and recreation facilities should be provided in and near residential neighborhoods. To attract young families, access to elementary schools must he assured.*
- ***Expand the capacity of infrastructure, including water supply, sewers, and storm drains.*** *Government needs to lead both planning and investment in renewing and expanding infrastructure. To remedy district- or neighborhood-scale infrastructure constraints is beyond the capability of individual landowners. Likewise, paying for relief lines and larger-scale projects that will benefit multiple landowners requires government leadership in providing long-term financing and apportioning costs.*
- ***Preserve the current inventory of affordable rental housing units.*** *The City should assure that the current inventory of affordable rental units, whether owned by the City or not, is preserved and retained as affordable rentals.*
- ***Provide incentives and cost savings for affordable housing.*** *Provide exemptions from zoning and building codes for housing projects that meet established standards of affordability, on a case-by-case basis.*
- ***Provide for high-density housing options in mixed-use developments around transit stations.*** *This type of "transit-oriented development" would facilitate transit use and allows for increased densities without generating increased vehicular congestion.*

Discussion: The Proposed Project is a compact mixed-use, mixed-income, bus-based TOD on State-owned land, which is currently underutilized, given the State's housing crisis. It will provide much-needed affordable senior rental units in the urban core of Honolulu near existing public bus lines and two future HART rail stations.

The Proposed Project consists of 800 affordable studio and one-bedroom residential rental units targeted to senior in households earning 30% to 60% of AMI. Incentives and cost savings for the affordable units may be sought during the permitting and approval process. The development team is also working with the City and other utility providers to ensure infrastructure is available to support the Proposed Project.

Section 3.3.3: Guidelines related to In-Town Housing Choices

- *In order to implement Development Plan policies, review and revise zoning regulations for apartment districts and other zoning districts that allow multifamily dwellings.*
- *Review and revise zoning and building regulations to allow more flexibility in design and reduce the cost of multi-family structures.*
- *Promote the location of grocery stores and other service businesses in higher-density neighborhoods. Having shops and services within walking distance is an important amenity of in-town living. In addition to promoting retail stores on the ground level of apartment buildings, zoning regulations should provide incentives for locating full-service grocery stores in high-*

density residential neighborhoods. An essential element of the higher-density livable neighborhood, grocery stores require much more floor area and service facilities than the typical retail use and therefore warrant special incentives.

Discussion: The Proposed Project is consistent with the PUC DP's policies for providing for in-town housing choices. The Proposed Project will provide a convenient and efficient mix of residential, commercial, retail and personal services, all within walking distance from an established bus lines and two future HART rail stations.

6.3.2.5 Develop a Balanced Transportation System

Section 3.5 of the Primary Urban Center Development Plan addresses the need to "'develop a balanced transportation system that reduces reliance on cars and improves alternate modes connecting neighborhoods and activity centers.' Full development of the Primary Urban Center, as called for in the O'ahu General Plan, can only be achieved with the support of a well-conceived transportation system that is tightly integrated with land use policies and regulations."

Relevant policies and guidelines (Section 3.5.2 and 3.5.3, respectively) for a Balanced Transportation System include the following and are discussed below.

Section 3.5.2: Policies for a Balanced Transportation System

- ***Implement land use strategies to achieve a balanced transportation system.*** *To improve the quality of life in the Primary Urban Center and to accommodate growth, development initiatives and regulatory controls should promote the growth of sustainable and appropriate alternative urban travel modes such as transit, walking, and biking.*
- ***Implement Transportation Demand Management strategies.*** *Due to the limited land area and high costs, it is increasingly necessary to shift from increasing roadway and parking capacity to policies and practices that reward use of transit and other alternative modes.*
- ***Implement the Honolulu Bicycle Master Plan.*** *Institutionalize the policy that every street and highway on which bicycles are permitted operate is a "bicycle street," designated and maintained to accommodate shared use by bicycles and motor vehicles.*
- ***Enhance and improve pedestrian mobility.*** *Create special pedestrian districts and corridors and a regional network of pedestrian facilities. Comprehensively address pedestrian safety concerns related to vehicle speeding and excessive volumes on local streets and neighborhood collector streets.*

Section 3.5.3: Guidelines for a Balanced Transportation System

- *Identify and stimulate transit-oriented development on potential infill and redevelopment properties within the rapid transit corridor. Examples of development stimulators include tax incentives, development code amendments, and public infrastructure investments.*

Discussion: While these policies and guidelines primarily relate to larger-scale regional improvements and to City related actions, the Proposed Project will be a mixed-use, bus- and TOD -oriented development of an existing infill site located within the PUC. The new internal streets will be designed as complete streets to support safe pedestrian and bicycle circulation through the site to area bus stops. The project will support the use of existing transit systems through integration of multimodal facilities such as bicycle parking and sidewalks in the site design to improve accessibility to public transit systems. The use of alternative modes of transportation will reduce individual car trips and promote a healthier lifestyle. Thus, the project's impacts to transit facilities and services are intended to support ridership as recommended in the PUC DP.

Section 5.8 of the EIS discusses in further detail the transportation and circulation recommendations, and how the Proposed Project supports improvements to area pedestrian, bicycle, and transit facilities. The project's strong orientation toward "smart growth," creating a multi-modal street network, and bus-based, transit-oriented development is consistent with the Primary Urban Center Development Plan's policies and guidelines described above.

6.3.2.6 Infrastructure and Public Facilities

Chapter 4 of the PUC DP discusses the infrastructure and public facilities that are "vital to all PUC communities. It is intended to give direction to the long-range functional and facility plans that should be prepared by each of the respective service agencies." While intended for City agency implementation, the relevant policies and guidelines for each of the public services are highlighted below and include the respective relevant section of the EIS to reference.

Section 4.1.2: Policies for Water Allocation and System Development

- *Adapt water conservation practices in the design of new developments and modification of existing uses, including landscaped areas.*

Section 4.1.3: Guidelines for Water Allocation and System Development

- *Conserve the use of potable water by implementing the following measures. as feasible and appropriate:*
- *Install low—flush toilets, flow restrictors rain catchment barrels, plumbing fixture meters. And other water conserving devices in commercial and residential developments.*
- *Promote xeriscaping techniques to reduce water use in landscaping by using various ground cover, drought—tolerant plant material and efficient irrigation systems in landscaped areas.*
- *Reuse tertiary treated wastewater effluent, brackish water sources, storm runoff and surface reservoirs for the irrigation of golf courses, parks, other open landscaped areas, and industrial use.*

Discussion: In order to reduce the amount of potable water required to serve the Proposed Project, all efforts will be made to include water reducing design elements into the Proposed Project such as low flow and ultra-low flow fixtures, automated irrigation systems with moisture sensors to prevent overwatering, and water catchment and reuse for non-potable uses such as irrigation. Landscaping will incorporate native and hardy climate-adapted plants that do not require significant amounts of water wherever possible. Water related issues are discussed in detail in Section 5.9.1 of the EIS.

Section 4.2: Wastewater System

None of the policies or guidelines in the PUC DP relate directly to the Proposed Project. However, wastewater issues related to the Proposed Project are discussed in Section 5.9.2.

Section 4.3.2: Policies for Electrical Power

- *Promote and implement energy conservation measures and integrated resource planning.*
- *Planning and building of new or relocated transmission lines should take into consideration system and cost concerns, and the impacts on the environment. Options to place utility lines underground should be considered, and priorities should be established.*

Section 4.3.3: Guidelines for Electrical Power

- *In planning new or relocated substations or transmission lines, the selection of the site or route of such facilities should avoid or mitigate adverse impacts on scenic and natural resources.*

Discussion: The Proposed Project will be designed to be as energy efficient as possible and will consider renewable energy generation such as solar PV to help offset the projected electricity demand. In addition, to help mitigate the visual impact the off- and onsite electrical and telecommunications utility lines will likely be placed underground and the design of the duct system will be in accordance with the specifications and standard practices of the respective utility companies utilizing the duct system. Additional discussion regarding electrical system is provided in Section 5.9.4 of the EIS.

Section 4.4: Telecommunications Facilities

None of the policies or guidelines in the PUC DP relate directly to the Proposed Project. However, telecommunication issues related to the Proposed Project are discussed in Section 5.9.4.

Section 4.5.2: Policies for Solid Waste

- *Reduce the solid waste stream by encouraging recycling and reuse.*

Section 4.3.3: Guidelines for Solid Waste

- *Promote waste recycling by expanding collection facilities and services, and public outreach and education programs.*

Discussion: The Proposed Project will support recycling for both households and commercial uses as well as green wastes generated onsite. Detailed design will include onsite facilities to support separating wastes into recyclable and non-recyclable materials and for central collection facilities within the buildings. Retirement Housing Foundation will also work with the City and contracted collection services to ensure as much recyclable materials are diverted from the waste stream from the project as they will be managing ongoing operations of the site once construction is complete. Best management practices during construction will also be implemented including every effort to divert materials that can be reused or recycled from landfills as well as minimizing the amount of waste generated.

Section 4.6.2: Policies for Stormwater Systems

- *Require methods of retaining or detaining stormwater for gradual release into the ground as the preferred strategy for the management of stormwater. Where feasible, utilize open spaces including parking lots, landscaped areas, parks, and golf courses to detain or infiltrate stormwater flows to reduce their volume and runoff rates. (City Council Resolution No. 94—296).*
- *Manage stormwater flows through best management practices to minimize stormwater runoff and peak discharge rates.*
- *Preserve stream and estuarine habitats.*

Section 4.6.3: Guidelines for Stormwater Systems

- *Integrate planned improvements to the drainage system into the open space network by emphasizing the use of retention basins, the creation of passive recreational areas, and recreational access for pedestrians and bicycles without jeopardizing public safety.*
- *Establish best management practices to guide stormwater management within the Primary Urban Center.*
- *Design and construct stormwater infrastructure in areas that contribute to high inflow and infiltration into the wastewater collection system.*

Discussion: The Proposed Project will be designed and built in compliance with all applicable Federal, State, and City regulations pertaining to storm water management including the City & County of Honolulu's grading ordinance, water quality rules, erosion and sediment control, and LID requirements, and the DOH NPDES permit program. To prevent indirect or cumulative impacts on streams and nearshore resources, BMPs will be implemented during and after construction to prevent erosion from the project into storm drains and the long-term build-up of sediments. Compliance with City's newly adopted "Rules Relating to Water Quality" and LID measures will also mitigate any potential impacts to nearshore resources. Additional measures may include garbage enclosures to prevent leakage or runoff into stormwater drainage areas and the installation of rain gardens and bioswales within landscaped areas to help capture potential pollutants prior to entering the projects drainage system. Onsite catchment and reuse of filtered runoff will also be considered as much as feasible as part of the design of the project. Additional discussion on the drainage system is provided in Section 5.9.3.

Section 4.8.2: Policies for Civic and Public Safety Facilities

- *Provide adequate staffing and facilities to ensure effective and efficient delivery of basic governmental service and protection of public safety.*

Discussion: While the Proposed Project will increase the population within the vicinity of the project, it is not anticipated to substantially increase regional population as it is anticipated future residents will be relocating from the surrounding Lanakila neighborhoods or elsewhere on Oʻahu. As a result, existing public services and facilities may need to adjust existing manpower and resources as needed to serve the Proposed Project. Additional discussion on public safety is provided in Section 5.10.2 of the EIS.

6.3.2.7 Relationship to Primary Urban Center Development Plan Maps

Significant Panoramic Views Map

The PUC DP identifies significant panoramic views in the Primary Urban Center, which includes the Proposed Project. Scenic Views, Section 3.1.1.2 of the PUC Development Plan, discusses the panoramic views of the urban skyline. Map A.1, Significant Panoramic Views depicts vantage points and orientation of major panoramic views within the PUC (Figure 8). View objects identified in this section which may be impacted by the Proposed Project include the Koʻolau Mountain Range, Lēʻahi Crater (Diamond Head) and Pūowaina Crater (Punchbowl). Of these geographical features, only Pūowaina Crater is visible from the Diamond Head end of the Project Site, and that view is largely obstructed presently by existing buildings and the tall light poles of Lanakila District Park. This section of the PUC DP also discusses panoramic views of the urban skyline from arrival points by air and sea, from above the Koʻolau and from outlying areas to the east and west as an important aspect of the City's image, as it establishes a distinctive identity for Honolulu, defines sub-districts within it, and provides directional orientation.

This section of the PUC DP also notes that the lateral extent of Honolulu's skyline is defined by Nuʻuanu Stream on the west and Kapiʻolani Park and Diamond Head on the east. At present, Downtown, with its taller profile and denser clustering of building emphasized by the low-rise profiles of the Chinatown and Hawaiʻi Capitol Districts, is a visually prominent element of the skyline in the western portion of the PUC is less pronounced than in Honolulu.

The PUC DP also discusses framed views, or view "corridors," of mountains and the shoreline along streets that are aligned in the mauka-makai orientation) (including makai to mauka views towards Kamehameha Schools (Kapālama Heights)). The width of the street, combined width of the street, combined with building setback requirements, create and retain these views. Views of the mountains or shoreline along the street are important directional reference points for pedestrians and motorist, particularly those who are not familiar with the City's street system or urban landmarks.

The Proposed Project is linear, and the makai end, fronts North School Street. This portion of School Street (between Lanakila Avenue and Kokea Street) is straight and runs parallel to the general orientation of the PUC (northwest to southeast). However, there is no prominent landform in either direction of School Street, and views of School Street fronting the Project Site include the following prominent features:

- Overhead utility lines on wooden poles along the makai side of School Street fronting apartment buildings (including one approximately 10 stories high) and single-family residences; Tall, 138kV lines on tall metal poles along the mauka side of School Street; Very different scenery along the HPHA frontage (mauka side of School Street) from two permanent looking buildings with hipped roofs setback from School Street and mature trees, to portable and industrial-looking buildings with less mature trees. When there are little or no trees, there are views available of HPHA's Puahala Homes and Kapālama Heights beyond.

The mauka side of the site is largely open and affords views of Puahala Homes and lower Kapālama Heights, which is largely covered by single-family homes.

Discussion:
Three apartment buildings (ranging from 144 to 153 feet in height) on lower-rise podiums (7 to 11 stories) proposed for the Project Site should not impact distant panoramic views of natural landmarks such as Lēʻahi Crater, Pūowaina Crater, Āliamanu Crater from certain viewpoints identified in the panoramic view map (Figure 8). The visual impacts from the project, however, must take into consideration:

- the existing multi-family and single-family development of this area;
- existing buildings such as Maluhia Health Center, Kapuna I, Hale Poʻai, Lanakila District Park Gymnasium and Lanakila Health Center;
- overhead utility lines along both sides of School Street (including 138kV lines on tall metal poles), and along the Diamond Head side of Lanakila Avenue; and
- the tall field lights at Lanakila District Park. (See Figure 9.)

The Proposed Project's current Master Plan's mix of varied building heights and massing creates a more appealing urban form when viewed from a distance and from the nearby streetscape. It breaks up the vertical mass of the buildings, as opposed to a concept where all the buildings are shorter than the multi-family residential buildings in height, but are taller along the street frontages and appear larger and more massive. The plan attempts to mitigate visual impacts, particularly to mauka-makai views and residential properties, located closer to the project by:

- Providing fewer multi-family residential buildings and more space between the multi-family residential buildings to preserve distant views;
- Activating the street level views with commercial uses and lower- and mid-rise multi-family residential buildings along the streets;
- Creating a more interesting skyline by varying building heights;
- Setting the multi-family residential buildings back from the street frontage to minimize view of them from the street level; and
- Orienting the multi-family residential buildings with their narrower sides facing the mauka-makai sides of the site and their wider side facing east-west to preserve mauka to makai views.

Open Space Map

The open space map is intended to illustrate the region's major open space patterns and resources. It highlights major open space elements and resources, including preservation lands; major recreational facilities; agricultural lands, golf courses, and cemeteries, harbors, waterfront promenades, and stream greenbelts; and major institutional campuses. The site (and the adjoining Lanakila District Park) is designated as "Urban Areas" on the open space map.

Discussion: The Proposed Project will not impact public open space resources. Urban open space, including open spaces and outdoor gathering areas, however, are incorporated in the Proposed Project's conceptual Master Plan.

Land Use Map

The Land Use Map illustrates the desired long-range land use pattern for the entire PUC. An Urban Community Boundary defines and contains the intended extent of developed or built-up areas of urban communities. The Project Site is designated as “Lower-Density Residential” and is within the designated Urban Community Boundary.

Medium and Higher Density Residential/Mixed Use designation is generally applied to centrally located neighborhoods that are served by major east-west highways and arterials, as well as by express public transit. As applicable to the Proposed Project, this includes areas of Liliha between the H-1 Freeway and Dillingham Boulevard; and areas across the coastal plain of central Honolulu – i.e., Liliha, Vineyard, Punchbowl, Makiki, Kakaʻako, McCully-Mōʻiliʻili, Waikīkī, and Date Street. This designation refers to a broad range of medium and high-density residential uses that vary in density from 13 to 140 units per acre, with medium density residential ranging from 13 to 90 units per acre and high density residential in the range of 90 to 140 units per acre. Building types range from low-density apartments to high-rise multi-family buildings. The integration or close location of multi-family residential buildings with office and retail services or recreation and community facilities should be encouraged as mixed-use is an essential component of this designation.

District Commercial includes a wide variety of commercial uses and related activities intended to serve district, regional, and/or island-wide populations. These uses typically include major office buildings, shopping centers, professional and business services, municipal services, and commercial activities along major streets. Mixed uses, including appropriate integrated medium or high-density residential facilities, and higher densities are encouraged in these areas.

Discussion: The Proposed Project is not consistent with the PUC Development Plan land use map designation, as higher densities and mixed-uses (residential/commercial) are encouraged in areas designated “Medium and Higher-Density Residential/Mixed-Use” and “District Commercial.” The Proposed Project will have a density of about 133 units per acre, which is lower than the PUC Development Plan’s density of about 140 units per acre. Additional density is required in order to construct the 800 proposed affordable rental apartment units in an efficient and cost-effective manner, in order to assist the State of Hawai’i’s legislative goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026 pursuant to Act 127, SLH 2016, while creating an opportunity for senior residents to access new, high-quality, sustainably-designed rental housing in the urban core of Honolulu in close proximity to a concentration, commercial and retail establishment, medical providers, established bus line and two planned HART rail stations.

6.3.3 City and County of Honolulu Land Use Ordinance

6.3.3.1 Land Use Ordinance Zoning Designation

The Land Use Ordinance, or LUO (Chapter 21, Revised Ordinances of Honolulu (ROH)), is the City and County of Honolulu's zoning ordinance. The LUO regulates land use in accordance with adopted land use policies, including the O'ahu General Plan and Development/Sustainable Communities Plans. The LUO seeks to encourage orderly development and promote and protect the public health, safety and welfare through the establishment of land use regulation and zoning districts.

The Proposed Project property is currently zoned R-5 Residential.

Discussion: The proposed conceptual Master Plan for the Project Site is not consistent with the current R-5 zoning district requirements. However, while a zone change would typically be required, during the EISPN Public Review period, the City and County of Honolulu, Department of Planning and Permitting wrote:

> *"…as a public use and structure, the project could qualify for a Zoning Waiver Permit to waive zoning requirements. As an affordable housing project, it could qualify for exemptions under a Chapter 201H approval. Alternatively, the State may use its preemptive powers to exempt elements of the project from certain County requirements."*

These options are discussed in more detail below.

6.3.3.2 Zoning Waiver Permit

According to the LUO, the strict application of the LUO can be waived by the Director of DPP:

> ***Sec. 21-2.130 Waiver of requirements.***
> *(a) A waiver of the strict application of the development or design standards of this chapter may be granted by the director for the following:*
>
> *(1) Public or public/private uses and structures, and utility installations.*

As a public use and structure, HPHA could file an application for a Zoning Waiver Permit (for the Proposed Project) with DPP for its review and approval.

6.3.3.3 Chapter 201H, HRS

Chapter 201H, HRS was enacted into law to provide a process whereby an affordable housing project may be granted exemptions from any statutes, ordinances and rules of any governmental agency relating to planning, zoning and construction standards that do not negatively affect the health and safety of the general public. Affordable housing projects are eligible if at least half (50 percent) of the units are made affordable to income target groups established by City rules, based on guidelines provided by the U.S. Department of Housing and Urban Development (HUD). The target groups are defined as a percentage (usually 80 to 140 percent) of the median income for Honolulu as determined by HUD.

As the Proposed Project includes 800 affordable rental units that will be targeted to senior households earning 30% to 60% of AMI the Proposed Project clearly meets the spirit and guidelines of Chapter 201H zoning requirements and entitlements could be address pursuant to a Chapter 201H application submitted to DPP.

6.3.3.4 State Exemption

According to Table 21-3 ("Master Use Table"), "Public uses and structures" are permitted in every zoning district (except for P-1). The LUO defines "Public uses and structures" as:

> *"Public uses and structures" means uses conducted by or structures owned or managed by the federal government, the State of Hawai'i or the city to fulfill a governmental function, activity or service for public benefit and in accordance with public policy.*

As the Proposed Project involves the delivery of 800 affordable rental units, this project aligns with the goal of Act 127, Session Laws of Hawai'i 2016. Accordingly, HPHA may use its preemptive powers to exempt the office and affordable housing elements of the project from certain County zoning requirements.

6.3.4 Special Management Area

Chapter 25, ROH, contains the City and County of Honolulu's Special Management Area ("SMA") rules. The SMA rules state that it is the City's policy "to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaiʻi. Special controls on development within an area along the shoreline are necessary to avoid permanent loss of valuable resources and foreclosure of management options, and to ensure that adequate public access is provided to public owned or used beaches, recreation areas, and natural reserves, by dedication or other means. It is also the policy of the City and County of Honolulu to avoid or minimize damage to natural or historic special management area wetlands wherever prudent or feasible; to require that activities not dependent upon a wetland location be located at upland sites; to allow wetland losses only where all practicable measures have been applied to reduce those losses that are unavoidable and in the public interest."

Discussion: The Proposed Project is located outside of the SMA. The SMA does not extend mauka of Sand Island in this area of Oʻahu.

6.3.5 Making Honolulu an Age-Friendly City: An Action Plan

In 2013, the City and County of Honolulu applied for and was accepted into the World Health Organization's (WHO) Global Network of Age-Friendly Cities and Communities and AARP's National Network of Age-Friendly Communities. This initiative was driven by the fact that Hawaiʻi is the most diverse state, and is growing older at a faster pace than the rest of the nation. The Honolulu Age-Friendly City Initiative was led by a well-respected Steering Committee, supported by a Technical Committee and a Citizens Advisory Committee (CAC) comprised of members of the community, including representatives from City and County departments, for-profit companies, non-profit organizations, advocates and the academic community. The University of Hawaiʻi Center on Aging was selected as the consultant for Honolulu's Age-Friendly City Initiative. The Center on Aging team coordinated Honolulu's Age-Friendly City effort, facilitated CAC workgroups, conducted focus groups and key informant interviews, and led in the development of the Making Honolulu an Age-Friendly City Action Plan (Action Plan).

The Action Plan includes a vision for an Age-Friendly Honolulu. The vision in the Action Plan is as follows:

> *"In an age-friendly Honolulu, inter-connected communities embrace older adults who want to remain socially involved and physically active; the city infrastructure remains responsive to capabilities and safety of its people; equitable services enable community-wide health promotion; robust opportunities for intergenerational exchanges exist; and, quality of life thrives among all residents. Honolulu's leadership understands active aging is a lifelong process and this initiative embodies the city's commitment to Honolulu being livable for all ages, not just for older adults. Safe and affordable transportation benefits for all people, young and old. Families experience less stress when they have access to community support and health services for older adults under their care. A barrier-free city infrastructure enhances the mobility and independence of people of all ages with disabilities."*

With this vision of an age- friendly Honolulu, the city embarked on a two year- long community input and planning process to develop this Age-Friendly City Action Plan which was completed in 2015.The resulting Age-Friendly City Action Plan includes a set of visions, goals, and recommendations for Honolulu's age-friendly "domains," which encompasses all facets of community life. The first three domains, Outdoor Space and Buildings, Transportation, and Housing are key features of the built environment and have a strong impact on mobility, safety, and security. The next three domains, include health and social welfare and ensure that we live vibrant and healthy lives over the course of life.

6.3.5.1 Housing

Vision

We envision a city where people have the ability to choose where they want to live as their needs change. Housing is clean, safe, and accessible for all. People are able to connect with their neighbors, and the communities they live in are safe. Public transportation is nearby for those who desire it, along with services like grocery stores, pharmacies, and doctor's offices. People are able to stay in their homes for as long as they desire, and those who chose to relocate to be closer to family or have more help with daily living have affordable options.

Goals and Recommendations for Housing

Goal A: Affordable housing options are widely available

Goal B: Home modifications are affordable and widely available to older adults and persons with disabilities

Goal C: Age-friendly design is incorporated in new housing communities and units

Discussion: As noted earlier in Section 5.7.1, the existing the Proposed Project census tract data reveals that:

- The population in Kalihi-Pālama is older, on average, that the island's population;
- The median age in the ZCTA is much higher than that of the island's population;
- Senior citizens (age 65 or older) account for 22 percent of the ZCTA population, but only 15 percent of the island population.

The Proposed Project will provide 800 new, affordable senior rental apartment units near Downtown Honolulu. All of the residential units are proposed as affordable (targeting senior households earning 30% to 60% of AMI. The Proposed Project is envisioned to be a cohesive community that combines a mix of residential, retail, commercial, and public office spaces in a compact, bus and TOD oriented project located in the PUC. The project's unique mixed-use character and high-quality design will create a community with comfortable streets for walking or biking, and a mix of uses complementary to the surrounding neighborhood with convenient access to existing bus line and two planned HART rail stations. Accordingly, the proposed project meets or exceeds the stated goals of the Age-Friendly City Action Plan.

6.3.6 Complete Streets

Complete streets are part of a transportation and design approach that aims to create a comprehensive, integrated network of streets that are safe and convenient for all people whether traveling by foot, bicycle, transit, or automobile, and regardless of age or ability. Complete Streets move away from streets designed with a singular focus on automobiles toward a design approach that is context-sensitive, multimodal, and integrated with the community's vision and sense of place. The end result is a road network that provides safe travel, promotes public health, and creates stronger communities.

The City and County of Honolulu is committed to complete streets solutions that improve safety, accessibility, and comfort for all users, encourage physical activity, and reflect community needs and character. In 2009, the State passed a law requiring all Counties and the State DOT to adopt a Complete Streets policy. In 2016, the City and County of Honolulu finalized its Complete Streets Design Manual and hired a Complete Streets Program Administrator to move toward implementation of improvements that make Honolulu's streets and neighborhoods safe and inviting for all users, regardless of age or ability.

The City and County of Honolulu is working to implement Complete Streets by updating policies, adopting guidelines, and applying these principles in all aspects of work. This includes incorporating Complete Streets features in roadway repaving projects, as well as location-specific improvements. the Proposed project intends embrace and incorporate and implement Complete Streets concepts as part of its final Master Plan however, as of the date of issuance of the draft EIS, no details were available regarding the timing of the Complete Streets plans for School Street. The City's recommended Complete Streets improvements to School Street could have a significant impact on the design of the walkways, landscaping, and street furniture along the project's frontage along School Street. As such, the implementation of the Complete Streets program has been identified as an "Unresolved Issue" under Section 8.6.

6.4 REQUIRED APPROVALS AND PERMITS

The following is a preliminary list of the anticipated permits and approvals required for the implementation of the Proposed Project and is subject to change over the course of the redevelopment. They are listed by the jurisdiction and agency who oversee approval of the permit applications.

Honolulu City Council

- Rezoning or 201H, HRS

City and County of Honolulu Department of Planning and Permitting:

- Zoning Waiver (if not Rezoning or 201H, HRS above)
- Grubbing, Grading, and Stockpiling Permit
- Building Permit for Building, Electrical, Plumbing, Sidewalk/Driveway, and Demolition Work
- Sewer Connection Permit

City and County of Honolulu Department of Transportation Services:

- Street Usage Permit

State of Hawaiʻi Department of Health:

- NPDES Permit
- Noise Permit

State of Hawaiʻi Department of Transportation:

- Permit to Perform Work within a State Right of Way

State Historic Preservation Division:

- Historic Site Review

7 ALTERNATIVES TO THE PROPOSED ACTION

Under HAR Title 11, DOH, Chapter 200, Environmental Impact Statement Rules, Section 11-200-17(F), a Draft EIS must contain a section discussing alternatives that could attain the project objectives regardless of cost, and in sufficient detail to explain why the specific alternative was rejected. This section describes alternatives to the Proposed Project design, along with reasons why each alternative was rejected. As stated in Section 3.1 (Statement of Objectives) of this EIS:

HPHA's objectives for this project include:

i. *Increasing the supply of affordable rental housing. On June 29, 2016, SB2561, SD2, HD1, CD1, was signed into law as Act 127, Session Laws of Hawai'i (SLH), to address the critical need for affordable housing in Hawai'i, establish a rental housing goal, and establish a Special Action Team on affordable rental housing, chaired by the Director of the Office of Planning (OP), to make recommendations on actions to promote rental housing. The goal is to develop or vest the development of at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026. The Proposed Project is intended to help fulfill this goal.*

ii. *High quality design. The design of the new affordable rental housing units should take into consideration innovative and non-traditional design that maximizes space and resources for greater utility and which is cost-effective, sustainable, and replicable in an extremely high-cost environment.*

iii. *Sustainable design. Create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project.*

iv. *Leverage resources. Pursue funding sources appropriate for the redevelopment program and maximize private funding to minimize the need for public resources. Work collaboratively with local, state and federal agencies, for-profit organizations, non-profit organizations, etc. to identify a variety of resources to support the redevelopment effort…*

v. *Neighborhood integration. Create a diverse new community that is incorporated into the surrounding neighborhood, strengthens the economic vitality of the area and supports the functions of daily life.*

vi. *Developing new Administrative Offices for the HPHA. The HPHA desires a new, modern central office in which to operate its federal and state low-income public housing and rental subsidy administrative programs. The office space needs to be able to accommodate HPHA's current staff of approximately 200 employees and current space requirements of approximately 30,000 square feet.*

The Hawaii Public Housing Authority ("HPHA") will be partnering with Retirement Housing Foundation ("RHF") under a Master Development Agreement to redevelop an underutilized land parcel housing

HPHA's existing, outdate offices and maintenance facilities, with a new, mixed-used development containing 800 affordable, age-restricted senior apartments, ancillary commercial uses and a new efficiently designed 30,000 square foot office building for HPHA's operations. All of the residential units are proposed as affordable and will be marketed to senior households earning 30% to 60% of AMI. This project is critical to achieving the State's goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026. The alternatives considered for the Proposed Project included:

- "No action";
- Mixed-use development containing 1,000 total residential units; (with 60% targeting families, and 40% targeting seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building
- Mixed-use development containing 1,000 total residential units; (with 40% targeting families, and 60% targeting seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building
- Mixed-use development containing 1,000 total residential units; (with 100% seniors); 10,000 square feet of ancillary commercial uses, 30,000 square foot HPHA office building

7.1 NO ACTION

The No Action alternative does not accomplish any of the stated project objectives as it leaves the existing site in its current condition. HPHA's existing, functionally obsolete administrative offices and maintenance facilities would remain in their current condition, and no additional housing units would be developed toward Act 127's stated goal of achieving at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026. Presently, the project area does not provide any affordable senior rental apartments.

7.2 ALTERNATIVE PROGRAMS

7.2.1 1,000 total residential units; (60% family, 40% senior units)

In addition to the Proposed Projects current mixed-use, Master Plan of800 affordable senior apartment program, an alternative of 1,000 apartments consisting of a mixture of family (60%) and senior (40%) units was considered. In general, with a typical household size of 3 more occupants, apartments designed for families usually require 2 or more bedrooms. Thus, the number of apartments that can be provided per floor reduces, requiring more floors to accommodate the same number of apartments, resulting in taller building heights and visual impacts.

Also, since the number of working adults or number of occupants who drive to work or school is larger than the number of seniors who need a car or still drive, more parking stalls are required for apartments designed for families than those designed for seniors. Since the off-street parking needs to be accommodated in a parking structure, and a typical family-sized apartment of between 600 square feet (SF) but less than 800 SF is required to provide 1.5 parking stalls (apartments larger than 800 SF in size need to provide two parking stalls; apartments smaller than 800 SF in size only need to provide one parking stall), the size of parking structures for apartments designed for families is larger than parking structures for all-senior units, especially since the off-street parking requirements for senior apartments is 0.5 stall per senior unit.

Table 7-1: Parking Structure Costs (60% Family, 40% Senior)

Program	# of Senior Stalls	# of Family Stalls (High)	# of Family Stalls (Low)	Cost per Stall (High $50,000/stall)	Cost per Stall (Low $28,000/stall)
Proposed Project					
800 All Senior	400			$20,000,000.00	$11,200,00.00
Alternative of 1,000 total residential units; (60% family, 40% senior units)					
1,000 (60% Family, 40% Senior)	200	1200		$70,000,000.00	$39,200,000.00
1,000 (60% Family, 40% Senior)	200		900	$55,000,000.00	$30,800,000.00

The alternative program of family (60%) and senior (40%) units totaling 1,000 units was deemed to be less desirable than the proposed action for the following reasons:

- Greater massing and scale of the buildings than the proposed all-senior residential project;
- Greater number of cars (1,100 to 1,400) vs. 400 cars (for 800 unit, all senior project);
- More project-related impacts on nearby intersections;
- Greater cost to project to provide parking ($30.8 million to $70 million) vs. $11.2 million to $20.0 million (for an 800-unit, all senior project);
- Longer construction duration, and longer duration of construction-related noise, vibration, and dust impacts.

7.2.2 1,000 total residential units; (40% family, 60% senior units)

In addition to the Proposed Project's current mixed-use Master Plan program of 800 affordable, all-senior apartments, an alternative of 1,000 apartments consisting of a mixture of family (40%) and senior (60%) units was considered. In general, with a typical household size of 3 more occupants, apartments designed for families usually require 2 or more bedrooms. Thus, the number of apartments that can be provided per floor reduces, requiring more floors to accommodate the same number of apartments, resulting in taller building heights and greater visual impacts.

Also, since the number of working adults or number of occupants who drive to work or school is larger than the number of seniors who need a car or still drive, more parking stalls are required for apartments designed for families than those designed for seniors. Since the off-street parking needs to be accommodated in a parking structure, and a typical family-sized apartment of between 600 square feet (SF) but less than 800 SF is required to provide 1.5 parking stalls (apartments larger than 800 SF in size need to provide two parking stalls; apartments smaller than 800 SF in size only need to provide one parking stall), the size of parking structures for apartments designed for families is larger than parking structures for all-senior units, especially since the off-street parking requirements for senior apartments is 0.5 stall per senior unit.

Table 7-2: Parking Structure Costs (40% Family, 60% Senior)

Program	# of Senior Stalls	# of Family Stalls (High)	# of Family Stalls (Low)	Cost per Stall (High $50,000/stall)	Cost per Stall (Low $28,000/stall)
Proposed Project					
800 All Senior	400			$20,000,000.00	$11,200,00.00
Alternative of 1,000 total residential units; (40% family, 60% senior units)					
1,000 (40% Family 60% Senior,)	300	800		$55,000,000.00	$30,800,000.00
1,000 (40% Family 60% Senior,)	300		600	$45,000,000.00	$25,200,000.00

The alternative program of family (40%) and senior (60%) units totaling 1,000 units was deemed to be less desirable than the proposed action for the following reasons:

- Greater massing and scale of the buildings than the proposed all-senior residential project;
- Greater number of cars (900 to 1,100) vs. 400 cars (for 800 unit, all senior project);
- More project-related impacts on nearby intersections;
- Greater cost to project to provide parking ($25.2 million to $55 million) vs. $11.2 million to $20.0 million (for an 800-unit, all senior project);
- Longer construction duration, and longer duration of construction-related noise, vibration, and dust impacts.

7.2.3 1,000 total residential units; (100% senior units)

In addition to the Proposed Project's current mixed-use Master Plan program of 800 affordable all-senior apartments, an alternative of 1,000 all-senior residential units was considered. The alternative program of 1,000 all-senior units compares to the Proposed Project (800 all-senior units) as follows:

- Greater massing and scale of the buildings than the proposed 800-unit residential project;
- Greater number of cars (500) vs. 400 cars (for the proposed 800-unit, all-senior project);
- Greater cost to project to provide parking ($14.0 million to $25 million) vs. $11.2 million to $20 million (for the proposed 800-unit, all-senior project);
- Shorter construction duration, and shorter duration of construction-related noise, vibration, and dust impacts.

Table 7-3: Parking Structure Costs for 100% Senior Alternatives

Program	# of Senior Stalls	# of Family Stalls (High)	# of Family Stalls (Low)	Cost per Stall (High $50,000/stall)	Cost per Stall (Low $28,000/stall)
1,000 All Senior	500	0	0	$25,000,000.00	$14,000,000.00
800 All Senior	400			$20,000,000.00	$11,200,00.00

7.3 ALTERNATIVES TO SITE PLAN OF HPHA REPLACEMENT OFFICES

During the EISPN Public Review period, the State Office of Planning wrote:

> *8. The DEIS should consider alternative site plans that would incorporate the HPHA administrative offices within the mixed-use center to encourage: (I) clustering of HPHA services near adjacent public services on Lanakila Avenue and the co-location of other public services within the complex; (2) capitalizing on proximity to the signalized cross-walk to improve access to onsite services and reduce pedestrian and vehicular conflicts when accessing the site; and (3) the reduction of impervious surface area and allow green space for residents at the western end of the Project Site.*

While the integration of the HPHA offices within the mixed-use center of the Proposed Project to encourage clustering of HPHA services near adjacent public services is a logical alternative, it is potentially problematic from a financing perspective, particularly with respect to perfecting a prospective lenders security interest in various aspects of the Proposed Project and restrictions and prohibitions relating to Low Income Housing Tax Credits financing that will likely be sourced for the residential portion of the Proposed Project.

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8 CONTEXTUAL ISSUES

8.1 RELATIONSHIP BETWEEN THE SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The relationship between the short-term uses of the environment and the long-term productivity of the Proposed Project primarily involve the short-term impacts during construction and the transition of the site from its current public agency administrative use to a mixed-use, mixed-income neighborhood. Short-term impacts during construction include temporary noise, air quality, and vibration impacts from the demolition of the existing buildings, required sitework and preparation, and construction of the new buildings. Groundwork will disturb soils and construction must stop if any inadvertent archaeological finds are unearthed. Traffic, including pedestrian, bicycle, bus, and vehicle circulation, may also be impacted temporarily during construction when materials and equipment are transported to the site and if any lane or road closures are required (Section 5.8). Additional mitigation will also be required since the construction is anticipated to occur in phases potentially impacting nearby residences.

Mitigation measures to these short term impacts are detailed in Sections 5.3, 5.4, and including the requirement that contractors shall be required to adhere to all federal, State, and City regulations and to ensure the use of proper equipment and regular vehicle maintenance reduce noise, vibration and airborne contaminates. Best practices shall be employed to minimize soil erosion, sediment runoff, and dust such as installation of dust screens and silt fences/bales and careful dewatering practices will be implemented. Construction will also be limited to daylight hours to minimize noise impacts to residents living onsite during construction and potential traffic impacts will be Coordinated with State and City traffic control operations.

These short-term impacts will cause temporary inconveniences that will be mitigated as much as possible during demolition and construction, that, unfortunately, must be endured in order to redevelop a presently under-utilized site that will benefit hundreds of future residents by allowing them to access safe, decent and affordable housing that is convenient to public transportation , located in close proximity to the urban core of Honolulu, with access to commercial and social services located nearby.

8.2 CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. The following section briefly describes the potential cumulative impacts the Proposed Project may have in conjunction with other area improvements and projects. Known major projects or long-range development plans within the vicinity of the Proposed Project at the time of this EIS include: Honolulu High-Capacity Transit Corridor Project (HHCTCP) or HART Rail Transit project, which will span 20 miles between East Kapolei and Honolulu and include 21 transit stations along the length of the rail line. The planned Iwilei Station is within a mile of the site and will be within a short bus trip of the property. In addition, HPHA's Mayor Wright Homes Redevelopment is roughly three-quarters of a mile to the southwest of the Proposed Project. While all of the projects are still in the early planning stages, there are likely to be cumulative impacts related to all of these potential developments within a roughly one-mile radius of each other.

As discussed in Sections 6.3.1 and 6.3.2, which highlight the Oʻahu General Plan and the PUC DP, the overall intensification of land uses within the urban core is a major goal of the City's long-range vision for Oʻahu's general development pattern. All of these plans emphasize the need for the existing urban core around Honolulu to remain the PUC of the island (with a secondary center in ʻEwa) in order to preserve and maintain the remaining rural areas.

The cumulative intensification of development in the urban core will also likely alter the regional cityscape and view planes. However, the Proposed Project's Master Plan has been designed to mitigate visual impacts by orienting the taller buildings with their longer sides running mauka-makai. The Proposed Project will also include landscaping and open space to support community activities and pedestrian, bicycle, and transit use to reduce impacts to vehicular traffic.

Cumulative impacts may also occur to the economy as the mix of uses in the area diversifies and is able to support additional businesses and services. The surrounding land values may also increase due to increased activity and densities. New activity and density may potentially increase tax revenues for both the State and the City in general excise tax, income tax, and property tax collections. However, because the Project Site is State-owned, it will not contribute to increased property tax revenues except for the onsite commercial uses. Smaller property owners in the area may be impacted disproportionately as increasing land values will also increase the amount of property tax they will pay which may impact the ability for smaller businesses and homeowners to remain in the area.

Cumulative impacts may also change the demographics of the area, impacting existing social networks and increasing the interactions between different income and ethnic groups. Section 5.7 discusses the potential impacts from affordable rental apartments, new commercial activity, and residents' ages are anticipated to improve the overall social-economic conditions of the Kalihi area as well as improve safety as natural surveillance will increase with the anticipated increase in residents and human activity in the area. Individual and community health are also anticipated to improve as residents will be able to circulate easily within this new mixed-use community and access needed services and businesses, which will be in close proximity to residences, social and medical services, and recreational amenities.

Temporary cumulative impacts related to construction may also occur should the construction phases of the above projects overlap. Potential temporary impacts to air quality, stormwater runoff, noise, and vibration may be compounded with multiple active construction sites in close proximity to each other. Temporary traffic and pedestrian and bicycle circulation impacts could be worsened if multiple roadways in the area are impacted by temporary lane or road closures. Coordination with State and City traffic control operations will be key to mitigating such impacts. There may also be cumulative impacts related to shortages of construction materials, skilled contractors, and other related inputs during the construction phases should multiple projects be under construction at the same time.

8.3 SECONDARY IMPACTS

Secondary impacts include those that are indirectly caused by the action and are later in time or are farther removed in distance, but are still reasonably foreseeable.

As discussed in Section 5.7, secondary socio-economic impacts are anticipated to result from the Proposed Project such as induced increases in the labor force and respective wages both during construction (47.4 to 229 induced and indirect jobs per year from 2021 to 2028, with $4.8 million to

$22.7million in total wages) and after construction (37jobs with a total of $1.9 million in wages through 2032).

Public services, such as the City's Police Department, may need to increase budgets or reallocate resources and staff as a secondary impact to serve the increased senior population at the site. Similarly, the increased population may have the secondary impact of the increased need for social services, medical services, and community programs, which may bring additional businesses and workers to the area. The Proposed Project anticipates having onsite social services and community programs. The Proposed Project is located next to Lanakila Multi-Purpose Senior Center (LMPSC) and the Lanakila Health Center, which are both anticipated to serve the Proposed Project's residents and surrounding neighborhood. Each already provides services to area residents. Additional discussion regarding this topic is provided in Section 5.10.

Increased ridership at existing and planned public transit facilities may result from the increased population either living or working at the site and that may have the secondary impact of crowded transit stops and the need to provide adequate space or improve existing space to safely accommodate those waiting at transit stops. Although the site is currently well-served by bus transit, there may be a point at which transit service may need to be increased if ridership increases beyond the capacity of current service. It's possible that public transportation may be supplemented by taxis or ride-sharing services (such as GoGoGrandparents).

Secondary social impacts involve subsequent changes resulting from the increased population onsite. Combined with the anticipated growth of the surrounding community, this may include a more diverse mix of ethnicities and income levels in the area, as well as changes in human behavior or activity. With more people living and circulating in the area at all hours of the day, natural surveillance increases, which may result in increased safety in the area as increased activity creates less desirable circumstances for illicit activities. More community activities and opportunities to meet people from diverse backgrounds may also stimulate new social networks and relationships between future residents, visitors, and future business or social services patrons to the site.

Future residents, who will be able to walk, bike, or take transit to work, or shop or recreate closer to home, may experience improved health benefits from the increased physical activity. They may also receive economic benefits as they will be able to save money on annual vehicle costs, which then allows for increased saving or reinvestment in the community by their increased spending on household essentials, education, and/or leisure/entertainment activities. For those who are reducing their commute time, particularly if they once drove long distances to work, they would be contributing to positive secondary impacts including reducing impacts to regional traffic, vehicle emissions, and fuel consumption, and increasing individual's economic efficiencies by reducing the amount of money spent on transportation and redistributing that spending to other purposes such as housing, child care, and nutrition. They will also have more time to exercise, or spend time with family and friends, which also improves their mental and emotional wellbeing as well as potentially their physical health. The availability of community gardens will also improve access to fresh air and fresh produce which in turn improves the health and physical wellbeing of future residents.

Secondary impacts related to increased utilities and infrastructure required to serve the Proposed Project may include induced jobs as discussed above for those utilities and infrastructure systems serving the Proposed Project such as telecommunication services, water, wastewater, electricity and solid waste, green waste, and recycling handlers and processors who will receive the increased materials from the Proposed Project. However, the Proposed Project is not anticipated to increase the overall population of Oʻahu as it is anticipated that the future residents of the project will be either from the existing area or Oʻahu residents with increased access to affordable housing who desire to live closer to the urban core of Honolulu. In this case the secondary impact is the shifting of demand on existing resources and services from other parts of the island only if the new residents and businesses are relocating from outside of the surrounding community. Increased GHG due to the 9.7 MW of electrical demand generated by the Proposed Project and vehicle noise and emissions due to increased traffic are also secondary impacts of the Proposed Project, which are discussed in more detail in Sections 5.3 and 5.5.

New internal street networks for the Proposed Project as well as the increased population and anticipated increases in pedestrian, bicycle and vehicle circulation, may require safety improvements in the surrounding street network to minimize the potential for conflicts between cars, pedestrians and bicyclists. The TIAR recommended two pedestrian enhancements that should be considered even without the Proposed Project as described in Section 5.8.3. In addition, the City of Honolulu's Complete Streets Program is actively evaluating the street networks throughout Honolulu and applying repaving and site-specific improvements to make them safe and inviting for all users, regardless of age or ability, in order to support increased multimodal transportation and bus-based-TOD projects such as the Proposed Project. The City of Honolulu is also embarking on an Oʻahu Pedestrian Plan, which will take a closer look at pedestrian facilities throughout its entire street network and make comprehensive recommendations on improving safety and connectivity for pedestrians.

8.4 POTENTIALLY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The construction of the Proposed Project will require the irreversible and irretrievable commitments of construction materials and the various resources used to demolish and construct the new facilities. These construction-related impacts will be temporary and will be offset by the urgently required greater social need of creating more affordable rental apartment units in mixed-use neighborhoods that are well connected to their surrounding community.

There will also be an increased demand for electricity and water to service the Proposed Project once built, which will be designed to maximize energy and water efficiency to help mitigate these impacts. There are also opportunities to reduce projected demands by installing solar PV to offset some of the electricity demand and using rainwater catchment systems to reduce non-drinking water demands. These potential mitigants are further detailed in Sections 5.9.4 and 5.9.1.

The impacts associated with the irreversible and irretrievable commitment of resources should be weighed against the significant positive and recurring benefits that will derive from the implementation of the Proposed Project. These include but are not limited to the significant increase in the amount of affordable rental apartments within the urban core of Honolulu, as well as providing safe and open spaced for recreation and gathering on site., and the transformation of the Project Site, from and under-utilized land use, into a vibrant mixed-use, mixed-income project that is well-connected to its community, where future residents will be able to walk, and take public transit to nearby businesses and medical services, reducing potential traffic impacts and increasing health and wellness and economic benefits.

Any irreversible and irretrievable commitment of resources should also be weighed against the consequences of taking no action which would continue to limit the options for seniors who desire affordable housing alternatives, or the implementation of less desirable alternatives for the site as described in Section 7 or locating the Proposed Project in less desirable locations such as outside of the urban core, which may require increased commitments of resources (such as energy and water) that may be more expensive to provide and negatively impactful to rural areas.

8.5 PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Some of the probable adverse effects that cannot be avoided are the removal of the existing older buildings presently existing on the Project Site. Although these buildings do not appear to be of significant historical value, the project team is working with SHPD to develop appropriate mitigation measures which may include interpretative information integrated into the design of the project that highlights the importance and richness of the site's history and the people who worked there as discussed in Section 5.1.

Once constructed, The Proposed Project may also create visual impacts as a result of the increased building heights compared to current conditions. In order to help preserve distant mauka views, the apartment buildings will be designed with their longer sides running mauka-makai as discussed in Section 5.6.

Increased demands on infrastructure and utility services and the associated impacts to those resources and the demolition and construction processes may have temporary adverse environmental effects. However, as discussed in Section 5, energy and water efficient design will be incorporated throughout the project to help reduce demand. Temporary impacts associated with construction, including potentially adverse impacts to noise and air quality, will be mitigated to the fullest extent possible and all required Federal, State, and City regulations and control measures will be implemented.

8.6 RATIONALE FOR PROCEEDING WITH THE PROPOSED ACTION NOTWITHSTANDING UNAVOIDABLE EFFECTS

As discussed in Section 1.1.1, Oʻahu residents are experiencing an affordable housing crisis, with increasingly unaffordable housing prices. There is an acute shortage of affordable rental housing options, particularly in the urban core of Honolulu, and many seniors live with the constant threat of homelessness due to the high cost of housing and living in Hawaiʻi. The Proposed Project will increase the supply of affordable rental apartments by 800 units. All of the residential units are proposed as affordable targeting senior households earning 30% to 60% of AMI. The Proposed Project is ideally located in the urban core of Honolulu, near a concentration of retail and commercial facilities, medical providers, infrastructure, and existing and planned public transportation networks. Redeveloping and existing under-utilized infill location reduces the pressure to develop in more rural areas that may be more adversely impacted by the Proposed Project as they may not have the same access to infrastructure, utilities, and transportation networks to adequately support a development of this scale and would likely result in more significant negative impacts including greater reliance on automobiles and the resulting traffic congestion and fuel related impacts, consumption, air and noise pollution and increase degradation of rural areas.

The Proposed Project also represents the efficient use of public resources (State-owned land) by leveraging both private and public funding to redevelop an existing urbanized site. It attempts to balance the potential impacts of the intensification of uses onsite with the social and environmental considerations of creating a high-quality, comfortable, and inviting community to live, work, and play in that may improve the health, well-being and overall quality of life for its future residents.

8.7 MITIGATION MEASURES PROPOSED TO AVOID, MINIMIZE, RECTIFY OR REDUCE IMPACT

Some of the probable adverse effects that cannot be avoided are the removal of the existing buildings. However, the project team is working with SHPD to develop appropriate mitigation which may include interpretative information integrated into the design of the project that highlights the importance and richness of the site's history and the people who worked there as discussed in Section 5.1.

The cumulative intensification of development in the urban core will also change the regional cityscape and viewplanes. However, the proposed development will be designed to mitigate visual impacts by orienting the taller buildings with their longer sides running mauka-makai. The project will also include landscaping and open space to support community activities and pedestrian, bicycle, and transit use to reduce impacts to vehicular traffic.

There will also be an increased demand for electricity and water to service the new facilities once built, but the Proposed Project will be designed to maximize energy and water efficiency to help mitigate these impacts. There are also opportunities to reduce projected demands by installing solar PV to offset some of the electricity demand and using rainwater catchment systems to reduce non-drinking water demands. These are detailed in Sections 5.9.4 and 5.9.1.

8.8 UNRESOLVED ISSUES

8.8.1 City and County of Honolulu's Complete Streets Program

As noted in Section 6.3.6, the City and County of Honolulu is working to implement Complete Streets by updating policies, adopting guidelines, and applying these principles in all aspects of work. This includes incorporating Complete Streets features in roadway repaving projects, as well as location-specific improvements. We understand that School Street will undergo an analysis and plan for implementing Complete Streets; however, as of the date of this EIS, no details were available about the timing of the Complete Streets plans for School Street. The City's recommended Complete Streets improvements to School Street could have a significant impact on the design of the walkways, landscaping, and street furniture along the project's frontage along School Street. As such, the implementation of the Complete Streets program is identified as an "Unresolved Issue".

8.8.2 City and County of Honolulu's Land Use Permits Process

The development team has not yet decided whether the Proposed Project will pursue a Zoning Waiver, Rezoning, or a 201H, HRS expedited process with the City and County of Honolulu Department of Planning and Permitting (DPP). An initial pre-consultation meeting was held with DPP on November 30, 2016, to discuss the project's permit options. Retirement Housing Foundation is currently weighing the benefits, costs, and complexity of each process. Therefore, rezoning, Zoning Waiver Permit and 201H, HRS process are listed under Section 6.4, Required Approvals and Permits, as potential options and is currently identified as an unresolved issue. Coordination with DPP will continue and the development team hopes to make a decision by the time the Final EIS is submitted.

9 PUBLIC ENGAGEMENT & CONSULTATION

9.1 PUBLIC ENGAGEMENT THROUGH THE CONCEPTUAL MASTER PLAN PROCESS

The Master Planning process involved a series of community meetings and charrettes that engaged with community members and stakeholders as co-designers in the planning and designing of the Proposed Project.

The first community meeting was held on October 12, 2016, at the HPHA office on North School Street. At this meeting, neighborhood residents and other community stakeholders discussed their neighborhood's assets and needs, and how the proposed Redevelopment could affect them, thereby providing valuable input to HPHA and the planning and development team.

The second community meeting was held on the evening of November 29, 2016, at the HPHA offices, and a follow-up workshop was held during the daytime on November 30, 2016, at the adjacent Lanakila Multi-Purpose Senior Center. At both November meetings, attendees provided meaningful suggestions for programs, services, and amenities for the Proposed Project. Attendees at the November 29 meeting also provided recommendations regarding the Project Site's layout and its connectivity (vehicular, pedestrian, and bicycle) to the surrounding neighborhood.

In January 2017, two 2-day charrettes and public meetings were held. The first 2-day charrette and public meeting was held on January 26 at the HPHA office, and on January 27 at the Lanakila-Multi-Purpose Senior Center. During Charrette #1, neighborhood residents and other community stakeholders previewed and provided input on alternative site plans and architectural style. The community's input was then incorporated into an updated draft conceptual plan for the second 2-day charrette & public meeting, which was held on January 30 at the HPHA office, and on January 31 at the Lanakila Multi-Purpose Senior Center. At Charrette #2, participants previewed the resulting updated draft conceptual plan and provided additional input and comment, which has informed further revision and refinement of the master plan. During the most recent presentations, the number of units studied was 1,000 rental apartments, however, no decision was made regarding whether the units would be for families or seniors or a combination of both.

A final round of community meetings was held for the Conceptual Master Plan. The same meeting agenda was conducted in the evening of October 18, 2017, at the HPHA Administrative Offices Board Room and again the following morning, October 19, 2017, at the Lanakila Multi-Purpose Senior Center. Over 60 people were in attendance on the 18th and 30 attended the meeting at the Senior Center the following day.

A Power Point presentation was shared that documented the progression of plans for the redevelopment project based on the community’s input. The presentation addressed the urgent need for additional affordable housing in Hawai’i. While citizens have expressed concerns about the number of units, they appeared to have gained a better understanding of the social need safe, decent and affordable housing for all residents. During the presentation, it was explained how the redevelopment project happening on under-utilized state land positively impacts the cost of the overall project.

Additional impacts from community feedback include:

1. Desire for both public and private green space.
2. No standalone parking building. Parking now included within the apartment buildings.
3. Building heights are stepped back so that the full height is not noticeable from the street.
4. The development serves seniors.

Participants were asked to discuss and document responses to the following questions that will further influence the development of the project in the next stages.

a. How can the HPHA development be the best neighbors?

   The community is most concerned about two elements. First, how will the Proposed Project impact infrastructure - namely sewer, water, electricity and transportation. While discussed at the round 6 meetings, community members appeared unclear that the EIS process would establish how the Proposed Project would impact infrastructure and that project will be designed to meeting existing capacity and planned upgrades. The second consideration desired by the community was for consideration regarding the scale and design of the Proposed Project in order to maintain and compliments the character of the existing neighborhood.

b. What amenities in the public green space can best serve the community?

   The most consistent recommendation is for there to be as much public and private green space as possible. The community wants gardens, benches, and walking paths. Additionally, there is a strong desire to save the trees.

c. What about this community can the HPHA redevelopment best celebrate? –

   The two most popular characteristics of the neighborhood that the community wants to maintain and celebrate – diversity and walkability.

9.2 EIS PUBLIC ENGAGEMENT

In the course of Master Planning for the Proposed Project, consultation comments were solicited from agencies and organizations that may have an interest in the project. This process helped inform the preparation of the EIS.

9.2.1 Act 172-12 EISPN Consultation

Various Federal, State, and County agencies, as well as organizations and members within the community, were consulted with or provided comments on the EIS Preparation Notice (EISPN) which aided in the preparation of the Draft EIS.

The EISPN was distributed for review and input to the following agencies, organizations, and individuals indicated in the table below with a check mark (√). The EISPN was also available on the OEQC website and published in the August 23, 2017 edition of *The Environmental Notice*. The EISPN was also sent to various media outlets and libraries including all public regional libraries to provide availability to the public. The public comment period was from August 23, 2017 to September 22, 2017. If comments were received on the EISPN, the date of the comment is indicated in the table next to the respective agency, organization, or individual's name. Comment letters and the respective responses can be found in Appendix O.

Table 9-1: Act 172-12 EISPN Consultation

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
FEDERAL AGENCIES		
U.S. Fish and Wildlife Service	√	
U.S. Department of the Interior, U.S. Geologic Survey	√	9/20/17
U.S. National Marine Fisheries Service	√	
U.S. Department of the Interior, National Park Service	√	
U.S.D.A., Natural Resources Conservation Service	√	
U.S. Army Corps of Engineers	√	
Department of the Navy	√	
Federal Aviation Administration	√	
Federal Transit Administration	√	
Federal Highway Administration	√	
U.S. Coast Guard	√	
Environmental Protection Agency	√	
Federal Emergency Management Agency	√	
STATE AGENCIES		
Hawaii Public Housing Authority	√	
Office of Environmental Quality Control	√	
Department of Agriculture	√	
Department of Accounting and General Services (DAGS)	√	9/15/17
Department of Accounting and General Services - Archives Division	√	
Department of Business Economic Development & Tourism (DBEDT)	√	
DBEDT, Hawaiʻi Housing Finance & Development Corporation	√	
DBEDT, Strategic Industries Division (formerly Energy Resources and Technology Division)	√	
DBEDT, Office of Planning	√	9/15/17
Department of Defense	√	8/29/17

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
Department of Education	√	9/13/17
Department of Hawaiian Home Lands	√	
Department of Health, Environmental Health Administration	√	
Department of Health, Environmental Planning Office		9/14/17
Department of Human Services	√	9/1/17
Department of Human Services, Hoʻopono Services for the Blind Branch		9/8/17
Department of Land and Natural Resources (DLNR)	√	9/20/17
DLNR, Historic Preservation Division (SHPD)	√	
Department of Transportation	√	9/25/17
Office of Hawaiian Affairs	√	
CITY & COUNTY OF HONOLULU AGENCIES		
Department of Environmental Services	√	
Department of Design and Construction	√	9/7/17
Department of Facility Maintenance	√	8/31/17
Department of Parks and Recreation	√	
Department of Community Services	√	
Board of Water Supply	√	8/28/17
Honolulu Fire Department	√	8/30/17
Department of Planning and Permitting	√	9/22/17 & 10/12/17
Honolulu Police Department	√	8/24/17
Department of Transportation Services	√	9/19/17
Honolulu Authority for Rapid Transportation	√	
ELECTED OFFICIALS		
The Honorable David Ige, Governor	√	
The Honorable Brian Schatz, U.S. Senator	√	
The Honorable Mazie Hirono, U.S. Senator	√	
U.S. House of Representatives First Congressional District Office for Hawaiʻi	√	
The Honorable Suzanne Chun Oakland, State Senator	√	
The Honorable Donna Mercado Kim, State Senator	√	9/14/17
The Honorable Glenn Wakai, State Senator	√	
The Honorable Will Espero, State Senator	√	
The Honorable Takashi Ohno, State Representative	√	
The Honorable John Mizuno, State Representative	√	
The Honorable Daniel Holt, State Representative	√	
The Honorable Romy Cachola, State Representative	√	
The Honorable Tom Brower, State Representative	√	
The Honorable Karl Rhoads, State Representative (now Senator)	√	
Councilmember Joey Manahan	√	
Councilmember Carol Fukunaga	√	9/22/17

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
Neighborhood Board No. 14 Chair Wesley Fong	√	
Neighborhood Board No. 14 Representative Carl Campagna	√	
Neighborhood Board No. 14 Representative John Hart	√	
Neighborhood Board No. 14 Representative Mela Kealoha-Lindsey	√	
Neighborhood Board No. 14 Representative Sai Weiss	√	
Neighborhood Board No. 14 Representative Chad Woke	√	
Neighborhood Board No. 14 Representative Brandon Mitsuda	√	
Neighborhood Board No. 14 Representative Kenneth Huang	√	
Neighborhood Board No. 14 Representative Carol Kaapu	√	
Neighborhood Board No. 14 Representative Donald Nitta	√	
Neighborhood Board No. 14 Representative Dale White	√	
Neighborhood Board No. 14 Representative Kaeo Kealoha-Lindsey	√	
Neighborhood Board No. 14 Representative Bob Mon	√	
Neighborhood Board No. 15 Chair Ryan Mandado	√	
Neighborhood Board No. 16 Chair Michael McDonald	√	
UNIVERSITY OF HAWAIʻI (UH)		
UH Office of Capital Improvement	√	
UH Water Resources Research Center	√	
UH Environmental Center	√	
UH Marine Program	√	
UH Office of Multicultural Student Services	√	
UH Thomas H. Hamilton Library	√	
UH at Hilo Edwin H. Moʻokini Library	√	
UH Maui College Library	√	
UH Kauaʻi Community College Library	√	
LIBRARIES		
Hawaiʻi State Library – Hawaiʻi Documents Center	√	
Liliha Public Library	√	
Kaimukī Regional Library	√	
Kalihi-Pālama Public Library	√	
Kāneʻohe Regional Library	√	
Pearl City Regional Library	√	
Hawaiʻi Kai Regional Library	√	
Hilo Regional Library	√	
Kahului Regional Library	√	
Līhuʻe Regional Library	√	
Legislative Reference Bureau Library	√	
City and County of Honolulu Department of Customer Services-Municipal Reference Center Library	√	
DBEDT – Research Division Library	√	

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
UTILITIES COMPANIES		
Hawaiian Telcom	√	
Hawaiian Electric Company, Inc.	√	
Hawaiʻi Gas	√	
Oceanic Time Warner Cable (now Spectrum)	√	
NEWS MEDIA		
Honolulu Star Advertiser	√	
Hawaiʻi Tribune Herald	√	
West Hawaiʻi Today	√	
The Garden Island	√	
Maui News	√	
Molokaʻi Dispatch	√	
Honolulu Civil Beat	√	
SCHOOLS		
Kapālama Elementary School	√	
Lanakila Elementary School	√	
Likelike Elementary School	√	
Central Middle School	√	
Kalākaua Middle School	√	
Kawananakoa Middle School	√	
McKinley High School	√	
Farrington High School	√	
Honolulu Community College	√	
Damien Memorial School	√	
Kamehameha Schools Kapālama	√	
COMMUNITY ORGANIZATIONS		
Pālama Settlement	√	
Kalihi-Pālama Health Center	√	
Kalihi-Pālama Hawaiian Civic Club	√	
Kalihi YMCA	√	
Kokua Kalihi Valley	√	
Lanakila Multi-Purpose Senior Center	√	9/20/17
Liliha Healthcare Center	√	
Maluhia Hospital	√	
Salvation Army	√	
St. Francis Medical Center	√	
Hawai'i Literacy	√	
Weed and Seed	√	
Pacific Gateway Center	√	
Institute for Human Services	√	
Parents and Children Together	√	
Mutual Housing Association of Hawaiʻi	√	

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
Adults for Youth	√	
Hawaiʻi Meals on Wheels	√	
Lanakila Meals on Wheels	√	
Helping Hands Hawaiʻi	√	
Honolulu Community Action Program	√	
Life of the Land	√	
FACE Hawaiʻi: Faith Action for Community Equity	√	
Catholic Charities Hawaiʻi	√	
Sierra Club of Hawaiʻi	√	
United Public Workers	√	
BUSINESSES		
Tamashiro Market	√	
Liliha-Pālama Business Association	√	
Realty Laua	√	
N&K CPAS Inc.	√	
AARP Hawaiʻi	√	
Castle & Cook Homes Hawaiʻi	√	
First Hawaiian Bank	√	
HY-PAC Self Storage	√	
Kalihi Business Association	√	
Kamehameha Schools	√	
Oʻahu Transit Services	√	
PBS Hawaiʻi	√	
Robinson Family Trust Estates and LLC.	√	
Susannah Wesley Community Center	√	
Harry and Jeanette Weinberg Foundation, Inc.	√	
Hawaiʻi Construction Alliance		9/8/17
Good Shepherd Preschool		9/20/17
CHURCHES		
Kaumakapili United Church of Christ	√	
Hawaiʻi Conference – United Church of Christ	√	
Aldersgate United Methodist Church	√	
Co-Cathedral of Saint Theresa	√	
Hawaiʻi First Samoan Assembly of God	√	
Samoan Congregational Christian Church of Honolulu, UCC	√	
St. Elizabeth Episcopal Church	√	
Hawaiʻi Chinese Baptist Church	√	
Bluewater Mission	√	
Samoan-Tokelau Seventh-Day Adventist	√	
Su Gran Alabanza	√	
PUBLIC COMMENTS		
Robert Arakaki		9/8/17, 9/12/17 9/21/17, 9/22/17

AGENCY/INDIVIDUAL	EISPN/ NOTIFICATION SENT	COMMENT DATED
Judy Asman		9/6/17
Susan Carvalho		8/29/17
Yukari Cash		9/15/17
Mary Helen DeLapp		9/18/17
Jamesner Dumlao		8/28/17
Fe Garay		9/6/17
Timothy Garry		9/12/17
Ally Ha		9/16/17
Thomas Hackett		9/7/17
Carole Kaapu		9/12/17
Gregory Kam		9/6/17
Adrian Keanu		8/12/17
Toby Kravet		9/14/17
Loy Kuo		8/15/17
Gary Lau		9/6/17
Jacky Li		9/13/17
Gayle Nakama		9/7/17, 9/13/17
Arlene Nakamura		8/17/17
Francis Nishimura		9/17/17
Karin Nomura		9/14/17
Jeffery Okazaki		9/13/17
D. Otsu		9/21/17
Kris Salas		9/18/17
Brandon Sasaki		9/21/17
Patricia Sasaki		8/23/17, 9/12/17, 9/19/17,
Stephen and Elvanette Silva		9/23/17
Louise Storm		9/8/17
Jade Tada		8/12/17
Karen Takamatsu		9/10/17
Phyllis Tom		9/21/17
Corinne Uehara		9/7/17
Melvin Won		9/7/17
Carol Wong		9/15/17
Tracy Yamashita		9/7/17
Amy Young		9/20/17
Angie Young		9/23/17
Dorothy *(Surname not provided)*		9/4/17

9.2.2 EIS Scoping Meeting

In addition to the EISPN, an EIS scoping meeting was held on September 12, 2017. The scoping meeting began with a brief presentation by PBR HAWAII to review the previously published EIS preparation notice, the general project steps and timeline (planning, design, and construction), methods and opportunities for submitting public comments (including online comments), and upcoming project milestones. The presentation was followed by an open discussion in which attendees had the opportunity to share their thoughts as well as address questions about the preparation of the Draft EIS and general components of the project thus far.

The points summarized below represent the questions, concerns, and comments shared by attendees during the meeting, except where indicated otherwise, which are organized by respective topic.

I) Zoning, Unit Count, and Population Increase:

- Unclear whether the Proposed Project design is considering a maximum or minimum building height (outside of current zoning restrictions).
- Current zoning allows for low-density residential, which does not conform with preliminary designs to accommodate 1,000 units.
- The alternatives for 2,000 or 1,000 units is too high, many community members in attendance were more comfortable with an alternative of 300-400 units.
- Existing resident's views will be obstructed by multiple tall apartment buildings.
- Building heights similar to the one across the street might be more OK.
- Replacement offices ok but not commercial, since proposed commercial will also impact traffic, parking and put a strain on infrastructure.

II) Infrastructure (traffic, sewage, parking, etc.):

- Traffic is already a big issue and additional residents and/or commercial development will exacerbate this (e.g. more cars and less available parking).
- Lifestyles of new residents in senior housing will still impact traffic and parking during peak hours.
- Already a lot of ambulances that go through the neighborhood and more will be going through with the addition of senior housing.
- The Proposed Project is likely to put huge demand on sewer capacity.

III) Location and Housing Type:

- Various community members in attendance were concerned that this and surrounding neighborhoods already have too many low-income public housing projects (therefore, new public housing projects should be located in other neighborhoods). The project team from PBR HAWAII clarified that many factors go into choosing locations, one of which is the benefit of using existing State-owned land for State projects instead of acquiring land from a different landowner. Some attendees do not want any type of low-income, mixed-income or mixed-use developments in the neighborhood.

- Residents are concerned about the impacts of the (public housing) Proposed Project on their property values (feel that the project could decrease their property value). The project team from PBR HAWAII clarified that the types of housing being considered for the Proposed Project include affordable apartment options, not public housing.

- All senior apartments were seen as more preferable than families.

- Residents were concerned about how potential future improvements to Puahala Homes (located within the same HPHA property) would also affect this project. PBR HAWAII clarified that the EIS will address all potential impacts of other projects if they are confirmed.

IV) EIS and Project Approval Process:

- Many attendees asked about the specific process of getting the Proposed Project approved. PBR HAWAII gave some examples of how similar projects might obtain approval throughout the entire process, but explained that there are multiple ways for a project to go about these processes (which has not been finalized for the Proposed Project).

- In response to questions about the EIS timeline, the PBR HAWAII project team clarified that no set timeframe is in place for the EIS (typically, this process will take approximately a year if all goes well).

- Many attendees expressed that they have been receiving conflicting information about types of housing being considered, unit count, building design, and other components of the Proposed Project.

- More could be done to notify the community about these meetings

- The PBR HAWAII project team clarified that the EIS will include technical studies for traffic.

V) Other Issues/Comments:

- The Proposed Project will impact the existing residents dramatically.

- There is too much development in the area in general (Hawaiʻi is losing its sense of “Aloha”).

- Parks or green space should also be considered as part of the Proposed Project (or something to benefit the entire community).

- Concerns that the community will not be considered throughout the process, or that the Proposed Project will try to bypass community involvement

- In addition to the verbal discussion, four written comment cards were collected at the meeting. These are attached as Appendix P.

9.2.3 Draft EIS Consultation

The Draft EIS will be sent to the following agencies, organizations, stakeholders, interested individuals, and elected officials. The final distribution list for the Draft EIS has been confirmed by OEQC prior to the publication date. The Draft EIS will also be sent to various media outlets and libraries including all regional public libraries to provide availability to the public. Comment letters received for the Draft EIS will be incorporated and included in the Final EIS as required by Section 343-5, HRS.

Table 9-2: Draft EIS Consultation

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
FEDERAL AGENCIES	
U.S. Fish and Wildlife Service	√
U.S. Department of the Interior, U.S. Geologic Survey	√
U.S. National Marine Fisheries Service	√
U.S. Department of the Interior, National Park Service	√
U.S.D.A., Natural Resources Conservation Service	√
U.S. Army Corps of Engineers	√
Department of the Navy	√
Federal Aviation Administration	√
Federal Transit Administration	√
Federal Highway Administration	√
U.S. Coast Guard	√
Environmental Protection Agency	√
Federal Emergency Management Agency	√
STATE AGENCIES	
Hawaii Public Housing Authority	√
Office of Environmental Quality Control	√
Department of Agriculture	√
Department of Accounting and General Services (DAGS)	√
DAGS, Archives Division	√
Department of Business Economic Development & Tourism (DBEDT)	√
DBEDT, Hawaii Housing Finance & Development Corporation (HHFDC)	√
DBEDT, Strategic Industries Division (formerly Energy Resources and Technology Division)	√
DBEDT, Office of Planning	√
Department of Defense	√
Department of Education	√
Department of Hawaiian Home Lands	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Department of Health, Environmental Health Administration	√
Department of Human Services	√
Department of Human Services, Hoʻopono Services for the Blind Branch	√
Department of Land and Natural Resources (DLNR)	√
DLNR, Historic Preservation Division (SHPD)	√
Department of Transportation	√
Office of Hawaiian Affairs	√
CITY & COUNTY OF HONOLULU AGENCIES	
Board of Water Supply	√
Department of Community Services	√
Department of Design and Construction	√
Department of Environmental Services	√
Department of Facility Maintenance	√
Department of Parks and Recreation	√
Department of Planning and Permitting	√
Department of Transportation Services	√
Honolulu Authority for Rapid Transportation	√
Honolulu Fire Department	√
Honolulu Police Department	√
ELECTED OFFICIALS	
The Honorable David Ige, Governor	√
The Honorable Brian Schatz, U.S. Senator	√
The Honorable Mazie Hirono, U.S. Senator	√
The Honorable Colleen Hanabusa, U.S. Representative	√
The Honorable Karl Rhoads, State Senator	√
The Honorable Donna Mercado Kim, State Senator	√
The Honorable Glenn Wakai, State Senator	√
The Honorable Will Espero, State Senator	√
The Honorable Takashi Ohno, State Representative	√
The Honorable John Mizuno, State Representative	√
The Honorable Daniel Holt, State Representative	√
The Honorable Romy Cachola, State Representative	√
The Honorable Tom Brower, State Representative	√
Councilmember Joey Manahan	√
Councilmember Carol Fukunaga	√
Neighborhood Board No. 14 Chair Wesley Fong	√
Neighborhood Board No. 14 Representative Mr. Carl Campagna	√
Neighborhood Board No. 14 Representative Mr. John Hart	√
Neighborhood Board No. 14 Representative Ms. Mela Kealoha-Lindsey	√
Neighborhood Board No. 14 Representative Mr. Sai Weiss	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Neighborhood Board No. 14 Representative Mr. Chad Woke	√
Neighborhood Board No. 14 Representative Mr. Brandon Mitsuda	√
Neighborhood Board No. 14 Representative Mr. Kenneth Huang	√
Neighborhood Board No. 14 Representative Ms. Carole Ka‘apu	√
Neighborhood Board No. 14 Representative Mr. Donald Nitta	√
Neighborhood Board No. 14 Representative Mr. Dale White	√
Neighborhood Board No. 14 Representative Mr. Kaeo Kealoha-Lindsey	√
Neighborhood Board No. 14 Representative Mr. Bob Mon	√
Neighborhood Board No. 15 Chair Ryan Mandado	√
Neighborhood Board No. 16 Chair Michael McDonald	√
UNIVERSITY OF HAWAI‘I (UH)	
UH Office of Capital Improvement	√
UH Environmental Center	√
UH Water Resources Research Center	√
UH Marine Program	√
UH Office of Multicultural Student Services	√
UH Thomas H. Hamilton Library	√
UH at Hilo Edwin H. Mo‘okini Library	√
UH Maui College Library	√
UH Kaua‘i Community College Library	√
LIBRARIES	
Hawai‘i State Library – Hawai‘i Documents Center	√
Liliha Public Library	√
Kalihi-Pālama Public Library	√
DBEDT, Research Division Library	√
Legislative Reference Bureau Library	√
City and County of Honolulu Department of Customer Services-Municipal Reference Center Library	√
UTILITIES COMPANIES	
Hawaiian Telcom	√
Hawaiian Electric Company, Inc.	√
Hawai‘i Gas	√
Oceanic Time Warner Cable (now Spectrum)	√
NEWS MEDIA	
Honolulu Star Advertiser	√
Hawai‘i Tribune Herald	√
West Hawai‘i Today	√
The Garden Island	√
The Maui News	√
Moloka‘i Dispatch	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Honolulu Civil Beat	√
SCHOOLS	
Kapālama Elementary School	√
Lanakila Elementary School	√
Likelike Elementary School	√
Central Middle School	√
Kalākaua Middle School	√
Kawananakoa Middle School	√
McKinley High School	√
Farrington High School	√
Honolulu Community College	√
Damien Memorial School	√
Kamehameha Schools Kapālama	√
COMMUNITY HEALTHCARE ORGANIZATIONS	
Kalihi-Pālama Health Center	√
Kokua Kalihi Valley	√
Liliha Healthcare Center	√
Maluhia Hospital	√
St. Francis Medical Center	√
Lanakila Multi-Purpose Senior Center	√
COMMUNITY ORGANIZATIONS	
Pālama Settlement	√
Kalihi YMCA	√
Kalihi-Pālama Hawaiian Civic Club	√
Salvation Army	√
Hawai'i Literacy	√
Weed and Seed	√
Pacific Gateway Center	√
Institute for Human Services	√
Parents and Children Together	√
Mutual Housing Association of Hawaiʻi	√
Life of the Land	√
Adult Friends for Youth	√
Helping Hands Hawaiʻi	√
Honolulu Community Action Program	√
United Public Workers	√
Hawaiʻi Meals on Wheels	√
Lanakila Meals on Wheels	√
Sierra Club of Hawaiʻi	√
The Outdoor Circle	√
BUSINESSES/OTHER	
Tamashiro Market	√
Liliha-Pālama Business Association	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Realty Laua	√
N&K CPAs Inc.	√
AARP Hawaiʻi	√
Castle & Cook Homes Hawaiʻi	√
First Hawaiian Bank	√
HY-PAC Self Storage	√
Kalihi Business Association	√
Kamehameha Schools	√
Oʻahu Transit Services, Inc.	√
PBS Hawaiʻi	√
Robinson Family Trust Estates and LLC	√
Susannah Wesley Community Center	√
Harry and Jeanette Weinberg Foundation, Inc.	√
Hawaiʻi Construction Alliance	√
Good Shepherd Preschool	√
CHURCHES	
Aldersgate United Methodist Church	√
Bluewater Mission	√
Catholic Charities Hawaiʻi	√
Co-Cathedral of Saint Theresa	√
FACE Hawaiʻi: Faith Action for Community Equity	√
Hawaiʻi Chinese Baptist Church	√
Hawaiʻi Conference – United Church of Christ	√
Hawaiʻi First Samoan Assembly of God	√
Kaumakapili United Church of Christ	√
Samoan Congregational Christian Church of Honolulu, UCC	√
Samoan-Tokelau Seventh-Day Adventist	√
St. Elizabeth Episcopal Church	√
Su Gran Alabanza	√
INDIVIDUALS	
Trusilla A Ho	√
Robert Arakaki	√
Judy Asman	√
Jon Barona	√
Dale Bartolome	√
Jon Bartolome	√
Nate Bartolome	√
Bobo Bartolome	√
Susan Carvalho	√
Floyd Cash	√
Yukari Cash	√
Michelle Cenido	√
Susie Chun Oakland	√
Samuel Cox	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Junko Davis	√
Mary Helen DeLapp	√
C. Diaz	√
Sam Domingo	√
Jamesner Dumlao	√
Lorraine Fay	√
Fe Garay	√
Tim Garry	√
Karen Ginoza	√
Catherine Graham	√
Donald Guerrero	√
Ally Ha	√
Thomas Hackett	√
Allen Hanaike	√
Aric Harris	√
Kendra and Miles Hatae	√
Mario Herrera	√
Daphne Hookano	√
Lillian Inatsuka	√
Frank G. Jahrling	√
Carole Kaapu	√
John Kalawa	√
Gregory Kam	√
Helene Kamita	√
Jack Katahira	√
Helen Katahira	√
Adrian Keanu	√
Toby Kravet	√
Loy Kuo	√
Sew LaMer	√
Betty Lou Larson	√
Gary Lau	√
Aaron Lau	√
Serville Lauser	√
Robert Lay	√
Jacky Li	√
Julie Lyons	√
Christy Macpherson	√
Rey Martin	√
Norma Martin	√
Tad Matsuno	√
Yuen Na Wong	√
Gayle Nakama	√
Arlene Nakamura	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Bob Nakata	√
Janelle Naone	√
Francis Nishimura	√
Donald Nitta	√
Karin Nomura	√
Jeffery Okazaki	√
D. Otsu	√
Keisha Pagdilao	√
John Pawn	√
Sam Pui Lam Lee	√
Martha Richard	√
Barbara Ripple	√
Arlyn Saga	√
Ernesto Saga	√
Kris Salas	√
Patricia Sasaki	√
Brandon Sasaki	√
Evelyn Say	√
Stephen and Elvanette Silva	√
Shari Simmons	√
Jiai Skouge	√
Sue Stacey	√
Louise Storm	√
Wilfred Suzuki	√
Jane Tada	√
Karen Takamatsu	√
Jenna Takenouchi	√
Imelda C. Tan	√
Lynette Teruya	√
Phyllis Tom	√
Aaron Tsang	√
Corinne Uehara	√
Marjorie Vidal	√
Raul Villanues	√
Melvin Won	√
Carol Wong	√
Eric Wong	√
Jennifer Wu	√
Ethel Yamaguchi	√
Tracy Yamashita	√
Wilfred Yorg Gasuk	√
Karen Yoshimoto	√
Amy Young	√
Angie Young	√

AGENCY/INDIVIDUAL	Draft EIS/NOTIFICATION ANTICIPATED TO BE SENT
Linda Young	√
Grace L. Young	√
Glen Young	√
Allen Zukemura	√
Patricia Zukemura	√
Dorothy *(surname not provided)*	√

10 LIST OF PREPARERS

The Draft EIS has been prepared by PBR HAWAII & Associates, Inc., with offices located at: 1001 Bishop Street, ASB Tower, Suite 650, Honolulu, Hawaiʻi 96813.

Several key technical consultants prepared specific assessments of environmental factors for this project. These consultants and their specialties are listed below:

Name	Area of Expertise
Fehr and Peers	Transportation Impact Analysis Report
Fung and Associates, Inc.	Architectural Inventory Survey
Belt Collins Hawai'i, LLC	Economic and Fiscal Impacts Analysis
Imata & Associates, Inc.	Preliminary Engineering
Robert Hobdy	Flora and Fauna Survey
ASM Affiliates, Inc.	Archaeological Inventory Survey and Cultural Impact Analysis Report
Terry A. Hayes Associates, Inc.	Air Quality Impact Analysis and Noise & Vibration Impacts Analysis

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Hawaii Public Housing Authority Administrative Offices Redevelopment

Draft Environmental Impact Statement Appendices

Proposing Agency:

Hawaii Public Housing Authority

Accepting Authority:

Governor, State of Hawaiʻi

Prepared by:

PBR HAWAII & ASSOCIATES, INC.

December 2017

Hawaii Public Housing Authority Administrative Offices Redevelopment

Draft Environmental Impact Statement
Appendices

Proposing Agency:

Hawaii Public Housing Authority

Accepting Authority:

Governor, State of Hawai'i

Prepared by:

PBR HAWAII
& ASSOCIATES, INC.

December 2017

LIST OF APPENDICES

APPENDIX A
Affordable Housing Brief

AFFORDABLE HOUSING BRIEF

DECEMBER 2016

"NOT IN MY BACKYARD": AFFORDABLE HOUSING AND NEARBY PROPERTY VALUES

A common challenge faced by affordable housing developers is resistance from nearby property owners concerned that the addition of an affordable housing property in their neighborhood will decrease property values. Interestingly, some of the fiercest opposition to building affordable housing is found in some of the nation's least affordable housing markets such as San Francisco and New York. So is property devaluation a legitimate fear? A recent study by Trulia[1] set out to answer that question.

The Study

Trulia chose the 20 least affordable housing markets in the country[2] to examine changes in nearby home values before and after a low-income housing project was placed in service over the 10-year period between 1996 and 2006. The study included 3,083 projects funded through the Low Income Housing Tax Credit (LIHTC)[3] in those 20 markets. To test for spillover effects of low-income housing, the study tracked home values in terms of price per square foot at two different distances from the low-income housing project. Properties within an inner ring of 2,000 feet of a given low-income housing project were identified as the "neighborhood" that might be impacted by the project. Properties located 2,001 to 4,000 feet from the low-income housing project were used as a comparison group.

The Findings

In the 20 markets analyzed, with a few exceptions noted below, no significant adverse effect on home values located near a LIHTC housing project was found. During the 10-year period examined, San Jose, CA. was the most aggressive in adding low-income housing units while Oakland, CA. added the fewest units per capita. Denver was the only metro area that registered a positive effect for home values of homes located near low-income housing projects after a project was placed in service. Boston and Cambridge, MA. both experienced price depreciation of homes near low-income projects during the 10-year analysis period, suggesting the existence of unique market characteristics in these two adjacent metro areas at that time.

The Exceptions

In the study, Trulia offers possible causes for the divergent results in Denver, Boston and Cambridge. Looking at the 10-year period used for the study, Trulia notes that the concentration of low-income projects added in particular areas of Boston and Cambridge in a short time-period might have crowded out other development activity creating areas of unusually high concentration of low-income residents. This could have depressed the development of newer, pricier single-family homes during that time. In contrast, Denver saw price appreciation of $7.35 per square foot for neighborhoods where low-income projects were developed versus the region as a whole. Trulia opined that the gentrification of the lower downtown Denver area and the construction of Coors Field in the 1990s made some of these neighborhoods the most sought after real estate in downtown Denver. Neighborhoods such as the Central Business District and Five Points, where low-income housing projects were concentrated in the study period outperformed greater Denver in terms of home values per square foot. In sum, these exceptions appear to be related more to collateral market dynamics than to the addition of low-income housing projects in the neighborhood.

While interesting, the Trulia study is not groundbreaking. Rather, it is further confirmation of numerous similar studies dating back to the mid-1990s that, with few exceptions, also reached the same conclusion—that the addition of subsidized housing to neighborhoods does not adversely affect property values.[4] In fact, much of the research suggests that what impact an affordable housing community has on property values is much more related to the quality of the properties' design, management and maintenance than to the fact that it is subsidized housing.

[1] *Trulia Blog/Affordability, "There Doesn't Go the Neighborhood: Low Income Housing Has No Impact on Nearby Home Values" November, 16, 2016.*
[2] *San Francisco, CA; San Jose, CA; Los Angeles, CA; Orange County, CA; Oakland, CA; Honolulu, HI; San Diego, CA; Ventura County, CA; New York, NY; Portland, OR; Seattle, WA; Newark, NJ; Riverside, CA; Miami ,FL; Sacramento, CA; Cambridge, MA; Boston ,MA; Long Island, NY; Fairfield County, CT; Denver, CO.*
[3] *Trulia focused on LIHTC projects only because they constitute the large majority of subsidized rental housing development in the country.*
[4] *See, The Center for Housing Policy, Insights from Housing Policy Insights, "Don't Put it Here!" 2009, for a summary of several of these earlier studies.*

APPENDIX B
Special Action Team on Affordable Rental Housing

Special Action Team on Affordable Rental Housing

Report to the Hawaii State Legislature

in Response to Act 127, Session Laws of Hawaii 2016

Prepared by

OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
STATE OF HAWAII

Honolulu, Hawaii
December 2016

Introduction

Housing is considered "affordable" when a household spends less than 30 percent of their income on shelter and utilities. But affordable housing is a serious challenge for Hawaii's low-income residents, who face one of the highest housing cost in the country. In a market with some of the most expensive for-sale homes in the county, 43% of the state's households must rent.[1] This is even more difficult for Hawaii's residents as rent increases but wages have not kept pace. There is a sense of urgency in developing needed rental housing units, particularly for households in the rental housing "gap" group (i.e., those earning between 60% and 80% of the area median income (AMI)). The need for affordable housing is particularly acute for households with low incomes.

On June 29, 2016, SB2561, SD2, HD1, CD1, was signed into law as Act 127, Session Laws of Hawaii (SLH), to address rental housing by establishing an affordable rental housing goal, and establishing a Special Action Team on affordable rental housing, chaired by the Director of the Office of Planning (OP), to make recommendations on actions to promote rental housing. The goal is to develop or vest the development of at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017 and December 31, 2026. The goal may be met through conversions (non-affordable to affordable) or new developments.

The Special Action Team (Action Team) on Affordable Rental Housing is established within OP, for administrative purposes. The Action Team is composed of eleven (11) members as shown below:

CHAIR Leo Asuncion Office of Planning	Craig Hirai HHFDC
STATE HOUSE OF REPRESENTATIVES Representative Mark Hashem Chair, House Committee on Housing	STATE SENATE Senator Breene Harimoto Chair, Senate Committee on Housing
HAWAII COUNTY Susan Akiyama Office of Housing and Community Development	HONOLULU CITY & COUNTY Jun Yang Mayor's Office of Housing
KAUAI COUNTY Gary Mackler Kauai County Housing Agency	MAUI COUNTY Carol Reimann Department of Housing & Human Concerns
AFFORDABLE HOUSING ADVOCACY * Scott Fuji PHOCUSED	NON-PROFIT DEVELOPERS* Keith Kato Hawaii Island Community Development Corporation
FOR PROFIT DEVELOPERS* Stanford Carr Stanford Carr Development, LLC	

* Public members appointed by the Governor

The tasks of the Special Action Team are to

- achieve 22,500 affordable rental housing unit goal by December 31, 2026;
- establish performance measures and timelines for the development of affordable rental housing units for the listed increments of area median incomes;

[1] SMS, Inc., Hawaii Housing Planning Study, December 2016.

- address and make recommendations to reconcile public interests that compete against and restrict development of rental housing;
- develop a ten-year plan that identifies state, county, and private parcels of land suitable for affordable units;
- incorporation of ten-year plan into the State Housing Plan;
- submit legislation proposing an update of the Hawaii State Planning Act to include the State Housing Plan for 2017 Session; and
- submit annual reports to the Legislature for 2017, 2018, and 2019 Sessions.

The Action Team has developed a dynamic Work Plan that will continue to be updated to provide the Action Team the ability to efficiently complete the tasks.

Work Plan

Month	Topic
2016 August	Kick-Off Meeting: Act 127 Overview - Deliverables/Timing
2016 September	Submit legislation proposing an update of the Hawaii State Planning Act to include the State Housing Plan for 2017 Session Ten-Year Plan for achieving 22,500 affordable rental units by December 26, 2026 • Inventory (current / proposed); production targets • Performance Measures • Recommendations to reconcile public interests that may compete against and restrict development of rental housing • Identify state, county, and private parcels of land suitable for affordable housing units
2016 October	2017 Legislation Ten-Year Plan (Continued)
2016 November	2017 Legislation (Pre-final / Final) Ten-Year Plan (Continued) Draft Annual Report to Legislature
2016 December	2017 Legislation (Final) Final Annual Report to Legislature
2017 January	2017 Legislature • Legislation Strategy
2017 February	2017 Legislature - Status of bills Ten-Year Plan - progress report / discussion
2017 March	2017 Legislature - Status of bills Ten-Year Plan - progress report / discussion
2017 April	2017 Legislature - Status of bills Ten-Year Plan - progress report / discussion
2017 May 2017 June	2017 Legislature - Status of bills/acts Draft Ten-Year Plan - discussion Final Ten-Year Plan
2017 July 2017 August 2017 September 2017 October 2017 November 2017 December	Implementation of Ten-Year Plan ↓

Status

Since being established, the eleven (11) members of the Action Team have met four (4) times in 2016. The initial meeting occurred on August 11, with lively discussions on housing issues in Hawaii. The Action Team then met three (3) subsequent times (September 23, October 21 and December 5) which included a site visit of eight (8) completed and proposed affordable housing projects on the island of Kauai. During this reporting period the Action Team has been working on an affordable rental housing inventory, suitability map, and proposed amendments to Hawaii Revised Statutes (HRS), Chapter 226, the Hawaii State Planning Act.

Affordable Rental Housing Inventory

To establish performance measures and timelines for the development of affordable rental housing units for the listed increments of area median incomes, an inventory of the rental housing stock is necessary. The Action Team is working on an affordable rental housing inventory which consist of proposed state and county affordable rental developments statewide. This inventory was initially coordinated and compiled through the efforts of HHFDC and contain the affordable rental projects for each island with estimated completion dates. The Action Team continues to track the data and has begun to enhance the list to include additional details (i.e., number of affordable vs total units, area median income (AMI) level, type of government financing, and issues/delays) for a comprehensive inventory of the affordable rental housing inventory for the state. Private sector developments that may include affordable rental units will be added to this list as information becomes available.

Suitability Maps

The Action Team has also begun work on developing maps for each island that shows the suitability of state and county, and eventually private lands, for residential development. The map utilizes geographic information system (GIS) data layers collected by the Action Team members and the staff of OP's GIS Program. The GIS data layers are incorporating transit-oriented development (TOD) areas (rail, bus and bike routes) and inundation zones. The GIS suitability map requires coordination among the various county offices for data collection and analysis.

Proposed Amendments to Statutes

The proposed amendments include amendments to HRS Section 226-19, Objectives and policies for social-cultural advancement-housing. This added language will allow for a more comprehensive directive on the statewide affordable housing plan. The proposed language also updates and unifies the categories of housing levels into "extremely low", "very low", "lower", "moderate", and "above-moderate income". Over the years there have been many classifications of housing levels, and this amendment will attempt to encompass all of the types into a single comprehensive list.

The proposal also includes amendments to HRS Section 226-55, Functional Plans; preparation. The proposal includes reference to an "update" of the Functional Plans after the initial or updated functional plan. To encourage the implementation and continued updates of the state functional plans, the proposed amendment directs the lead state agency to establish the advisory committee with the concurrence of the governor. These amendments encourage the lead agencies to take advantage of existing advisory committees or enhance their advisory committees to include membership of at least one public official from each county, members of the public, experts in the field for which a functional plan is being prepared and state officials.

Lastly, the proposed amendment includes language to HRS Section 226-106, Affordable housing by including "urban lands" for consideration in meeting the housing needs. Currently the statute only lists marginal or nonessential agricultural and public land to meet affordable housing needs. A copy of the draft legislation is included as Appendix 1 to this status report.

Next Steps and Recommendations

The Action Team will continue to meet and begin developing recommendations for reconciling public interest that may compete against and restrict the development of rental housing. As they evaluate the regulatory burden associated with converting, developing, managing, and operating subsidized affordable housing projects, the Action Team will utilize the broad range of advocates to evaluate preservation of the environment and protection of the quality of life of the surrounding communities. As they balance the demands on public resources and scarcity of available land, the Action Team will work to identify and encourage a variety of rental housing solutions throughout the state.

As the Action Team develops a ten-year plan to identify state, county, and private parcels of land that are suitable for affordable housing units, they will continue to work with HHFDC to incorporate the plan into the State Housing Plan. In upcoming legislative sessions, the Action Team will be coordinating with HHFDC in the amendments to the State Housing Plan to assure the recommendations and guidance being developed is identified (see Appendix II).

The following is a list of general recommendations that the Action Team will be researching and developing in the coming year.

1. Encourage the state to build a high school in or near the UH West Oahu site.
2. Lifting of the $38 million cap on conveyance tax revenues for the Rental Housing Revolving Fund.
3. Revenue Bonds. Work with the City and County of Honolulu to re-initiate the issuance of revenue bonds.
4. County Financing. Utilizing the Rental Housing Revolving Fund process administered by HHFDC to award additional county funds for rental projects.
5. Pilot Affordable Rental Housing Financing Program. Create a pilot financing program to provide gap financing for the projects at 61% - 120% AMI. The loan would be in the form of a soft, second which would be available to private developers. Project's rents could only increase according to increases in the HUD established income limits.
6. Rent to Own Program. Create a program to utilize state or county resources to offer affordable residential units for rent in a program for eventual ownership. The program would be a 3-5 year program for applicants to go through credit counseling and repair/maintenance training on how to own and maintain a home. The applicant would have 3-5 years to save up the money necessary and improve their FICO scores and reduce debt.
7. Existing Transitional Housing Projects. Re-evaluate existing Transitional Housing Projects that are to be reverted to the State. What are the plans for reverting the Ulu Ke Kukui transitional shelter in Maili to DHHL: 78 short-term affordable units, commercial kitchen that provides 1500 meals a day; and a variety of services and resources for its residents.

8. DOE Impact Fees. Re-evaluate or suggest exemptions for DOE impacts fees on Affordable Rental projects.
9. Research the purpose and oversight of the state DOH Disability and Communication Access Board (DCAB). DCAB is required under HRS § 103-50 to review state and county documents. Does the City also review for accessibility?

Special Action Team on Affordable Rental Housing
Annual Report to the Hawaii State Legislature

Appendix I
Proposed Amendments to HRS Chapter 226

§226-19 Objectives and policies for socio-cultural advancement--housing. (a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:

(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more rental and market for sale affordable housing is made available to extremely low, very low, lower[~~low and~~], moderate[~~income~~], and above-moderate income segments of Hawaii's population.

(2) The orderly development of residential areas sensitive to community needs and other land uses.

(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.

(b) To achieve the housing objectives, it shall be the policy of this State to:

(1) Effectively accommodate the housing needs of Hawaii's people.

(2) Stimulate and promote feasible approaches that increase affordable rental and market for sale housing choices for extremely low, very low, lower [~~low-income~~], moderate[~~-income~~], and above-moderate income [~~gap-group~~]households.

(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.

(4) Promote appropriate improvement, rehabilitation, and maintenance of existing rental and market for sale housing units and residential areas.

(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.

(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.

(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.

(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii. [L 1978, c 100, pt of §2; am L 1986, c 276, §18; am L 1992, c 27, §2]

§226-55 Functional plans; preparation; update. (a) The state agency head primarily responsible for a given functional area shall prepare and periodically update the functional plan for the area. In the preparation or update of the functional plan, the state agency head shall work in close cooperation with the advisory committee, respective officials, and people of each county. In the formulation of the initial or updated functional plan, the preparing agency shall solicit public views and concerns. The formulation and revision of a state functional plan shall conform to the provisions of this chapter and shall take into consideration the county general plans. Functional plans and any revisions thereto shall be [~~approved~~]accepted by the governor to serve as guidelines for funding and implementation by state and county agencies.

(b) The functional plan shall identify priority issues in the functional area and shall contain objectives, policies, and implementing actions to address those priority issues. Actions may include organizational or management initiatives, facility or physical infrastructure development initiatives, initiatives for programs and services, or legislative proposals.

(c) For each functional plan, the lead state agency, with concurrence of the governor, shall establish an advisory committee, where an advisory body which meets the criteria set out hereunder is not already in existence, whose membership shall be composed of at least one public official from each county [~~to be nominated by the mayor of each county~~]; members of the public; experts in the field for which a functional plan is being prepared; and state officials. [~~The governor shall request the nominations from each of the respective mayors and shall appoint the public official nominated by the mayor of the respective county to serve on the advisory committee. If the nominations of county officials by a mayor are not submitted to the governor within sixty days following the date of the governor's request for such nominations, the governor shall appoint at least one public official from that county to serve on the advisory committee without nominations from that mayor.~~] The advisory committee shall advise the lead state agency in preparing, implementing, monitoring, and updating the functional plan to be in conformance with the overall theme, goals, objectives, policies, and priority guidelines contained within this chapter. The draft functional plan shall be submitted to relevant federal, state, and county agencies for review and input. The advisory committee shall serve as a temporary advisory body to the state agency responsible for preparing each respective functional plan. The terms of members from the public and experts in the field for which a functional plan is prepared shall be for four years. Each term shall commence on July 1 and expire on June 30. No member from the public or expert in the field shall be appointed consecutively to more than two terms. These appointments shall not be subject to senate confirmation, and shall be exempt from sections 26-34(a) and 78-4(a) regarding the appointment to boards and commissions. [L 1978, c 100, pt of §2; am L 1980, c 225, §2; am L 1984, c 236, §8 and c 237, §2; am L 1985, c 44, §2; am L 1987, c 336, §4(7); am and ren L 1991, c 76, pt of §1]

§226-106 Affordable housing. Priority guidelines for the provision of affordable housing:

(1) Seek to use marginal or nonessential agricultural land, urban land, and public land to meet housing needs of extremely low, very low, lower[~~low-~~], [~~and~~] moderate[~~-income and gap-group~~], and above-moderate income households.

(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.

(3) Improve information and analysis relative to land availability and suitability for housing.

(4) Create incentives for development which would increase home ownership and rental opportunities for Hawaii's extremely low, very low, lower[~~low-~~] and moderate-income households[~~, gap-group households,~~] and residents with special needs.

(5) Encourage continued support for government or private housing programs that provide low interest mortgages

to Hawaii's people for the purchase of initial owner-occupied housing.

(6) Encourage public and private sector cooperation in the development of rental housing alternatives.

(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.

(8) Give higher priority to the provision of quality housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii. [L 1986, c 276, §33; am L 1989, c 250, §3]

Special Action Team on Affordable Rental Housing
Annual Report to the Hawaii State Legislature

Appendix II
Proposed State Housing Plan

The Hawaii State Plan

HOUSING

DRAFT

Prepared by

Hawaii Housing Finance and Development Corporation
Department of Business, Economic Development & Tourism
State of Hawaii

December 2016

DAVID Y. IGE
GOVERNOR

CRAIG K. HIRAI
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

PREFACE

Chapter 226, Hawaii Revised Statutes, outlines a long range guide for Hawaii's future and establishes a statewide planning system. The system includes the formulation of State functional plans, including this plan on housing, to guide programs and actions and for the allocation of resources.

The Hawaii Housing Finance and Development Corporation is charged with the responsibility of preparing a functional plan on housing. This State Housing Functional Plan is aimed at implementing the goals, objectives, and policies of The Hawaii State Plan and County General Plans. It presents a balanced set of strategies and implementing actions directed towards meeting Hawaii's housing needs.

The State Housing Functional Plan was prepared under the guidance of the Office of Planning and the Special Action Team ("Special Action Team") on Affordable Rental Housing, which was established by Act 127, Session Laws of Hawaii 2016. The Special Action Team is established within the Office of Planning, Department of Business Economic Development & Tourism, State of Hawaii for administrative purposes and is composed of eleven members.

Craig K. Hirai

CRAIG K. HIRAI
Executive Director

SPECIAL ACTION TEAM ON AFFORDABLE HOUSING

CHAIR Leo Asuncion Director Office of Planning	Craig K. Hirai Executive Director Hawaii Housing Finance and Development Corporation
STATE HOUSE OF REPRESENTATIVES The Honorable Mark Hashem Chair House Committee on Housing	STATE SENATE The Honorable Breene Harimoto Chair Senate Committee on Housing
HAWAII COUNTY Susan Akiyama Administrator Office of Housing and Community Development	CITY & COUNTY OF HONOLULU Jun Yang Executive Director Mayor’s Office on Housing
KAUAI COUNTY Gary Mackler Kauai County Housing Agency	MAUI COUNTY Carol Reimann Director Department of Housing and Human Concerns
AFFORDABLE HOUSING ADVOCACY* Scott Fujii Executive Director PHOCUSED	NON-PROFIT DEVELOPERS* Keith Kato Executive Director Hawaii Island Community Development Corporation
FOR PROFIT DEVELOPERS* Stanford Carr President Stanford Carr Development, LLC	

* Public members appointed by the Governor

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CHAPTER I. INTRODUCTION

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes) provides a long-range guide for Hawaii's future. It establishes a Statewide Planning System to achieve State goals, objectives, policies, and priorities. This system requires the development of State Functional Plans which are approved by the Governor. The functional plans are intended to promote coordination of State and County government actions, as well as those of the private sector, toward achievement of common Statewide goals. They are prepared to address areas which include, but are not limited to, agriculture, conservation lands, education, energy, higher education, health, historic preservation, housing, recreation, tourism, and transportation.

PURPOSE OF THE STATE FUNCTIONAL PLANS

In conjunction with County General Plans, State Functional Plans are the primary guideposts for implementing the Hawaii State Plan. While the Hawaii State Plan establishes long-term objectives for Hawaii, the State Functional Plans delineate specific strategies of policies and priority actions that should be addressed in the short-term.

In addition, there is an increased emphasis on the implementation of programs and actions. Therefore, Functional Plans contain specific, implementable actions that can be directly related to budget items.

The purposes of the State Functional Plans with respect to Chapter 226, as amended, are to:

- Guide activities of State and County agencies toward implementation of Hawaii State Plan goals, objectives, policies, and priority guidelines;
- Provide a basis for allocation of resources to carry out various State activities in coordination with County activities;
- Identify major interrelationships among functional areas and guide programs and activities of State agencies; and
- Assist in clarifying State and County roles and responsibilities in the implementation of the Hawaii State Plan.

ROLE IN STATEWIDE PLANNING SYSTEM

The Functional Plans primarily address priority actions that should be taken within a two- to six-year period. This time frame coincides with the Biennial Budget and Capital Improvement Program budgetary cycles. The plans primarily affect State operations; however, recommendations for coordinated actions at the Federal, County and private sector levels are also included.

State Functional Plans provide the link between the Hawaii State Plan and the specific programs and processes carried out by State agencies. They provide the key mechanism for coordinating State and County concerns, responsibilities and activities in each functional area.

Functional Plans provide sufficient specificity and direction to guide, where applicable:

- Amendments to the County General and Development Plans;
- Development and execution of State programs;
- Appropriation of funds for major programs under the biennial and supplemental budgets;
- Appropriation of funds for major plans and projects under the Capital Improvements Program;
- Decisions of the Land Use Commission; and
- Decisions of the Department of Land and Natural Resources.

State Functional Plans are guidelines for action; they are not regulatory nor legislated documents.

PLAN PREPARATION/REVISION

Functional Plans are prepared and maintained by State agencies in accordance with guidelines prepared by the Department of Budget and Finance. The process involves input and coordination from advisory committees, State and County agencies, the Office of Planning and the general public.

The State Housing Functional Plan is maintained by the Hawaii Housing Finance and Development Corporation ("HHFDC"). The Special Action Team on Affordable Rental Housing ("Special Action Team") provided the direction and oversight in the preparation of this revised 2016 State Housing Functional Plan. The Special Action Team was established by Act 127, Session Laws of Hawaii 2016 to make recommendations on actions to promote rental housing. The Special Action Team is comprised of 11 members – Office of Planning (which chairs the team), HHFDC, Member of the House of Representatives, Member of the Senate, four County representatives, and three members of the public appointed by the Governor.

CHAPTER II. FOCUS

BACKGROUND

Hawaii's housing market suffers from a persistent shortage of housing, particularly housing that is affordable to Hawaii's workforce and lower income groups. Indicators of Hawaii's tight housing market are highlighted below. The data is gleaned from the Hawaii Housing Planning Study, 2016 ("2016 HHPS"), which serves as a technical reference document for this State Housing Functional Plan.

Cost Burden
Approximately 36 percent of Hawaii's households are cost-burdened, meaning they pay more than 30 percent of their income for housing costs. Approximately half of these households pay more than 50 percent of their income for housing.

Shelter-to-Income Ratio by County, 2016

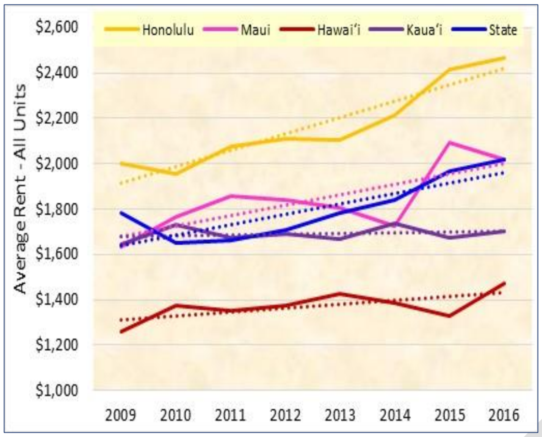
Shelter Payment as % of HH Income	County				State
	Hawai'i	Honolulu	Kaua'i	Maui	
None	27.0%	21.3%	20.8%	15.0%	21.4%
Less than 30%	37.2%	37.1%	36.8%	35.2%	36.8%
30 to 40%	10.3%	11.4%	10.8%	12.4%	11.3%
40 to 50%	4.0%	7.0%	5.6%	7.2%	6.5%
More than 50%	15.2%	17.4%	20.7%	24.2%	18.0%

Source: SMS, Inc., Hawaii Housing Planning Study 2016, Table 3, December 2016

Crowding and Doubling-up
Hawaii's crowding rate, as measured by more than 1.01 person per bedroom, is consistently among the highest in the nation. The 2015 American Community Survey shows Hawaii was ranked at the top in crowding for owner occupied units (6.4%) and renter-occupied units (12.3%). This is consistent with findings from the 2016 HHPS survey which found that 12 percent of Hawaii households are doubled-up, meaning the housing units are occupied by two or more families or groups of persons who are not related by birth, marriage, or adoption. In total, 20.2 percent of households were crowded or doubled-up in 2016.

Rents
Average statewide contract rents have risen by 13 percent, from $1,783 in 2009 to $2,019 in the first quarter of 2016. In 2016, households in the City and County of Honolulu have the highest average contract rent ($2,468), followed by Maui ($2,106), Kauai ($1,704), and Hawaii ($1,474).

Average Rents, Counties and State of Hawai‘i, 2009-2015



Source: SMS, Inc., Hawaii Housing Planning Study 2016, Figure 7, December 2016

Sales Prices

Across the state, the median sales price of single family dwellings has increased by 18 percent, to $600,000, between 2010 and 2015. The median condominium sales price has increased by 13 percent, to $364,000, over the same period.

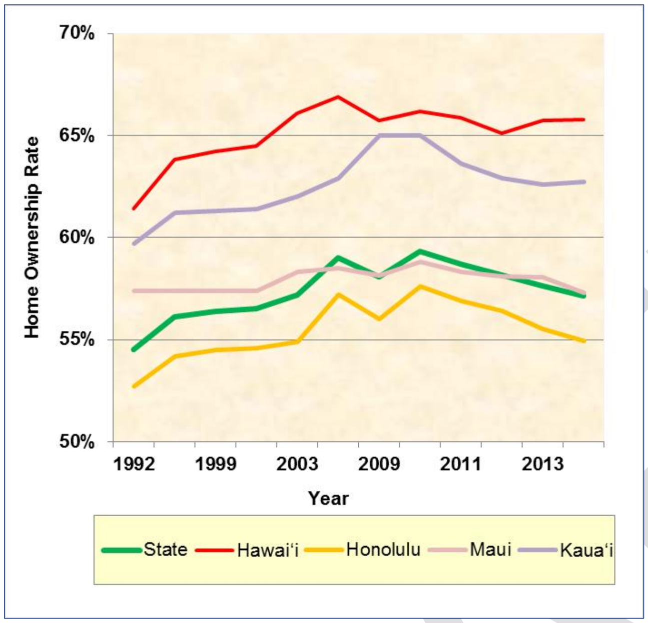
Median Home Sales Prices, Counties and State of Hawai‘i, 2009 and 2015

	County				State
	Hawai‘i	Honolulu	Kaua‘i	Maui	
	Single-Family House Sales Prices (in thousand)				
2009	$277	$576	$469	$496	$495
2010	$258	$599	$494	$459	$486
2011	$244	$577	$462	$435	$470
2012	$262	$624	$459	$469	$501
2013	$294	$646	$520	$527	$543
2014	$317	$673	$543	$568	$572
2015	$330	$699	$625	$585	$600
	Multi-Family Condominium Sales Prices (in thousand)				
2009	$285	$303	$314	$394	$313
2010	$254	$306	$269	$384	$311
2011	$210	$302	$234	$309	$292
2012	$259	$316	$293	$354	$316
2013	$261	$333	$302	$372	$333
2014	$283	$350	$344	$412	$352
2015	$273	$363	$359	$411	$364

Source: SMS, Inc., Hawaii Housing Planning Study 2016, Table 21, December 2016

Homeownership rates have fallen across the nation since the Great Recession and Hawaii was no exception. In 2014, Hawaii's homeownership rate fell to 57.1 percent from a high of 60 percent in 2006.

Homeownership Rates, 1990-2014



Source: SMS, Inc., Hawaii Housing Planning Study 2016, Figure 3, December 2016

Homelessness
There were 7,620 homeless persons in Hawaii on any given night in 2015, according to the Point-in-Time Count. This was an increase of approximately 10.1 percent from 2014. That growth was attributable to an increase in unsheltered homeless persons (24%). Hawaii had the highest per capita homeless rate among the 50 states – 53.7 persons per 100,000.

Residential construction fell after the Great Recession in 2008. Total housing units grew by about 5,600 units per year (2.2%) between 2009 and 2011. Housing growth slowed to 2,800 units per year between 2011 and 2014 – half of what it was in the previous five years.

Estimated Housing Need
Statewide, approximately 24,551 housing units are estimated to be needed in the five-year period from 2016-2020. Nearly 20,000 units (81%) are estimated to be needed by Hawaii's workforce and lower income households (i.e., those earning 140% and below the area median income ("AMI") established by the U.S. Department of Housing and Urban Development ("HUD")).

- Of the total units, approximately 13,500 units (55%) are estimated to be needed for households earning 80% and below the AMI. These are typically rental housing units.

- Another 6,400 units (26%) are estimated to be needed for households earning from 80-140% AMI. These are typically for-sale units primarily for first-time homebuyers.

STATEWIDE ESTIMATE OF HOUSING NEED BY INCOME GROUP AND COUNTY									
	HUD Income Classification (% of Area Median Income)								Total
	Less than 30	30 to 50	50 to 60	60 to 80	80 to 120	120 to 140	140 to 180	180+	
State of Hawaiʻi	4,581	3,417	2,037	3,467	2,954	3,452	1,339	3,305	24,551
Honolulu	1,734	1,381	714	1,737	1,439	1,761	530	931	10,226
Maui	863	725	331	604	754	736	367	720	5,102
Hawaiʻi	1,637	892	900	903	632	772	244	1,462	7,442
Kauaʻi	348	417	91	223	128	184	198	192	1,782
		Income Classifications							
		Less than $30k	$30k to $45k	$45k to $60k	$60k to $75k	$75k to $100k	$100k to $150k	More than $150k	Total
State of Hawaiʻi		6,710	3,998	2,677	2,954	2,659	4,068	1,486	24,551
Honolulu		2,125	1,256	1,426	1,543	1,211	1,906	759	10,226
Maui		1,330	826	512	672	621	851	290	5,102
Hawaiʻi		2,771	1,517	571	606	604	1,030	343	7,442
Kauaʻi		484	399	168	133	223	281	94	1,782
Source: SMS, Inc., Hawaii Housing Planning Study 2016, Table 28, December 2016									

The purpose of this State Housing Functional Plan is to set forth a plan of action to address Hawaii's many housing problems.

The State Housing Functional Plan is based largely on joint public/private efforts to finance, build, and maintain an adequate supply of affordable housing. It will be a working tool to guide the State, the counties, as well as the private sector in meeting the overall goal that **every Hawaii resident will have the opportunity to live in a safe, decent and affordable home**.

In order to respond to Hawaii's housing needs, the statewide housing plan must focus on a renewed State commitment to housing, and the preservation and expansion of affordable housing. This will require active cooperation and collaboration between the private and public sectors, including federal, state and local governments; housing developers, contractors and subcontractors, property managers, financial institutions, realtors, and investors; non-profit housing corporations, religious and civic groups; and housing consumers.

SCOPE

Major Concerns Addressed

The Implementing Actions of the State Housing Functional Plan focus on four broad areas on a statewide level:

1. Expand and preserve rental housing opportunities;
2. Increase homeownership;

3. Address barriers to residential development; and
4. Maintain a housing information system.

The State Housing Functional Plan is one of several areas of housing planning in the State. For brevity and clarity, this document must assume the use of existing programs at both State and County levels to attain the goals and objectives of The Hawaii State Plan.

Geographic Coverage

The State Housing Functional Plan addresses housing issues on a statewide basis.

DEFINITIONS

As used in this Plan:

"Affordable housing" in the context of identifying the persons or families intended to be served by such housing, primarily includes housing for persons or families whose incomes are identified as one hundred forty percent or less of the area median income ("AMI") for each of the counties of Hawaii, Maui, Honolulu, and Kauai as determined by the United States Department of Housing and Urban Development ("HUD") from time to time, and as adjusted by family size. For the purpose of this Plan, such persons or families include persons or families within the following income groups:

1. "Extremely low income" – those earning 30% of the AMI and below.
2. "Very low income" – those earning 50% of the AMI and below.
3. "Lower income" – those earning between 50% and 80% of the AMI.
4. "Moderate income" – those earning between 80% and 120% of the AMI.
5. "Above-moderate income" – those earning between 120% and 140% of the AMI.

The term "affordable housing" is generally broken down into two sub-categories, namely "affordable rental housing" and "affordable for-sale housing".

A rule of thumb states that a family should not have to pay more than 30 percent of its annual income for rent and utilities. This being the case, an affordable payment for a 2-bedroom unit for a family of 4 with an annual income of $60,300 is approximately $1,357 a month for rent and utilities. The target group for affordable rental housing is guided by the income limits established by HUD and includes persons and families within the income groups named in (1) to (3) above.

Since the income level for the affordable rental housing target group is capped at 80% of the HUD established median income, the income level for the affordable for-sale target group continues on from the 80% level and ranges upward to approximately 140% of the HUD established median income. This target group generally includes the above-referenced moderate and above-moderate income groups. However, families with earnings as low as 50% of the AMI could also be assisted utilizing programs such as the U.S. Department of Agriculture (USDA) – Rural Development 502 program which subsidizes mortgage interest rates to as low as 1.00%.

It should be noted that the definition of "affordable housing", particularly the definitions used to describe the five income groups, may conflict with the definitions used in other documents or for other programs.

<u>"Homeless", "homeless individual", and "homeless person"</u> means—

(1) an individual or family who lacks a fixed, regular, and adequate nighttime residence;

(2) an individual or family with a primary nighttime residence that is a public or private place not designed for or ordinarily used as a regular sleeping accommodation for human beings, including a car, park, abandoned building, bus or train station, airport, or camping ground;

(3) an individual or family living in a supervised publicly or privately operated shelter designated to provide temporary living arrangements (including hotels and motels paid for by Federal, State, or local government programs for low-income individuals or by charitable organizations, congregate shelters, and transitional housing);

(4) an individual who resided in a shelter or place not meant for human habitation and who is exiting an institution where he or she temporarily resided;

(5) an individual or family who—

- (A) will imminently lose their housing, including housing they own, rent, or live in without paying rent, are sharing with others, and rooms in hotels or motels not paid for by Federal, State, or local government programs for low-income individuals or by charitable organizations, as evidenced by—
  - (i) a court order resulting from an eviction action that notifies the individual or family that they must leave within 14 days;
  - (ii) the individual or family having a primary nighttime residence that is a room in a hotel or motel and where they lack the resources necessary to reside there for more than 14 days; or
  - (iii) credible evidence indicating that the owner or renter of the housing will not allow the individual or family to stay for more than 14 days, and any oral statement from an individual or family seeking homeless assistance that is found to be credible shall be considered credible evidence for purposes of this clause;
- (B) has no subsequent residence identified; and
- (C) lacks the resources or support networks needed to obtain other permanent housing; and

(6) unaccompanied youth and homeless families with children and youth defined as homeless under other Federal statutes who--

- (A) have experienced a long term period without living independently in permanent housing,
- (B) have experienced persistent instability as measured by frequent moves over such period, and
- (C) can be expected to continue in such status for an extended period of time because of chronic disabilities, chronic physical health or mental health conditions, substance addiction, histories of domestic violence or childhood abuse, the presence of a child or youth with a disability, or multiple barriers to employment.

“Mixed-use” development means a development that contains affordable residential dwelling units that may be combined with governmental, educational, commercial, cultural, institutional, or industrial uses.

“Non-residential” or “transient” housing means those housing units other than condominium units in rental pools and which are intended for transient occupancy.

“Special needs housing” means housing for persons for whom social problems, age, or physical or mental disabilities impair their ability to live independently and for whom such ability can be improved by more suitable housing conditions.

“Transit-oriented development”, or TOD, is a type of community development that includes a mix of land uses such as housing, office, retail and/or other amenities integrated into a walkable, moderate- to high-density neighborhood and located within designated TOD zones or within a one-half mile radius of public transportation nodes.[1]

[1] This definition is used by the Hawaii Interagency Council for Transit-Oriented Development, as adapted from Reconnecting America (http://reconnectingamerica.org/what-we-do/what-is-tod/).

CHAPTER III. OBJECTIVES, POLICIES, AND IMPLEMENTING ACTIONS

This chapter presents the problem statements, objectives, strategies, policies, and implementing actions of the State Housing Functional Plan. Although the State Housing Functional Plan contains a number of objectives to be achieved by the year 2020 and 2026, the specific implementing actions contained in this Plan are generally actions to be achieved within a two-year timeframe.

ISSUE AREA: RENTAL HOUSING

PROBLEM STATEMENT: Hawaii is faced with a shortage of safe, decent and affordable rental housing.

In 2016, Hawaii ranked #1 in the nation for having the widest gap between wages and the price of rental housing. The National Low Income Housing Coalition's ("NLIHC") annual report, Out of Reach, documents the gap between wages and the price of housing across the United States. The report's Housing Wage is an estimate of the hourly wage that a full-time worker must earn to afford a modest and safe rental home without spending more than 30% of his or her income on rent and utility costs.

In 2016, the national Housing Wage is $20.30 for a two-bedroom rental unit, assuming a 40-hour work week, 52 weeks per year. A worker earning the federal minimum wage of $7.25 per hour would need to work 2.8 full time jobs, or approximately 112 hours per week for all 52 weeks of the year, in order to afford a two-bedroom apartment at HUD's Fair Market Rent ("FMR").

In comparison, Hawaii's Housing Wage is $34.22 for a two-bedroom rental unit. In 2016, the FMR for a two-bedroom apartment in Hawaii was $1,780. In order to afford this level of rent and utilities — without paying more than 30% of income on housing — a household must earn $5,932 monthly or $71,184 annually. A worker earning the federal minimum wage of $7.25 per hour would need to work 4 full time jobs, or approximately 161 hours per week for all 52 weeks of the year, in order to afford a two-bedroom apartment at HUD's FMR.

The NLIHC's 2016 report highlights the struggle faced by millions of families in affording a safe and decent home. Wage stagnation, particularly among lower wage workers, rising rents, and an inadequate supply of affordable housing continue to present significant challenges.[2]

The State Legislature enacted Act 127, Session Laws of Hawaii 2016 (S.B. 2561, SD 2, HD1, CD1) Relating to Rental Housing to address Hawaii's rental housing problem. The Legislature found that an insufficient number of rental housing units are being supplied, either in the affordable, the subsidized or the market-rate rental markets. Further, that *"the lack of supply leads to higher rents for households of all income levels, leaving all tenants with less disposable income, increasing the personal stress of tenants, reducing tenant quality of life, and exacerbating the population overcrowding and homelessness problems. Without sufficient*

[2] National Low Income Housing Coalition, Out of Reach 2016

affordable rental housing, the future social, community, and economic consequences for Hawaii may be dire." Act 127 establishes a Special Action Team to make recommendations on actions to promote rental housing statewide and an affordable rental housing goal to develop or vest the development of 22,500 units by 2026.[3]

Governor David Ige's "State of Hawaii Housing Plan" sets forth a production target of 10,000 housing units by the year 2020. Because of the current housing crisis, the focus is on affordable for sale and rental housing projects that are already in the planning and production pipeline.[4]

OBJECTIVE A: INCREASE AND SUSTAIN THE SUPPLY OF PERMANENT RENTAL HOUSING THAT IS AFFORDABLE AND ACCESSIBLE TO HAWAII RESIDENTS, PARTICULARLY THOSE WITH INCOMES AT OR BELOW 80% AMI.

ATTAIN THE LEGISLATIVE GOAL OF 22,500 RENTAL HOUSING UNITS BY 2026.

STRATEGY: Expand and preserve the supply of affordable rental housing units through joint public/private efforts. Expand and mobilize resources to better assist households seeking rental housing opportunities, including lower income households, the elderly, persons with disabilities, and homeless households. And, pursue sources of funding for rent subsidies.

POLICY A (l): Direct federal, state, and county resources toward the financing and development of rental housing projects.

> IMPLEMENTING ACTION A(1)(a): Efficiently utilize existing federal, state and county financing programs, including the Low Income Housing Tax Credit, Hula Mae Multifamily Revenue Bond, and the Rental Housing Revolving Fund programs, to facilitate the development of permanent rental housing projects in areas suitable for development (i.e., urbanized areas in proximity to schools, jobs, public transportation, etc.).
>
> > Lead Organizations: HHFDC, HPHA, counties
> > Assisting Organizations: HCDA, HUD
> > Starting Date: Ongoing
> > Measures of Effectiveness: Number of rental units completed which are affordable to extremely-, very low-, low-, moderate-, and above-moderate income households; number of accessible rental units completed; number of family and senior rental units.

[3] Pursuant to Act 127, SLH 2016, "affordable housing unit" means a privately-owned residential unit that the owner: (1) has completed the construction, reconstruction, renovation, repair, or acquisition of after December 31, 2016; and (2) pledges to comply and require each manager or successor owner of the unit to comply with the following for a period of at least thirty years: (A) rent the unit to a family with an annual income of not more than one hundred forty per cent of the area median income for a family of the same size; and (B) charge a monthly rent, excluding utility expenses, for the unit that does not exceed thirty per cent of the family's monthly income.

[4] Executive Chambers, State of Hawaii Housing Plan, August 2016/

IMPLEMENTING ACTION A(1)(b): Seek new sources of financing to increase the supply of permanent rental housing units in collaboration with legislators.

Lead Organizations: HHFDC, HPHA, counties
Assisting Organizations: HCDA, State Legislature
Starting Date: Ongoing
Measures of Effectiveness: New financing sources/programs; number of rental units in projects financed.

IMPLEMENTING ACTION A(1)(c): Prioritize the development of rental housing on state land in TOD areas to enhance affordability.

Lead Organizations: HHFDC
Assisting Organizations: Counties, Hawaii Interagency Council for TOD
Starting Date: FY 2017
Measures of Effectiveness: New rental housing near rail/transit stations.

IMPLEMENTING ACTION A(1)(d): Support the development of permanent supportive housing for special need groups including persons with disabilities, frail elderly, and the chronic homeless.

Lead Organizations: HHFDC, HPHA, county housing agencies
Assisting Organizations: HUD, VA, DOH, DHS, service providers, nonprofit developers, private sector
Starting Date: Ongoing
Measures of Effectiveness: Obtain federal grants to develop rental housing (i.e., HUD section 811 or 202); project-based vouchers for veterans (VASH) and other special needs groups; number of rental units; number of accessible rental housing units.

POLICY A (2): Encourage increased participation from private developers and other state entities to develop rental housing.

IMPLEMENTING ACTION A(2)(a): Form public/private partnerships and/or enter into public/private development agreements to develop rental housing.

Lead Organizations: HHFDC, HPHA, counties, private sector
Assisting Organizations: HCDA, State Legislature
Starting Date: Ongoing
Measures of Effectiveness: Number of rental projects and units developed as a result of public private/development agreements.

IMPLEMENTING ACTION A(2)(b): Form partnerships and/or enter into agreements with state agencies to develop mixed-use developments which include rental housing.

Lead Organizations: HHFDC
Assisting Organizations: HCDA, HPHA, DLNR, DAGS, other State agencies that own land, private sector
Starting Date: Ongoing
Measures of Effectiveness: Number of mixed-use developments and rental units developed as a result of partnerships.

IMPLEMENTING ACTION A(2)(c): Streamline government procedures and reorient policies towards housing production, particularly rental housing.

Lead Organizations: HHFDC
Assisting Organizations: HCDA, county housing agencies, private for-profit and non-profit developers, unions
Starting Date: Ongoing
Measures of Effectiveness: Alignment of state agency policies and procedures; increased efficiency/effectiveness of financing programs; reduction in time to complete housing projects.

IMPLEMENTING ACTION A(2)(d): Create incentives to encourage the development of rental housing for extremely-low income households.

Lead Organizations: HHFDC, HCDA, HPHA
Assisting Organizations: County housing agencies, private for-profit and non-profit developers, State Legislature
Starting Date: FY 2017
Measures of Effectiveness: Number of rental housing units for households at 30% AMI and below; new feasible incentives.

POLICY A (3): Ensure that (1) housing projects and (2) projects which impact housing provide a fair share/adequate amount of affordable housing opportunities, including rental housing opportunities.

IMPLEMENTING ACTION A(3)(a): Impose realistic and fair housing requirements on projects that seek Urban land use designations, general or development plan amendments, zoning, or development permits.

Lead Organizations: LUC, county land use making bodies, HCDA
Assisting Organizations: OP, county housing agencies
Starting Date: Ongoing
Measures of Effectiveness: Number of rental housing units produced as a result of housing conditions.

POLICY A (4): Sustain a long-term supply of rental housing.

IMPLEMENTING ACTION A(4)(a): Renovate and/or redevelop public housing facilities.

Lead Organizations: HPHA
Assisting Organizations: HHFDC, State Legislature, counties, private sector
Starting Date: Ongoing
Measures of Effectiveness: Number of public housing projects/units renovated/redeveloped.

IMPLEMENTING ACTION A(4)(b): Assist in the acquisition and/or rehabilitation of rental housing projects.

Lead Organizations: HHFDC, private nonprofits
Assisting Organizations: County housing agencies, private sector
Starting Date: Ongoing
Measures of Effectiveness: Number of rental housing projects/units preserved.

ISSUE AREA: HOMEOWNERSHIP

PROBLEM STATEMENT: Research shows that homeownership has positive impacts on the stability of communities as families support and nurture their homes and surrounding neighborhoods. Homeownership has also been linked with increased civic engagement, higher voter turnout, enhanced home maintenance, and reduced crime rates. Moreover, homeownership, and the stability afforded by homeownership, has been linked with positive behavioral outcomes and educational achievement among children.[5]

Major obstacles to homeownership include (1) college debt and student loans, (2) not making enough money to purchase a home, and (3) not enough money for a down payment and closing costs.[6] Other obstacles include (4) inventory is low and new construction is increasingly catering to wealthier buyers, (5) tight credit, and (6) high rent burdens, making it difficult to save.[7]

Homeownership in Hawaii has been falling steadily since 2006. In 2014, the Census reports it at 57.1 percent statewide. High prices, low inventories and a lack of confidence in the market have slowed home sales, especially in high-priced markets like Hawaii's. More important, the impact of the slow economic recovery falls heaviest on first-time homebuyers. It is their entry to the market that boosts the homeownership rate.[8]

[5] Bipartisan Policy Center Housing Commission, Housing America's Future: New Directions for National Policy, February 2013
[6] Ibid
[7] Joint Center for Housing Studies of Harvard University, The State of the Nation's Housing 2016
[8] SMS, Inc., Hawaii Housing Planning Study 2016, December 2016

OBJECTIVE B: INCREASE THE HOMEOWNERSHIP RATE.

STRATEGY: Facilitate the private development of affordably priced for-sale residential units, particularly for moderate and above-moderate first-time homebuyers.

POLICY B (l): Direct Federal, State and county resources and efforts toward the development of affordable for-sale housing units.

IMPLEMENTING ACTION B(l)(a): Utilize development tools, such as 201H powers and interim construction loans, to assist in the private development of affordably-priced homes in areas suitable for development (i.e., urbanized areas in proximity to schools, jobs, public transportation, etc.).

Lead Organizations: HHFDC, County housing agencies
Assisting Organizations: County Councils
Starting Date: Ongoing
Measures of effectiveness: Number of development agreements; number of for-sale units completed; number of projects assisted under 201H; number of construction loans.

IMPLEMENTING ACTION B(1)(b): Participate with financial institutions to provide eligible moderate and above-moderate first-time homebuyers with mortgage financing assistance.

Lead Organization: HHFDC
Assisting Organization: B&F, State Legislature
Starting Date: Ongoing
Measure of Effectiveness: Number of homebuyers assisted with Mortgage Credit Certificates, Hula Mae mortgage loans.

IMPLEMENTING ACTION B(1)(c): Update the State Downpayment Assistance Loan program.

Lead Organization: HHFDC
Assisting Organization: B&F, State Legislature
Starting Date: FY2018
Measure of Effectiveness: Revise the downpayment assistance program; amend administrative rules; number of homebuyers assisted.

POLICY B (2): Assist moderate and above-moderate first-time homebuyers to become successful homeowners.

> <u>IMPLEMENTING ACTION B(2)(1):</u> Ensure that homebuyers assisted through government programs obtain homebuyer education from HUD-approved counseling agencies.
>
> > <u>Lead Organization:</u> HHFDC, HCDA, Counties
> >
> > <u>Assisting Organization:</u> HUD, private developers, lenders, nonprofit HUD-approved counseling agencies
> > <u>Starting Date:</u> Ongoing
> > <u>Measure of Effectiveness:</u> Amended administrative rules and procedures.
> > <u>Comment:</u> HUD-approved Housing Counseling agencies must be trained to provide counseling services. They are permitted to charge reasonable and customary fees for housing counseling and education services, including pre-purchase, reverse mortgage, rental, and non-delinquency post-purchase counseling services and non-delinquency post-purchase counseling services, provided certain conditions are met:
> >
> > - Agencies must provide counseling without charge to persons who demonstrate they cannot afford the fees;
> > - Agencies must inform clients of the fee structure in advance of providing services;
> > - Fees must be commensurate with the level of services provided.

POLICY B (3): Ensure that housing projects provide a fair share of affordable for-sale housing opportunities.

> <u>IMPLEMENTING ACTION B(3)(a)</u>: Impose realistic and fair housing requirements on projects that seek Urban land use designations, general or development plan amendments, zoning, or development permits.
>
> > <u>Lead Organizations:</u> SLUC, county land use making bodies, HCDA
> > <u>Assisting Organizations:</u> OP, HHFDC, county planning departments and housing agencies
> > <u>Starting Date:</u> Ongoing
> > <u>Measures of Effectiveness:</u> Number of affordable for-sale housing units produced as a result of housing conditions.

ISSUE AREA: IMPEDIMENTS TO RESIDENTIAL DEVELOPMENT

PROBLEM STATEMENT: Previous studies have identified major impediments to the development of housing in Hawaii including the lack of "reasonably priced", developable land; lack of major off-site infrastructure; high development costs; government regulations; community opposition; and growing environmental requirements.[9]

The *Final Report & Recommendations of the Affordable Housing Advisory Committee*, April 2006 notes that the current infrastructure capacity is a significant barrier to providing more housing units in the urban core of Honolulu. All forms of public infrastructure are in dire need of maintenance, up-grade and new installation. Roads, sewer, water, drainage, and schools have historically been the responsibility of government to construct. Many of the required infrastructure improvements have been passed on to the developer, adding to the price of a house. A Joint Legislative Housing and Homeless Task Force encouraged creative, innovative and cost-effective ways such as tax increment financing or the establishment of improvement districts to finance the construction of offsite infrastructure, as well as the appropriation of capital improvement project funds.[10] On the Big Island, there have been ample areas designated for residential growth; however, the issue is the lack of infrastructure.

Government regulations and the process for implementing the regulations have been identified as a major barrier to housing production in Hawaii. In August 2007, Hawaii accepted an invitation from HUD to join the "National Call to Action for Affordable Housing Through Regulatory Reform" initiative. A statewide Affordable Housing Regulatory Barriers Task Force, comprised of representatives from the counties, business, labor, developers, architects, non-profit service providers, the state, and the legislature, was convened to address regulatory barriers to affordable housing. The task force noted that *"in the context of building homes that are affordable, government regulations often work against the goal of delivering more affordable housing. Although government policies and regulations are often intended to control or direct growth, target resources, and prioritize areas of importance, the unintended consequence is often that these regulations add to the cost of building affordable homes. Many regulations are in place to ensure health and safety and to protect natural resources. However, all regulation has some direct or indirect effect on the supply and cost of housing.*[11]

[9] SMS, Inc., Hawaii Housing Planning Study 2016

[10] Joint Legislative Housing and Homeless Task Force, prepared by staff of the Senate Majority Office, with contributions from the House Majority Staff Office, "Report of the Joint Legislative Housing and Homeless Task Force Pursuant to Act 196, Session Laws of Hawaii 2005," January 2006

[11] State of Hawaii, Office of the Governor, "Report of the Governor's Affordable Housing Regulatory Barriers Task Force," December 2008

OBJECTIVE C: ADDRESS BARRIERS TO RESIDENTIAL DEVELOPMENT.

STRATEGY: Coordinate and facilitate the production of housing by addressing development impediments including lack of land, infrastructure, and regulations that add to the cost of housing.

POLICY C (1): Utilize state and county land for mixed-use and mixed-income housing development with focus on rental housing.

IMPLEMENTING ACTION C(1)(a): Prepare suitability maps which identify state and county owned parcels in the State Land Use Urban District that are county zoned for rental housing and located outside of the SMA.

Lead Organizations: OP
Assisting Organizations: Counties, Special Action Team members
Starting Date: Ongoing
Measures of Effectiveness: Suitability maps.

IMPLEMENTING ACTION C(1)(b): Lease suitable state and county land, particularly parcels in TOD areas, for rental housing development.

Lead Organizations: DLNR, HHFDC, HPHA, Counties
Assisting Organizations: DAGS, DOE, UH, other state/county agencies; private developers
Starting Date: Ongoing
Measures of Effectiveness: Number of leases; number of rental units.

POLICY C (2): Coordinate and share regional infrastructure investments between State, counties, and private developers.

IMPLEMENTING ACTION C(2)(a): Assist in financing regional state infrastructure improvements in areas of planned growth, such as near rail stations.

Lead Organizations: HHFDC
Assisting Organizations: OP, DOT, Counties, State Legislature
Starting Date: Ongoing
Measures of Effectiveness: Number of financing agreements; increased infrastructure capacity; number of residential units developed.

IMPLEMENTING ACTION C(2)(b): Utilize Improvement Districts, Tax Increment Financing, and/or other infrastructure financing mechanisms.

Lead Organizations: Counties
Assisting Organizations: Private developers, HHFDC, B&F, other state and county agencies
Starting Date: FY 2018
Measures of Effectiveness: Number of financing agreements; increased infrastructure capacity; number of residential units developed.

IMPLEMENTING ACTION C(2)(c): Leverage federal funds to increase capacity in the regional roadway network to facilitate housing development.

Lead Organizations: Counties, DOT
Assisting Organizations: Private developers
Starting Date: FY 2018
Measures of Effectiveness: Increased infrastructure capacity to support residential development.
Comment: An example is the use of funds under the American Recovery and Reinvestment Act of 2009 ("ARRA"), which was intended to jumpstart the economy. The County of Hawaii used most of the $35 million in ARRA funds to finance construction of a three-mile stretch of the Ane Keohokalole Highway in order to open up new sites for residential development.

POLICY C (3): Address regulatory barriers including the lengthy land use entitlement process, lack of consistency and coordination in state and county agency reviews, impact fees and exactions, fiscal policy, and administrative processes that add to the cost of housing.

IMPLEMENTING ACTION C(3)(a): Reduce redundancies in the land use entitlement process.

Lead Organizations: LUC, County planning departments
Assisting Organizations: OP, HHFDC, county housing agencies
Starting Date: FY 2017
Measures of Effectiveness: Increased approval efficiencies.

IMPLEMENTING ACTION C(3)(b): Promote predictability and reliance in land use matters by supporting existing residential zoning and approved housing projects. If such projects are meeting the conditions of their approvals and are proceeding in good faith and in a timely manner, then these properties whether through zoning, development agreement, subdivision approval or otherwise should be defended from any subsequent down zoning actions or other actions that would delay their development.

Lead Organizations: LUC, HCDA, County Councils
Assisting Organizations: OP, counties, HHFDC
Starting Date: Ongoing
Measures of Effectiveness: Perceived predictability in land use matters.

IMPLEMENTING ACTION C(3)(c): Examine ways to revise the regulatory and procurement systems to allow for faster expenditure of funds to support residential development, including development to increase infrastructure capacity.

Lead Organizations: OP, HHFDC, DAGS
Assisting Organizations: Other state agencies, counties, private sector, TOD Council
Starting Date: Ongoing
Measures of Effectiveness: Increased efficiencies in encumbering/expending funds.

ISSUE AREA: HOUSING INFORMATION SYSTEM

PROBLEM STATEMENT: HHFDC posts on its website a list of government-assisted rental housing projects. HHFDC also periodically produces a housing planning study which provides a comprehensive assessment of the housing market, including housing conditions; demographic and economic characteristics of Hawaii’s households; the housing supply; demand for housing by geographic areas and income group; projected housing need; and inventory of housing stock. However, a comprehensive information system of existing and new data useful in estimating housing need, tracking housing production, and preparing and updating housing plans in a form which allows for periodic updating is lacking and needs to be developed.

OBJECTIVE D: MAINTAIN A STATEWIDE HOUSING DATA SYSTEM FOR USE BY PUBLIC AND PRIVATE AGENCIES ENGAGED IN THE PROVISION OF HOUSING.

POLICY D: Coordinate housing-related information systems which are currently maintained by individual public and private agencies.

IMPLEMENT ING ACTION (D)(l)(a): Conduct a statewide survey of agencies who are engaged in the provision of or the planning, development, construction, financing, sale, lease or management of housing to ascertain the scope of housing data maintained by these agencies, as well as their housing information needs.

Lead Organization: HHFDC
Assisting Organizations: County housing agencies, DBEDT, private sector
Starting Date: FY 2018
Budget Estimate: $ Undetermined
Measures of Effectiveness: Assessment of information availability and needs.

IMPLEMENTING ACTION D (l)(b): Maintain a schedule of planned and completed housing projects. This schedule will be used to track housing goals (i.e., 10,000 housing units by 2020 and 22,500 rental housing units by 2026) and update housing plans and policies.

Lead Organization: HHFDC
Assisting Organizations: OP, Special Action Team, county housing agencies, private developers
Starting Date: Ongoing
Measures of Effectiveness: Updated production schedule.

ABBREVIATIONS

The following is a list of abbreviations of various organizations and agencies referred to in the plan:

AMI	Area median income established by HUD
B&F	State Department of Budget and Finance
County housing agencies	Office of Housing and Department of Community Services (Honolulu) Office of Housing and Community Development (Hawaii) Kauai County Housing Agency Department of Housing and Human Concerns (Maui)
DAGS	State Department of Accounting and General Services
DBEDT	State Department of Business, Economic Development & Tourism
DHS	State Department of Human Services
DLNR	State Department of Land and Natural Resources
DOE	State Department of Education
DOH	State Department of Health
DOT	State Department of Transportation
HCDA	Hawaii Community Development Authority
HHFDC	Hawaii Housing Finance and Development Corporation
HPHA	Hawaii Public Housing Authority
HUD	U.S. Department of Housing and Urban Development
LUC	State Land Use Commission
OP	Office of Planning
Special Action Team	Special Action Team established by Act 127, SLH 2016
TOD Council	Hawaii Interagency Council for Transit-Oriented Development
UH	University of Hawaii
USDA-RH	U.S. Department of Agriculture – Rural Housing
VA	U.S. Department of Veteran’s Affairs

APPENDIX C

Master Planning Process: Status Report Update

STATUS REPORT UPDATE

HPHA ADMINISTRATIVE OFFICES REDEVELOPMENT MASTER PLANNING PROCESS

DRAFT - DECEMBER 14, 2017

RHF

PBR HAWAII & ASSOCIATES, INC.

concordia

AVALON GROUP

DESIGN PARTNERS INCORPORATED

BACKGROUND & GOALS

The Hawaii Public Housing Authority (HPHA) selected Retirement Housing Foundation (RHF), a non-profit developer, as the Master Developer for the redevelopment of HPHA's administrative headquarters [located at 1002 N. School Street in Honolulu]. HPHA and the Redevelopment Team recognizes the importance and value of engaging the community in the planning and redevelopment of the site of the HPHA administrative offices. This project offers an opportunity to positively impact the neighborhood by creating much needed affordable housing, community-focused amenities and new offices for HPHA. Through a series of participatory co-design meetings, the project Team quickly learned from community members and key stakeholders of the importance of maintaining and enhancing the "neighborhood feel," as well as the opportunity to brighten up the community with this redevelopment project.

Overarching goals for this mixed use development project are to:

- Address Honolulu's demand for **affordable housing**,
- **Improve access to new retail opportunities** and **community-based services** for future tenants and area residents, and
- **Replace and enhance** HPHA's aging administrative offices.

'A mixed-use development with mom & pop stores that serve surrounding multi-generational, multi-ethnic community.' - Meeting 1 Table Vision

'The new development should provide color and spark to the streetscape. It should also feature a gathering space, and perhaps another space for veterans. We're excited!' - Meeting 1 Table Vision

THE PROCESS

Consistent and true to its community-oriented mission and focus, RHF invited area residents, State, County, local and neighborhood officials, community stakeholder groups and individuals to participate in a co-design planning and redevelopment process over several meetings held between October 2016 and October 2017. This co-design process engaged participants in hands-on activities that directly informed the Redevelopment Team's conceptual master plan designs.

The process included two evening meetings at the HPHA offices as well as two meetings at the Lanakila Senior Center. These meetings were followed by a 2-day charrette open to the public in January of 2017.

The October 2016 meetings focused on understanding existing conditions, neighborhood assets, and community needs that could potentially be addressed through the redevelopment project.

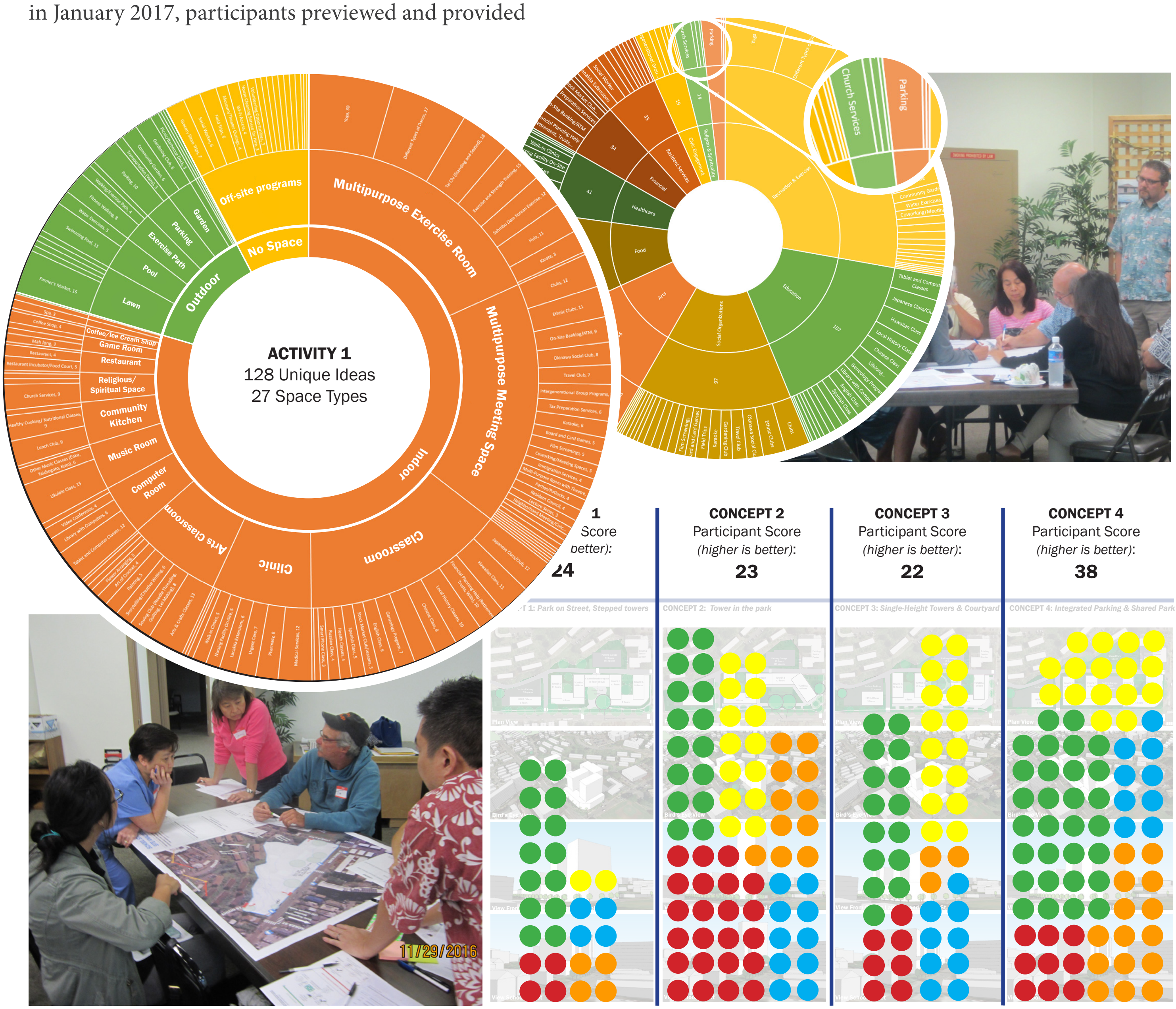
Participants shared how some residents rely on the city bus system for transportation, others were concerned over the potential impact the proposed Redevelopment might have on parking and traffic congestion in the area. The anticipated increase in traffic also raised concerns and the need for more curbs, sidewalks, and bike lanes in the neighborhood.

With the project likely having a focus on providing much needed affordable senior housing, the Team welcomed the opportunity to meet with seniors at the Lanakila Senior Center. These citizens spend much of their time at the Senior Center and in the neighborhood. Some of them even expressed a desire to possibly live in the new development. We had a chance to review all of the numerous programs offered at the Center and to find opportunities to understand how potential services and amenities offered at the new mixed-use development might enhance opportunities for seniors, their families and friends who live in or visit the neighborhood.

In meetings held at the HPHA offices and the Lanakila Senior Center in November 2016, attendees were asked to suggest programs, services, and amenities that might be offered at the proposed Redevelopment. Attendees also provided recommendations regarding the site's layout and its connectivity (vehicular, pedestrian, and bicycle) to the surrounding neighborhood.

During the two 2-day charrettes and public meetings held in January 2017, participants previewed and provided input on alternative site plans and architectural style. The Redevelopment Team worked with the community to understand preferences and concerns regarding architectural design elements, materials, scale and massing of buildings on the site and how these elements can enhance the activity on the street and in the surrounding area while maintaining a neighborhood feel.

Input from the first of two design charrettes was incorporated into an updated draft concept plan which was then presented for comment and review at the second 2-day charrette & public meetings held on January 30th and 31st at HPHA and the Lanakila Senior Center respectively.



CRITERIA

The comments and input generated at the 2nd set of charrettes and community meeting have further informed the revision and refinement of a draft master plan. At the time, example massing studies based on 1,000 units were presented to give participants an idea of what the site might look like and what the potential visual impacts might be. Though 1,000 affordable units were discussed, no decision was made on whether those units would be designed exclusively for families, seniors or a mix of both. Because unit sizes for families tend to be larger than those designed for seniors, participants were informed that the total number of units proposed could vary from as few as 800 units to as many as 1,000 units, and that further study is required before a decision can be made.

The massing studies showed five (5) structures including a separate 3 to 4 story replacement HPHA office building, three separate residential structures of roughly 10 to 15 stories, 12 to 16 stories, and 20-28 stories respectively. The residential structures would share an adjoining parking structure for approximately 565 vehicles, separate surface level parking would be included near the HPHA replacement office for 75 vehicles. Anticipated building heights for the residential complexes varied based on:

- The land area available, including the footprint of the existing HPHA Administrative buildings;
- The estimated unit sizes necessary to accommodate families (multi-bedroom units), seniors (studios to one bedrooms) or a mix of both; and
- The off-street parking requirements (depending on number and type of residential units).

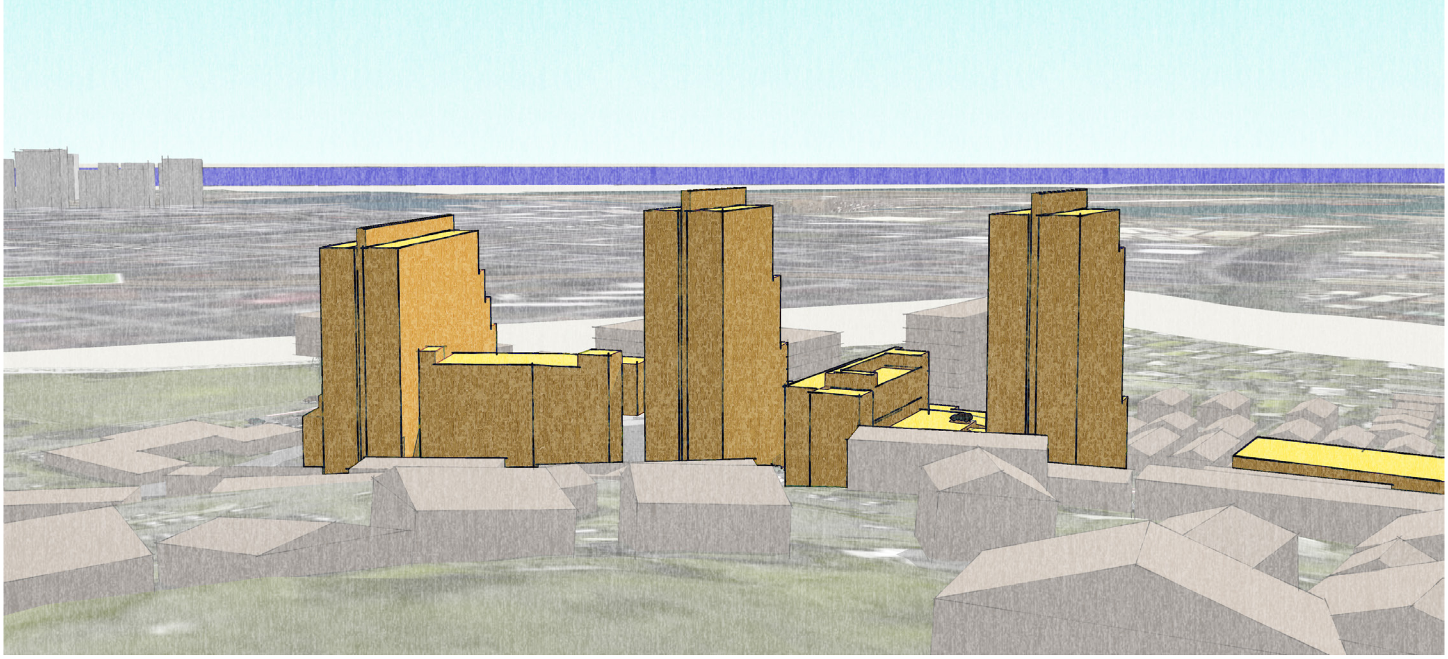
Several criteria were used to estimate the number of parking stalls required. The City and County of Honolulu's off-street parking requirements mandate one stall for up to 600 square foot (SF) apartments, 1.5 stalls for every apartment larger than 600 SF and less than 800 SF, and 2 stalls for each apartment over 800 SF. As a result, the higher the percentage of family units, the greater the requirement for more parking stalls (and a larger parking structure) – and the taller the apartment buildings (and parking structure) will have to be. Conversely, the higher the percentage of senior residential units, the smaller the units, the fewer required parking stalls, the smaller the parking structure required – and the shorter the apartment buildings. Additionally, a lower number of parking stalls has a positive impact (lower volumes) on traffic generated. Moreover, seniors have less reason to travel during peak hour traffic (commuting to school or work) as a large percentage are retired and/or take public transportation.

SITE PLAN

AERIAL VIEW OF MASSING ABOVE LIKELIKE SCHOOL - 1000 UNITS

1000 Total Units

78% / 22% Respective Senior vs. Multi-Family Housing Ratio	Phase 1	Phase 2	Phase 3
Tunnel Form Senior Buildings (Max. Stories / Max. Height)	22 / 207'	22 / 207'	19 / 180'
Multi-Family Podium Construction (Max. Stories / Max. Height)	10 / 90'	11 / 99'	7 / 63'



A PLAN FOR SENIORS & THE NEIGHBORHOOD

With these assumptions in mind, RHF predicts that providing affordable housing exclusively for Honolulu's growing senior population produces multiple benefits including the need for fewer parking stalls, accommodates smaller apartment sizes resulting in lower apartment building heights, and reduces demand for on-street parking and traffic congestion.

The Redevelopment Team believes the optimal solution is an 800 unit all-senior project. RHF also believes there is a synergistic relationship with the neighboring Lanakila Senior Center that could result in three senior affordable apartment buildings of roughly 10 to 15 stories, 11 to 16 stories, and 7 to 16 stories respectively. The residential structures would share 3 smaller, adjacent parking structures that would provide parking for approximately 400 vehicles. Separate surface level parking would be included near the HPHA replacement office for 75 vehicles. This potential scheme would also include a separate 3 to 4 story replacement HPHA office building.

There could be a significant reduction in parking requirements if the development were to only serve seniors. Research supports .25 stalls of parking per unit for senior housing with access to public transportation, bike lanes and ride share programs.

The image above shows what a 1,000 unit senior and multi-family mixed use project looks like like compared with an 800 unit all-senior project image on the next page.

The Redevelopment Team and HPHA are grateful for the participation of community members and key stakeholders in the Master Planning process and believes that this collaboration is what will minimize impacts on parking demand and traffic congestion, while making for a most successful project that brings benefits to new residents and the surrounding community.

AERIAL VIEW OF MASSING ABOVE LIKELIKE SCHOOL - 800 UNITS

800 Total Units

100% Senior Housing with 640 1br units & 160 2br units	Phase 1	Phase 2	Phase 3
Tunnel Form Senior Buildings (Max. Stories / Max. Height)	15 / 144'	16 / 153'	16/ 153'
Senior Podium Construction (Max. Stories / Max. Height)	10 / 90'	11 / 99'	7 / 63'

COMMUNITY MEETING #6

The School Street Redevelopment Team conducted a final round of community meetings for the Master Plan Phase of the affordable housing redevelopment project. The same meeting agenda was conducted in the evening of October 18th, 2017 at the HPHA Administrative Offices Board Room and again the following morning, October 19th, 2017 at the Lanakila Senior Center. Over 60 people were in attendance on the 18th and 30 attended the meeting at the Senior Center the following day.

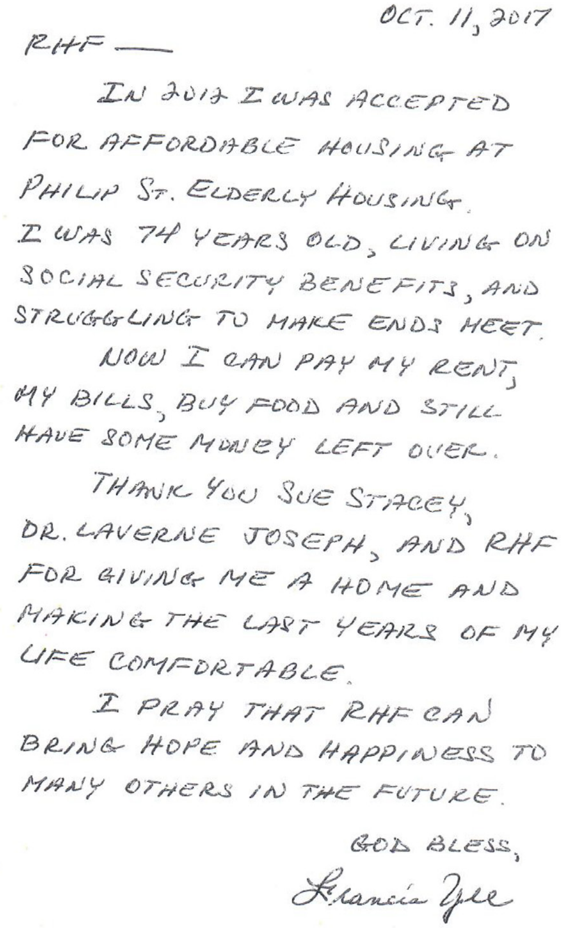
The Team shared a Power Point presentation that documented the progression of plans for the redevelopment project based on the community's input. The presentation addressed the need for affordable housing in Hawaii. While citizens have expressed concerns about the number of units, they have a better understanding of the need. The Team explained how the redevelopment project happening on state land positively impacts the cost of the overall project. The Team was able to negate assumptions that the project would include public housing.

RHF LETTERS OF RECOMMENDATION

"Thank you...RHF for giving me a home and making the last years of my life comfortable...

I pray that RHF can bring hope and happiness to many other in the future."

- Current RHF Senior Housing Resident



OCT. 11, 2017

RHF —

IN 2012 I WAS ACCEPTED FOR AFFORDABLE HOUSING AT PHILIP ST. ELDERLY HOUSING. I WAS 74 YEARS OLD, LIVING ON SOCIAL SECURITY BENEFITS, AND STRUGGLING TO MAKE ENDS MEET.

NOW I CAN PAY MY RENT, MY BILLS, BUY FOOD AND STILL HAVE SOME MONEY LEFT OVER.

THANK YOU SUE STACEY, DR. LAVERNE JOSEPH, AND RHF FOR GIVING ME A HOME AND MAKING THE LAST YEARS OF MY LIFE COMFORTABLE.

I PRAY THAT RHF CAN BRING HOPE AND HAPPINESS TO MANY OTHERS IN THE FUTURE.

GOD BLESS,

Francis Yee

one of dozens of letters of support recieved from current RHF residents.

RESULTS OF ENGAGEMENT PROCESS

Additional impacts from community feedback include:

1. *Desire for both public and private green space.*
2. *No stand alone parking building. Parking now included within the housing units.*
3. *Building heights are stepped back so that the full height is not noticeable from the street.*
4. *The development serves seniors.*

Participants were asked to discuss and document responses to the following questions that will further influence the development of the project in the next stages.

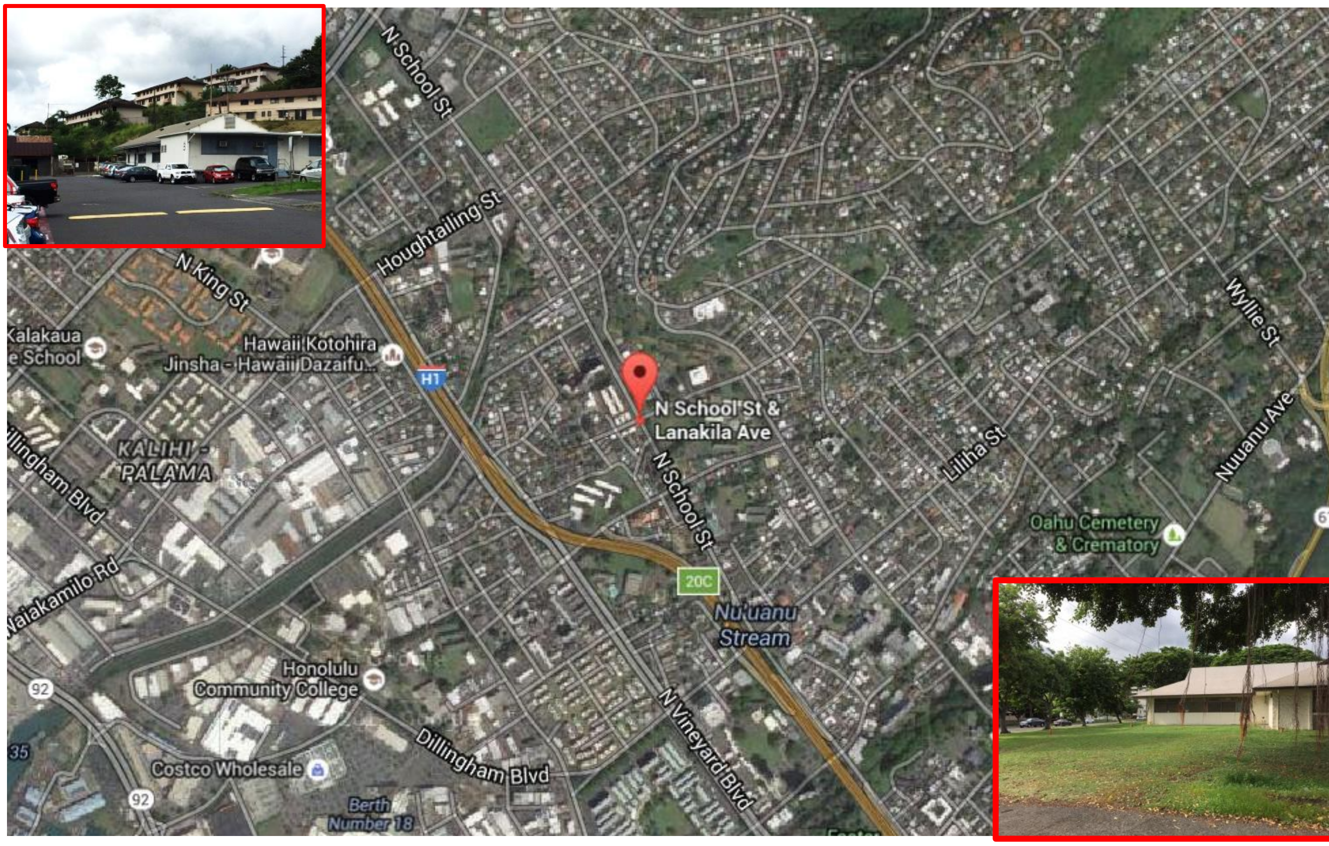
1. How can the HPHA development be the best neighbors? – The community is most concerned about two elements. First is how this project will impact infrastructure - namely sewer, water, electricity and transportation. While we discussed this at the round 6 meetings, community members don't understand that the EIS will establish how this project will impact infrastructure and that project will be designed to meet existing capacity. The second consideration desired by the community is there be consideration for the scale and design of the project that maintains and complements the existing neighborhood.

2. What amenities in the public green space can best serve the community? The most consistent recommendation is for there to be as much public and private green space as possible. The community wants gardens, benches, and walking paths. Additionally, there is a strong desire to save the trees.

3. What about this community can the HPHA redevelopment best celebrate? There are two most popular characteristics of the neighborhood that the community wants to maintain and celebrate – diversity and walkability.

APPENDIX D
Retail Market Demand Assessment

Retail Market Demand Assessment
for the
Property at Lanakila Avenue and North School Street



February 8, 2016

Prepared for

Retirement Housing Foundation

Prepared by

Colliers International
220 S. King Street, Suite 1800
Honolulu, HI 96813
www.colliers.com
808.524.2666

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Project Scope and Methodology

PROJECT SCOPE

Colliers Consulting was engaged to assist Retirement Housing Foundation (RHF) to determine the level of retail demand for their proposed development located at Hawaii Public Housing Authority's site at the corner of Lanakila Avenue and North School Street.

Colliers Consulting worked in conjunction with Mr. Ricky Cassiday from Data@Work , who had been selected to provide a residential market demand study for this proposed development. This report references several tables from Mr. Cassiday's report and uses his unit absorption and resident population estimates for our retail demand models.

PROJECT METHODOLOGY

Colliers Consulting provides an evaluation of the current market conditions and projects the level of retail demand based on two models, a population and a consumer expenditures model.

The population model bases its estimates on the number of resident consumers in a target market area and the ratio of retail square footage per resident. A penetration rate is used to derive the level of demand for retail for this proposed development site.

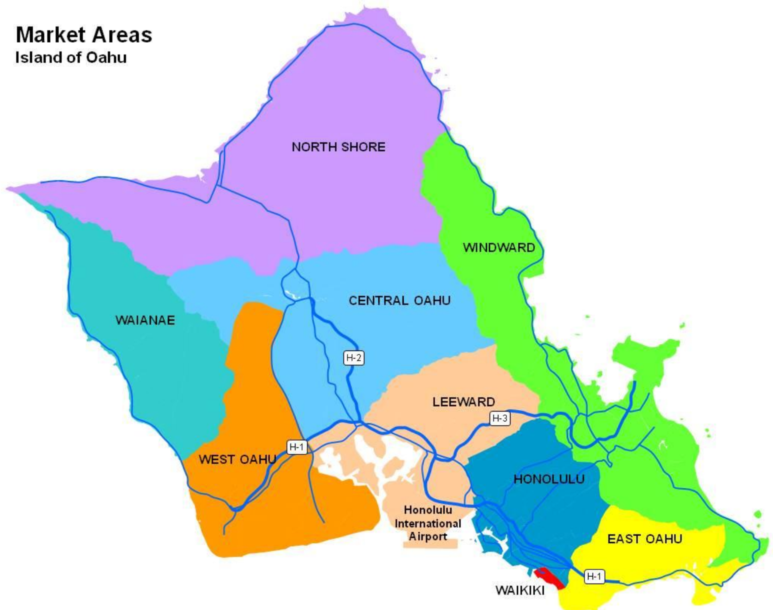
The consumer expenditures model uses the household retail expenditures by the target market and calculates a market retail sales per square foot ratio based on local market comparables. Through this effort, Colliers is able to derive a level of retail square footage demand based on the projection of new households formed in the target market area.

Colliers Consulting uses these two models to provide a conservative, moderate and aggressive development scenarios. Based on a developer's level of risk, they can select the most appropriate scenario for their project.

Retail Market Conditions

OAHU RETAIL MARKET OVERVIEW

The total retail center inventory on Oahu is approximately 16.39 million square feet spread amongst nine submarkets. Since Oahu is the primary population hub of the state, the majority of the island's retail centers serve the resident population. However, since tourism is one of the main economic engines, the market also consists of resort retail centers primarily in Waikiki. Honolulu and Leeward Oahu are the largest submarkets with over 4 million square feet of inventory each. The subject site is located in the Honolulu submarket.



FOURTH QUARTER 2015 - Oahu Retail Market Statistics

RETAIL MARKET INVENTORY - BY SUBMARKET AREA

	TOTAL INVENTORY (SF)	VACANT SPACE (SF)	VACANCY RATE	4TH QTR NET ABSORPTION (SF)	YTD NET ABSORPTION (SF)	AVG. LOW NNN ASKING RENTS (PSF/MO)	AVG. HIGH NNN ASKING RENTS (PSF/MO)	AVG. CAM EXPENSES (PSF/MO)
CENTRAL OAHU	889,235	52,797	5.94%	(780)	13,293	$3.25	$4.21	$0.98
EAST OAHU	1,511,774	35,587	2.35%	(1,027)	(1,451)	$4.20	$5.77	$1.54
HONOLULU*	4,833,231	355,371	7.35%	409,965	422,865	$3.13	$3.92	$1.38
LEEWARD OAHU	4,407,948	112,759	2.56%	(463)	(9,906)	$3.45	$3.96	$1.15
NORTH SHORE	198,125	3,407	1.72%	3,900	560	$3.19	$4.00	$1.39
WAIANAE	342,060	59,917	17.52%	(700)	(6,485)	$1.58	$2.33	$0.98
WAIKIKI	1,440,527	134,348	9.33%	(12,205)	18,300	$8.84	$19.37	$1.97
WEST OAHU	1,140,957	22,878	2.01%	(1,279)	8,882	$4.11	$4.67	$1.29
WINDWARD OAHU	1,621,750	54,067	3.33%	5,729	15,378	$3.13	$4.60	$1.37
TOTALS*	**16,385,607**	**831,131**	**5.07%**	**403,140**	**461,436**	**$3.40**	**$4.28**	**$1.29**

*Islandwide total for average rents and CAM calculations exclude Waikiki and Ala Moana Center

RETAIL MARKET INVENTORY - BY BUILDING CLASS

	TOTAL INVENTORY (SF)	VACANT SPACE (SF)	VACANCY RATE	4TH QTR NET ABSORPTION (SF)	YTD NET ABSORPTION (SF)	AVG. LOW NNN ASKING RENTS (PSF/MO)	AVG. HIGH NNN ASKING RENTS (PSF/MO)	AVG. CAM EXPENSES (PSF/MO)
COMMUNITY/POWER CENTER	3,381,852	122,865	3.63%	(5,354)	(9,958)	$4.12	$4.97	$1.41
NEIGHBORHOOD	4,725,648	154,121	3.26%	7,994	31,356	$3.31	$4.13	$1.27
REGIONAL*	5,183,388	308,024	5.94%	402,660	403,575	$3.17	$9.70	$2.41
RESORT/SPECIALTY	1,529,831	142,946	9.34%	(3,661)	21,483	$7.84	$18.84	$1.95
STRIP	1,564,888	103,175	6.59%	1,501	14,980	$3.20	$4.01	$1.21
TOTALS**	**16,385,607**	**831,131**	**5.07%**	**403,140**	**461,436**	**$3.40**	**$4.28**	**$1.29**

* Includes Ala Moana Center in calculations

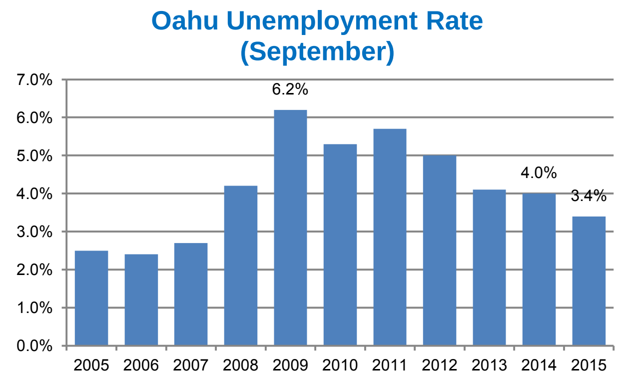
**Islandwide total for average rents and CAM calculations exclude Waikiki and Ala Moana Center

OAHU ECONOMIC MARKET OVERVIEW

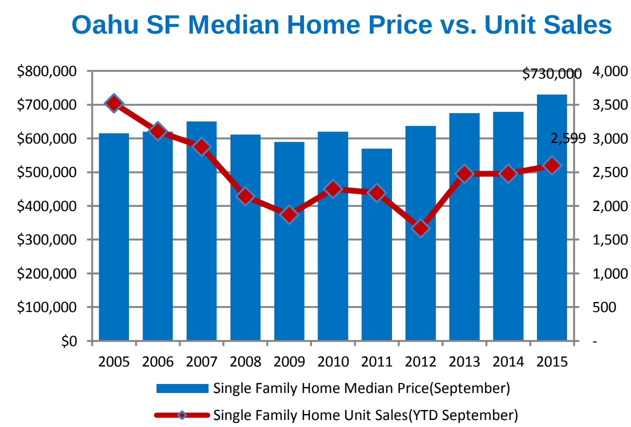
Healthy job growth, rising home prices and an ongoing tourism boom are helping to perpetuate both consumer and retailer optimism. Oahu's consumer spending base is expanding as more people find jobs. Oahu's unemployment rate fell to 3.4% in September 2015, its lowest level in eight years. During this time period, the combination of an additional 12,700 civilians were added to payrolls and 3,200 fewer unemployment claims resulted in an important milestone – the number of employed civilian workers now exceeds the level of peak employment established prior to the last recession.

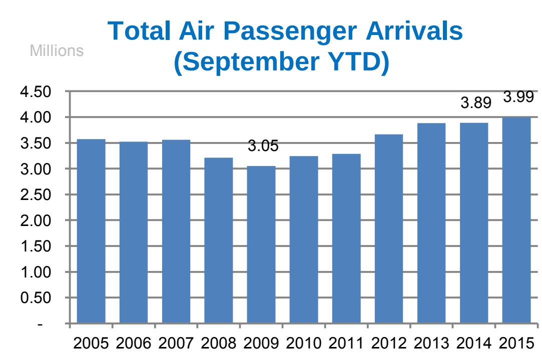
The median single family home price rose to a record $730,000 in September 2015, which helps to boost consumer confidence levels and positively impact retail spending. While demand for homes remains strong, the shortage of available properties for sale has created increased competition among buyers and resulted in a robust price increase. Over the past year, the single family median home price increased by 7.6% and nearly 15% during the past three years.

The year-to-date September 2015 air passenger arrival count also hit another record level. Nearly 4.0 million visitors traveled to Honolulu International Airport, a 2.6% gain over the same period last year. The tourism sector has benefited from 6 consecutive years of growth and has posted a 30.8% jump in visitor arrivals since the end of the recession in 2009.



Source: DBEDT





Source: DBEDT

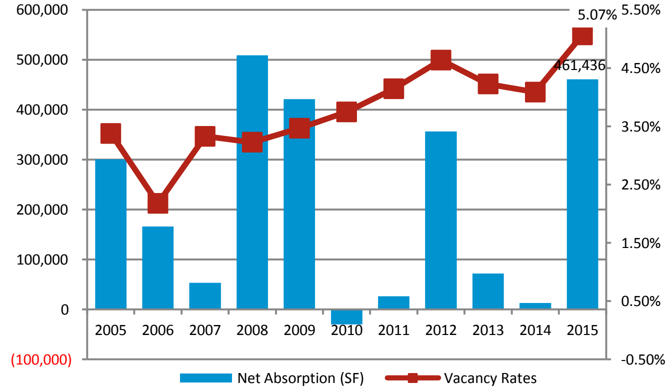
At year-end 2015, Oahu's retail market received a sizeable occupancy boost when the widely anticipated expansion of Ala Moana Center's Ewa Wing contributed more than 400,000 square feet of positive net absorption to the island-wide total of 461,436 square feet.

Historically, the introduction of new retail centers have been greatly received with the strongest absorption reported when these projects are delivered.

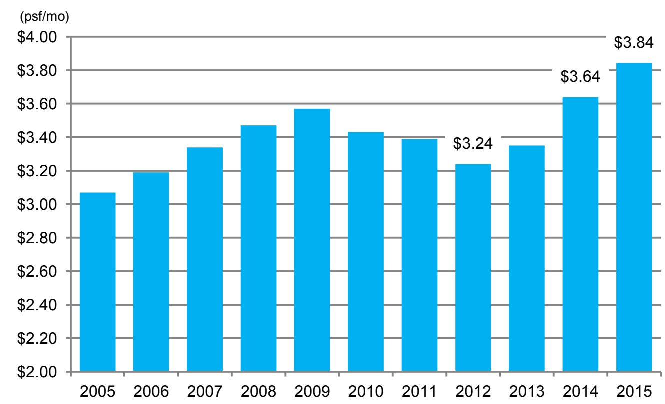
While vacancy rates have risen to their highest level in the past decade, the 5.07% is still well below the national average retail vacancy rate of 8%.

The delivery of the Ewa Wing of Ala Moana Center is only the start of more than 4.0 million square feet of retail development on Oahu. While many believe that Oahu is still currently "under-retailed", the delivery of all these projects would boost the total retail shopping center inventory by a healthy 25% over the a short three year period.

Oahu Retail Net Absorption vs. Vacancy Rate



Oahu Retail Average Asking Base Rent



Oahu's retail average asking base rent rose for the third consecutive year, posting a healthy 5.5% jump during the past year, increasing from $3.64 per square foot per month ("psf/mo") to $3.84 psf/mo. In total, retail rents have increased a solid 18.5% over the past three years.

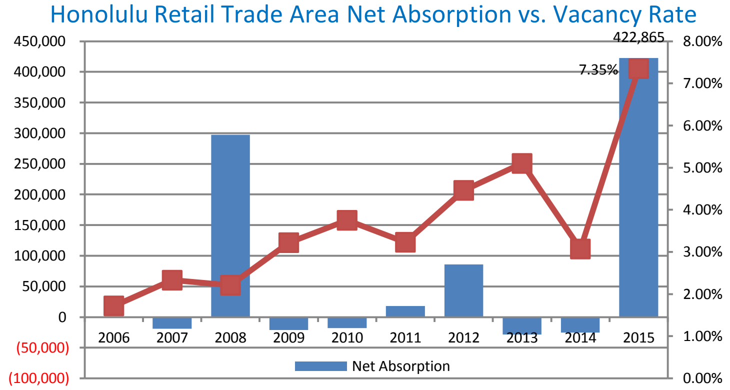
The University of Hawaii Economic Research Organization and the State Department of Business, Economic Development and Tourism both the primary economic forecasters for the State of Hawaii, anticipates that 2016 will experience moderate growth. Despite a slowdown in air passenger arrivals, the State will continue to benefit from a boost in job counts and healthy real personal income growth.

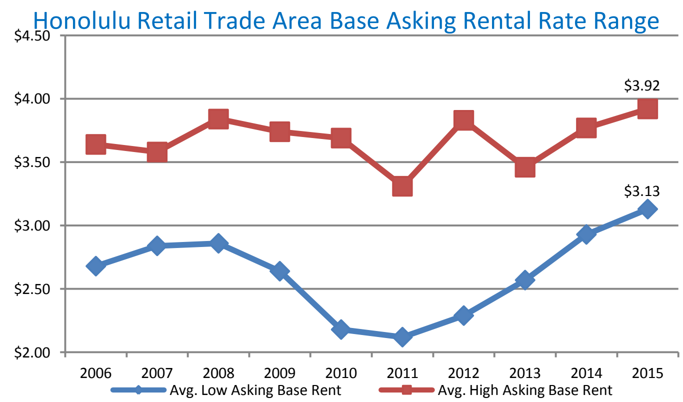
HONOLULU TRADE AREA MARKET OVERVIEW

The Honolulu retail trade area consists of shopping centers in urban Honolulu from Salt Lake Boulevard to University Avenue. This diverse area includes the State's top performing regional mall, Ala Moana Center, Iwilei's Big Box retailers, and numerous neighborhood centers and strip centers.

Vacancy rates have historically ranged from a low of 1.72% to a current high of 7.35%. However, the small market size makes this submarket volatile. The delivery of the 650,000 square foot at Ala Moana Center caused the vacancy rate to rise to 7.35% from 3.07% a year ago. Brisk leasing activity is expected with Ala Moana Center to reach stabilized occupancy by the end of 2016. In addition to Ala Moana Center, Ward Centers also has additional retail development planned to coincide with the delivery of several high rise condominium complexes.

Average asking base rental rate range reached a new high at the end of 2015, posting a low average asking rent of $3.13 psf/mo and a high average asking rent of $3.92 psf/mo. Rents have steadily increased over the past two years.



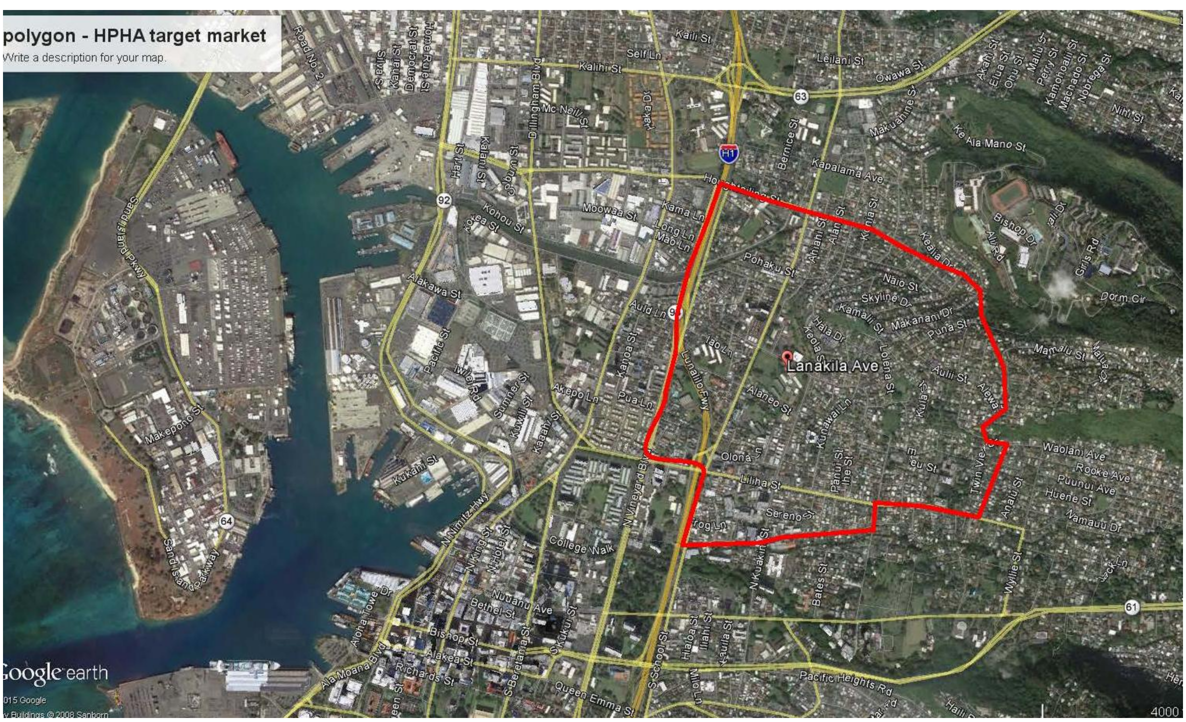


Primary Trade Area

The primary trade area is principally the area where the majority of consumer expenditures will be derived from. For the Lanakila Avenue at N. School Street location, the primary trade area is roughly a three block radius around the subject property or a 0.5 mile radius. The northern boundary is Houghtailing Street, Vineyard Boulevard is the western boundary, and the southern boundary is Bachelot Street.

The primary trade area is principally a residential neighborhood with several major thoroughfares with commercial tenants. N. School Street is the principal commercial street for this area. Notable businesses and landmarks in the primary trade area include Damien High School, Likelike and Lanakila Elementary Schools, Kuakini Medical Center, Foodland Grocery Store, and Lanakila Health Center.

PRIMARY TRADE AREA MAP



PRIMARY TRADE AREA –RETAIL INVENTORY

Property Name	Tenant	Address	Square Footage GLA	Trade Area
Walgreens	Walgreens	1520 N. School St	21,697	Primary
Pizza Hut	Pizza Hut	516 N. Kuakini St	3,227	Primary
Longs Drug	Longs Drug	1748 Liliha Street	3,146	Primary
Liliha Bakery		515 N. Kuakini at Liliha St	6,440	Primary
7-Eleven Gas Station/Convenience Store	7-Eleven Gas Station/Convenience Store	11 Kuakini St	2,400	Primary
Tesoro Gas Station/Convenience Store	Tesoro Gas Station/Convenience Store	1992 Kalihi St	1,170	Primary
Ono's Convenience Mart	Ono's Convenience Mart	1912 Kalihi St	1,500	Primary
KFC	KFC	1702 N. King St	1,652	Primary
Nuuanu Shopping Center	McDonalds	414 N. School St	15,252	Primary
	Foodland Grocery	414 N. School St		Primary
Tamashiro Market	Tamashiro Market	802 N. King St	3,402	Primary
Ritchies Drive Innn	Ritchies Drive Innn	1178 N. King St	3,302	Primary
Golden City	Golden City	1418 N. School St	2,222	Primary
Chevron Gas	Chevron Gas	1402 N. School St	1,624	Primary
Burts Union Service	Burts Union Service	1342 N. School St	2,000	Primary
Yummy land	Yummy land	1336 N. School St	2,000	Primary
Helena's Hawaiian Food	Helena's Hawaiian Food	1240 N. School St	6,848	Primary
Mistuba Deli	Mistuba Deli	1218 N. School St	3,000	Primary
			80,882	

Within the primary trade area, there is an inventory of roughly 81,000 square feet of retailers. These are principally fast food, gas stations and convenience stores. The Nuuanu Shopping Center, which has a Foodland grocery story and McDonalds, is the closest grocery store to the subject property.

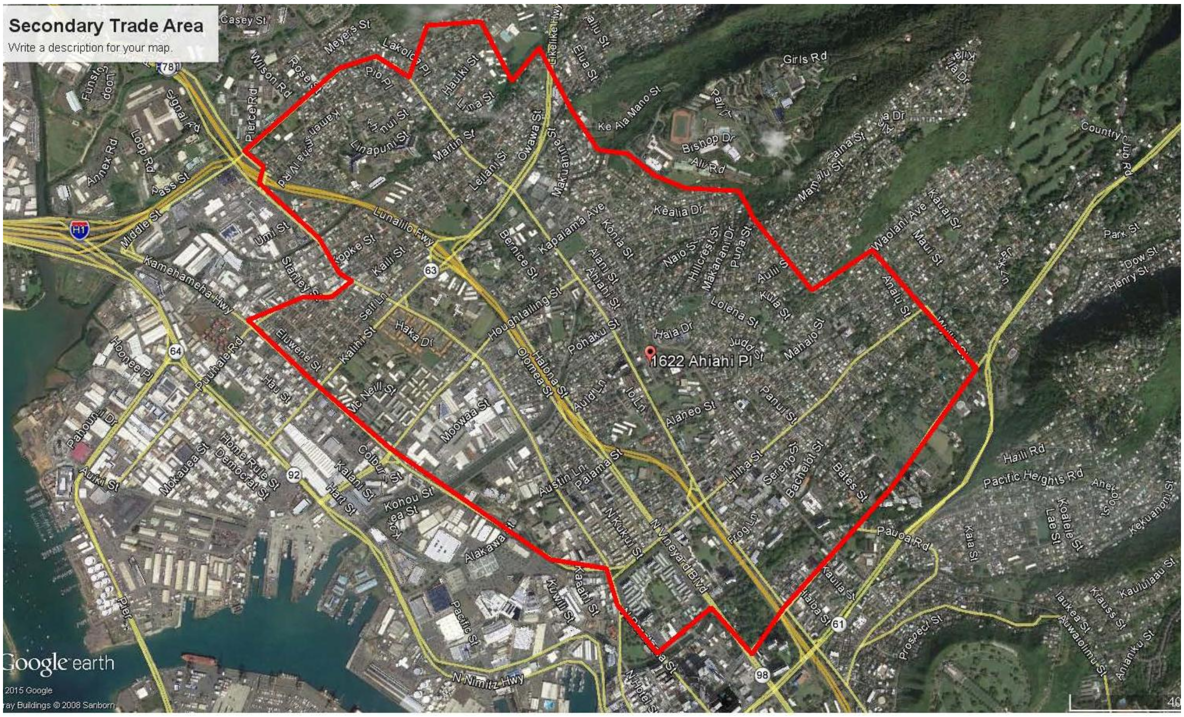
Secondary Trade Area

The secondary trade area expands the consumer trade area to include most of Kalihi-Palama, Liliha-Kapalama and portions of Iwilei. The secondary trade area is very diverse with businesses that range from wholesale distributors that rely on the Port of Honolulu, Honolulu Community College, to Big Box Retailers such as such as Costco, Home Depot, Lowes, City Mill and Best Buy.

This region is also home to several large public housing projects such as Kukui Gardens, Waena Apartments, King Kalakaua and Mayor Wright as well as the Oahu Community Correctional Center.

In addition to big box retailers, this region is home to Dilliingham Plaza Shopping Center, Waiakamilo Shopping Center, Kamehameha Shopping Center, Liliha Square Shopping Center and City Square Shopping Center.

SECONDARY TRADE AREA MAP



SECONDARY TRADE AREA –RETAIL INVENTORY

Property Name	Address	Square Footage GLA	Trade Area
Kamehameha Shopping Center	1620 N. School St	125,139	Secondary
Liliha Square Shopping Center	1425 Liliha St	45,000	Secondary
Kingsgate Plaza	King Street	58,242	Secondary
Service Station	666 N. King Street	1,624	Secondary
Molina Market	675 N. King Street	1,324	Secondary
	719 N. King Street	2,888	Secondary
Kings Market/Mr. Mandoo	1101 N.King Street	11,458	Secondary
Chevron Gas Station	743 N.King Street	1,277	Secondary
	731 N. King Street	1,725	Secondary
Tamashiro Market	802 N. King Street	3,402	Secondary
	844 N. King Street	2,400	Secondary
	940 Hikina Street	2,784	Secondary
	944 N. King Street	1,440	Secondary
	951 N. King Street	5,093	Secondary
	1001 N. King Street	1,216	Secondary
Aloha Petroleum	1010 N. KingStreet	1,404	Secondary
	1013 N. King Street	4,560	Secondary
discount market	1070 N. KingStreet	12,434	Secondary
Nimitz Video Emporrium	1208 N. King Street	2,028	Secondary
Toshi's Deli/Florwer Impression	1226 N. King Street	2,212	Secondary
	1248 N. King Street	1,672	Secondary
	1252 N. King Street	2,422	Secondary
Tax Busters/Reno	1270 N. King Street	6,409	Secondary
	1311 N. KingStreet	7,260	Secondary
	965 Kamenani Street	1,605	Secondary
New Diners Drive In	1333 N. King Street	1,845	Secondary
	1465 N. King Street	1,554	Secondary
	1475 N. King Street	2,466	Secondary
KFC	1704 N. King Street	1,652	Secondary
	1712 N. King Street	2,301	Secondary
Chevron Station	1715 N. North School St	507	Secondary
7-Eleven	1717 N. King Street	2,310	Secondary
	1810 N. King Street	3,538	Secondary
	1818 N. King Street	1,592	Secondary
Aloha Petroleum	1007 Kaili Street	2,680	Secondary
	1874 N. King Street	1,131	Secondary
	1911 Hani Lane	9,225	Secondary
	1881 N. King Street	432	Secondary
	1891 N. King Street	8,866	Secondary
	1931 N. King Street	5,536	Secondary
	920 Industrial Road	4,000	Secondary
	1955 N. King Street	3,348	Secondary
	2024 N. King Street	1,300	Secondary
	922 Factory Street	2,880	Secondary
	931 Kopke Street	2,576	Secondary
	2033 N. King Street	544	Secondary
	2110 N. King Street	8,372	Secondary
Dillingham Shopping Plaza	1505 Dillingham St	181,577	Secondary
Home Depot	421 Alakawa	129,494	Secondary
Lowes	411 Pacific	140,483	Secondary
Costco	525 Alakawa	152,727	Secondary
Best Buy	478 Alakawa	50,188	Secondary
Dole Cannery	680 Iwilei Street	149,573	Secondary
City Mill	660 N. Nimitz Hwy	28,248	Secondary
Nimitz Center	1130 N. Nimitz	71,639	Secondary
City Square Shopping Center	1287 Kalani St	85,167	Secondary
Kapalama Shopping Center	1210 Dillingham	40,832	Secondary
Waikamilo Shopping Center	1414 Dillingham	36,864	Secondary
Kokea Center	1095 Dillingham	32,557	Secondary
Chevron Station	1305 Middle Street	1,102	Secondary
Middle Market	1335 Middle Street	885	Secondary
CashPlus	1330 Middle Street	5,389	Secondary
Royce's Mini Market	1408 Middle Street	1,350	Secondary
EBT Mini Market	1435 Middle St	1,872	Secondary
7 - Eleven	2404 N. School Streert	2,664	Secondary
Aloha Gas Station	2314 North School St	2,608	Secondary
Jack in the Box	2317 North School St	2,339	Secondary
	2225 N. School Street	2,824	Secondary
Sunny's Market	2215 North School St	2,862	Secondary
Jin's Market	2161 North School St	3,240	Secondary
		1,502,157	

TRADE AREA DEMOGRAPHICS

PRIMARY AREA DEMOGRAPHICS (2015)	
Population	
Estimated Population (2015)	13,045
Projected Population (2020)	13,684
Projected Annual Change (2015-2020)	1.0%
Historical Annual Change (2000-2010)	0.9%
Households	
Estimated Households (2015)	3,794
Projected Households (2020)	3,984
Projected Annual Change (2015-2020)	1.00%
Historical Annual Change (2000-2010)	0.20%
Age	
Median Age	43.1
Age 19 years or Less	22.50%
Age 20 Years to 64 Years	53.40%
Age 65 Years or Over	24.10%
Average Household Income	
Estimated Average Household Income (2015)	$83,137
Projected Average Household Income (2015)	$91,980
Projected Annual Change (2015-2020)	2.10%
Historical Annual Change (2000-2010)	2.60%
Housing	
Total Housing Units (2015)	3,918
Housing Units Occupied (2015)	3,794
Housing Units Owner Occupied	47.30%
Housing Units Renter Occupied	52.70%
Daytime Demographics	
Total Businesses	270
Total Employees	3,571
Employee Population Per Business	13.2 to 1
Residential Population per Business	48.4 to 1
Source: Sites USA	

SECONDARY AREA DEMOGRAPHICS (2015_	
Population	
Estimated Population (2015)	50,128
Projected Population (2020)	52,480
Projected Annual Change (2015-2020)	0.90%
Historical Annual Change (2000-2010)	0.20%
Households	
Estimated Households (2015)	13,072
Projected Households (2020)	13,713
Projected Annual Change (2015-2020)	1.00%
Historical Annual Change (2000-2010)	0.30%
Age	
Median Age	39.3
Age 19 years or Less	25.20%
Age 20 Years to 64 Years	55.00%
Age 65 Years or Over	19.90%
Average Household Income	
Estimated Average Household Income (2015)	$79,183
Projected Average Household Income (2015)	$86,986
Projected Annual Change (2015-2020)	2.00%
Historical Annual Change (2000-2010)	2.90%
Housing	
Total Housing Units (2015)	13,469
Housing Units Occupied (2015)	13,072
Housing Units Owner Occupied	41.10%
Housing Units Renter Occupied	58.90%
Daytime Demographics	
Total Businesses	1,210
Total Employees	14,481
Employee Population Per Business	12.0 to 1
Residential Population per Business	41.4 to 1
Source: Sites USA	

Population Demand Model

Colliers utilized the population model to identify the level of consumer demand for a retail development. This model examines the demand potential from the existing population and projected population growth for a market area using a retail square footage per resident ratio. The potential or residual demand is calculated by subtracting the current and planned inventory of retail shopping center space in the primary and secondary target markets from the calculated total retail demand. If the residual demand is positive, it would indicate that there is a need for additional retail space to be built.

By using U.S. Census figures and demographic market reports, Colliers can evaluate whether population projections provide an accurate indication of a geographic region's growth. In a market with healthy residential development, Colliers would also incorporate information on household formation growth. **The planned residential development projections, as well as the potential housing demand for the subject site from the residential demand study were used for our analysis.**

The International Council of Shopping Centers ("ICSC") calculates national ratios for the amount of retail square footage per resident. Colliers also tracks these ratios on a statewide, county wide and geographic specific basis with the use of its proprietary commercial property database. **For this analysis, we used a ratio range of 50 to 58 square feet per resident**

Lastly, Colliers uses a "market penetration rate" to determine the percentage of the market that would likely shop at the subject property. For a market with few retail developments, the subject property would generally have a higher capture rate. For a market with a large existing retail inventory, the market penetration rate would be much lower. **For this analysis, we assumed that a development at the subject property would be able to capture 1% of the residual retail demand .**

	Number of Families	Number of Individuals	Average Gross Annual Income
Hale Po'ai	203	298	$11,741.54
Halia Hale	40	51	$10,731.13
Puahala Homes	112	364	$15,964.46
Totals	355	713	

Source: Hawaii Public Housing Authority

As most retail developments have an inherent risk, Colliers incorporates a conservative, moderate and aggressive development scenario into the model and allows the developer to determine their level of risk aversion.

The existing population at the public housing facilities total 355 families for a total population of 713. we have incorporated this population into our trade area population counts.

Additionally, with this planned affordable housing development, the wide range of 300 to 700 units are being evaluated for the site. Based on Ricky Cassiday's population estimate for the range of development options, Colliers added new resident population into our population demand model. This population is categorized by family or senior units, by adjusted median income, and by total units built..

Population Estimate for New Units

Families	Number of Units				
AMI	300	400	500	600	700
30%	219.6	212.6	269.8	320.6	377.8
40%	113.2	104.6	130.0	155.4	187.2
50%	121.9	116.9	147.9	173.6	206.8
60%	48.8	54.9	66.5	79.2	90.8
80%	92.9	82.5	103.7	123.8	144.9
totals	596.4	571.5	717.8	852.5	1,007.5

Seniors	Number of Units				
AMI	300	400	500	600	700
30%	118.5	158.1	197.7	238.5	276.6
40%	35.7	49.8	61.2	72.6	85.5
50%	19.2	25.5	31.8	39.6	44.7
60%	17.0	22.5	28.0	35.0	39.5
totals	190.4	255.9	318.7	385.7	446.3

Total Population	Number of Units				
AMI	300	400	500	600	700
30%	338.1	370.7	467.5	559.1	654.4
40%	148.9	154.4	191.2	228.0	272.7
50%	141.1	142.4	179.7	213.2	251.5
60%	65.8	77.4	94.5	114.2	130.3
totals	693.9	744.9	932.9	1,114.4	1,308.9

Source: Ricky Cassiday, Data @ Work

For a development of 300 units, the estimated total additional population added to the site would be 693.9.

For a 400 unit development, the total population would rise to 744.9. As the development increases in unit counts, a corresponding increase to the resident population occurs.

Unit Absorption Rates				
Units Built	Year One Absorption	Year Two Absorption	Year One Population	Year Two Population
300	300	0	693.9	
400	400	0	595.88	148.97
500	400	100	746.28	186.57
600	400	200	1,114.40	222.88
700	400	300	872.60	436.30

Source: Ricky Cassiday, Data @ Work

In addition to estimates for population, we used Ricky Cassiday's projections for unit absorption. For a development of 400 units or smaller, all units are anticipated to be absorbed within the first year of the leasing/sales effort. For a development of 401-600, it would take fifteen months. For a development 600 to 700 units, it would take eighteen months.

Population Demand Model Estimates

Using a 2015 population base of 50,128, the estimated retail demand for this market ranged from a conservative 2.7 million square feet to an aggressive 3.1 million square feet.

After we subtracted the existing inventory and utilized a capture rate of 1%, the residual retail demand for a 400 unit affordable housing development built in 2015 would range in size from a conservative 9,234 square feet to an aggressive 13,244 square feet. For this same development built in 2020, retail demand would increase to a range of 10,938 to 15,221 square feet in size.

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 300 units		
Scenario	2015	2020
Conservative	9,234	10,918
Moderate	11,239	13,057
Aggressive	13,244	15,197

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 400 units		
Scenario	2015	2020
Conservative	9,234	10,938
Moderate	11,239	13,080
Aggressive	13,244	15,221

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 500 units		
Scenario	2015	2020
Conservative	9,234	11,045
Moderate	11,239	13,195
Aggressive	13,244	15,345

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 600 units		
Scenario	2015	2020
Conservative	9,234	11,148
Moderate	11,239	13,306
Aggressive	13,244	15,464

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 700 units		
Scenario	2015	2020
Conservative	9,234	11,259
Moderate	11,239	13,426
Aggressive	13,244	15,593

Consumer Expenditures Demand Model

In addition to the Population Demand model, Colliers uses a Consumer Expenditures model to estimate the level of consumer support for a retail development. The Consumer Expenditures model evaluates a market's retail potential based on actual retail sales being generated by the target audience.

Colliers uses retail expenditure data and projections from the U.S Census (Regis/Sites USA) demographic market reports. Retail sales per square foot ratios from ICSC which were modified to best fit Hawaii's retail market, as well the average ratio for Hawaii and elected Central Oahu shopping centers were analyzed. By dividing the retail expenditures by these ratios, we can identify the level of retail demand in a market.

Retail sales have increased overall for the island and were $27.28 billion or $686 per square foot in 2013/2014. It should be noted that these sales also include visitor expenditures which are a significant contributor to the retail tax base. A better measure of a retail sales per square foot benchmark would be the Honolulu trade area average of $501 per square foot. **Our analysis assumes a range of $425 to $475 per square foot and does not include visitor expenditure in the analysis.**

Just as with the population model, the residual demand is calculated by subtracting the current inventory of retail shopping center space in the primary and secondary target markets from the estimated total retail demand**.** If the residual demand is positive, it would indicate that there is a need for additional retail space to be built.

RETAIL SALES PER SQUARE FOOT (2013/2014) (Shopping Centers)	
U.S. Retail Mall Sales/SF (1)	$320
Hawaii (State) Sales/SF (1)	$332
Honolulu County Sales/SF (2)	$686
Selected Central Oahu Shopping Centers (3)	$501

(1) *Source: International Council of Shopping Centers*

(2) *Sources: Department of Taxation and Colliers International*

(3) *Colliers International*

CONSUMER EXPENDITURES DEMAND ESTIMATE

Based on a household count of 13,072 for 2015 and the total retail household expenditures of $679 million for the target market, our model determined that the area's retail expenditures are not sufficient to develop additional retail space in the area. For 2015, the conservative and moderate development scenarios indicate a negative reading (typical of an oversaturated market). Only under the aggressive development scenario was there a small demand for additional retail space.

POTENTIAL RETAIL DEMAND (sf) – 400 units						
Scenario	2015	2016	2017	2018	2019	2020
Conservative	(1,540)	(1,254)	(516)	(210)	103	421
Moderate	(746)	(445)	335	658	988	1,324
Aggressive	141	460	1,286	1,628	1,977	2,333

Colliers makes an assumption that this affordable housing development is delivered to the market in 2017. After the introduction of a new 400 unit complex, our consumer expenditure model generated a positive demand for the moderate development scenario. By 2020, retail demand ranges from 421 to 2,333 square feet.

For development scenarios for a 300, 400, 500, 600 and 700 unit project, retail demand for 2020 ranges from roughly 303 to 2,727 square feet.

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 300 UNITS						
	2015	2016	2017	2018	2019	2020
Conservative	(1,540)	(1,254)	(628)	(324)	(14)	303
Moderate	(746)	(445)	217	538	865	1,199
Aggressive	141	460	1,161	1,501	1,847	2,201

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 400 UNITS						
	2015	2016	2017	2018	2019	2020
Conservative	(1,540)	(1,254)	(516)	(210)	103	421
Moderate	(746)	(445)	335	658	988	1,324
Aggressive	141	460	1,286	1,628	1,977	2,333

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)						
500 UNITS	2015	2016	2017	2018	2019	2020
Conservative	(1,540)	(1,254)	(516)	(97)	218	539
Moderate	(746)	(445)	335	777	1,109	1,448
Aggressive	141	460	1,286	1,754	2,106	2,465

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)						
600 UNITS	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative	(1,540)	(1,254)	(516)	16	333	656
Moderate	(746)	(445)	335	896	1,231	1,572
Aggressive	141	460	1,286	1,880	2,235	2,596

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)						
700 UNITS	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative	(1,540)	(1,254)	(516)	129	448	774
Moderate	(746)	(445)	335	1,016	1,353	1,696
Aggressive	141	460	1,286	2,007	2,363	2,727

Retail Market Demand Assessment Findings

The population model findings indicate a much stronger demand for retail space than that of the consumer expenditures model. With a large number of multi-tenant rental housing complexes in the target market , this heavy population density provides a strong basis for additional retail development in the area.

Unfortunately, the consumer expenditure model provides little support for additional development as the 2015-2017 retail demand estimations indicated that the retail saturation point had been broached. The high concentration of low income families residing in subsidized affordable housing projects created a lower level of demand for retail.

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf)300 units		
Scenario	2015	2020
Conservative	9,234	10,918
Moderate	11,239	13,057
Aggressive	13,244	15,197

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
300 UNITS	2015	2020
Conservative	(1,540)	421
Moderate	(746)	1,324
Aggressive	141	2,333

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 400 units		
Scenario	2015	2020
Conservative	9,234	10,938
Moderate	11,239	13,080
Aggressive	13,244	15,221

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
400 UNITS	2015	2020
Conservative	(1,540)	421
Moderate	(746)	1,324
Aggressive	141	2,333

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 500 units		
Scenario	2015	2020
Conservative	9,234	11,045
Moderate	11,239	13,195
Aggressive	13,244	15,345

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
500 UNITS	2015	2020
Conservative	(1,540)	539
Moderate	(746)	1,448
Aggressive	141	2,465

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 600 units		
Scenario	2015	2020
Conservative	9,234	11,148
Moderate	11,239	13,306
Aggressive	13,244	15,464

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
600 UNITS	2015	2020
Conservative	(1,540)	656
Moderate	(746)	1,572
Aggressive	141	2,596

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 700 units		
Scenario	2015	2020
Conservative	9,234	11,259
Moderate	11,239	13,426
Aggressive	13,244	15,593

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
700 UNITS	2015	2020
Conservative	(1,540)	774
Moderate	(746)	1,696
Aggressive	141	2,727

In a situation where the two retail demand models do not correlate, Colliers applied a heavier weighting to one of the models to best represent the market potential for the subject site. Despite the heavy population density for the area, the high percentage of low income wage earners raises the level of risk for a retail development. For purposes of this development the Consumer expenditures model garners a heavier weighting of 80% and the Population model is given a weighting of 20%.

Our findings indicate that the subject site could support a 2020 retail development for 2,500 to 5,300 feet in size.

BLENDED RETAIL DEMAND ESTIMATIONS (SF)		
300 UNITS	2015	2020
Conservative	615	2,521
Moderate	1,651	3,671
Aggressive	2,762	4,906

BLENDED RETAIL DEMAND ESTIMATIONS (SF)		
400 UNITS	2015	2020
Conservative	615	2,525
Moderate	1,651	3,675
Aggressive	2,762	4,911

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
500 UNITS	2015	2020
Conservative	615	2,640
Moderate	1,651	3,798
Aggressive	2,762	5,041

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
600 UNITS	2015	2020
Conservative	615	2,755
Moderate	1,651	3,919
Aggressive	2,762	5,170

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF)		
700 UNITS	2015	2020
Conservative	615	2,871
Moderate	1,651	4,042
Aggressive	2,762	5,300

Retail Gap Analysis

Retail Gap Analysis is performed by comparing the level of consumer expenditures for a specific retail category to determine if there is an opportunity for a store to capture increased retail spending or garner a larger market share within a target market area.

Establishments (NAICS)	
Automobile Dealers	4
Other Motor Vehicle Dealers	0
Automotive Parts, Accessories, Tire Stores	4
Furniture Stores	1
Home Furnishings Stores	7
Electronics, Appliance Stores	6
Building Material, Supplies Dealers	4
Lawn, Garden Equipment, Supplies Stores	0
Grocery Stores	39
Specialty Food Stores	8
Beer, Wine, Liquor Stores	4
Health, Personal Care Stores	19
Gasoline Stations	13
Clothing Stores	19
Shoe Stores	2
Jewelry, Luggage, Leather Goods Stores	5
Sporting Goods, Hobby, Musical Instr. Stores	13
Book, Periodical, Music Stores	1
Department Stores	2
Other General Merchandise Stores	3
Florists	7
Office Supplies, Stationery, Gift Stores	3
Used Merchandise Stores	2
Other Miscellaneous Store Retailers	10
Electronic Shopping, Mail-Order Houses	1
Vending Machine Operators	0
Direct Selling Establishments	3
Eating Places	97
Drinking Places	9

Source: Pitney Bowes Consumer Expenditures Report

Retail Sales (NAICS)	
Automobile Dealers	$82,387,820
Other Motor Vehicle Dealers	$0
Automotive Parts, Accessories, Tire Stores	$8,268,032
Furniture Stores	$5,938,830
Home Furnishings Stores	$10,718,100
Electronics, Appliance Stores	$5,671,665
Building Material, Supplies Dealers	$3,024,199
Lawn, Garden Equipment, Supplies Stores	$0
Grocery Stores	$352,601,100
Specialty Food Stores	$21,842,830
Beer, Wine, Liquor Stores	$4,967,391
Health, Personal Care Stores	$74,154,380
Gasoline Stations	$63,293,800
Clothing Stores	$16,240,180
Shoe Stores	$2,127,963
Jewelry, Luggage, Leather Goods Stores	$3,593,344
Sporting Goods, Hobby, Musical Instrument Stores	$5,056,072
Book, Periodical, Music Stores	$1,718,780
Department Stores	$2,437,275
Other General Merchandise Stores	$8,413,488
Florists	$2,916,836
Office Supplies, Stationery, Gift Stores	$1,937,351
Used Merchandise Stores	$1,597,040
Other Miscellaneous Store Retailers	$34,759,820
Electronic Shopping, Mail-Order Houses	$792,384
Vending Machine Operators	$147,013
Direct Selling Establishments	$912,873
Eating Places	$34,825,440
Drinking Places	$10,827,440

Source: Pitney Bowes Consumer Expenditures Report

Based on our evaluation, the site would support a retail development sized between 2,500 and 5,300 square feet. This size limitation provides guidance as to the type of store that might be developed at this site. Typically strip centers are under 25,000 square feet in size and garner tenancy from retailers that provide goods and services targeted at a market within a 0.5 mile radius (or within walking or a short five minute drive).

The demographic profile for this area indicates a lower income, lower educated population with a slightly higher median age. This population is more than 70% Asian and more than 11% of the households are comprised of 6 persons or more.

On page 10 of this report, there is a list of current retailers located in the secondary trade area. This list includes several large shopping centers, a concentration of big box retailers, and a number of gas stations and fast food establishments. Many of the target area's primary retail needs are likely being satisfied with the existing retail establishments.

The primary retail merchandising for this center would target residents of HPHA facilities and those living within a two to three block radius.

Recommendations for a small 2,500 – 5,300 square foot retail center:

1. **Convenience store – with household sundries, household food staples (milk, eggs etc.), soda and beer, pastries, candy, small toys.**
2. **Fast food - plate lunch, local prepared foods, okazuya, chinese, hawaiian, korean, south pacific islander.**
3. **Coffee Shop - serving breakfast and lunch**
4. **Small grocery mart with food targeted at HPHA residents (need demographic breakdown)**
5. **Farmers Market – fresh fruits and vegetables**
6. **Dry cleaners**
7. **Mailbox/shipping store**

Additionally, while the average asking rent for urban Honolulu resident centers range between \$3.13 and \$3.92 psf/mo. Kalihi retail rents ranged from a low of \$1.11 psf/mo for spaces at Dole Cannery Mall to \$2.25 psf/mo for retail spaces at Sand Island Center. Colliers recommends rents for this site at the \$1.50 - \$2.00 psf/mo NNN range to insure increased retail tenant interest and faster lease absorption.

Appendix

- Retail Demand – Population Model
- Retail Demand – Consumer Expenditures Model

RETAIL DEMAND ANALYSIS - PRIMARY MARKET - POPULATION MODEL

TARGET MARKET POPULATION ESTIMATE		2015	2016	2017	2018	2019	2020
Existing Population (1)		50,128	50,629	51,136	52,442	52,966	53,496
New Residents- Subject Property (2)		0	0	787		0	0
New Residents- Other Development (2)		0	0	0	0	0	0
Total		**50,128**	**50,629**	**51,923**	**52,442**	**52,966**	**53,496**
TARGET MARKET RETAIL DEMAND ESTIMATE (sf)							
Scenario	**SF per resident**						
Conservative	50.0	2,506,400	2,531,464	2,596,129	2,622,090	2,648,311	2,674,794
Moderate	54.0	2,706,912	2,733,981	2,803,819	2,831,857	2,860,176	2,888,777
Aggressive	58.0	2,907,424	2,936,498	3,011,509	3,041,624	3,072,041	3,102,761
TARGET MARKET RETAIL INVENTORY	**GLA (sf)**						
Existing Inventory	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039
Planned Development		0	0	0	0	0	0
Total		1,583,039	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039
TARGET MARKET RESIDUAL DEMAND (sf)							
Scenario							
Conservative		923,361	948,425	1,013,090	1,039,051	1,065,272	1,091,755
Moderate		1,123,873	1,150,942	1,220,780	1,248,818	1,277,137	1,305,738
Aggressive		1,324,385	1,353,459	1,428,470	1,458,585	1,489,002	1,519,722

TOTAL RETAIL DEMAND ESTIMATE - POPULATION MODEL

TOTAL MARKET RESIDUAL DEMAND (sf)							
Scenario		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative		923,361	948,425	1,013,090	1,039,051	1,065,272	1,091,755
Moderate		1,123,873	1,150,942	1,220,780	1,248,818	1,277,137	1,305,738
Aggressive		1,324,385	1,353,459	1,428,470	1,458,585	1,489,002	1,519,722
MARKET PENETRATION	**Rate as % of Population**						
Primary Market	1.0%						
POTENTIAL RETAIL DEMAND (sf)							
Scenario		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative		9,234	9,484	10,131	10,391	10,653	10,918
Moderate		11,239	11,509	12,208	12,488	12,771	13,057
Aggressive		13,244	13,535	14,285	14,586	14,890	15,197

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 300 units

Scenario	2015	2020
Conservative	9,234	10,918
Moderate	11,239	13,057
Aggressive	13,244	15,197

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 400 units

Scenario	2015	2020
Conservative	9,234	10,938
Moderate	11,239	13,080
Aggressive	13,244	15,221

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 500 units

Scenario	2015	2020
Conservative	9,234	11,045
Moderate	11,239	13,195
Aggressive	13,244	15,345

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 600 units

Scenario	2015	2020
Conservative	9,234	11,148
Moderate	11,239	13,306
Aggressive	13,244	15,464

POPULATION MODEL - POTENTIAL RETAIL DEMAND (sf) 700 units

Scenario	2015	2020
Conservative	9,234	11,259
Moderate	11,239	13,426
Aggressive	13,244	15,593

RETAIL DEMAND ANALYSIS - PRIMARY MARKET - CONSUMER EXPENDITURES MODEL

TARGET MARKET HOUSEHOLDS		2015	2016	2017	2018	2019	2020
Existing and projected HH [1]		13,072	13,190	13,308	13,731	13,854	13,979
Planned Development Demand- Subject Property [2]		0	0	300	0	0	0
Planned Development - Other [2]		0	0	0	0	0	0
Primary Market Households		**13,072**	**13,190**	**13,608**	**13,731**	**13,854**	**13,979**
TARGET MARKET RETAIL EXPENDITURES							
Primary market expenditures - Existing HH [1]		$ 678,783,625	$ 692,359,298	$ 706,206,484	$ 736,568,472	$ 751,299,841	$ 766,325,838
Planned HH - Subject Property		$ -	$ -	$ 15,919,469	$ -	$ -	$ -
Planned HH - Other		$ -	$ -	$ -	$ -	$ -	$ -
Primary Market Retail Expenditures		$ 678,783,625	$ 692,359,298	$ 722,125,953	$ 736,568,472	$ 751,299,841	$ 766,325,838
TARGET MARKET DEMAND ESTIMATE (sf)	**Retail Sales psf**						
Conservative	$475	1,429,018	1,457,599	1,520,265	1,550,670	1,581,684	1,613,318
Moderate	$450	1,508,408	1,538,576	1,604,724	1,636,819	1,669,555	1,702,946
Aggressive	$425	1,597,138	1,629,081	1,699,120	1,733,102	1,767,764	1,803,120
TARGET MARKET RETAIL INVENTORY	**GLA (sf)**						
Existing GLA	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039	1,583,039
Planned Development		0	0	0	0	0	0
Total (sf)			**1,583,039**	**1,583,039**	**1,583,039**	**1,583,039**	**1,583,039**

TARGET MARKET RESIDUAL RETAIL DEMAND ESTIMATE (sf)						
Scenario	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative	(154,021)	(125,440)	(62,774)	(32,369)	(1,355)	30,279
Moderate	(74,631)	(44,463)	21,685	53,780	86,516	119,907
Aggressive	14,099	46,042	116,081	150,063	184,725	220,081

CONSUMER EXPENDITURES MODEL - TOTAL RETAIL DEMAND ESTIMATE - RESIDENT MARKET

TOTAL MARKET RESIDUAL DEMAND (sf)						
Scenario	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative	(154,021)	(125,440)	(62,774)	(32,369)	(1,355)	30,279
Moderate	(74,631)	(44,463)	21,685	53,780	86,516	119,907
Aggressive	14,099	46,042	116,081	150,063	184,725	220,081

MARKET PENETRATION	as % of
Primary Market	1.0%

POTENTIAL RETAIL DEMAND (sf)						
Scenario	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Conservative	(1,540)	(1,254)	(628)	(324)	(14)	303
Moderate	(746)	(445)	217	538	865	1,199
Aggressive	141	460	1,161	1,501	1,847	2,201

CONSUMER EXPENDITURES MODEL - COMBINED MARKET DEMAND (SF)

	2015	2016	2017	2018	2019	2020
Conservative	(1,540)	(1,254)	(628)	(324)	(14)	303
Moderate	(746)	(445)	217	538	865	1,199
Aggressive	141	460	1,161	1,501	1,847	2,201

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 300 UNITS	2015	2020
Conservative	(1,540)	303
Moderate	(746)	1,199
Aggressive	141	2,201

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 400 UNITS	2015	2020
Conservative	(1,540)	421
Moderate	(746)	1,324
Aggressive	141	2,333

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 500 UNITS	2015	2020
Conservative	(1,540)	539
Moderate	(746)	1,448
Aggressive	141	2,465

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 600 UNITS	2015	2020
Conservative	(1,540)	656
Moderate	(746)	1,572
Aggressive	141	2,596

CONSUMER EXPENDITURES MODEL - MARKET DEMAND (SF) 700 UNITS	2015	2020
Conservative	(1,540)	774
Moderate	(746)	1,696
Aggressive	141	2,727

APPENDIX E

Flora and Fauna Survey

BIOLOGICAL RESOURCES SURVEY

for the

HAWAII PUBLIC HOUSING AUTHORITY
ADMINISTRATIVE OFFICES REDEVELOPMENT PROJECT

HONOLULU, O’AHU

by

Robert W. Hobdy
Environmental Consultant
Kokomo, Maui
November 2016

Prepared for:
PBR Hawaii

BIOLOGICAL RESOURCES SURVEY
HAWAII PUBLIC HOUSING AUTHORITY
ADMINISTRATIVE OFFICES REDEVELOPMENT PROJECT

INTRODUCTION

The Hawaii Public Housing Authority (or HPHA) Administrative Offices Redevelopment Project is located in Liliha at 1002 North School Street, west of Lanakila Avenue. Ahiahi Street passes through the property (TMK 1-6-09:03 por.) see Figure 1. This biological resources study was initiated by HPHA in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

This approximately 5.9 acre project area lies within an urban setting. The property includes a number of buildings that house administrative offices, maintenance facilities and storage warehouses. Much of the area has paved parking stalls. The portion facing School Street is landscaped with lawns, hedges and a few large trees. The upper portion is steeper and has an assortment of tall grasses, shrubs and small trees. The soil is classified as Kaena Clay, 2 – 6% slopes, a deep and somewhat poorly drained soil (Foote et al, 1972). Rainfall averages 30 – 35 inches a year, the bulk falling during the winter months (Armstrong, 1983).

SURVEY OBJECTIVES

This report summarizes the findings of a biological resources survey of the proposed HPHA Administrative Offices Redevelopment Project which was conducted in November 2016. The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.

2. Document the status and abundance of each species.

3. Determine the presence or likely occurrence of any native flora and fauna species, particularly any that are federally listed as Threatened or Endangered. If such species occur, identify what features of the habitat may be essential for these species.

4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used selecting routes to cover the entire area and all habitat types. Areas most likely to harbor native or rare plants were more intensively examined. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation was made up primarily of low maintenance grasses and urban weeds that survive mowing. In addition, there are hedges and a variety of ornamental plantings around some of the buildings. One small area in the upper northwest corner was undeveloped and overgrown with tall grass and shrubs. A total of 73 plant species were recorded during the survey.

Four species were common within the project area: pitted beardgrass (*Bothriochloa pertusa*), Guinea grass (*Megathyrsus maximus*), straggler daisy (*Calyptocarpus vialis*) and rainbow shower (*Cassia x nealiae*). Twenty three species were ornamental landscape plants and fifty species were volunteer lawn grasses and urban weeds.

DISCUSSION AND RECOMMENDATIONS

The vegetation within the project area consists entirely of non-native plants. None of these are of any conservation interest or concern.

No federally listed Endangered or Threatened plant species (USFWS, 2016) were found in the project. No special habitats were identified within the project area. This project area lies within urban Honolulu, distant from any natural habitats.

Because of the above existing conditions it has been determined that there is little of botanical concern in the project area, and that the anticipated disturbances associated with the proposed redevelopment work are not expected to have a significant negative impact on the botanical resources in this part of O'ahu.

It is recommended, however, that coastal and lowland native plant species might be incorporated into future landscape designs.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within two groups: Monocots and Dicots. Taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999) and Staples & Herbst (2005).

For each species, the following information is provided:

1. Scientific name with author citation.

2. Common English or Hawaiian name.

3. Bio-geographical status. The following symbols are used:

   endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   Polynesian introduction = plants introduced to Hawai'i in the course of Polynesian migrations and prior to western contact.

   non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

   abundant = forming a major part of the vegetation within the project area.

   common = widely scattered throughout the area or locally abundant within a portion of it.

   uncommon = scattered sparsely throughout the area or occurring in a few small patches.

   rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
GYMNOSPERMS			
CYCADACEAE (Cycad Family)			
Cycas revoluta Thunberg	Japanese cycad	non-native	rare
MONOCOTS			
ARECACEAE (Palm Family)			
Dypsis lutescens (Wendl.) Beentjie & Dransfield	areca plam	non-native	rare
Roystonea regia (Kunth) O.F. Cook	royal palm	non-native	rare
Veitchia joannis H. Wendland	joannis palm	non-native	rare
ASPARAGACEAE (Asparagus Family)			
Cordyline fruticosa (L.) A. Chev.	ki, ti	Polynesian	rare
Dracaena fragrans (L.) Ker Gawler	fragrant dracaena	non-native	rare
Dracaena marginata Lamarck	money tree	non-native	rare
COMMELINACEAE (Spiderwort Family)			
Commelina benghalensis L.	hairy honohono	non-native	rare
CYPERACEAE (Sedge Family)			
Cyperus gracilis R. Brown	McCoy sedge	non-native	uncommon
Kyllinga nemoralis (Forster & Forster) Dandy	kili'o'opu	non-native	rare
POACEAE (Grass Family)			
Axonopus compressus (Sw.) P. Beauv.	broad-leaved carpetgrass	non-native	uncommon
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	non-native	common
Cenchrus ciliaris L.	buffelgrass	non-native	rare
Cenchrus echinatus L.	common sandbur	non-native	uncommon
Chloris barbata (L.) Sw.	swollen fingergrass	non-native	uncommon
Cynodon dactylon (L.) Pers.	Bermuda grass	non-native	uncommon
Dicanthium aristatum (Poir.) Hubb.	Wilder grass	non-native	uncommon
Digitaria insularis (L.) Mez ex Ekman	sourgrass	non-native	rare
Digitaria violascens Link	smooth crabgrass	non-native	rare
Eleusine indica (L.) Gaertn.	wire grass	non-native	uncommon
Eragrostis amabilis (L.) Wight & Arnott	Japanese lovegrass	non-native	rare
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	non-native	rare
Megathyrsus maximus (Jacq.) Simon & Jacobs	Guinea grass	non-native	common
Melinis repens (Willd.) Zizka	Natal redtop	non-native	rare
Setaria verticillatus (L.) P. Beauv.	bristly foxtail	non-native	rare
Urochloa subquadripara (Trin.) R.D. Webster	tropical signalgrass	non-native	rare
DICOTS			
ACANTHACEAE (Acanthus Family)			
Asystasia gangetica (L.) T. Anderson	Chinese violet	non-native	uncommon
Pseuderanthemum carruthersii var. *reticulatum* (W. Bull) Fosberg	false eranthemum	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
AMARANTHACEAE (Amaranth Family)			
Alternanthera pungens Kunth	khaki weed	non-native	rare
Amaranthus viridis L.	slender amaranth	non-native	rare
ANACARDIACEAE (Mango Family)			
Mangifera indica L.	mango	non-native	rare
APOCYNACEAE (Dogbane Family)			
Plumeria rubra L.	plumeria	non-native	rare
Tabernaemontana divaricata (L.) Roemer & Shuttes	crape gardenia	non-native	uncommon
ASTERACEAE (Sunflower Family)			
Bidens alba (L.) DC.	romerillo	non-native	rare
Calyptocarpus vialis Less.	straggler daisy	non-native	common
Cyanthillium cinereum (L.) H. Rob.	little ironweed	non-native	rare
Tridax procumbens L.	coat buttons	non-native	uncommon
BERBERIDACEAE (Barberry Family)			
Nandina domestica Thunberg	heavenly-bamboo	non-native	rare
BIGNONIACEAE (Bignonia Family)			
Tabebuia heterophylla (de Candolle) Britton	pink tecoma	non-native	uncommon
BORAGINACEAE (Borage Family)			
Carmona retusa (Vahl) masamune	Fukien tea	non-native	rare
BRASSICACEAE (Mustard Family)			
Capsella bursa-pastoris (L.) Medik.	shepherd's purse	non-native	rare
CACTACEAE (Cactus Family)			
Opuntia cochenillifera (L.) P. Miller	spineless cactus	non-native	rare
CLEOMACEAE (Cleome Family)			
Cleome gynandra L.	wild spider flower	non-native	uncommon
CONVOLVULACEAE (Morning Glory Family)			
Ipomoea obscura (L.) Ker Gawler	obscure morning glory	non-native	uncommon
Ipomoea triloba L.	little bell	non-native	rare
CUCURBITACEAE (Gourd Family)			
Coccinea grandis (L.) Voigt	ivy gourd	non-native	uncommon
Momordica charantia L.	bitter melon	non-native	rare
ERICACEAE (Heath Family)			
Rhododendrum simsii Planchon	Indian azalea	non-native	rare
EUPHORBIACEAE (Spurge Family)			
Codiaeum variegatum (L) Blume	croton	non-native	rare
Euphorbia hirta L.	hairy spurge	non-native	uncommon
Ricinus communis L.	Castor bean	non-native	uncommon
FABACEAE (Pea Family)			
Cassia x nealiae H.S. Irwin & Barneby	rainbow shower	non-native	common
Indigofera spicata Forssk.	creeping indigo	non-native	uncommon
Leucaena leucocephala (Lam.) de Wit	koa haole	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Pithecellobium dulce (Roxb.) Benth.	'ōpiuma	non-native	rare
Samanea saman (Jacq.) Merr.	monkeypod	non-native	uncommon
MALVACEAE (Mallow Family)			
Malvastrum coromandelianum (L.) Garcke	false mallow	non-native	rare
Sida ciliaris L.	bracted fanpetals	non-native	rare
Sida rhombifolia L.	arrowleaf sida	non-native	rare
Sida spinosa L.	prickly sida	non-native	uncommon
MORACEAE (Mulberry Family)			
Ficus benghalensis L.	banyan	non-native	rare
Ficus microcarpa L. fil.	Chinese banyan	non-native	uncommon
MORINGACEAE (Drumstrick Tree Family)			
Moringa oleifera Lamarck	horseradish tree	non-native	rare
NYCTAGINACEAE (Four-o'clock Family)			
Boerhavia coccinea Mill.	scarlet spiderling	non-native	uncommon
Bougainvillea spectabilis Willd.	bougainvillea	non-native	uncommon
Mirabilis jalapa L.	four-o'clock	non-native	rare
OXALIDACEAE (Wood Sorrel Family)			
Oxalis corniculatus L.	ihiʻai, yellow wood sorrel	Polynesian	rare
PASSIFLORACEAE (Passion Flower Family)			
Passiflora suberosa L.	cork bark passion flower	non-native	rare
PHYLLANTHACEAE (Phyllanthus Family)			
Phyllanthus tenellus L.	long-stalked phyllanthus	non-native	rare
PUNICACEAE (Pomegranate Family)			
Punica granatum L.	dwarf pomegranate	non-native	rare
RUBIACEAE (Coffee Family)			
Oldenlandiopsis callitrichoides (Griesb.) Terrell & Lewis	creeping bluet	non-native	rare
RUTACEAE (Citrus Family)			
Murraya paniculata (L.) W. Jack	mock orange	non-native	uncommon
URTICACEAE (Nettle Family)			
Cecropia obtusifolia Bertol.	Guarumo	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus semotus*) in the area.

RESULTS

MAMMALS

Just two non-native mammal species were observed in the project area during two site visits. Taxonomy and nomenclature follow Tomich (1986). Mongoose (*Herpestes auropunctatus*) were of uncommon occurrence while dogs (*Canis familia*ris) were rare. Other mammal species one could expect to see in the area include cats (*Felis catus*), rats (*Rattus* spp.) and mice (*Mus domesticus*).

An evening survey was conducted within the project area using a bat detecting device (Batbox IIID), set to the frequency of 27,000 Hertz that the Hawaiian hoary bats are known to use for echolocation in their pursuit of nocturnal flying insects. No bats were detected.

BIRDS

Bird life was modest in the diversity of species observed but fairly well represented in total numbers. Taxonomy and nomenclature follow American Ornithologists' Union (2014). A total of seven non-native bird species were observed during two site visits. Four non-native bird species were common in the project area, the common myna (*Acridotheres tristis*), the zebra dove (*Geopelia striata*), the spotted dove (*Streptopelia chinensis*) and the red-vented bulbul (*Pycnonotus cafer*). Three species were uncommon or rare.

INSECTS

Insect life was sparse throughout the project area due primarily to the lack of habitat diversity. Eleven non-native insect species were observed during two site visits. Taxonomy and nomenclature follow Nishida et al (1992). One species was found to be abundant throughout the area, the dung fly (*Musca sorbens*). The honey bee (*Apis mellifera*) was common. Nine other insect species were uncommon or rare. No native insect species were found.

DISCUSSION AND RECOMMENDATIONS

The HPHA Administrative Offices Redevelopment Project area is a fully developed urban environment that is sparsely vegetated. This discourages many forms of wildlife from utilizing the habitat. All types of wildlife, including mammals, birds and insects were poorly represented. Only a few hardy species, adapted to human activities, were observed in the project area.

No native wildlife species were observed in the project area during the survey. All mammal, bird and insect species were common non-native species that are of no special conservation concern. As a result no endangered or threatened wildlife species occur in the project area.

The endemic and protected Hawaiian hoary bat was not detected during the survey. These bats are not known to inhabit urban Honolulu and are not expected to occur in the project area.

No Endangered nēnē or Hawaiian goose are known from O′ahu except in captivity and are not expected in the project area.

No Blackburn's sphinx moths (*Manduca blackburni*) were found during the survey. They are not presently known from O′ahu and none of their special host plants were found either.

No protected waterbirds, the ae′o or Hawaiian stilt (*Himantopus mexicanus knudseni*), ′alae ke′oke′o or Hawaiian coot (*Fulica alai*), ′alae′ula or common moorhen (*Gallinula chloropus sandvicensis*) or the koloa or Hawaiian duck (*Anas wyvilliana*) were seen during the survey and no suitable wetland habitat occurs on or near to the project area.

Hawaiian petrels (*Pterodroma phaeopygia sandwichensis*) and Newell's shearwaters (*Puffinus newellii*), (collectively known as seabirds) may transit over the project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November). Fatalities to these seabirds resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawai′i where high densities of transiting seabirds occur. Additionally, artificial lighting such as floodlighting for construction work can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences and vehicles. Fledgling seabirds are especially affected by artificial lighting and have a tendency to exhaust themselves while circling the light sources and become grounded. Too weak to fly, these birds become vulnerable to predation by predators such as mongoose, cats and dogs. These threats can be minimized by the shielding of any outdoor lighting so that the light is visible only from below.

No other recommendations regarding wildlife are deemed necessary.

Because of the above existing conditions it has been determined that there is little of wildlife concern in the project area, and that the anticipated disturbances associated with the proposed redevelopment work are not expected to have a significant negative impact on the wildlife resources in this part of O′ahu.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within three groups: Mammals, Birds and Insects. For each species the following information is provided:

1. Common name.

2. Scientific name.

3. Bio-geographical status. The following symbols are used:

   endemic = native only to Hawaiʻi; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   non-native = all those animals brought to Hawaiʻi intentionally or accidentally after western contact.

   migratory = spending a portion of the year in Hawaiʻi and a portion elsewhere. In Hawaiʻi the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

   abundant = many flocks or individuals seen throughout the area at all times of day.

   common = a few flocks or well scattered individuals throughout the area.

   uncommon = only one flock or several individuals seen within the project area.

   rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
Herpestes auropunctatus Hodgson	mongoose	non-native	uncommon
Canis familiaris L.	domestic dog	non-native	rare
BIRDS			
Acridotheres tristis L.	common myna	non-native	common
Geopelia striata L.	zebra dove	non-native	common
Streptopelia chinensis Scopoli	spotted dove	non-native	common
Pycnonotus cafer L.	red-vented bulbul	non-native	common
Lonchura punctulata L.	nutmeg mannikin	non-native	uncommon
Estrilda astrild L.	common waxbill	non-native	uncommon
Columba livia Gmelin	rock pigeon	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
Order DIPTERA - flies			
MUSCIDAE (House Fly Family)			
Musca sorbens Wiedemann	dung fly	non-native	abundant
Order HYMENOPTERA - bees, wasps, ants			
APIDAE (Honey Bee Family)			
Apis mellifera L.	honey bee	non-native	common
FORMICIDAE (Ant Family)			
Paratrechina longicornis Latreille	crazy ant	non-native	rare
Pheidole megacephala Fabricius	big-headed ant	non-native	uncommon
SPHECIDAE (Thread-waisted Wasp Family)			
Sceliphron caementarium Drury	mud dawber wasp	non-native	rare
Order LEPIDOPTERA - butterflies, moths			
HESPERIIDAE (Skipper Butterfly Family)			
Hylephila phyleus Drury	fiery skipper	non-native	rare
LYCAENIDAE (Gossamer-winged Butterfly Family)			
Lampides boeticus L.	long-tailed blue	non-native	uncommon
NYMPHALIDAE (Brush-footed Butterfly Family)			
Danaus plexippus L.	monarch butterfly	non-native	rare
PIERIDAE (White and Sulphur Butterfly Family)			
Eurema niccipe Cramer	sleepy orange butterfly	non-native	uncommon
Pieris rapae L.	cabbage butterfly	non-native	uncommon
Order ODONATA - dragonflies, damselflies			
LIBELLULIDAE (Skimmer Dragonfly Family)			
Croccothemis servilia Drury	scarlet skimmer	non-native	rare

Figure 1. HPHA Administrative Office Site


Figure 2. View east along School Street below the HPHA Administrative Offices


Figure 3. View southeast toward the HPHA Administrative Offices and parking.

Figure 4. View east along School Street at lower edge of the project area.


Figure 5. View east of the northwest corner of the project area.

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APPENDIX F
Archaeological Inventory Survey

Archaeology • History • Ethnography • Architectural History

February 21, 2017

Ms. Susan Lebo, Ph.D.
Archaeology Branch Chief
State of Hawai‘i, Department of Land and Natural Resources
State Historic Preservation Division
Kakuhihewa Building
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707

Subject: Archaeological Study in Support of the Hawai‘i Public Housing Authority's Administrative Offices – Environmental Impact Statement for 1002 North School Street, Kapālama and Honolulu Ahupua‘a, Kona District, Island of O‘ahu (portion of TMK: (1) 1-6-009:003)

Dear Susan:

At the request of PBR Hawai‘i, on behalf of the Hawai‘i Public Housing Authority (HPHA), ASM Affiliates (ASM) conducted an archaeological study of a roughly 6-acre area on the southern half of TMK: (1) 1-6-009:003, Kapālama and Honolulu Ahupua‘a, Kona District, Island of O‘ahu (Figures 1, 2, and 3). The land is owned by the State of Hawai‘i and HPHA offices and shops are located in the study area. HPHA is considering redevelopment of the study area. The current archaeological inspection was conducted to determine if any undocumented archaeological resources are present within the proposed redevelopment area. We have submitted this letter report, per your guidance, in support of an Environmental Impact Statement (EIS) being prepared for the proposed project in compliance with Hawai‘i Revised Statutes (HRS) Chapter 343. ASM is also preparing a separate Cultural Impact Assessment (CIA) in support of the EIS. A separate study on the potential historic architectural resources present on the property was conducted by Fung Associates. While the land-use and development history of the current study area is also examined in this study, the focus of the research and field inspection is only on the archaeological resources potentially present in the study area.

On October 31, 2016 Robert B. Rechtman, Ph.D. and David Crowell, M.S., RPA conducted an archaeological surface inspection of the study area, which is located at the corner of School and Lanakila Streets on a terrace at the base of the Kamehameha Heights area of Kapālama Ahupua‘a. The irregularly shaped, contiguous study area is oriented southeast to northwest on its long axis, along the School Street corridor. The southeastern corner of the study area is bisected by the *ahupua‘a* boundary that separates Kapālama and Honolulu, with a small part of the study area falling within Honolulu Ahupua‘a. The study area receives an average of 55 inches of precipitation annually with monthly rainfall being fairly consistent, and the driest months starting in April and ending in October. September is the driest month with 2.28 inches average monthly precipitation and March is the wettest with 6.42 inches average monthly precipitation. Soils within this general geographical area are classified as Kaena clay with two to six percent slopes (Figure 4). The HPHA Puahala Homes border the study area to the northeast and the parcel is surrounded by dense urban residential and commercial development. There are two streams, now channelized into the Kapālama Drainage Canal, bounding the narrow and relatively small Kapālama Ahupua‘a: Kalihi on the northwest side and Niuhelewai on the southeast side.

The field inspection showed that the study area is a completely modern landscape (Figures 5 through 15). Largely undeveloped through the early 1860s. Prior to the 1860s, the study area was traditionally used for agriculture, specifically wetland taro and rice farming. From the 1860s through the present day, the study area has been almost continuously developed and re-developed, beginning with the construction and expansion of the Oahu Insane Asylum (until its relocation to Kāneʻohe in the early 1930s). The study area continued to be used for a variety of different purposes, and proposals for redevelopment continued until the early 1950s. It was at this time that the predecessor to HPHA, the Hawaii Housing Authority (HHA), assumed control of the property, and built shops and an administrative office on site. From the 1950s to the present day, the HPHA has demolished existing buildings and constructed new buildings and infrastructure, while the City and County of Honolulu has added multiple utilities and infrastructure across the property.

The *ahupuaʻa* of Kapālama is bounded on the west by Kalihi Ahupuaʻa and the east by Honolulu Ahupuaʻa, all within Kona District. According to Pukui et al. (1974:87), the name Kapālama refers to an enclosure (*pā*) of *lama* wood which surrounded the residence of high ranking *aliʻi* (chiefs). In a traditional account, Kapālama is referred to as "an establishment in which the young *aliʻi* were kept just before pairing off for offspring" McAllister (1933:88). The two streams Kalihi and Niuhelewai, on each side of the *ahupuaʻa*, provided optimal environmental conditions that were well suited for Precontact native Hawaiian subsistence practices. As recounted by Handy (1939:79), the *ahupuaʻa* was well-watered by the two streams as well as numerous springs, ideal for the construction of *loʻi* (irrigated terraces) for taro in an almost continuous, three quarters of a mile long system both *makai* to *mauka* (southwest to northeast); from ʻIwilei to the Koʻolau foothills above School Street and between the two streams (northwest to southeast).

Another traditional account about Kapālama Ahupuaʻa refers to Keanakamanō, or "cave of the shark", once located near the current Kamehameha Schools site (Sterling and Summers 1978:323), which was thought to have collapsed during earthquakes in 1900 (Mitchell 1993). According to the legend, Kamohoaliʻi, king of the sharks was the older brother of Pele, the Hawaiian volcano goddess, and navigator of their family's long voyage to Hawaiʻi. Oral traditions recount that Kamohoaliʻi enjoyed swimming through the extensive lava tube system running between Pearl Harbor and the upper Kalihi Valley. Upon arrival in the terrestrial uplands, Kamohoaliʻi assumed his human form and walked to his cave, Keanakamanō, in Kapālama Heights (Mitchell 1993). Kalaepohaku is a stone promontory in Kapālama, just above the study area, and has long been the site of a cemetery and is recounted in Fornander (1917) as the site of a palace for Ahuapau, a King of Oʻahu.

A late Precontact battle took place at Niuhelewai Stream in Kapālama Ahupuaʻa. The battle was between Kahahawaʻi, the war chief for Kahekili, the King of Maui, and Kahāhana, the ruler of Oʻahu from 1780 until his death in the battle in 1783 (Cordy 2002:19). Kahekili, as reigning ruler of Maui, sent Kahahawaʻi and a number of warriors to Oʻahu to make war on Kahāhana, whom they defeated at Niuhelewai (Fornander 1919:498- 499). During the Maui rule over Oʻahu, chiefs from the Kona and ʻEwa districts planned to murder the Maui chiefs, but the Maui chiefs were forewarned. The plotters from Kona and ʻEwa were able to temporarily convince Kahekili that those chiefs responsible were on Kauaʻi, however, the truth was revealed and attacks were carried out against Kona and ʻEwa Districts, the plotting chiefs killed, chiefesses tortured, and the people of the districts slaughtered (Kamakau 1992:138).

Shortly after initial contact with Europeans, the Hawaiian Islands, with the exception of Kauaʻi, were united under the rule of Kamehameha I in 1795. Kauaʻi was included under Kamehameha I's rule in 1810. By this time, the Hawaiian population was devastated largely by foreign diseases, an epidemic that swept through the islands around 1804, and the wars of conquest in the previous decade. The Hawaiian Kingdom under Kamehameha set aside lands in Kapālama, Honolulu, and Waikīkī for native Hawaiian settlements to encourage people in these areas to cultivate crops for their own use or for foreign trade as means of stimulating population growth and prosperity (Kamakau 1992).

Reverend Hiram Bingham described Honolulu in 1820 as a largely native Hawaiian environment with a population that generally maintained traditional settlement and subsistence practices. The Honolulu Plain contained the village and the fort, clustered east of Nuʻuanu Stream and around the harbor. Fishponds and salt works lined the shore and outside of Honolulu and outside the village, habitations were scattered throughout Nuʻuanu Valley, as were extensive beds of taro. Residential areas of the village and scattered habitations were made up of modest grass thatched house structures (Bingham 1981:92-93). The earliest maps that contain any level of detail about Kapālama Ahupua‘a, generated in 1851 and 1885, show the same land use patterns persisted well into the historic period with extensive taro *lo‘i* and scattered habitations in the lower and middle parts of the *ahupua‘a.*

By the middle of the nineteenth century, the ever-growing population of Westerners forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership in the Hawaiian Islands, and the Great *Māhele* became the vehicle for determining ownership of native lands. During this period, land interests of the King (Kamehameha III), the high-ranking chiefs, and the low-ranking chiefs, the *konohiki,* were defined. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission (Chinen 1961:13). During the *Māhele* all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands. All lands awarded during the *Māhele* were subject to the rights of the native tenants therein. Native tenants of the lands could claim and acquire title to *kuleana* parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered the *kuleana* as Land Commission Awards (LCAw.).

Because of its agricultural productivity, Kapālama Ahupua‘a was a very desirable part of the south shore of O‘ahu (along with Nu‘uanu, Mānoa, and Waikīkī). Following Kamehameha’s victory over O‘ahu, the islands lands were divided among the *ali‘i* and “. . .’kept of himself” the *ahupua‘a* of Kapālama. . .” (Kame‘eleihiwa 1992:59). Years later, during the *Māhele*, Kapālama Ahupua‘a was retained as Crown Land by King Kamehameha III, which included the current study area. ‘Iwilei and lands in Kapālama were awarded (LCAw. 07714B) to Moses Kekūāiwa, grandson of Kamehameha I. Upon Kekūāiwa’s death in 1848, his lands (the *‘ili* [smaller land divisions] of Kalaepohaku, Kapālama Ahupua‘a and the *‘ili* of Kauluwela, Honolulu Ahupua‘a), including portions of the current study area, passed to his sister, Victoria Kamāmalu. According to the Waihona ‘Aina *Māhele* database, 190 claims for *kuleana* were made within the *ahupua‘a* of Kapālama, with 101 *kuleana* lots awarded to native tenants.

The 1851 map (Figure 16) by A. Bishop is the first map to show any level of detail of Kapālama, which includes the surrounding *‘ili,* a spring (*pūnāwai*) and stream (*kahawai*), along the northwest end of the study area. Niuhelewai Stream is also depicted on the map and the course of the stream generally corresponds to the boundary between Kapālama and Honolulu *ahupua‘a*. A stone quarry, Pao Kalaepohaku, is shown above the study area to the north. The stone quarry will play a prominent role in the later land use history of the study area.

The current study area is labelled “no Pila”, which can be interpreted to mean: of, or belonging to Pila. Other nearby lands are noted on the map as belonging to Pila, Hali, and Harbottle. No formal records could be found describing the Pila or Hali lands; however, information on the Harbottle lands was available. The Harbottle Family was a prominent family of Hawai‘i that was very closely connected to the Kingdom both by marriage and with important positions within the government. William Harbottle, a court favorite of Kamehameha III, was married to Kalaimoku (McKinzie 1986:61). According to the Waihona ‘Aina *Māhele* database, in 1857 William Harbottle received 8.32-acres in Kapālama Ahupua‘a (LCAw. 2937) in the*‘ili* of Kalaepohaku and 5.78-acres in the *‘ili* of Kuipaakea in 1862 and 1880 under RP 4539 and 7505, respectively.

The 1885 map of Kapālama by J.F. Brown (Figure 17) was the first map that depicted details of land ownership around the current study area. The 1885 map shows the southern end of the study area located on a portion of LCAw. 10806, Crown Lands awarded to Kamehameha III. A land transfer from Widemann to the Minister of the Interior is noted as well (Lib 9 P. 441). The central portion of the study area, originally part of LCAw. 7713:38 to Victoria Kamāmalu, which contained a large part of the Oahu Insane Asylum, was transferred by Trustees of Victoria Kamāmalu to the Minister of the Interior. Two slivers of land on either side of this parcel were transferred from the Trustees of the Bishop Estate to the Superintendent of Public Works, but did not include the quarry at Kalaepohaku. A portion of the southwestern edge of the study area was part of LCAw. 2266:2 (R.P. 2816), a .50-acre *ʻāpana* (lot) awarded to Kuhiana. The remaining properties around the study area are a patchwork of Crown Lands, Government Lands, *Konohiki* lands, *kuleana* lots, and leased lands.

The location and distribution of the LCAw. parcels around the current study area generally confirm the expected Precontact settlement patterns for the Kapālama region discussed above - residences dispersed within and throughout agricultural fields. *Māhele* documents identify these *kuleana* parcels as comprised of house sites and agricultural sites. The 1885 Brown map, as well as later maps, show most of the LCAw. lots were clustered around springs, streams, and wetland areas where numerous *ʻauwai* (irrigation ditches), taro *loʻi* (later rice paddies) were located; and near the coast where *loko* (fishponds) were located. The location and distribution of LCAw. parcels indicate traditional settlement practices continued into the late nineteenth century. No awards were made to the north of the study as depicted in the 1885 map. All lands awarded were concentrated in an area that stretched from the coast, proceeding *mauka* to just above modern day School Street. The map also indicates large areas of land adjacent to the "river" (Niuhelewai Stream) set aside as *Konohiki* lands (see Figure 17).

The current study area is located on the former site of a medical facility dedicated to the care of the mentally ill, originally known as the Oahu Insane Asylum. In 1862, under Kamehameha IV, the Legislature proposed and passed *He Kanawai e hoonohonoho ana I hale e malama a e lapuu i na pupule* (An Act to establish an Insane Asylum) into law authorizing the establishment of the mental hospital for the purpose of "the reception of all insane persons" (Kamehameha IV 1862:32 Section 1). The law stated, ". . . this facility will furnish restraint till the person becomes of sane mind or is discharged" (Kimmich 1956:345). The law also granted that the Judges of the Supreme, Circuit, police, and District Courts had the power to commit any person on a satisfactory complaint of insanity was made of a person, and that the public safety requires committal until a person is recovered and/or is ordered to be discharged. To be discharged, the Physician of the Hospital, certified in writing to the Minister of the Interior, that any person committed to the Hospital was recovered from the insanity and was of sound mind, at which time the Minister had the power to discharge a person (Kamehameha IV 1862:31).

Five months after the act became law, the periodical, the *Polynesian*, applauded the passage of the act but lamented the slow pace of implementation and construction of the facility for the mentally ill, and their removal from jails and prisons to more proper hospital facilities (January 31,1863:2). A month later, the need for a proper facility for the mentally disturbed was still great as the Oahu Prison was not adequately or appropriately treating the mentally ill (Polynesian, February 28,1863:3). By 1864, the Government was still working on the selection of a site for the facility (*Pacific Commercial Advertiser* [PCA], February 4, 1864:2). The initial appropriation for the construction of the Asylum was set aside in 1862 and totaled $7,000 (PCA October 15, 1864:2). By 1864, PCA reported a total of $12,000 in appropriations for an insane asylum (January 14, 1865:2) and within a year, a notice appeared in PCA soliciting sealed tenders for suitable lots in the vicinity of Honolulu for an insane asylum (April 15, 1865:2).

A June 16, 1865 notice reported the purchase of a lot of land by the Minister of the Interior, from H. A. Widemann (Chief Clerk for the Office of the Interior) for the establishment of an insane asylum (PCA June 24, 1865:4). The notice also requested that the sheriffs and magistrates of all the Hawaiian Islands report any lunatics "as are likely to require accommodation" within the asylum since the Interior Department was "about to erect suitable buildings thereon for the reception and safe-keeping of lunatics" (ibid.). A letter to the editor opposed the Government's purchase of a lot in Kapālama because it was unsuitable for an insane asylum: parched and dry in the summer and a bog during the winter months, lacking pure water for sanitation and cooking and drinking (PCA June 17, 1865:3 c.4). The same letter alleged negligence in site selection and a waste of money for a site unsuitable even for a residence (ibid.).

According to the Report of the Minister of Finance to the Legislature of 1866, dated April 25, 1866 and published in the PCA, the Insane Asylum was nearing completion (May 5, 1866:4). The same report stated that the $12,000 appropriation was disbursed as follows: $3,500 for house and lot, $4,084 for carpenters, painters, etc., $2,000 and $2010.85 to T.C. Heuck for lumber and labor, $130 to C.L. Richards & Co., and $3,918.31 paid to Contractor for labor and to finish the work (ibid.). In 1865 a resolution was introduced by the Assembly of the Hawaiian Legislature, for the Minister of the Interior to, “set apart some room in the insane asylum for the purpose of taking care of old women and men who have no children”, and for the Minister of Finance to set aside “the sum of $3,000 for their support” (PCA June 9, 1866:1). Despite the decision of the legislature and subsequent appropriations that began in 1862, according to an article titled “Hawaii’s Hospitals, 1831-1956”, the Oahu Insane Asylum did not open until September of 1866 (Schmitt 1956). Since its inception, “the hospital has been maintained at government expense” (Schwallie 1916:873), originally under the Board of Health (ibid.).

The first patients at the Oahu Insane Asylum were six individuals who were transferred from the Oahu Prison in ‘Iwilei. Dr. Robert A. Kimmich’s 1956 article “100 Years of Hawaiian Psychiatry” recounts that the annual report of 1867 included a total of 62 admissions for the year, which included the discharge of 17 “recovered” patients, and that the average age of the patients was forty years (Kimmich 1956:345). An article published in the PCA in early 1883 after a visit to the facility by the press and officers of the government, boasts of a new addition to the facility (referred to as the Kalihi Insane Asylum), the favorable overall conditions, and the patient population (fifty-two total); of which, “twenty-two are natives, six Americans, six Englishmen, two East Indians, and fourteen Chinamen (PCA January 13, 1883:4)”. It was reported that although the most dangerous patients were closely monitored to prevent escape, violence was not used except in cases of absolute necessity, and patients had all possible freedom. Those capable, of light physical labor tended to the taro patches and garden grounds. Once patients showed signs of absolute recovery they were permitted leave for probationary periods, and if proven to be cured, discharged. Patients may be returned if their condition arose again (ibid.).

While the 1885 map (see Figure 17) shows only a rough plan view of the Oahu Insane Asylum, Figure 18 is a detailed plan of the Insane Asylum showing the locations and functions of the buildings and grounds in 1885. Figure 19 is a plan view of the Insane Asylum buildings and grounds as well as some of the surrounding parcels in 1888. Figure 20 shows the extensive taro and rice fields, fed by the springs and streams of Kapālama Ahupuaʻa, still present in 1893, although the development of Honolulu is beginning to reach out to what were once far removed lands.

Figure 21 shows the buildings and grounds of the Asylum in 1895, ten years after the first plan map. During this time, one building, Mrs. Bindts cottage, was removed from the northwest end of the property and two additional buildings constructed near the former cottage site. A letter from the Minister of Interior dated May 8, 1892, shows that a bid of $974 was accepted to erect one of these new buildings at the asylum (Hawaii State Archives [HSA]; Interior Department-Lands, Letter).

In late 1898, the issue of overcrowding at the asylum, which had then become known as the Territorial Insane Asylum, prompted the construction of a new building to accommodate all the patients at the facility. An item for the new building had been included in an Appropriations bill that had passed the joint committee of both houses; however, the funding appeared to have gotten “lost in the shuffle” (Evening Bulletin December 24, 1898:1). A few days later, George Mason, Clerk of the Senate, published an Editor Bulletin in the same periodical in an effort to set the record straight, stating that “special committees were appointed to visit the place and make recommendations” in response to the “urgency of more accommodations at the Asylum” (The Evening Bulletin December 27, 1898:4). Furthermore, appropriations included “$25,000 for a new fire-proof building to be built of concrete with an iron roof. . . $2,600 for the purchase and erection of an electric plant at the Asylum” and an increase in the maintenance budget for the Asylum from $20,000 to $33,600 (ibid.). Apparently, the item for the electric light plan was indeed inserted in the Appropriations bill and passed. However, the Senate made a unanimous decision not to include the item for the new main building in the Appropriations bill because the new building qualified as a "permanent improvement" and "belonged in the Loan Bill, which at the time the Government had not presented" (ibid.). Unfortunately, it appears that the item was forgotten entirely despite the Senate's intentions to secure the funding and proceed with construction. In 1900, the asylum had a daily average of 140 patients and by 1910 there were 309 persons cared for with a daily average of 225 (Schwallie 1916).

A February 7, 1901 Physician's Report to the Board of Health declared the Asylum "in first class condition" (Honolulu Republican [HR] February 7, 1901:1). Kimmich summarized the early struggles at the facility as follows: "The hospital had a somewhat stormy history but managed to fulfill an increasingly large function in the care and isolation of the mentally ill" (1956:345). In the early 1900s, four Grand Jury investigations into the facility, now referred to as the Territorial Insane Asylum, were conducted with recommendations for: "a resident physician, a specialist if possible, whose entire time could be given to the study and treatment of the inmates" based on the model set by "all State and Territorial Asylums" in the United States; the construction of "a half-way station" receiving building for incoming patients; the replacement of the existing Wards No. 2 and 6; the construction of modern restrooms with flush toilets; improvements to the women's ward to reduce overcrowding; the installation of upgraded safety and security systems; and the cessation of rock quarry operations on nearby Bishop Estate lands (HR March 6, 1901:1, C.1). The Grand Jury investigations also found that there were 130 patients at the asylum and that a $30,000 appropriation had been made in early 1900 by the Council of State but never awarded. This was because "the funds of the Government have been so depleted by reason of the plague and other causes" (ibid.). Ultimately, the rock quarry was found to provide the best rock for road construction in the islands, which set in motion an effort to relocate the asylum elsewhere so that the quarry could continue its operations (ibid.).

In 1902, the Board of Health decided to relocate the Oahu Insane Asylum upon government land rather than invest government funds in the rebuilding of the original facility (PCA May 29, 1902:12). In 1903 it was decided to relocate the asylum, described as "in a tumbledown condition, the roofs of some of them having been battered in by the rocks thrown from the blasts in the adjoining stone quarry", and temporarily shut down the crusher until such time as a new location had been secured (PCA July 10, 1903:3). The Insane Asylum site was also inconveniently located for an expanding Honolulu and Pearl Harbor naval station, railway system, and electric street car system (PCA July 16, 1903:2). Figure 22 shows the growing city and naval station starting to surround the Insane Asylum property. The maintenance and control of the Insane Asylum was transferred from the Board of Health to the Territorial Board of Public Institutions, according to a letter from the secretary of the Board of Health to the Secretary of the Territorial Board of Public Institutions dated June 4, 1903 (HSA-Governor Dole Series, Letter). In 1904, the Insane Asylum committee appears to have approved plans for the construction of a physician's cottage at the facility (Hawaiian Gazette [HG] March 11,1904:5). The same notice mentions an extension to School Street, which would "run along the margin of the Asylum grounds instead of cutting through their midst" (ibid.).

Despite the controversies and the intention to relocate the Asylum away from Kapālama, a contract was awarded to construct new buildings at the facility. As a result, a legal battle ensued between the Superintendent of Public Works, Mr. Holloway, and the contractor, American-Hawaiian Engineering and Construction Company (PCA December 21, 1904; January 20, 1905:5;). The litigation involved the architect, the Governor and the Attorney General, among others, and left a long paper trail, currently housed at the Hawaii state archive (Hawaii State Archives Executive Governor Files 2-8, letters). Awarded in early 1904, the contract languished in the court system for months as the contractors refused to submit to arbitration because, in part, the ambiguity concerning the type of concrete blocks that would be used in the construction of the new building (PCA December 20, 1904:1). Allegations of fraud, followed by accusations and denials, were made by both parties. After two years, a settlement was reached with the contractor paying the Territory "a forfeit of $500 for failure to carry out its contract in constructing the new buildings at the Asylum. As the appropriation has expired, the Legislature must make a new appropriation before the construction work can again be carried on" (PCA August 8, 1906).

In 1907, the appropriation for the new buildings at the asylum were renewed due to persistent overcrowding and in particular, the need for “a new building for men, a new dining room and a new kitchen” (PCA March 7, 1907:6). The Board of Health requested that the $52,459 balance of the appropriation be applied to the construction of the new buildings and furnishings and that any remainder be applied to the establishment of an infirmary annex (ibid.). According to the Superintendent of the Asylum there were no details about the buildings of the asylum prior to 1910, however, during that year, the following structures were built: one cottage, a concrete fireproof laundry, an annex with 18 small rooms, a concrete fireproof bath-house for men, and ground was cleared and foundations prepared for a women’s bath-house (Schwallie 1916:874). In addition, existing buildings were painted and repaired, and the grounds were maintained (ibid.).

In 1913 a new, two-story fireproof building to accommodate 120 new patients was built of reinforced concrete with screened *lānai* surrounding it in its entirety, and a Spanish tile roof. This new building was built for $43,000 from a $50,000 appropriation from the legislature and in addition to the housing of patients the building contained a laboratory and operating room, and later a modern, sanitary dining room was added (HG June 20, 1913:2). Figure 23 shows the U-shaped, structure in 1923 along with other new additions to the facility. By 1923, the entire Insane Asylum property was redeveloped, the roads and drives and the layout of the grounds had all changed and only one asylum building remained from the 1895 map. According to the 1923 Hawaii Governor’s Annual Report to the Secretary of the Interior, the total number of patients under care and treatment between June 30 1922 and June 30, 1923 was 432 individuals (comprised of 325 males and 123 females), of these 81 males and 34 females were admitted during the year (Hawaii Governor 1923:89). A total of 32 patients were discharged “recovered” and another 32 patients were discharged “improved”, while 30 patients died during the year (ibid.).

The search for a new location for the Oahu Insane Asylum that began in 1901 as a means of solving the rock quarry dilemma and removing the Asylum out of the area to allow further expansion and development of Honolulu ended in late 1928, when a site in Kāneʻohe was selected as the new location for the Asylum. The 524-bed facility was known officially as the Territorial Hospital and opened in 1930 (Kimmich 1956:346). The United States Army assisted in the relocation of the patients from the Oahu Insane Asylum Facility, using a military convoy to transport the patients from one facility to another on January 6, 1930. A review of historic photographs at the State Archives reveals many onlookers gathered along the streets of Honolulu to observe the convoy as it moved the patients over the Pali Highway to their new home in Kāneʻohe.

Following the move, the former Oahu Insane Asylum buildings within the current study area went unused and languished, while various reuses were proposed for the buildings and multiple proposals for the redevelopment of the property were explored. In 1931, shortly after the Asylum was vacated, the property was selected as a proposed site for a junior high school (Figure 24). In 1939, The finance committee of the board of supervisors suggested that the main building be renovated for use as a city-county hospital (the *Honolulu Advertiser* October 27, 1939:1). The reported cost of renovating the former Asylum building was estimated at $110,000 for the renovations necessary to transition the building into a city hospital including “new floors, ceilings, water systems, plumbing, millwork a new kitchen and other items” (the *Honolulu Advertiser* March 1 1940; *Honolulu Star Bulletin* February 22, 1941). Despite the various proposals to reuse and/or redevelop the property and the intention to not let the main building fall into ruin, by 1940 it was hardly more than a concrete shell and it appears any efforts to rehabilitate the structure were abandoned by 1952.

An aerial photo from 1952 shows the former Asylum buildings present at the site (Figure 25). Also visible in the 1952 photo are the Lanakila Emergency Homes, created under a portion of Executive Order 1274 and built in 1951 by HHA. The Lanakila Emergency Housing project was erected around the former Asylum buildings and incorporated some of the Asylum structures to further address the Honolulu housing shortage that dated back to the early 1930s and was exacerbated by World War II. In February 1951, the Territory funded the construction of the concrete block Puahala Homes, adjacent to the current study area, which were built in four phases between 1952 and 1959 (Fung Associates 2011). A review of City and County Building Permits from the 1950s documented that HHA also built two of the buildings currently present on the property; a one-story maintenance shop building in 1953 located in the north-central portion of the study area and a one-story office building in 1955, in the center of the current study area. Figure 26 shows the study area in 1959. From the 1950s through the 1980s, HHA, and later HPHA, built, moved, and demolished several buildings within the current study area.

Records on file at the Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD) indicate that the study area was not previously surveyed for archaeological resources. However, in 1995, the HHA, with funding from the U.S. Department of Housing and Urban Development (HUD), proposed building a new 2,880 square-foot Family Investment Center within what is now the study area. Following a site inspection on March 23, 1995, HHA sent a March 24, 1995 letter to DLNR-SHPD/ State Historic Preservation Officer (SHPO) stating a determination that the proposed project would have no effect on properties listed on or eligible for the NRHP (On file at DLNR-SHPD). A June 5, 1995 letter from DLNR-SHPD/SHPO concurred with HHA determination and stated that “A review of our records shows that there are no known historic sites at the project location. Aerial photographs from the 1970s show that the parcel has been cleared and modified making the presence of historic sites unlikely. Thus, we believe that this action will have ‘no effect’ on historic sites” (SHPD/DLNR Log No. 14731, Doc No. 9505EJ12).

Few archaeological studies have been conducted within the vicinity of the current study area. Table 1 and Figure 27 detail the archaeological studies previously completed in the vicinity of the current study area.

Table 1. Previous archaeological studies.

Year	***Author***	***Type of Study***
2007	O’Hare et al.	Field Inspection
2008	Hammatt and Chiogioji	Archeological Inventory Survey
2012	Hunkin et al.	Monitoring
2013	Hunkin and Hammatt	Monitoring
2016	Yucha and Hammatt	Archaeological Inventory Survey

O’Hare et al. (2007) completed a field inspection and literature review report for the Nuʻuanu portion of the Kalihi/Nuʻuanu Sewer Rehabilitation Project. The only portion of that project that is in the vicinity of the current study area is Area-4, Lanakila. The results of the field inspection for Area-4 called for on-site monitoring of all excavations exceeding a depth of one foot. Sites of concern within Area 4 would be potential remains of habitation/agricultural sites and traditional/historic burials. Hammatt and Chiogioji (2008) completed an AIS for a proposed water line in Nuʻuanu and Kapālama. However, no historic properties were identified. The survey was limited to the roadway corridors, and testing revealed fill disturbance from roadway construction and utility trenching. Hunkin et al. (2012) conducted archaeological monitoring for the Kalihi-Nuʻuanu Sewer Rehabilitation Project. No historic properties were identified in the Kapālama vicinity of this project. However, one isolated human femur fragment was found in fill material at an area along the western slope of Punchbowl. No site number was assigned to this fragment and it was handed over to SHPD for reburial. Hunkin and Hammatt (2013) conducted archaeological monitoring in support of a portion of the Kalihi Valley Sewer System Improvement Project. The monitored portion was in close proximity to known cemeteries, but no historic properties or human remains were identified during monitoring. Yucha and Hammatt (2016) completed an AIS report for the Holana Bridge Replacement Project. The focus of the AIS was collecting documentation of the Halona Street Bridge and portions of the Kapālama Drainage Canal, both of which were constructed in the early twentieth century. Two SIHP Sites were identified, the Holana Street Bridge, (SIHP # 50-80-14-7807) built in 1938, and the Kapālama Drainage Canal (SIHP # 50-80-14-7808) which was completed in 1939.

Background research and the October 31, 2016 field inspection have demonstrated that the varied and interesting history of the property has resulted in the near continuous development and redevelopment of the current study area. This redevelopment has involved numerous, episodic and extensive ground disturbing activities, which has obliterated any potential archaeological properties that may have been present below the ground surface. Currently, there are numerous underground utilities and easements across and around the study area, such as the Kapālama Drainage Unit (C.S.F. 10597) located along the southeast and southwest edges of the study area and a 20,445 square foot Transmission Line and Pole Easement along School Street (Imata 2016). The HPHA campus contained within the study area is thoroughly developed and contains thirteen different buildings (nearly 31,000 square feet total) and associated underground utilities, with most of the rest of the study area covered with concrete pads and sidewalks, and asphalt parking lots and driveways crisscrossed by underground storm sewers.

Given the findings of the current study coupled with the previous DLNR-SHPD/SHPO determination, we believe that the proposed redevelopment project in the current study area will have no effect on archaeological resources. In the unlikely event that any potential such resources or human skeletal remains are encountered during ground disturbing work in the study area, work in the immediate vicinity of the discovery will be halted and DLNR-SHPD contacted as outlined in HAR 13§13-275-12. Should you require further information, or wish to visit the property, please contact me directly.

Sincerely,

David M. Crowell

David M. Crowell, M.S., RPA
Senior Archaeologist

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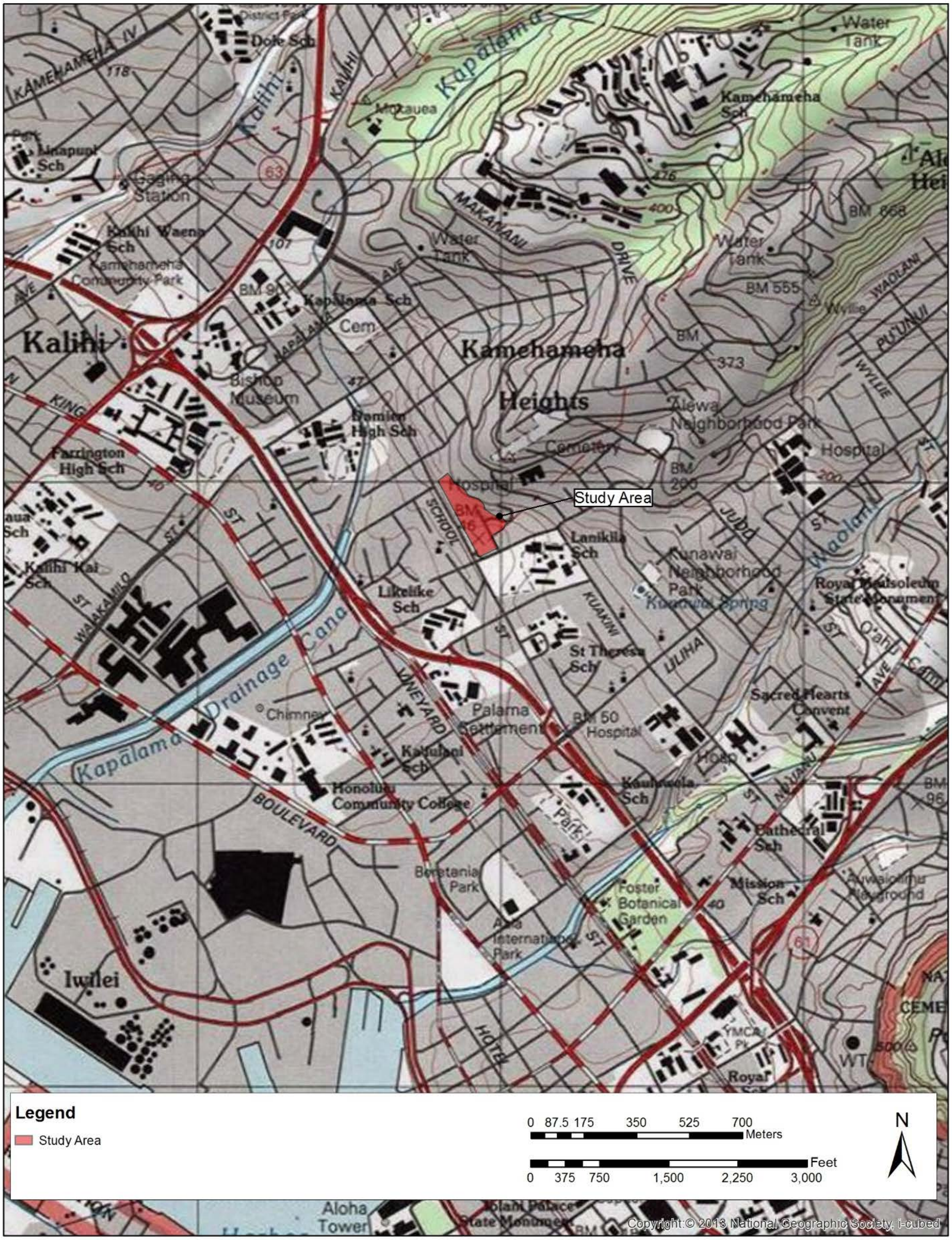


Figure 1. Current study area location (portion of U.S.G.S. 7.5 min. series, Honolulu quadrangle, 1998).

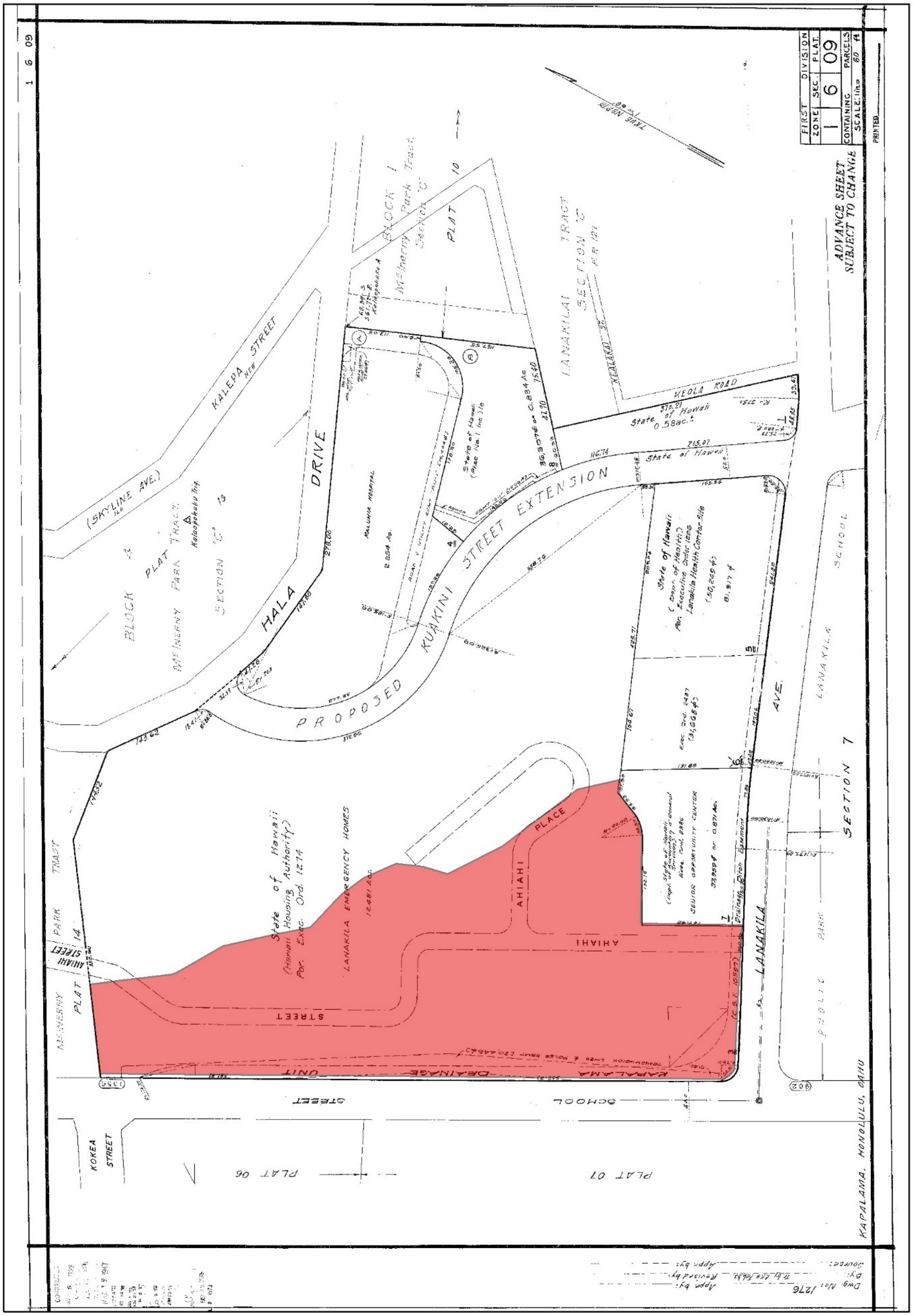


Figure 2. Tax Map Key: (1) 1-6-009 showing the current study area (Parcel 003) shaded red.

Figure 3. Aerial view of the current study area.

Figure 4. Soils in the vicinity of the current study area.

Figure 5. South end of current study area, view to the north.

Figure 6. Storm sewer/Kapālama Drainage Canal running along the southwest edge of the study area, view to the southeast.

Figure 7. Storm sewer running along the southwest edge of the study area, view to the northwest.

Figure 8. Grading, parking, drainage, and building construction along southwest edge of study area, view to the southeast.

Figure 10. Grading, parking, drainage, and building construction in the central part of study area, view to the northeast.

Figure 11. Grading, parking, drainage, utility, and building construction in the central portion of the study area, view to the north-northwest.

Figure 12. Grading, parking, drainage, utility, and building construction at the northwest end of the study area, view to the north-northwest.

Figure 13. Filling and grading, utility, parking, and construction at the northwest end of the study area, view to the north.

Figure 14. Grading, parking, utility, and building construction in the central part of study area, view to the southeast.

Figure 15. Grading, parking, drainage, utility, and building construction along the northeast side of the study area, view to the east.

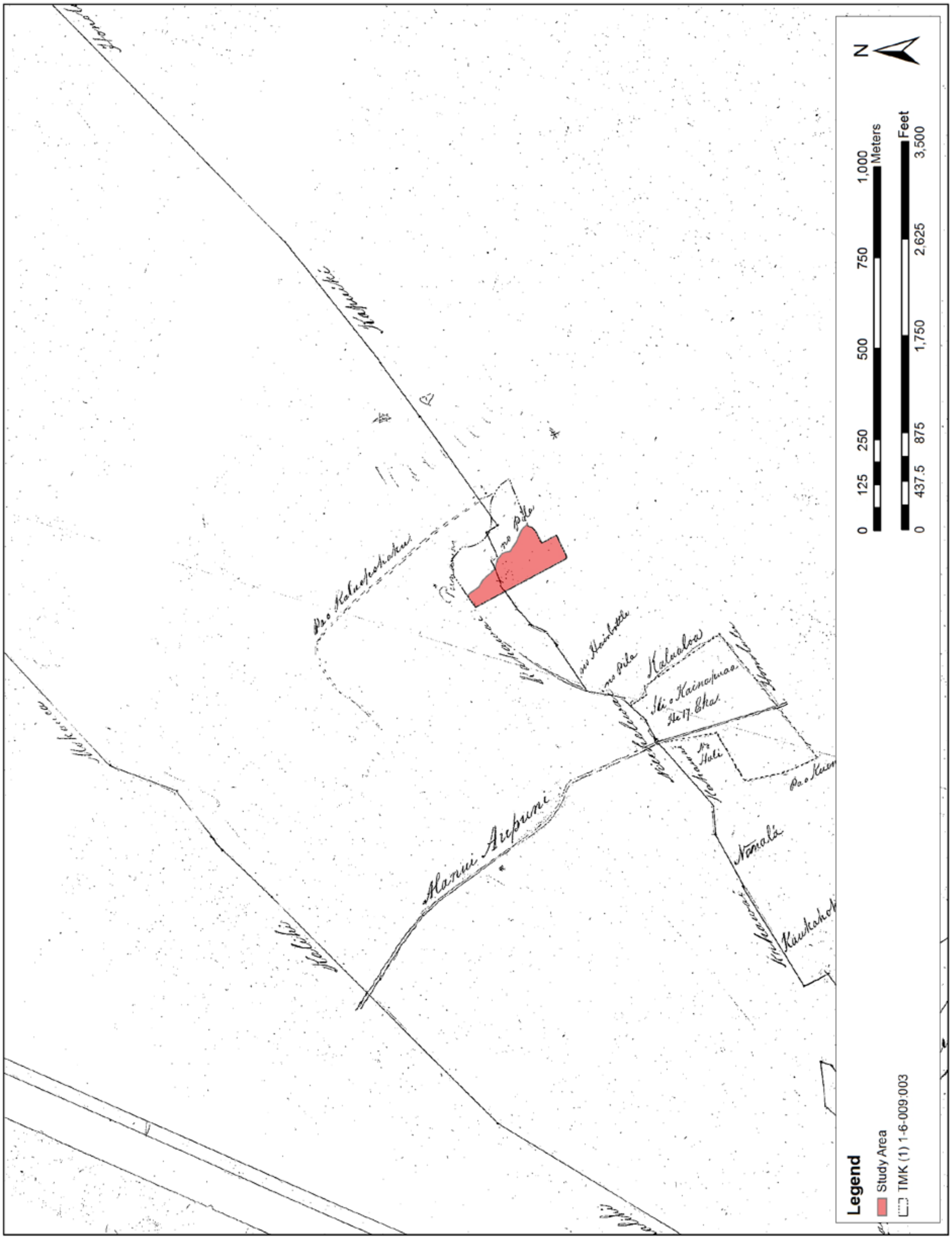


Figure 16. Registered Map 0079 (1851) showing the current study area in red.

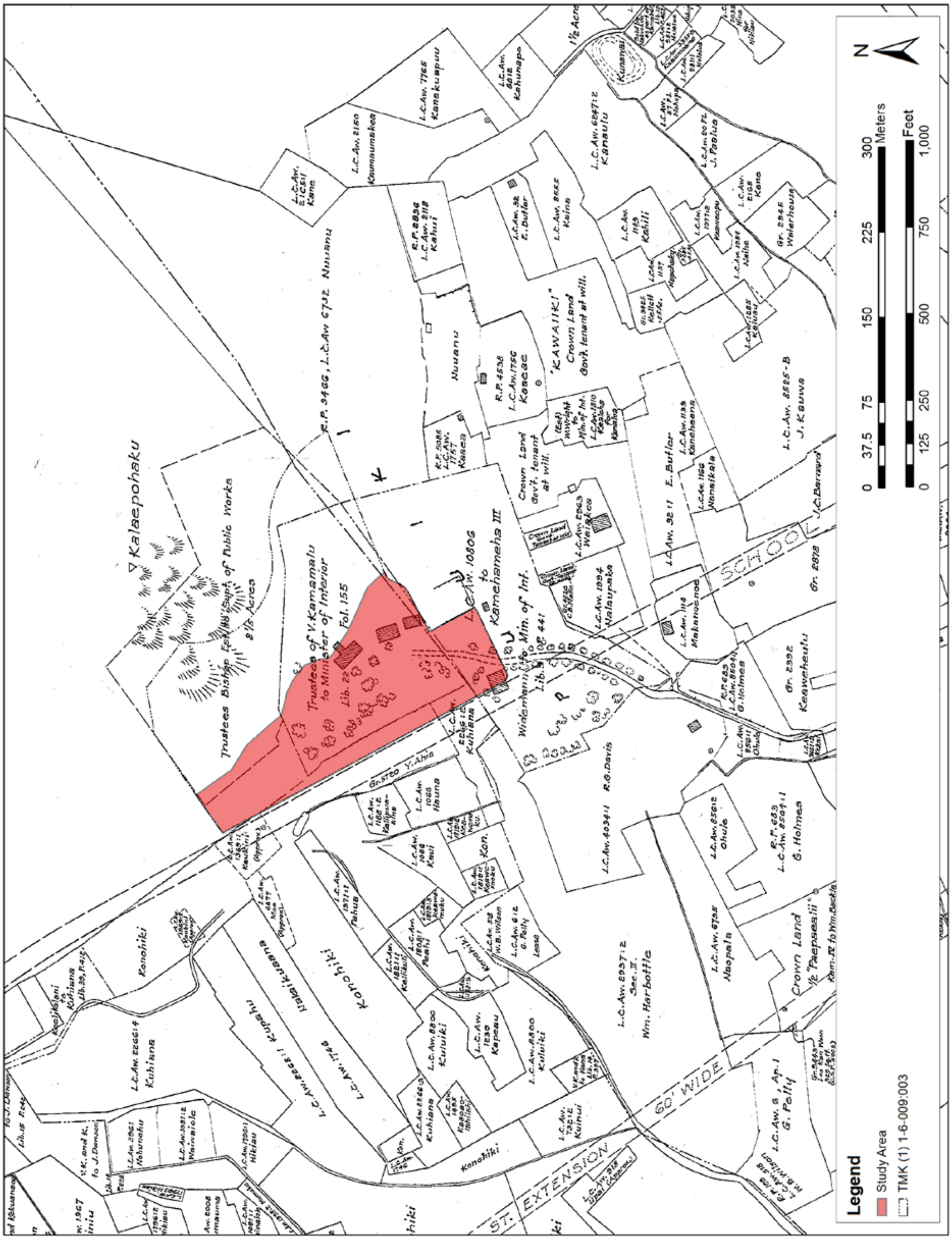


Figure 17. Registered Map 1039 (1885) showing the current study area in red.

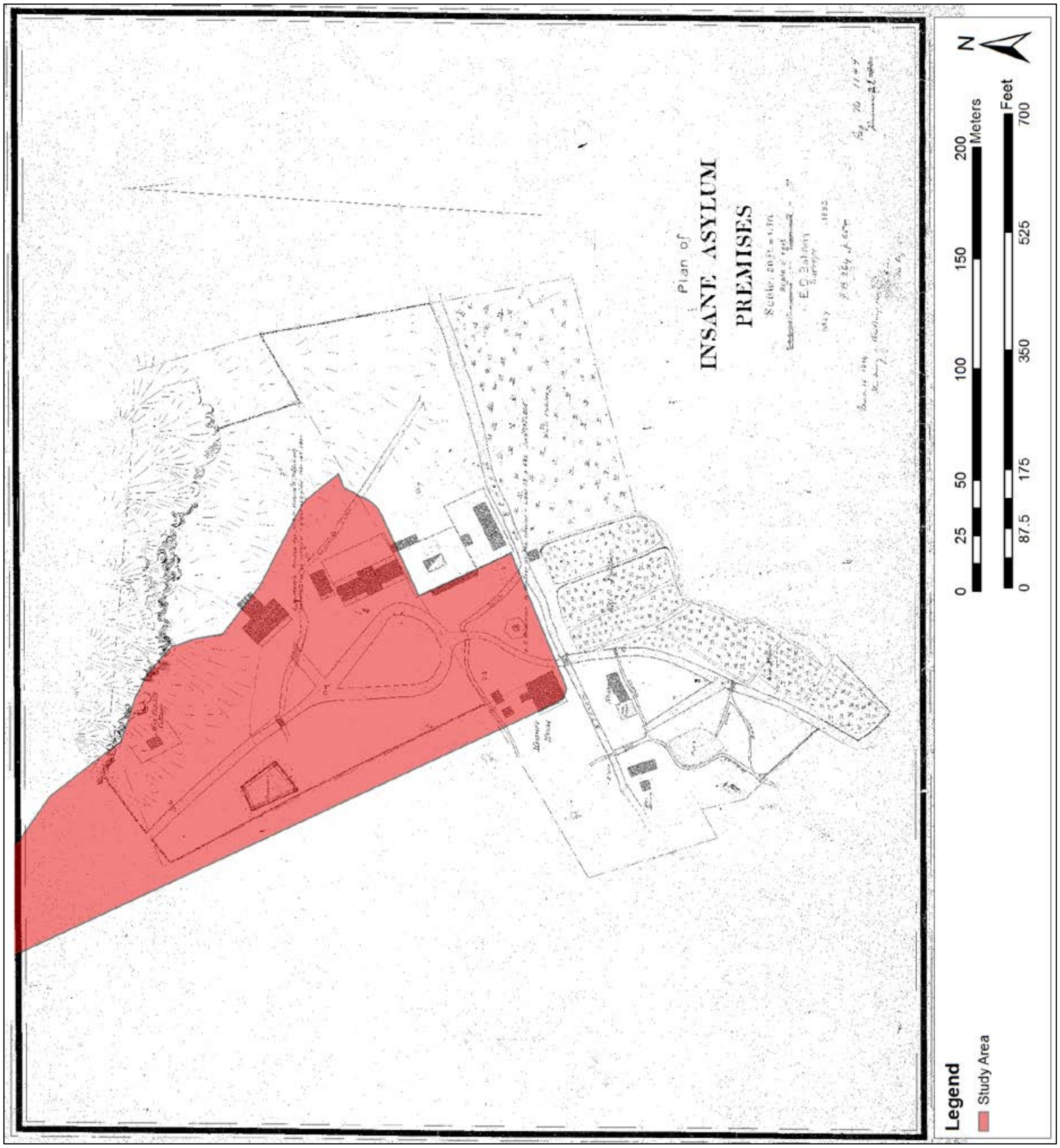


Figure 18. Registered Map 1149 (1885) showing the current study area in red.

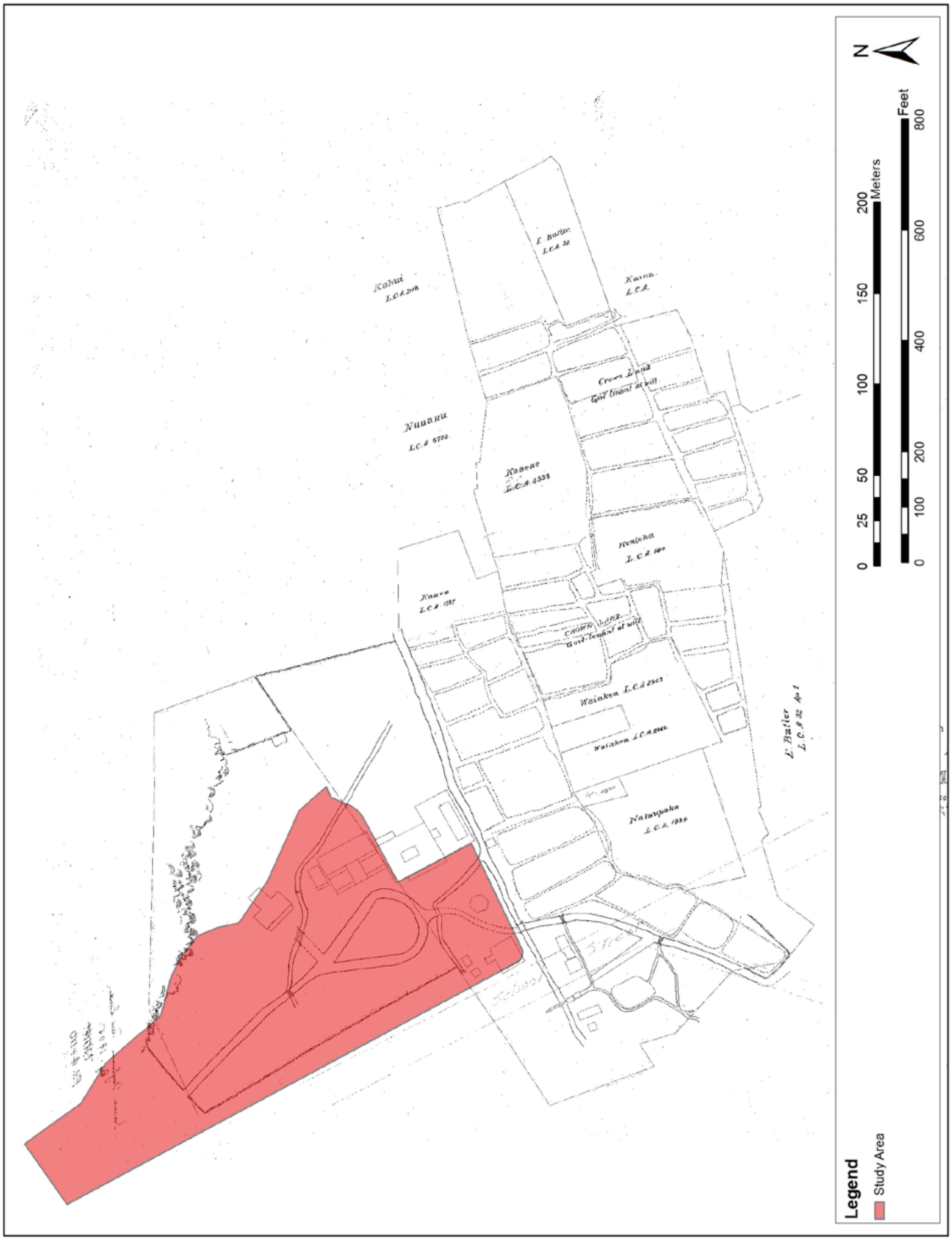


Figure 19. Registered Map 1805 (1888) showing the current study area in red.

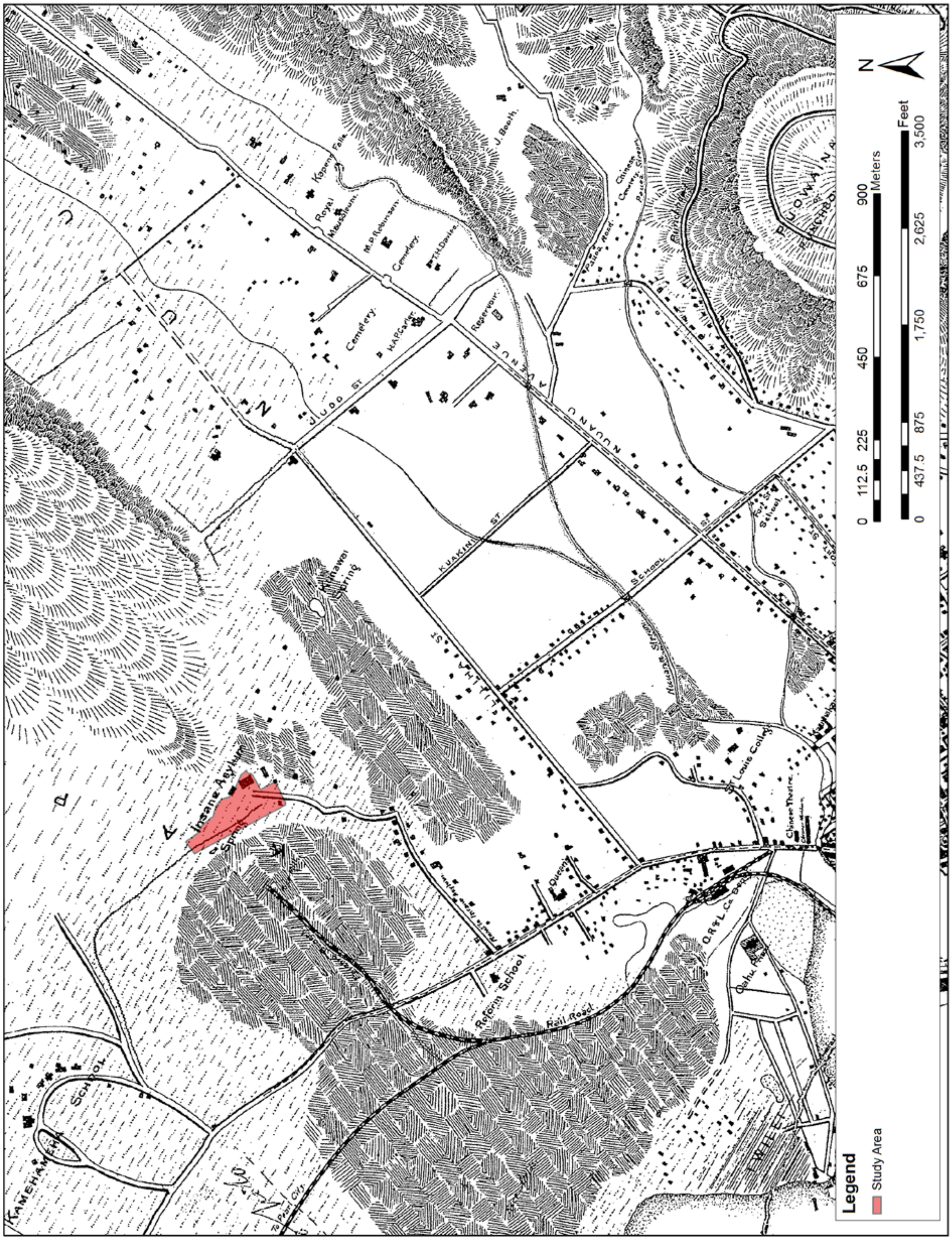


Figure 20. Registered Map 1690 (1893) showing the current study area in red.

Figure 21. Registered Map 1835 (1895) showing the current study area in red.

Figure 22. Registered Map 2374 (1902) showing the current study area in red.

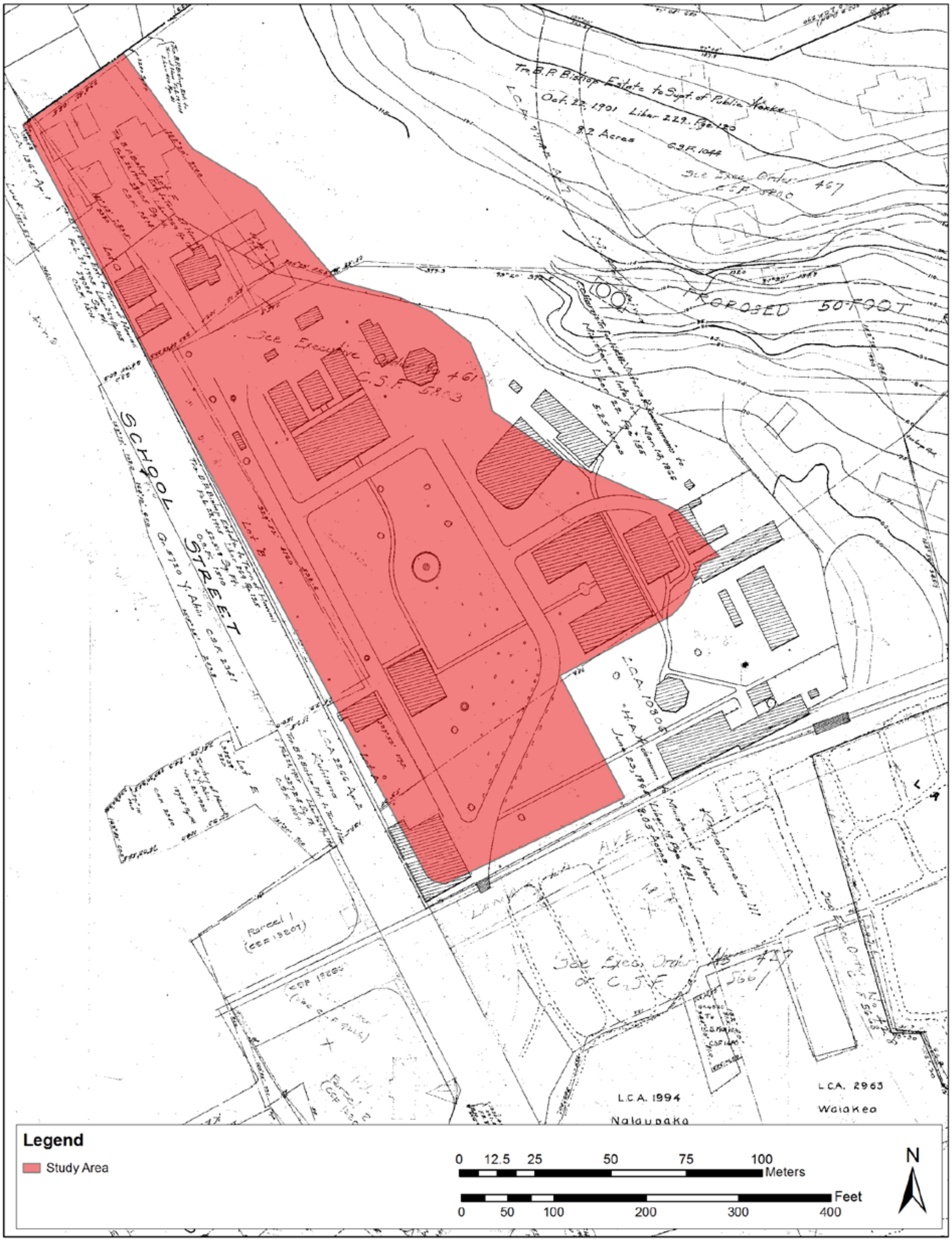


Figure 23. Registered Map 2571 (1923) showing the current study area in red.

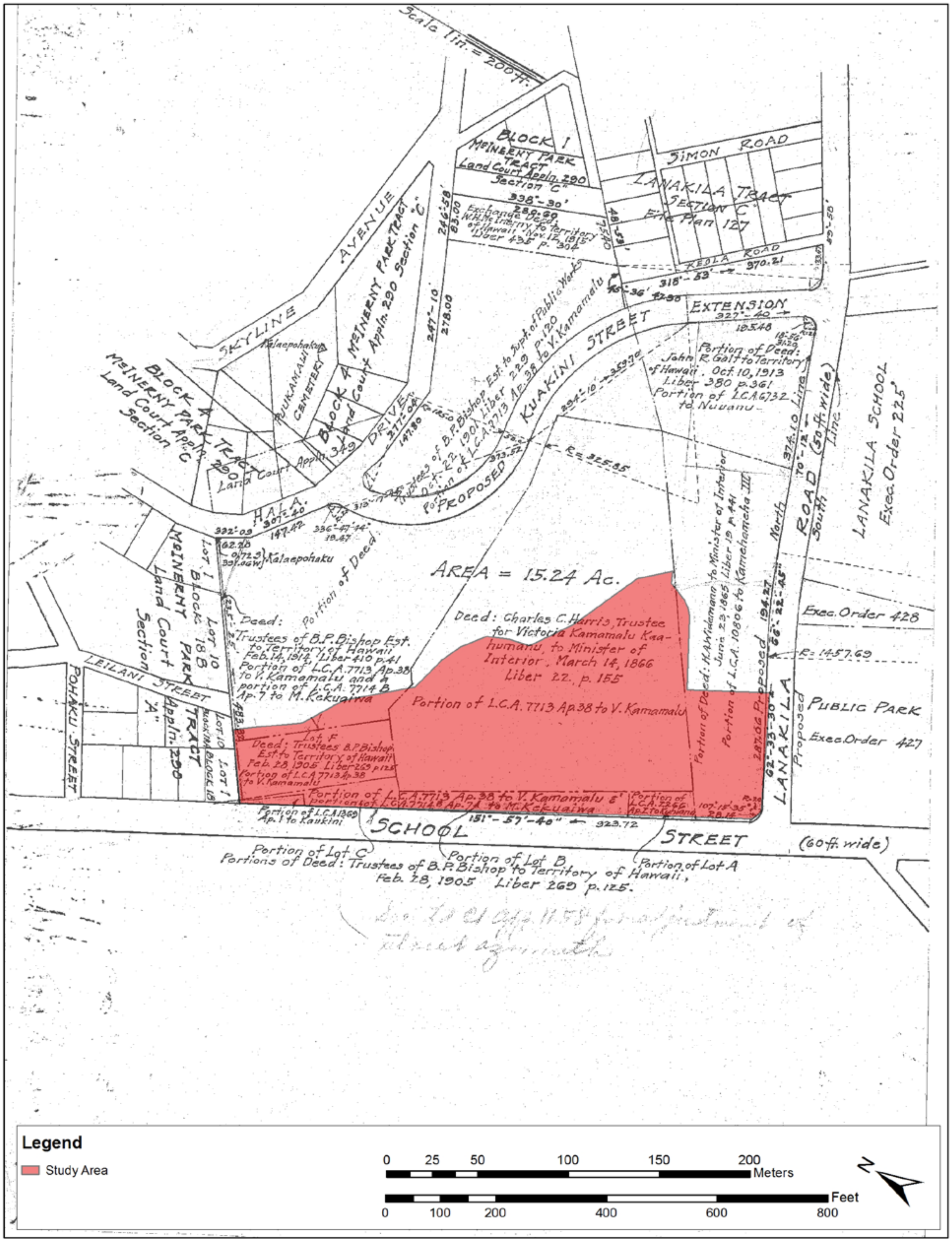


Figure 24. Copy of Survey Furnished (C.S.F) map 05803 (1931) showing the current study area in red.

Figure 25. USGS 1952 aerial photograph showing the current study area in red.

Figure 26. USGS 1959 aerial photograph showing the current study area in red.

Figure 27. Previous archaeological studies conducted in the vicinity of the current study.

APPENDIX G
Architectural Inventory Survey

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

JEFFREY T. PEARSON, P.E.
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, HAWAII 96707

October 4, 2017

IN REPLY REFER TO:
LOG NO: 2017.01570
DOC NO: 1709TGM19
Architecture

Mr. Hakim Ouansafi, Executive Director
Hawaiʻi Public Housing Authority
1002 North School Street
Honolulu, HI 96817

Dear Mr. Ouansafi:

SUBJECT: **Chapter 6E-8 Historic Preservation Review**
Reconnaissance Level Survey - Administration Offices Redevelopment
1002 North School Street, Honolulu, HI 96817
Owner Name: State Hawaiʻi Public Housing Authority
Kapālama Ahupuaʻa, Kona District, Island of Oʻahu
TMK: (1) 1-6-009:003

Thank you for the opportunity to comment on this request from the Hawaiʻi Public Housing Authority (HPHA) for Hawaiʻi Revised Statutes (HRS) Chapter 6E-8 review. The State Historic Preservation Division (SHPD) received this submittal on July 21, 2017 and additional information was received on September 27, 2017.

The existing site is bounded by N. School Street to the west, Lanakila Avenue to the south, a portion of Ahiahi Street to the east, and a residential district to the north. The proposed project includes demolishing the existing 13 low-rise administrative and maintenance buildings and constructing 1,000 housing units, 30,000 s.f. of administrative office space for the HPHA, and 7,500 s.f. of commercial retail space.

The architectural reconnaissance level survey (RLS) by Fung Associates identified that out of the 13 buildings within the APE, only five are over 50 years old: (1) The 1955 Administration Building (Building A); (2) a maintenance shop and (3) semi-attached central store room (together known as Building D); (4) a set of garages; and (5) a facilities office building (Building C). These five buildings are eligible for listing on the Hawaiʻi and National Registers of Historic Places under criterion C. The five buildings were designed by local architect Edwin Bauer and constructed between 1953 – 1955 for the Hawaiʻi Housing Authority during the immediate post-war period. Building A is designed in a modern Hawaiian style and the other four are designed in the utilitarian style.

SHPD accepts the RLS. Please confirm if this project is defined as an undertaking pursuant to 36 CFR 800.16(y) and subject to Section 106. NHPA.

SHPD looks forward to receiving the 6E submittal packet which includes the 6E submittal form, building permit application, permit set, plans, and photographs.

Please contact Ms. Tanya Gumapac-McGuire, Architectural Historian, at (808) 692-8022 or at Tanya.Gumapac-Mcguire@hawaii.gov regarding architectural resources or this letter.

Aloha,

Alan Downer

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

cc: Mr. Bob Fard, Retirement Housing Foundation, Bob.fard@rhf.org
Ms. Alison Chiu, Fung Associates, Inc., alison@funghawaii.com
Ms. Tonia Moy, Fung Associates, tonia@funghawaii.com

DAVID Y. IGE
GOVERNOR

HAKIM OUANSAFI
EXECUTIVE DIRECTOR

BARBARA E. ARASHIRO
EXECUTIVE ASSISTANT

STATE OF HAWAII
HAWAII PUBLIC HOUSING AUTHORITY
1002 NORTH SCHOOL STREET
POST OFFICE BOX 17907
HONOLULU, HAWAII 96817

IN REPLY PLEASE REFER TO:
17:OED/039-

July 17, 2017

Dr. Alan Downer, Administrator
State Historic Preservation Division
601 Kamokila Blvd., #555
Kapolei, Hawaii 96707

SUBJECT: Hawaii Revised Statutes, Chapter 6E-8, Review of Proposed Projects
Hawaii Public Housing Authority Property at 1002 North School Street
TMK: (1) 1-6-009: 003 (por.)
Honolulu, Oahu

Dear Dr. Downer:

On behalf of the Hawaii Public Housing Authority, selected developer Retirement Housing Foundation, and the project team, we are submitting the proposed redevelopment of the Hawaii Public Housing Authority Administration Offices at 1002 North School Street, for your review. Please refer to J. *Project Description* for additional information.

I. GENERAL INFORMATION

A. Project Proponent: Hawaii Public Housing Authority (HPHA)

B. Local Agency Address: 1002 North School Street
Honolulu, HI 96817

C. Project Contact: Bob Fard, Director of Acquisitions
Retirement Housing Foundation
911 N. Studebaker Road
Long Beach, CA 90815-4900
Phone: (562) 257-5352
Email: Bob.fard@rhf.org

D. Additional Contacts: Tonia Moy, Fung Associates, Inc.
Phone: (808) 941-3000
Email: tonia@funghawaii.com

E. Project Name: Redevelopment of the HPHA Administration Offices

F. Project Street Address: 1002 North School Street
Honolulu, HI 96817

G. Location: Kapalama
Honolulu Ahupua'a, Honolulu (Kona) District

H. TMK: (1) 1-6-009: 003 (por.)

I. Area of Potential Effect (APE): The APE has been identified as the physical footprint of a portion of the TMK parcel, which is bounded by N. School Street to the west, Lanakila Avenue to the south, and encompasses a portion of Ahiahi Street to the east, and a residential boundary to the north in Honolulu (*See Figures 1 & 2, attached)*. The APE, or project area, is equivalent to the portion of land upon which the thirteen buildings that comprise the administrative building and support buildings currently occupy. We believe the Puahala housing on each side of the project area is not eligible for listing on the Hawaii or National Register of Historic Places; thus, these have been excluded from the APE.

J. Project Description: There is a great need for affordable housing within the community; the Hawaii Public Housing Authority works to meet this need in its plan to produce up to 1,000 units of new affordable housing on this site.

This project involves the proposed redevelopment of 13 existing low-rise administrative and maintenance buildings located on the HPHA site bordering North School Street into the design and construction of up to 1,000 housing units, 30,000 square feet of administrative office space for the HPHA, and 7,500 square feet of commercial retail space at the same location through means of a public/private partnership.

Initial efforts to identify redevelopment opportunities on this site are influenced by, but are not limited to, various factors such as community discussion, nearby planned transit-oriented development and traffic needs, and existing historic preservation and archaeological resources.

While select buildings within the APE may be eligible for listing (see II. *Identification of Historic Places*, below), an initial look at project feasibility to incorporate up the design scope requirements suggests that retaining the low-rise, Central Office Building (1955) may result in the possible following scenarios:

1. A high-rise tower solution at the south corner of the site, and/or
2. Reduction of 340 units and/or planned open space.

K. Consulting Parties: Historic Hawaii Foundation and other Historic Preservation Partners will also be consulted. If you know of other individuals or organizations with whom you believe we should consult, we request that you kindly share this information with us.

While the master plan has not yet been developed, the project team has taken early steps to engage with the community in this area by holding initial public meetings to better understand community needs and existing concerns, as planning and design for the project move forward. The team began meeting with community groups in 2016 (October 12 and November 29) and early 2017 (January 26, 27, 30 and 31). Additional meetings are anticipated to be held throughout this process. *(See X, Community Meeting Summary).*

II. IDENTIFICATION OF HISTORIC PLACES

A. The architectural reconnaissance survey identified thirteen buildings within the survey area; of these, five buildings were over 50 years of age and appear to be eligible for listing on the Hawaii and National Registers of Historic Places under Criterion C as being significant at the local level as good examples of utilitarian buildings erected by the Hawaii Housing Authority (predecessor to HPHA) during the immediate post-war period to support its maintenance operations. However, these five buildings do not appear to be of high preservation value.

Information supporting eligibility for listing of select buildings within the APE is included in Figure 3, *Architectural Reconnaissance Survey of the Hawaii Public Housing Authority Administrative Headquarters and Maintenance Facility*, prepared by Fung Associates, Inc., dated December 6, 2016.

Previous consultation with the State Historic Preservation Division (SHPD) regarding this site includes a 1995 determination stating, "A review of our records shows that there are no known historic sites at the project location. Aerial photographs from the 1970s show that the parcel has been cleared and modified making the presence of historic sites unlikely. Thus, we believe that this action will have 'no effect' on historic sites." (SHPD/DLNR Log No. 14731, Doc No. 9505EJ12). (*See Figure Y, letter, attached).*

Although determined to have "no effect" on historic sites at the time, architectural features should be re-evaluated on a present day basis, since some of the structures located within the APE have now reached an age of 50 years or more.

B. Background research indicates the site area located within the APE has undergone continuous development and redevelopment throughout the years.

Please refer to "Archaeological Study of the Hawaii Public Housing Authority Property at 1002 North School Street," prepared by ASM Affiliates, dated December 13, 2016 for more details (not attached).

It is anticipated that the proposed undertaking will result in an "adverse effect" determination to one or more historic properties located within the project APE. We look forward to working with you through consultation to resolve any adverse effect that may occur within the scope of the proposed project.

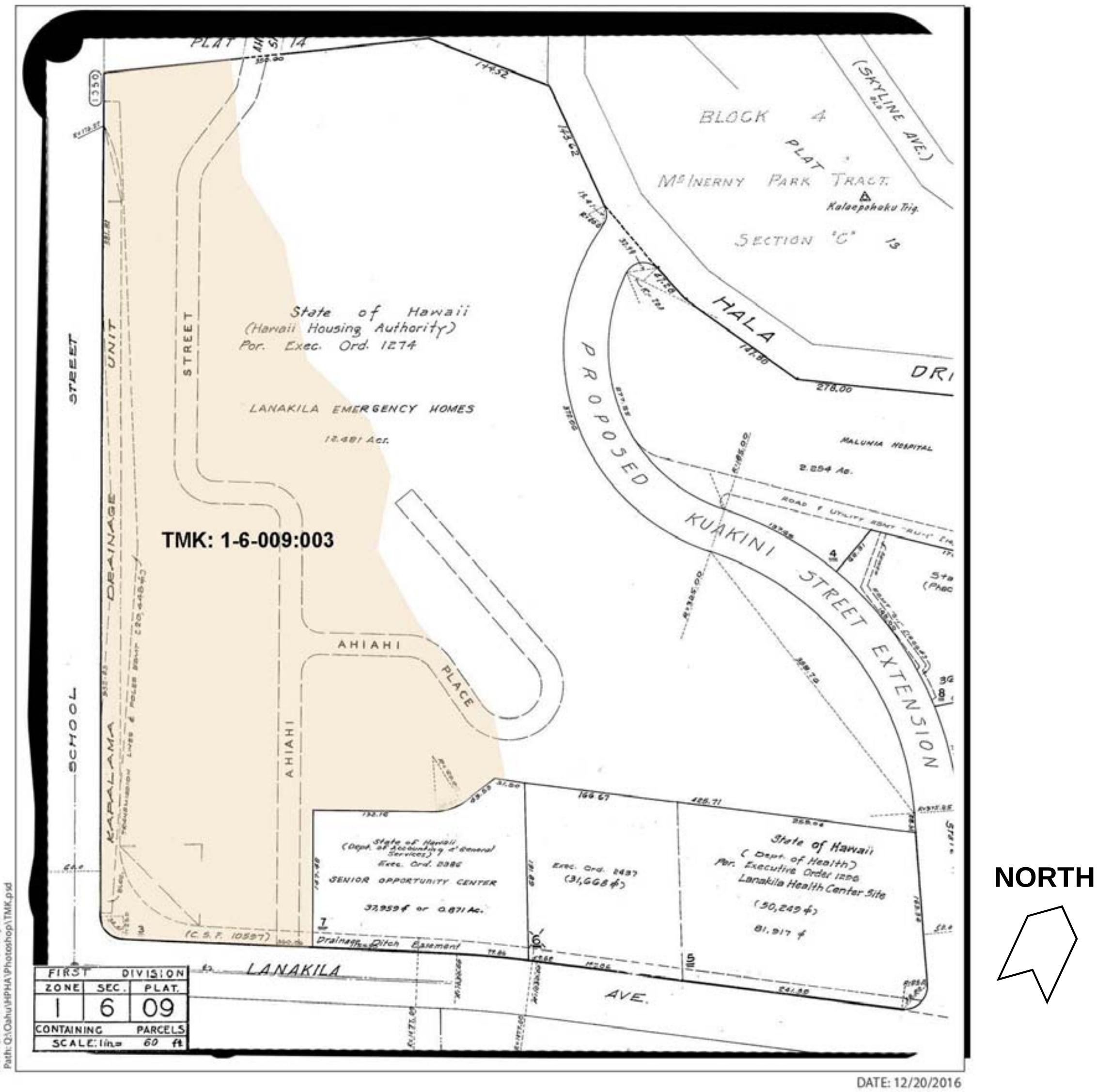
Thank you very much for your consideration. Please feel free to call myself or Ms. Becky Choi, State Housing Development Administrator at (808) 832-4694 should you or your staff have any questions. We look forward to working with SHPD on these needed improvements.

Sincerely,

Hakim Ouansafi
Executive Director

Attachments: Figure 1, *Tax Map Key: Hawaii Public Housing Authority Site*
Figure 2, *HPHA Administrative Office Site*
Figure 3, *Architectural Reconnaissance Survey of the Hawaii Public Housing Authority Administrative Headquarters and Maintenance Facility*, prepared by Fung Associates, Inc., dated December 6, 2016
Figure X, *Community Meeting Summary*
Figure Y, 1995 Letter (SHPD/DLNR Log No. 14731, Doc No. 9505EJ12)

Figure 1: Tax Map Key: Hawaii Public Housing Authority Site



LEGEND

Project Site

FIGURE 3:
Tax Map Key

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority Island of O'ahu

Not to scale

Source: City and County of Honolulu
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 2: HPHA Administrative Office Site

<u>Figure 3</u>

Architectural Reconnaissance Survey

of the Hawaii Public Housing Authority

Administrative Headquarters and Maintenance Facilty

Corner of North School Street and Lanikila Avenue

<u>Research Design</u>

This architectural reconnaissance survey was undertaken at the request of the Hawaii Public Housing Authority (HPHA), formerly known as the Hawaii Housing Authority at the time of the Central Office Building's construction in 1955. For purposes of this report, the historic name Hawaii Housing Authority will be utilized only within its historic context. The objective of the survey is to ascertain whether any possible historic properties are located within the Area of Potential Effect (APE), or project area (*See Figures 1 & 2, attached*), should lands at the southwest corner of the site located at North School Street and Lanikila Avenue under the control of HPHA be developed. No historic contexts were prepared as a part of this survey.

The survey followed a methodology that included performing background research, completing a site visit to photograph and gather information on the buildings located on the parcel, and writing up the results of the survey so any identified properties may be placed in the State Historic Preservation Division's (SHPD) Statewide Inventory of Historic Places.

<u>Coverage and Methodology</u>

The survey examined a portion of Tax Map Key (TMK) 1-6-009:003, a 12.481-acre parcel. An approximately 5.9 to 6-acre portion of the parcel running along North School Street and immediately adjacent to either side of Ahiahi Street, was examined. This area is utilized as the HPHA administrative headquarters and maintenance facilities.

Prior to the start of any fieldwork, background research was undertaken. The preliminary background research involved an examination of pertinent materials provided by the client. The SHPD inventory files disclosed that this property is not currently included in the Statewide Inventory of Historic Places.

Tonia Moy, Alison Chiu, and Don Hibbard, all of whom meet the Secretary of Interior's Professional Qualifications Standards as either a historic architect or an architectural historian, walked the survey area on November 20, 2016, examining all the buildings in the survey area. Approximately two hours were spent in the field photographing and taking notes on the physical character of the buildings and structures within the study area. One hundred percent of the survey area, which covered approximately 5.9 to 6 acres, was investigated.

Following the site survey, additional research was undertaken at the County Tax Office, Department of Planning and Permitting, and Hawaii State Library. This included a review of tax records, newspaper articles, departmental annual reports, and building permits. Following the gathering of information, this report was prepared, reviewed, and finalized. A reconnaissance level inventory form was completed for the Hawaii Public Housing Authority central office building and another for the maintenance facility. These four buildings are over fifty years of age.

Survey Results

The survey identified thirteen buildings in the survey area (see “Survey Coverage Map” on following page). Of this number, only five were over fifty years of age: 1) the 1955 administration building (Building A); 2 and 3) a maintenance shop and semi-attached central store room (together referred to within this survey as Building D); 4) a set of garages; and 5) a facilities office building (Building C). The present administration building (Building E) was erected in 1978, following plans by Ossipoff, Snyder, Rowland & Goetz.

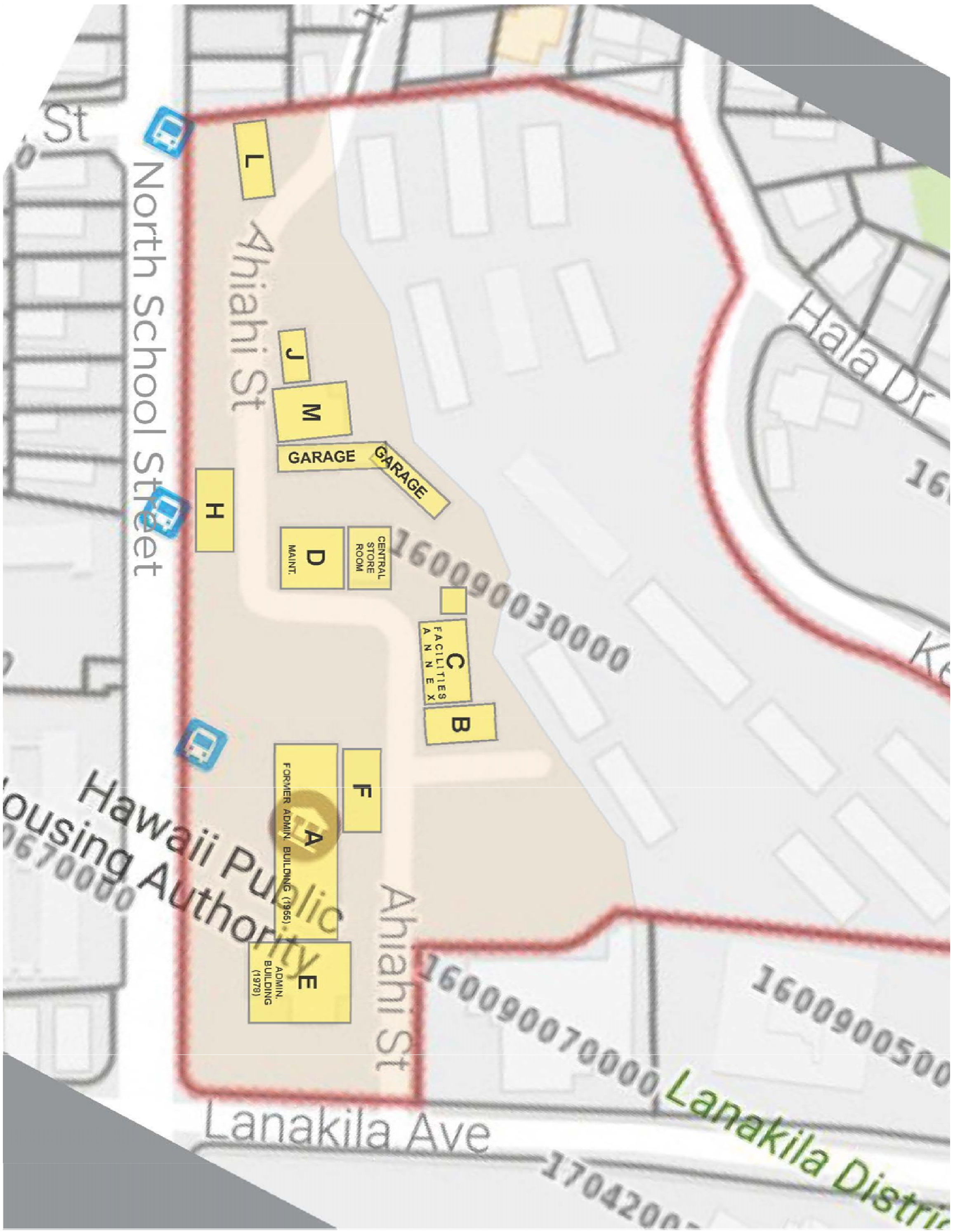
The five buildings over fifty years of age identified in the course of the reconnaissance survey appear to meet criterion C for listing in the Hawaii and National Registers of Historic Places. Although significant, the 1955 Hawaii Housing Authority’s Central Office Building and the buildings associated with the authority’s maintenance efforts, do not appear to have high preservation value. The former administration building’s lanai has been partially enclosed and a small addition has been added to its front. In addition, the interior has undergone remodeling over the course of time. The maintenance yard buildings are utilitarian, and a number of other buildings of similar design and function still remain standing throughout the Islands. Should a project be proposed that could potentially have an adverse effect upon these buildings, documentation according to Historic American Buildings Survey (HABS) standards and interpretation would appear to be reasonable mitigation.

Survey Coverage Map

= TMK Boundary

= Buildings surveyed

= Buildings surveyed



HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

FOR SHPD USE ONLY:	**Site #** Click here to enter text.	**TMK #** Click here to enter text.

I. GENERAL INFORMATION

Common / Present Name: **Hawaii Public Housing Authority (HPHA) Headquarters**

Historic Name: **Hawaii Housing Authority Central Office Building**

Property Owner: **State of Hawaii**

Address: **1002 North School Street**

City/ Town/ Location: **Honolulu**

County: **Honolulu**

TMK [(X)-X-X-XXX:XXX)]: **1-6-009:003 (partial)**

Subdivision/Neighborhood: **Kalihi-Palama**

Latitude: **157°51'46.6"W**

Longitude: **21°19'39.5"N**

Parcel Number: Click here to enter text.

Historic District: **N/A**

Original Use: **Office**

Current Use: **Office**

Architect/ Builder (if known): **Edwin Bauer**

Date of Construction (if known): **1955**

II. Photograph of Resource

Prepared By: Don Hibbard and Alison Chiu Consulting Firm: Fung Associates, Inc.
Address: 1833 Kalakaua Avenue #1008 Honolulu, Hawaii 96815
Telephone Number: (808) 941-3000 Email: projects@funghawaii.com Date: 12/06/2016

FOR SHPD USE ONLY:	**Site #** Click here to enter text.	**TMK #** Click here to enter text.

III. CONDITION ASSESSMENT

Category (select all that apply):

☒**Building(s)**

☐Residential ☐Commercial ☐Educational ☒**Public/Civic** ☐Religious

☐Structure(s)

☐Object(s)

☐Site(s)/Landscape(s)

☐Archaeology or potential for archaeology (Please provide a description of the potential for archaeology within VI. Description of Resource Features below.)

Condition:

☐Excellent

☒**Good**

☐Fair

Eligibility (select all that apply):

☒**National Register of Historic Places**

☒**State Register of Historic Places**

☐Not Eligible

☒**Eligible**

☐Listed

☐Contributing to Historic District:

Name of District: Click here to enter text.

☐Unknown

Criteria of Significance (select all that apply)

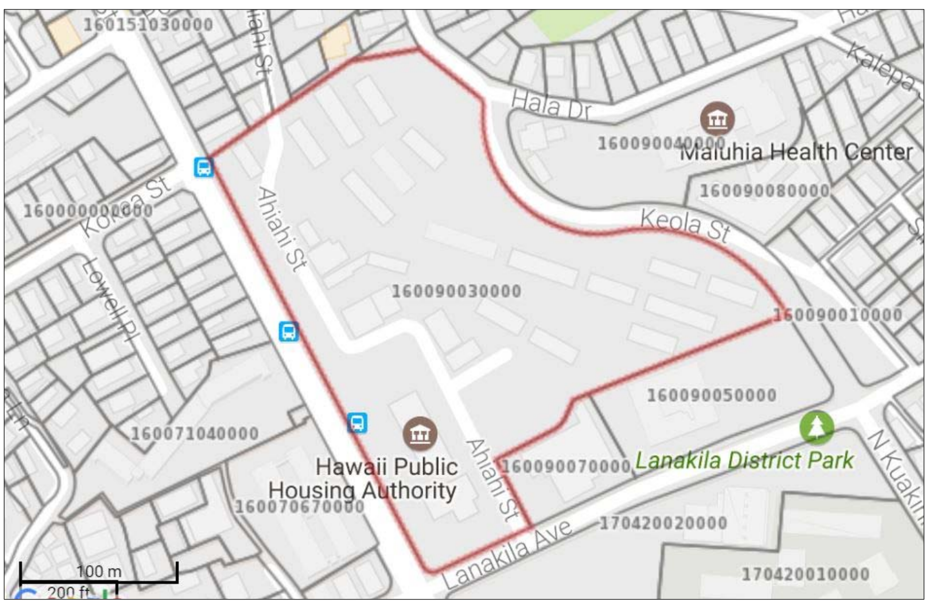
☐A: Associated with Events

☐B: Associated with Significant Person(s)

☒**C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)**

☐D: Have yielded or may be likely to yield information important to history or prehistory.

IV. MAP



FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒**Stories**: 1	☐N/A
☐Below Ground	☐Other: Click here to enter text.

Exterior Walls (siding):

☐Aluminum Siding	☐Metal	☐Plywood
☐Asbestos	☐Shingles-Asphalt	☐OSB
☐Brick	☐Shingles-Wood	☐Fiberboard
☐Ceramic	☐Stone	☐Fiber Cement
☒**Concrete**	☐Stucco	☐Vinyl Siding
☐Horizontal Wood Siding	☐Vertical Wood Siding	☐Other:
☐Log	☐Engineered Siding	Click here to enter text.

Roof:

☒**Asphalt, shingle**	☐Slate	☐Wood Shingle
☐Asphalt, roll	☐Built Up	☐None
☐Metal	☐Ceramic Tile	
☐Other: Click here to enter text.		

Foundation:

☐Brick	☐Concrete Slab	☐Stone
☐Concrete Block	☒**Poured Concrete**	☐Raised/Pile
☐Other: Click here to enter text.		

Structural Support:

☐Baled Hay	☐Frame-wood	☐Puddled Clay
☐Concrete Block	☐Frame-metal/steel	☐Rammed Earth
☐Concrete Framed	☐Brick-load bearing	☐Sod
☒**Concrete Poured**	☐Stone-load bearing	
☐Other: Click here to enter text.		

Windows:

☐Double Hung Sash	☐Jalousie	☐Stained Glass
☐Single Hung Sash	☐Glass Block	☐Replacement
☐Casement	☐None/Unknown	☐Aluminum
☐Fixed	☐Ribbon	☐Vinyl
☒**Other**: **Awning**		

Lanai(s)

☐Arcade	☒**Recessed**	☐Wrap-around
☐Balcony	☐Stoop	☐Verandah
☐Porte-Cochere	☐Portico	☐None
☐Other: Click here to enter text.		

Chimney

☐Brick	☐Stuccoed Masonry	☐Stove Pipe
☐Concrete	☐Stone	☐Siding
☒**None**	☐Other: Click here to enter text.	

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

X. Continuation Sheet

Please use this sheet and those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

The Hawaii Housing Authority Central Office Building (Building A) is located near the corner of North School Street and Lanikila Avenue, with a new administrative office building (Building E) now sitting adjacent to it on the east side. Designed by local architect Edwin Bauer and constructed in 1955, the original office building is a single-story concrete building with a composition shingled, hip-gabled roof with overhanging, closed eaves. Copper horizontal slat vents are visible in the gable ends.

The building is three bays wide with the central bay having a recessed lanai with four decorative concrete panels depicting *kalo* (taro) leaves to either side. The original lanai has been partially enclosed and handicap access ramps now run in front of the decorative panels. The bays to either side of the lanai each have two sets of windows. Each set has three pairs of stacked, metal awning windows. The interior was not inspected at this time, since it is not within the scope of this reconnaissance survey; however, it is known that a mural painted by Baron S. Katayama in 1956, still remains intact within the building on the wall of the employees' break room. Mr. Katayama was a Building Construction Inspector with the Hawaii Housing Authority.

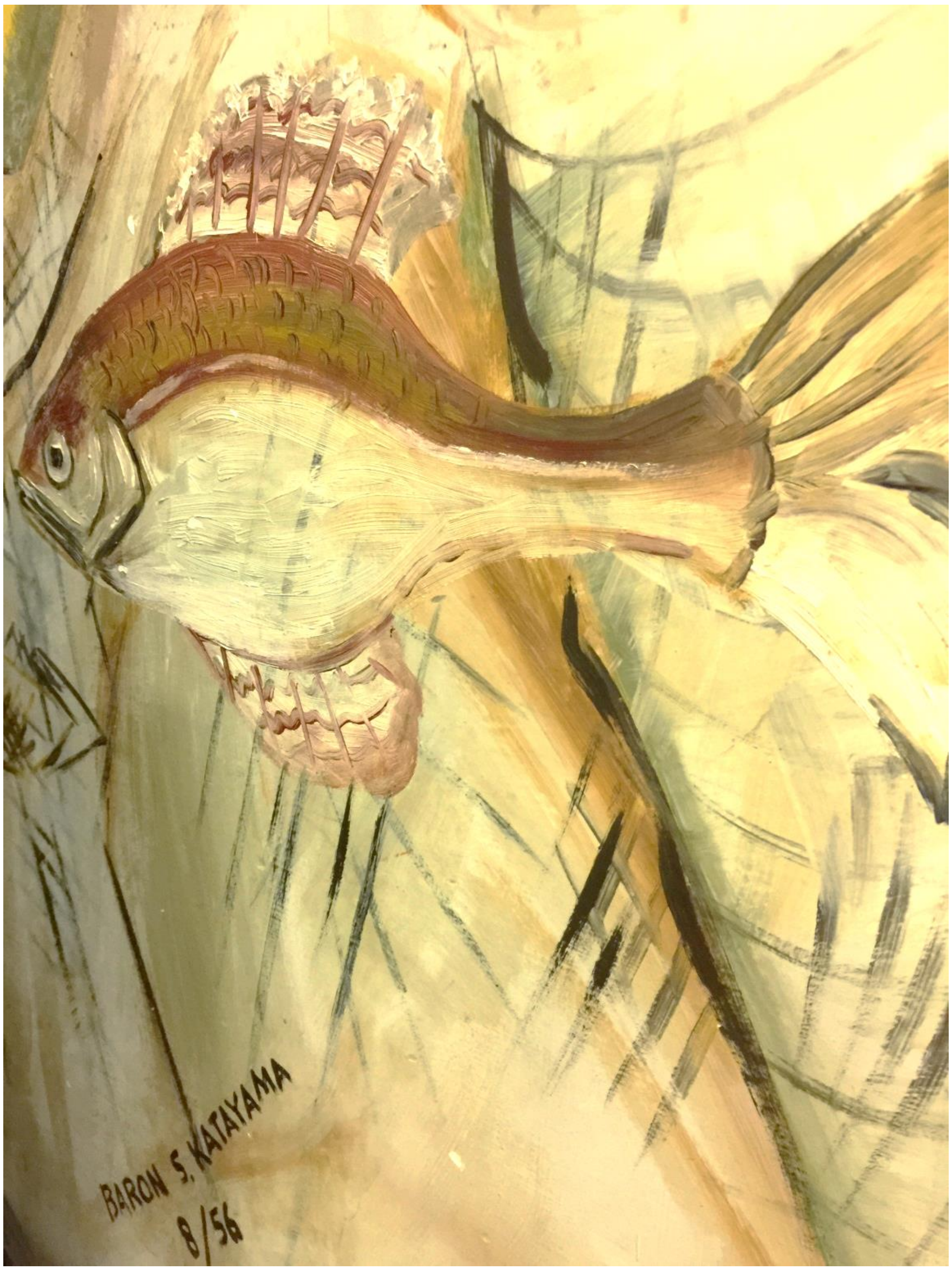
Although the building has had several alterations to its lanai and interior, it appears to meet National Register criterion C, as being significant at the local level as a good example of a public building in Kalihi-Palama rendered in a modern Hawaiian style during the 1950s.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

X. Continuation Sheet

Mural painted by Baron S. Katayama, Building Construction Inspector, 1956; wall of employee's lunch room at central administration office (Building A).

FOR SHPD USE ONLY:	Site #Click here to enter text.	TMK # Click here to enter text.



Mural detail with signature.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Mural detail.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Mural detail.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

FOR SHPD USE ONLY:	**Site #** Click here to enter text.	**TMK #** Click here to enter text.

I. GENERAL INFORMATION

Common / Present Name: **Hawaii Public Housing Authority (HPHA) Headquarters**
Historic Name: **Hawaii Housing Authority Maintenance Facilities**
Property Owner: **State of Hawaii**
Address: **1002 North School Street**
City/ Town/ Location: **Honolulu**
County: **Honolulu**
TMK [(X)-X-X-XXX:XXX)]: **1-6-009:003 (partial)**
Subdivision/Neighborhood: **Kalihi-Palama**
Latitude: **157°51'47.6"W**
Longitude: **21°19'41.9"N**
Parcel Number: Click here to enter text.
Historic District: **N/A**
Original Use: **Office**
Current Use: **Office**
Architect/ Builder (if known): **Edwin Bauer**
Date of Construction (if known): **1953**

II. Photograph of Resource

Building C: Office Annex

Prepared By: Don Hibbard and Alison Chiu Consulting Firm: Fung Associates, Inc.
Address: 1833 Kalakaua Avenue #1008 Honolulu, Hawaii 96815
Telephone Number: (808) 941-3000 Email: projects@funghawaii.com Date: 12/06/2016

FOR SHPD USE ONLY:	**Site #** Click here to enter text.	**TMK #** Click here to enter text.

III. CONDITION ASSESSMENT

Category (select all that apply):

☒**Building(s)**

☐Residential ☐Commercial ☐Educational ☒**Public/Civic** ☐Religious

☐Structure(s)

☐Object(s)

☐Site(s)/Landscape(s)

☐Archaeology or potential for archaeology (Please provide a description of the potential for archaeology within VI. Description of Resource Features below.)

Condition:

☐Excellent

☒**Good**

☐Fair

Eligibility (select all that apply):

☒**National Register of Historic Places**

☒**State Register of Historic Places**

☐Not Eligible

☒**Eligible**

☐Listed

☐Contributing to Historic District:

Name of District: Click here to enter text.

☐Unknown

Criteria of Significance (select all that apply)

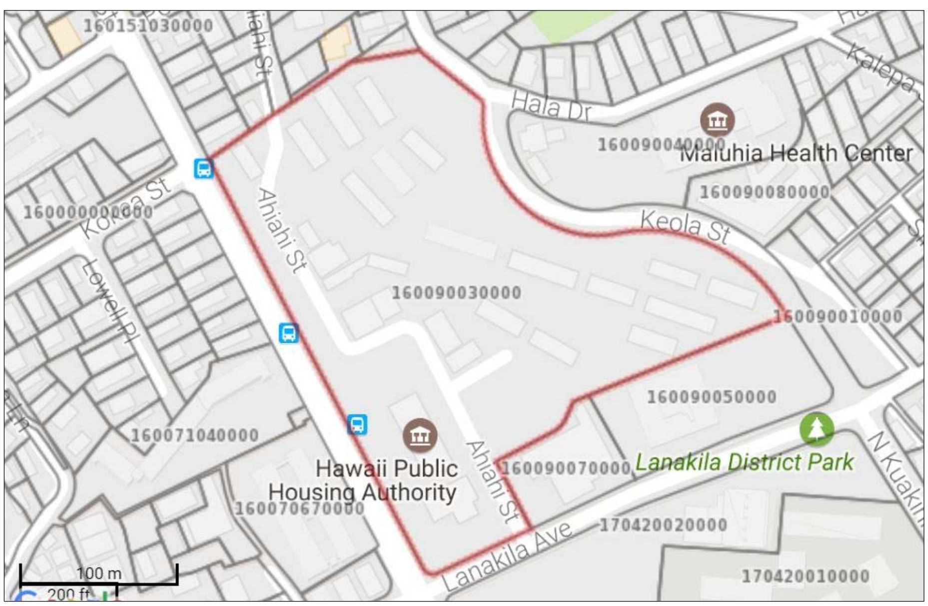
☐A: Associated with Events

☐B: Associated with Significant Person(s)

☒**C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)**

☐D: Have yielded or may be likely to yield information important to history or prehistory.

IV. MAP



FOR SHPD USE ONLY: **Site #**Click here to enter text. **TMK #** Click here to enter text.

V. DESCRIPTION

Materials (please check those materials that are visible):

Height

☒**Stories**: **2 (main building); 1 (maintenance and garage structures)**
☐Below Ground
☐N/A
☐Other: Click here to enter text.

Exterior Walls (siding):

☐Aluminum Siding	☒**Metal**	☐Plywood
☐Asbestos	☐Shingles-Asphalt	☐OSB
☐Brick	☐Shingles-Wood	☐Fiberboard
☐Ceramic	☐Stone	☐Fiber Cement
☐Concrete	☐Stucco	☐Vinyl Siding
☐Horizontal Wood Siding	☐Vertical Wood Siding	☐Other: Click here to enter text.
☐Log	☐Engineered Siding	

Roof:

☐Asphalt, shingle	☐Slate	☐Wood Shingle
☐Asphalt, roll	☐Built Up	☐None
☒**Metal**	☐Ceramic Tile	
☐Other: Click here to enter text.		

Foundation:

☐Brick	☐Concrete Slab	☐Stone
☐Concrete Block	☒**Poured Concrete**	☐Raised/Pile
☐Other: Click here to enter text.		

Structural Support:

☐Baled Hay	☐Frame-wood	☐Puddled Clay
☐Concrete Block	☒**Frame-metal/steel**	☐Rammed Earth
☐Concrete Framed	☐Brick-load bearing	☐Sod
☐Concrete Poured	☐Stone-load bearing	
☐Other: Click here to enter text.		

Windows:

☐Double Hung Sash	☐Jalousie	☐Stained Glass
☐Single Hung Sash	☐Glass Block	☐Replacement
☐Casement	☐None/Unknown	☐Aluminum
☐Fixed	☐Ribbon	☐Vinyl
☒**Other**: **Pivot**		

Lanai(s)

☐Arcade	☐Recessed	☐Wrap-around
☐Balcony	☐Stoop	☐Verandah
☐Porte-Cochere	☐Portico	☒**None**
☐Other: Click here to enter text.		

Chimney

☐Brick	☐Stuccoed Masonry	☐Stove Pipe
☐Concrete	☐Stone	☐Siding
☒**None**	☐Other: Click here to enter text.	

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

X. Continuation Sheet

Please use this sheet and those that follow to attach additional information about the site; including, but not limited to additional floor plans, drawings, photographs, maps, etc.

The Hawaii Public Housing Authority (HPHA) Maintenance Facilities are located at a double bend in Ahiahi Street. The facility is comprised of three sets of buildings:

1. Building D, a maintenance shop and central store room;
2. Building C, a facilities management office; and
3. A complex of two garages.

Building D is a two story Butler Building, constructed in 1953 with Honolulu architect Edwin Bauer named as designer on the building permit. The rectangular, approximately 60' x 70' maintenance shop sits on a raised concrete foundation and has a front facing gable roof. It faces southeast and is made of galvanized steel with a steel structural system. The building has three doors on its front side; a centered, hinged door on the first story; a set of double doors on the east corner on the first story, and a slightly off-center hinged door at the second story. The latter is approached by a metal set of steps with 15 non-slip diamond pattern treads. Attached to the east side of the maintenance shop is a single-story central store room. This pre-dates the maintenance shop and is made of corrugated metal. It sits on a concrete slab foundation and has a lateral-running gable roof. A wide opening in its façade has a rollup door.

Building C serves as a facilities management office. It has a rectangular footprint with a lateral-running gable roof. Both its walls and roof are of corrugated metal. It sits on a raised, 32"-high concrete masonry unit (CMU) foundation, and has hinged doors at either end of the façade. The doors are approached by concrete steps. Between the two doors are two sets of four jalousie windows.

The garages are located behind and to the east side of Building D. There is a paved yard in front of them and they are enclosed by a chain link fence with gates on the southeast and southwest sides. The garages all have corrugated metal shed roofs supported by 4" pipe columns. The garage directly behind Building D has six bays and no walls. However, the eastern-most bay is enclosed with extruded metal mesh. The other two garages are located to the side of the central store room and stand next to each other, with the eastern-most garage's roof being slightly higher than the other. Each of these garages has four bays with 4" pipe columns supporting the roof structure. Both garages have rear walls of corrugated metal. The first bay of the eastern-most garage is enclosed with chain link fencing and the second bay is enclosed with chain link on the bottom and extruded metal mesh on top.

These three sets of buildings appear to meet the National Register criterion C, as being significant at the local level as good examples of utilitarian buildings erected by the Hawaii Housing Authority during the immediate post-war period to support its maintenance operations.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

X. Continuation Sheet

Building D: Maintenance Service Section, view facing north.

FOR SHPD USE ONLY:	Site #Click here to enter text.	TMK # Click here to enter text.

Building D and Central Storeroom Building: view facing northwest.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Building D: Maintenance Service Section, view facing northwest. “Butler” logo visible near ridge.

HAWAII STATE HISTORIC PRESERVATION DIVISION
HISTORIC RESOURCE INVENTORY FORM –Reconnaissance Level

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Central Storeroom Building, view facing west.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Open, covered garages located at rear of Building D and Central Storeroom.

FOR SHPD USE ONLY:	**Site #**Click here to enter text.	**TMK #** Click here to enter text.

Open, covered garages located at rear of Building D and Central Storeroom.

Figure X: Community Meeting Summary

SCHOOL STREET REDEVELOPMENT

DRAFT Community Meeting #1 Summary

MEETING SUMMARY

HPHA, RHF, and the planning team are committed to an authentic process that engages with the community as planning and design for the School Street Redevelopment moves forward. On October 12th, HPHA convened a community meeting at their office on North School Street. Twenty-four neighborhood residents and other community stakeholders attended the meeting to discuss their neighborhood's assets and needs, and how the School Street Redevelopment could affect them.

HPHA opened the meeting with an introduction to the project, and RHF and Concordia gave a joint presentation that introduced the planning and design team to the meeting's attendees.

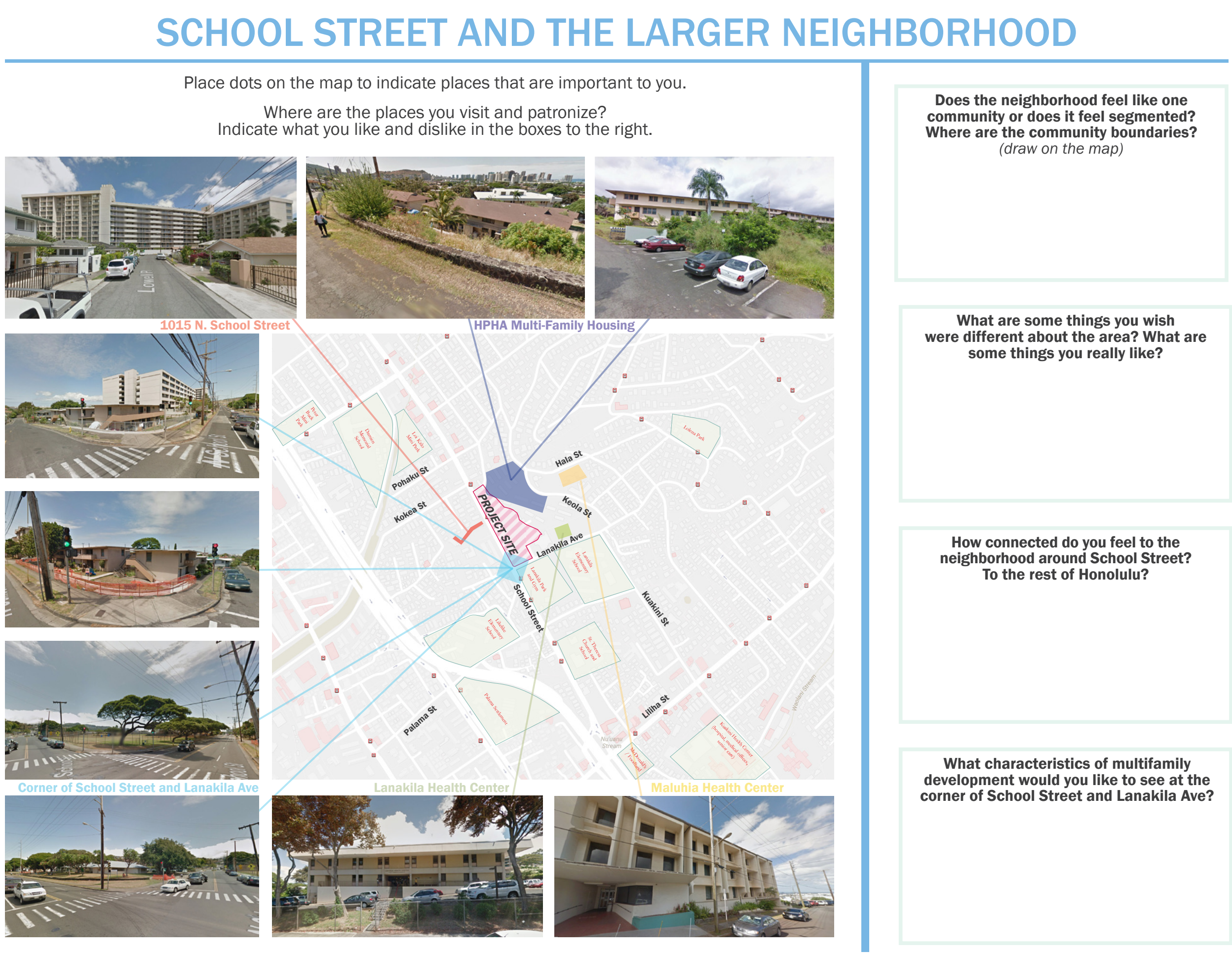
After a brief Q&A session, the meeting's attendees divided into six table groups, where they recorded their thoughts about the neighborhood and the School Street Redevelopment in a two-part activity. At the end of the activity, neighborhood residents and stakeholders commented on the engagement process in a three-question meeting evaluation.

ACTIVITY SUMMARY

Meeting attendees discussed their community and their hopes and concerns for the School Street Redevelopment in a two-part activity. First, table groups of community members collectively answered a set of five questions:

- **What do you like about the neighborhood and community around School Street?**
- **What is most important to your quality of life in the neighborhood?**
- **How is local culture celebrated in the neighborhood?**
- **What contributes to safety in the neighborhood?**
- **What businesses or services are missing in the neighborhood?**

Next, community members marked neighborhood assets and boundaries on a map and answered a smaller set of questions. The table sheet is reproduced below, and the activity's results are summarized on the next page.



Activity sheet at each table.

ACTIVITY RESULTS

Community members described the neighborhood around School Street as a suburban, “old style” neighborhood populated by many different waves of immigrants. Residents said they liked the neighborhood’s proximity to downtown, which gives them access to downtown amenities without compromising their peace and quiet. Residents like the neighborhood’s mom & pop stores and restaurants, and mentioned that food is an important part of how they celebrate local culture.

Residents feel they can rely on the bus system to connect them to other parts of Honolulu, but numerous residents also expressed the need for more parking in their neighborhood, especially in light of the School Street Redevelopment which they feel will increase traffic congestion. Also in response to the anticipated traffic congestion, many residents would like to see more curbs, sidewalks, and bike lanes in the neighborhood.

Community members praised the variety of church groups, public and social services, and health facilities available to them.

Many residents asked for outdoor gathering spaces that are greener and safer than what is currently accessible, and one resident asked if the trees on the current HPHA site could be preserved. Other services and businesses requested by residents included a bank, a new senior center, a farmer’s market, a coffee shop, and a better grocery store. One resident hoped that the new development would “spark up the neighborhood” with a more colorful façade than the neighboring buildings on School Street.

At the end of the activity, each table group summarized their most pressing desires and concerns for the School Street Redevelopment in a brief statement. The statements are paraphrased below:

- **Table 6:** We’re going to need more parking, especially along School Street. How will the School Street Redevelopment affect property tax in the surrounding neighborhood?
- **Table 5:** Could a new police substation for the neighborhood be part of the School Street Redevelopment?
- **Table 4:** A mixed-use development with mom & pop stores that serve surrounding multi-generational, multi-ethnic community.
- **Table 3:** More parking so residents can have continued access to the many amenities in their neighborhood.
- **Table 2:** A vibrant, multi-generational community that serves the neighborhood and is walkable and comfortably lit.
- **Table 1:** The new development should provide color and spark to the streetscape. It should also feature a gathering space, and perhaps another space for veterans. We’re excited!

MEETING EVALUATIONS SUMMARY

After the activity, participants were asked to fill out a three question evaluation of the meeting.

Residents were thankful that the community was engaged during the project's early stages, and they expect the planning and design processes to remain transparent and open to community input. Community members are excited for the addition of "much needed" affordable housing to their neighborhood, and many residents believe the development will "upgrade", "refresh", and "revitalize" the neighborhood.

Traffic congestion and a lack of parking accommodation are common concerns. Residents are also concerned about the future of the Lanakila Multi-Purpose Senior Center. They'd like the new development to include a similar multi-purpose space for seniors.

Going forward with the project, many residents stressed the importance of maintaining a "Hawaiian sense of place". They'd like to see the current greenspace on the site preserved or expanded, and they don't want a design that looks "transplanted from the mainland."

See pages 6 and 7 for the complete verbatim evaluations.

NEXT STEPS

For discussion on 10/21.

WHAT ABOUT THE SCHOOL STREET REDEVELOPMENT MAKES YOU MOST HOPEFUL?

Providing additional housing units.

Will refresh the neighborhood and provide much needed affordable housing.

Active community involvement and input--especially senior residents.

Neighborhood improvements.

It's an upgrade to the neighborhood. More housing is always needed.

Hawaii needs more affordable housing built for local residents. I like that this need bracket will actually be served.

Community involvement, though more needed.

It's not low income. Affordable housing is way better. Include seniors!

Would add standard of living value to the community.

Meetings make things hopeful.

It will revitalize this area.

I am glad that this is not a one-way conversation.

Senior City!

An opportunity to give a fresh new start to the community, families, etc.

Potential opportunity to redevelop the neighboring senior center.

The various organizations/teams seem to work well together and invite the community's comments. Very good presentation.

WHAT ARE YOUR CONCERNS ABOUT THE SCHOOL STREET REDEVELOPMENT?

Construction. Will people/services be displaced? Not change what makes the area unique.

That it will take so long.

That the project is not overbuilt/too dense or tall.

Traffic. Street improvements?

Increase in traffic flow.

With redevelopment, safety concerns (lighting crosswalks etc.) need to be kept up.

More people. Hope people will be interviewed before being allowed to live there.

Parking for the Lanakila Multi-Purpose Senior Center.

Gentrification.

The lack of taking action involving Puahala Public Housing! Why build a new development with a ghetto hovering over it.

The present park-like atmosphere on HPHA property will be replaced by urban congestion.

Knowing the process...no concerns.

Impact on the existing senior center due to shared parking.

Too much traffic without enough parking.

Timing factor--would love to see changes in ~2 years (if possible). Traffic during construction.

WHAT IS THE MOST IMPORTANT THING DEVELOPERS AND DESIGNERS SHOULD KEEP IN MIND WHILE THEY WORK ON THE PROJECT?

This is an area for new immigrants.

A Hawaiian sense of place--not a development that looks like it was transplanted from the mainland.

Maintain the sense of community feeling in the proposed buildings.

Maintaining the nostalgia and ambience of the neighborhood, i.e. old Hawaii, yet still be progressive.

Traffic & parking.

This specific area has a negative reputation overall. It's important to build up the area through beautification + resources so people will want to be part of the community.

Since many in area are seniors, need center that not only serves their needs but uses their talents.

Redevelopment will be part of the community.

Keep community informed--open communication.

Seniors most important.

Safety for residents. Parking. Convenience.

Keep it focused on seniors, and complimenting their needs and safety.

Keep all the trees on HPHA property and the lawn area around the trees. Confine the construction to the East side of the HPHA property.

Be open to community stake-holder feedback & input.

Safety + accessibility + transparency of process.

Don't forget Lanakila Senior Center next door.

Continue with community meetings.
Communication via email and possibly Facebook.

ADDITIONAL COMMENTS:

Relieved that it's not another low-income project.

Affordable housing for seniors, low income, and veterans are much needed in Honolulu.

Table activities/community participation for planning is very helpful.

APPENDIX H
Cultural Impact Assessment

A Cultural Impact Assessment for the Proposed Redevelopment of the HPHA Property at 1002 N. School St.

TMK: (1) 1-6-009:003 por.

Kapālama and Honolulu *ahupuaʻa*
Kona District
Island of Oʻahu

DRAFT VERSION

Prepared By:

Teresa Gotay, M.A.
and
Robert B. Rechtman, Ph.D.,

Prepared For:

PBR Hawaii
1001 Bishop St.
Honolulu, HI 96813

June 2017

ASM affiliates
Archaeology • History • Anthropology • Architectural History

Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
820 Mililani Street, Suite 700, Honolulu, HI 96813

ASM Project Number 27370.00

A Cultural Impact Assessment for the Proposed Redevelopment of the HPHA Property at 1002 N. School St.

TMK: (1) 1-6-009:003 por.

Kapālama and Honolulu *ahupua'a*
Kona District
Island of O'ahu

ASM affiliates

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1. INTRODUCTION

At the request of PBR Hawai‘i, on behalf of the Hawai‘i Public Housing Authority (HPHA), ASM Affiliates has prepared this Cultural Impact Assessment (CIA) for the proposed redevelopment of a roughly 5.9-acre property (TMK: [1] 1-6-009:003 por.) located in Kapālama and Honolulu *ahupua‘a*, Kona District, Island of O‘ahu (Figures 1 and 2). HPHA is considering the redevelopment of the project area, which currently hosts the HPHA offices and shops, into a mixed-use, transit-oriented affordable housing development.

The current report was prepared in support of an Environmental Impact Statement (EIS) being conducted for the proposed project in compliance with Hawai‘i Revised Statutes (HRS) Chapter 343, and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997. As stated in Act 50, which was proposed and passed as Hawai‘i State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, ". . . environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights . . . native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the 'aloha spirit' in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups."

Below is a description of the general project area followed by a detailed cultural and historical background that includes a presentation of prior studies; all of which combine to provide a physical and cultural context for the project area. The consultation effort is then presented, followed by a discussion of the results and analysis.

Figure 1. Project area location (portion of U.S.G.S. 7.5 min. series, Honolulu quadrangle, 1998).

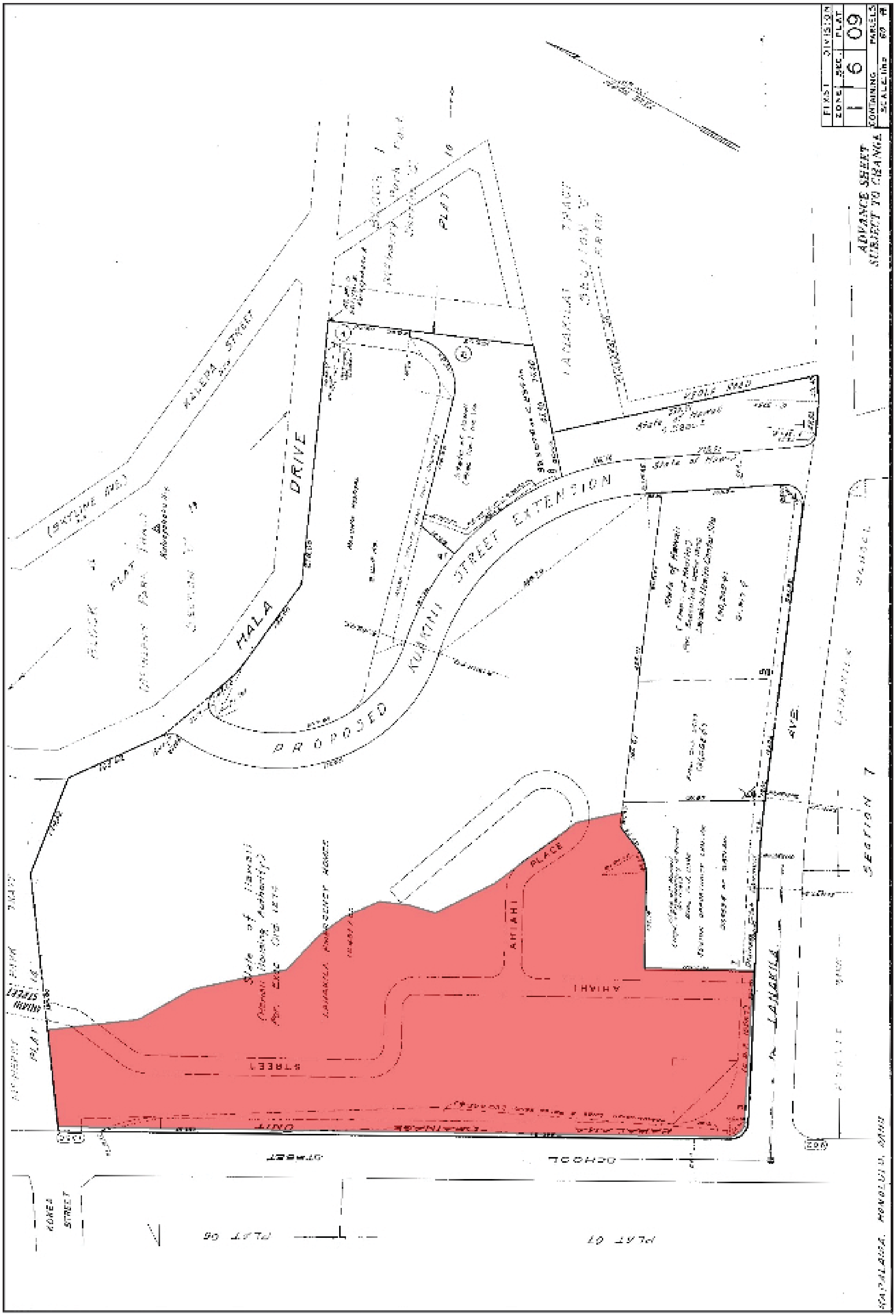


Figure 2. Tax Map Key (TMK) (1) 1-6-009 showing the current project area shaded red.

2. PROJECT AREA DESCRIPTION

The project area is located at the corner of School and Lanakila Streets on a terrace at the base of the Kamehameha Heights. The majority of the project area falls within Kapālama Ahupuaʻa except for the southeastern corner, which falls within Honolulu Ahupuaʻa. The irregularly-shaped, contiguous project area is surrounded by dense residential and commercial development, and oriented northwest to southeast with its long axis situated along the School Street corridor (Figure 3). The project area is bound to the northeast by HPHA Puahala Homes, while the Kapālama Canal defines the southern and western boundaries.

The entirety of the project area has been altered by nearly continuous development and redevelopment, which began in the early 1860s with the construction and subsequent expansion of the Oahu Insane Asylum. Since the 1950s, the project area has been redeveloped by HPHA demolishing existing buildings and constructing new buildings and infrastructure, and by the City and County of Honolulu who has multiple utilities and infrastructure crisscrossing the property (Figures 4 and 5). The historical land use of the project area as well as a discussion of the Precontact cultural context within the subject *ahupuaʻa* and greater Kona district is presented in the pages that follow.

Figure 3. Satellite image showing location of current project area (shaded red).

Figure 4. Construction and associated infrastructure within the central portion of the project area, view to the northeast.

Figure 5. Construction and associated infrastructure at the northwest end of the project area, view to the north-northwest.

2. CULTURE-HISTORICAL CONTEXT

The *ahupua'a* of Honolulu and Kapālama are two of roughly a dozen traditional land divisions found in the District of Kona, situated between the Ko'olau Mountains and the sea along the leeward (southeastern) coast of the Island of O'ahu. Several short valleys and narrow coastal plains make up the eastern portion of the Kona, which extends westward from Kuli'ou'ou to Diamond Head and beyond to Moanalua. The landscape to the west of Diamond Head is marked by longer valleys that emptied out on to a wide coastal plain. The current project area is located within this western portion of Kona, which Cordy describes at the time of European Contact as "the economic and demographic core of the district, with Waikiki *ahupua'a* (with Mānoa-Pālolo) the political center" (2002:5-7) The present-day city of Honolulu falls within the district of Kona; thus, many people use the two names interchangeably when referring to the district.

In the book, *Native Planters in Old Hawaii*, written in the 1930s, Handy et al. describe the Kona coast of O'ahu in their discussion of areas of habitation thusly,

> There were abundant rain, ever flowing streams, springs, pools, verdant interior valleys, broad slopes and well-watered low-lands, fishpond areas, harbors, beaches, and lagoons. Altogether Kona was for Oahu, the area richest in natural resources and most pleasant for abundant and comfortable living. (1991:474)

They also relate the following details about Kapālama Ahupua'a specifically:

> The next ahupua'a southeast of Kalihi was Kapalama and, like Kailihi, had extensive *lo'i*, from Iwilei at the shore up to the foothills. There were two streams that irrigated these *lo'i*, evidently originating in springs, sice there is no valley mountainward but only a broad hillside on which are now The Kamehameha Schools and the residential section called Alewa heights. In prediscovery days there was somewhere in the area a stockade and house in which young ali'i were sequestered before marriage. This was constructed entirely of *lama* wood, or native ebony. *Lama* also means light. Ka-pa-lama means "The-enclosure-of-*lama*." (ibid.:475)

Regarding the etymology of Honolulu Ahupua'a, Westervelt, in his collection titled *Legends of Old Honolulu*, proposes the following:

> Ho-no-lu-lu is a name made by the union of the two words "Hono" and "lulu." Some say it means "Sheltered Hollow." The old Hawaiians say that "Hono" means "abundance" and "lulu" means "calm," or "peace," or "abundance of peace."
>
> "Honolulu" was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu, one of the high chiefs of the time of Kakuhihewa, according to the legends. Kamakau, the Hawaiian historian describes this farm district thus: "Honolulu was a small district, a pleasant land looking toward the west, -- a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala-tree." (1915:1-2)

Also according to Westervelt (1915), the O'ahu Chief Kakuhihewa divided the island among his favorite chiefs who in some cases assigned their names to the lands they received. As a result, the land that comprised ancient Honolulu were often refered to as Kou, named after one of the highest officers under Kakuhihewa, an *ilāmuku* (marshal) called Kou (ibid.). Up until the 1800s, the place name Kou was used to refer to Honolulu Harbor and its vicinity as opposed to all the land encompassed by present-day Honolulu. Specifically,

> "Kou" appears to have been a small district, or, rather a chief's group of houses and grounds, loosely defined as lying between Hotel Street and the sea and between Nuuanu Avenue and Alakea Street. (ibid.:2)

It is within this general context that the following discussion of the history and culture of the project area is framed. The chronological summary presented below begins with a synthesis of Precontact settlement patterns and Historic land use that includes legendary and historical references to the subject *ahupua'a* and the greater Kona District. The discussion concludes with a review of the findings from prior investigations conducted in the project area vicinity. Combined, this information provides a means for understanding the project area within the context of the greater cultural landscape.

EARLY HAWAIIAN SETTLEMENT PATTERNS

While the question of the timing of the first settlement of the islands of Hawai‘i by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., archaeological, genealogical, mythological, oral-historical, radiometric). However, none of these theories is today universally accepted because there is no archaeological evidence to support the proposed timing for the initial settlement, or colonization stage of island occupation. More recently, with advances in palynology and radiocarbon dating techniques, Kirch (2011) and others (Athens et al. 2014; Wilmshurst et al. 2011) have convincingly argued that Polynesians arrived much later in the Hawaiian Islands, sometime between A.D. 1000 and A.D. 1200 and expanded rapidly thereafter (c.f., Kirch 2011).

The initial settlement of Hawai‘i is believed to have originated from the southern Marquesas Islands. In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). The Settlement Period was a time of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought from their homeland certain universal Polynesian customs and belief: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *‘aumakua* concept; and the concept of *mana*.

Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and deep sea fisheries. The near shore fisheries and coastal fishponds, which were enriched by nutrients carried in the fresh water, also offered opportunities for resource extraction and stewardship. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Clusters of houses were found in these coastal areas where, over time, agricultural production first became established. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and inland elevations began to be used for agriculture and some habitation. Meanwhile, an increasing separation of the chiefly class from the common people began to emerge. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of the Hawaiian Islands were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites from the Developmental Period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*ko‘i*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are ‘*ulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985).

As the population continued to expand so did social stratification. The Expansion Period is characterized by the major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period. It was during the Expansion Period that a second major migration settled in Hawai‘i, this time from Tahiti in the Society Islands. According to Kirch’s (1985) model, the concept of the *ahupua‘a* was established sometime during the A.D. 1400S, adding another component to a then well-stratified society. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas.

By this time (A.D. 1400s), the island of O‘ahu appears to have been divided into six traditional districts or *moku*. As previously mentioned, the current project area is located within the traditional *moku* (district) of Kona (Figure 6). The *moku* were further divided into distinct land units known as *ahupua*‘*a*. The *ahupua‘a* became the equivalent of a local community, with its own social, economic, and political significance. *Ahupua‘a* were ruled by *ali‘i ‘ai ahupua‘a*; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. The *ali‘i ‘ai ahupua‘a* in turn answered to an *ali‘i ‘ai moku,* a higher chief who ruled over the *moku* and claimed the abundance of the entire district. Thus, *ahupua‘a* resources supported not only the *maka‘āinana* (commoners) and *‘ohana* (extended families) who lived on the land, but also provided support to the ruling class of higher chiefs and ultimately the crown. *Ahupua‘a* were usually wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). The *ali'i* and the *maka'āinana* were not confined to the boundaries of an *ahupua'a*; when there was a perceived need, they also shared with their neighbor *ahupua'a 'ohana* (Hono-ko-hau 1974). The *ahupua'a* were further divided into smaller sections such as *'ili, mo'o'āina, paukū'āina, kīhāpai, kō'ele, hakuone*, and *kuakua* (Hommon 1986, Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or *mō'ī* (king). *Heiau* building flourished as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture, such as *heiau*, "played a key role as visual markers of chiefly dominance" (Kirch 1990:206). This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning, in which the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). In communities with long-term royal residents there was a strict divisions of labor, with specialists in various occupations on land and in procurement of marine resources.

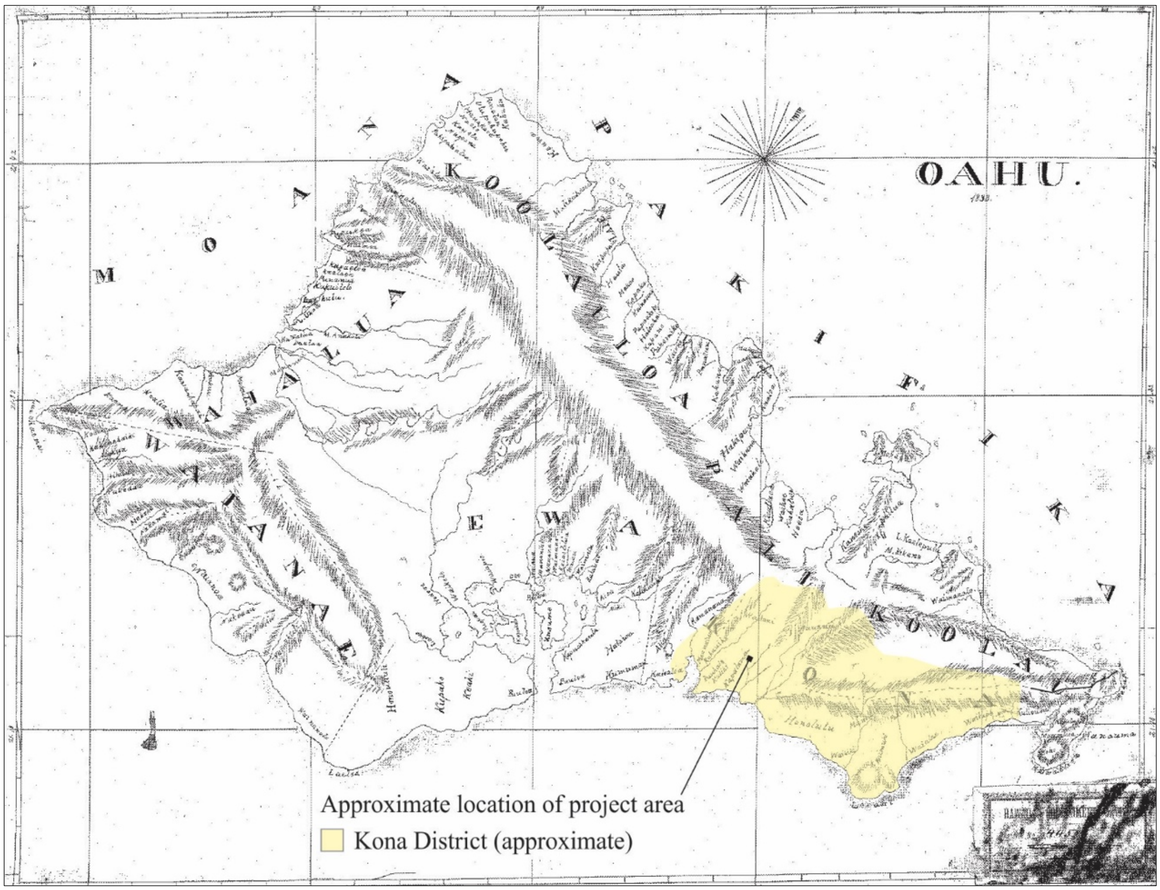


Figure 6. Reg. Map No. 455 showing *moku* of O'ahu and approximate location of project area ca. 1833.

LEGENDARY ACCOUNTS OF KAPĀLAMA AND HONOLULU AHUPUA'A

Traditional *mo'olelo* were passed down orally through the generations and many tales focus on *wahi pana* or legendary places. There are some myths and legends associated with the *wahi pana* of Kapālama. In *Legends of Honolulu,* Westervelt relates the story of Lepeamoa, which he describes as a blend of Hawaiian daily life and the supernatural realm. The legend titled "The Chicken-girl of Palama" (1915:204-211) is summarized below. The highest chief of Kaua'i, Keahua left Wailua to visit the home of chiefess Kapalama in the hope of bringing her beautiful daughter Kauhao back to Kauai with him as his wife. Upon their return to Kauai, they angered a *kupua* god possessing supernatural powers with the ability of appearing as a man or as an animal:

> This kupua was called Akua-pehu-ale (God of the swollen billows). He devoured his enemies and was greatly feared and hated even by his own tribe. He attacked Keahua, destroyed his people and drove him into the forests far up the mountain sides, where. . . the chief gathered his followers together and built a new home.

> One day Kapalama, who was living in her cluster of houses in the part of Honolulu which now bears her name, said to her husband: "O Honouliuli, our daughter on Kauai will have a child of magic power and of kupua character. Perhaps we should go thither, adopt it, and bring it up; there is life in the bones." (ibid.:205)

When they arrived on Kaua'i they discovered the child had been born; but it was only an egg, which Keahua had ordered to be an offering to the monsters of the deep sea. However, Kauhao "and her soothsayers thought it should be kept and brought to life" (ibid.). The legend continues:

> Kapalama, coming at this time, took the egg, wrapped it carefully in soft kapas, bade farewell to her daughter, and returned to Oahu. Here she had her husband build a fine thatched house of the best grass he could gather. The kapas put inside for beds and clothing were perfumed by fragrant ginger flowers, hala blossoms, and the delicate bloom of the cocoanut, while festoons of the sweet-scented maile graced its walls. For a long time that egg lay wrapped in its coverings of soft kapas. (ibid.:206)

Kapalama had her husband prepare an *imu* for their grandchild and shortly thereafter Kapalama visited the house of the egg and discovered, "a wonderfully beautiful chicken born from that egg. The feathers were of all the colors of all kinds of birds. They named the bird child Lepe-a-moa." (ibid.). Lepeamoa had a relative named Keaolewa (the moving cloud), who also shared the *kupua* character of transforming between a bird and a woman. A sorceress of the sky, Keaolewa knew to provide a swimming pool for Lepeamoa, well before she hatched. Lepeamoa indeed bathed in the small pool each day, "and by herself she changed her bird form into that of a very beautiful girl, her body shone with beauty like the red path of sunlight on the sea, or the rainbow bending in the s*ky*" (ibid.:207). When her grandmother first saw Lepeamoa's human form, "she was overcome with surprise, and staggered back and fell to the ground as if dead" (ibid.:208), but Honouliuli was able to revive her. Kapalama tied a colored skirt around her granddaughter, who also wore a green and yellow feather lei, in this way Lepeamoa "came into her two bodies and received her gift of magic powers" (ibid.).

> Lepe-a-moa's beauty was so full of shining power that her colors rested in the air around her and attended her wherever she went. Her rainbow was over her house when she was in it, or it was over the pool when she was bathing, or even over her when she went down to the beach. (ibid.:210)

In her bird body, Lepeamoa only ate sweet potatoes and she desired to try fish and moss and she ventured to the shore in search of food:

> . . . nearer her own home a fine sand beach welcomed the surf waves of Kapalama. She chanted as she saw this white surf: "My love, the first surf. I ride on these white waves."
>
> . . . The grandparents rejoiced when they saw the excellent food provided them. Again and again she went to the sea, catching fish and gathering sweet moss from the reef. Thus the days of their childhood passed. Her grandfather gave his name, Honouliuli, to a land district west of Honolulu, while Kapalama gave hers to the place where they lived. The bird-child's parents still dwelt in their forest home on Kauai, hidden from their enemy Akua-pehu-ale. (ibid.:211)

The project area vicinity is mentioned again in another legend from the same volume recorded by Westervelt: "Kauilani Finds His Sister Lepe-a-moa" (1915:220-227). Chief Kauilani, was born to Kauhao and Keahua, and raised on Kaua'i by his paternal grandparents. Upon hearing of the existence of his elder sister, Kauilani decided to go to O'ahu to find her. Before he set out on his journey, Kauhou said:

> "I will tell you about my people and their lands." So she told him about his ancestors, his grandparents and their rich lands around the Nuuanu stream and its bordering plains; also of the stopping-places as he should cross the island to Kapalama, his grandmother, where he would find his sister under a rainbow having certain shades of strong color. (ibid.:221)

Kauilani landed in Waianae, and used his enchanted spear to help guide him along his path to Kapalama. The spear led the young chief to the edge of the sea where he first glimpsed Lepeamoa's rainbow in the distance as she was catching squid and shellfish for their grandparents. After this sighting, the spear carried him off "to the cluster of houses where Kapalama was living with her husband and grandchild" (ibid.:224) and the four of them spent many happy days together.

In still another legend published in *Legends of Honolulu*, "The Battle of the Kupuas" (Westervelt 1915:227-245), Kauilani goes to visit the court of King Kakuhihewa at Waikiki. At that time, the Oahu king had been hosting his sister and her husband, Maui-nui, the king of Maui, which meant many days of gambling on cockfights. Kakuhihewa got himself into a bind and bet the kingdom of Oahu in an effort to win back what he had already lost. Kakuhihewa knew that Maui-nui was using a magical bird (Keauhelemoa) to beat him. He had heard tales about Kauilani of Kauai and decided to "ask this young chief to come to his aid, promising as a reward the hand of his favorite and most beautiful daughter in marriage; but the days passed and no word came from Kauai" (ibid.:230). Because Kauilani was already on Oʻahu visiting his sister, he was announced as a chief from Kapālama when he came before the king at his court. The young chief went on to impress the king with his knowledge of the fighting birds and in exchange for his help in beating Maui's magical rooster, the king offered his daughter in marriage to the chief from Kapālama. Kauilani married the king's daughter and devised a plan in which Lepeamoa would assume her bird form and fight the magical rooster. However, Kauilani would have to conceal his sister's identity until the fight. When he came to court with Lepeamoa in her splendid human form, his new wife got angry and jealous and drove him away. After a long battle with many shapeshifts, Lepeamoa defeated Keauhelemoa, and she and her brother escaped the crowds gathered at court. After the battle, Kauilani was nowhere to be found, "by and by two chiefs, Kou and Waikiki, saw the signs of a high chief over Kapalama's group of houses" (ibid.:243). After Kou and Waikiki's visit, Lepeamoa told her brother to go back to his wife for she would give birth soon. He did so, and recited the following chant at his wife's bedside:

> "O Aumakuas! Ghost gods!
> Come from the north, the south, the east, the west.
> Male and female and children,
> Come for this cry of distress.
> O all those who have power in the skies!
> Come in this time of death.
> O all the household of Kapalama!
> Come and give life.
> I am Kauilani,
> The strong child of Keahua and Kauhao.
> Life for the mother and this child." (ibid.:244)
>
> While he was chanting this prayer the child was born. Lepe-a-moa saw that her brother was very busy before the gods, so she secretly took the child and hurried to Kapalama. . .
>
> Kakuhihewa was troubled when he knew that the child had disappeared, but was satisfied when he learned that it was with Kapalama and Lepe-a-moa.
>
> The baby was a girl and very beautiful, so Lepe-a-moa adopted it as her own and gave it the name of Kamamo. (ibid.:244-245)

Kapālama is also mentioned in another legendary account, published in Volume V of the *Fornander Collection of Hawaiian Antiquities and Folk-lore*, tells the story of the warrior hero Palila, grandson of Hina, and briefly mentions Kapālama as the location of the palace of Ahuapau, the king of Oʻahu, "His palace was situated at Kalaepohaku, close to Wailakio at Kapalama" (Fornander 1918:142). In addition, the "Legend of Kaulu," published in the same volume, includes a reference to Niuhelewai as the home of a female *akua* (ghost) called Haumea, "Niuhelewai is a place at Kapalama, where Haumea lived" (ibid.:368). Haumea threatened to kill Kaulu, but he bested her by trapping her with the enchanted nets of Makalii (Maoleha and its mate) and burned her alive in her house as she slept.

Yet another legend associated with the project area vicinity tells of Kamohoaliʻi, the king of the shark gods and brother of the goddess Pele. The Kamehameha School's Kapālama Heights campus is believed to be the location of a former shallow cave called Keanakamanō (which translates as "cave of the shark"), which served as the terrestrial entrance to a system of lava tubes that Kamohoaliʻi loved to explore (Mitchell 1993:145). According to Mitchell,

> Here at the entrance to his cave, Kamohoaliʻi enjoyed the view of pearl Harbor as he was cooled by the breezes that wafted down Kalihi Valley. The more venturesome human residents of the valley also hiked or swam through these tunnels in the latter years of the past century [nineteenth]. Then nature intervened. Severe earthquakes around the year 1900 caused the lava tubes to crumble and the famous cave to close. Today, there is an access street on the Kamehameha School campus called Kealamanō (which translates as "the way of the shark") that was named for this cave (ibid.:146).

Kapālama is mentioned in regards to the traditional Hawaiian concept of *hoonoho*, introduced by Malo and further clarified by Emerson. In chapter XXXV titled, "Religious Ceremonies Performed by the Aliis to Secure Offspring" of *Hawaiian Antiquities*, Malo (1903) states the following:

> 2. In the case of high chiefs the affair was conducted as follows; a high chief of the opposite sex was sought out and, after betrothal, the two young people were at first placed (*hoonoho*) under keepers in separate establishments, preparatory to pairing off for offspring, the purpose being to make the offspring of the highest possible rank. Worship was paid to the gods, because it was firmly believed that the genius, power and inspiration (mana) of a king was like that of a god. (ibid.:179)

Emerson clarifies the concept of *hoonoho* in the following note regarding section 2 of Chapter XXXV:

> Hoonoho ia, put in an establishment, placed under the care of a guardian or of a duenna. Such an establishment was surrounded by an enclosure, pa, made of the sacred lama, a tree whose wood in color and fineness of grain resembles boxwood. Hence this special care or guardianship was called palama. It is said that an establishment of this kind was anciently placed at that suburb of Honolulu which for that cause to this day bears the name of Ka-pa-lama. (ibid.:184)

In his discussion of "Famous Men of Early Days," Fornander (1918) relates the following details regarding Kahahawai, the great Maui war chief, which specifically refer to Niuhelewai stream. Niuhelewai once bordered the current project area and defined a stretch of the southern boundary of Kapālama Ahupuaʻa, and has since been channelized and is now known as the Kapālama Canal. Fornander recounts:

> When Kahekili was reigning as king of Maui, and Kahahana was king of Oahu, it was during this period that Kahahawai with a number of warriors came to make war on Oahu. In this battle the people of Oahu were defeated and slaughtered at Niuhelewai, and the waters of the stream were turned back, the stream being dammed by the corpses of men. . . Thus Oahu remained in subjugation until the reign of Kalaikupule, Kahekili's son, when it was conquered by Kamehameha. (ibid.:498)

Fornander goes on to state in a footnote that Niuhelewai "is the name of the locality of the Palama cane field between the Fire and Pumping stations" (ibid.:498). According to Cordy (2002:19), Kahāhana reigned between 1780 and 1783 and died shortly after this battle in 1785.

Another mention of Niuhelewai stream is made in the account of a second bloody massacre that took place after Kahāhana's death when the Maui chiefs conquered Oʻahu. According to Kamakau (1992), a plot to kill the Maui chiefs who were staying in Kailua and ʻEwa was developed and the plotters attempted to throw suspicion on others by spreading rumors that death was coming from Kauaʻi and Waipiʻo (in ʻEwa). Kamakau relays the events thusly,

> But the plot came out, and when Ka-hekili learned that Elani of ʻEwa was one of the plotters, the districts of Kona and ʻEwa were attacked, and men, women and children were massacred, until the streams of Makaho and Niuhelewai in Kona and of Kahoaʻaiʻai in ʻEwa were choked with the bodies of the dead, and their waters became bitter to the taste, as eyewitnesses say, from the brains that turned the water bitter. All of the Oahu chiefs were killed and the chiefesses tortured. (ibid.:138)

KAPĀLAMA AND HONOLULU AFTER EUROPEAN CONTACT

The arrival of Western explorers in Hawaiʻi signified the end of the Precontact Period ca. 1778, and the beginning of the Historic Period. With the arrival of foreigners such as British explorer Captain James Cook, in command of the ships *H.M.S. Resolution* and *H.M.S. Discovery*, Hawaiian culture and economy underwent drastic changes. Demographic trends during the late Precontact early Contact Periods indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first there was a continued trend toward craft and status specialization, intensification of agriculture, *aliʻi* controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history (Kirch 1985; Kent 1983). The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered Oʻahu, Maui and Molokaʻi, in 1795, Hawaiʻi had seen the beginnings of a market system economy (Kent 1983). Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1849). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional life-ways in the Hawaiian Islands. This marked the end of the Precontact Period and the end of an era of uniquely Hawaiian culture.

Early Historic Accounts of Kapālama and Honolulu

Hawaiian Historian Samuel Kamakau mentions in *Ruling Chiefs of Hawaii* that Kamehameha I "cultivated land at Waikiki, Honolulu, and Kapalama" (1992:190), prior to conquering Kauai and uniting all the islands under his rule. Similarly, Hawaiian historian John Papa ʻĪʻī, reports in *Fragments of Hawaiian History* that Kamehameha personally farmed with members of his court throughout the Kona District, "especially in Nuuanu. . . He also farmed at Ualakaa in Manoa, in Waikiki, and in Kapalama" (1959:68). ʻĪʻī, goes on to describe the region thusly: "They found innumerable people all over the farming area, from down below the present road at Niuhelewai to the bend in the road where the houses of the Portuguese now stand" (ibid.). ʻĪʻī, also related that Kamehameha personally attended to his farms in such places as Kapālama, and that he "participated in all the projects," in addition ʻĪʻī also mentions that "the places Kamehameha farmed and the houses he lived in at those farms were show places" (ibid.:69), although the king resided primarily in Waikiki and Honolulu.

ʻĪʻī also mentions both Honolulu and Kapālama in his description of the events surrounding his experience while at court of a *makahiki* ceremony, "when the makahiki gods went forth from the luakini heiau at Leahi" (ibid.:70). In particular, ʻĪʻī states the following:

> In the evening of the day on which the wooden gods departed to go on their circuit of the island, the chiefs who had fed the attendant remained secluded with their possessions from daylight to dark. The attendants of the gods carried them facing backward when they traveled. Therefore it was said that the eyes of Lono remained upon the activities of the people when the gods left the presence of the chiefs for the circuit of the island. The procession went from Honolulu toward Ewa, and when the procession reached the boundary between Honolulu and Kapalama, the *akua loa* stopped with its two *alai* markers, two sticks that were used to mark the area that was made kapu for the god. This area was forbidden to the people, but not the attendants. As the *akua loa* stood on its designated place, the persons in charge of the land of Kapalama brought all the taxes of the land. If the taxes were sufficient, the tapa of *aku loa* [*sic*] was gathered in (*papioʻia*) and the god proceeded to the next *ahupuaʻa*. The *akua paʻani* [tapa cloth] was placed where the *akua loa* had stood to inspire men to box. (ibid.:75)

Following the death of Kamehameha I in 1819, the Hawaiian religious and political systems began a radical transformation; Kaʻahumanu proclaimed herself "*Kuhina nui*" (Prime Minister), and within six months the ancient *kapu* system was overthrown. Within a year, Protestant missionaries arrived from America (Fornander 1969; ʻĪʻī 1959; Kamakau 1992). In 1820, American missionary Hiram Bingham and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Oʻahu seeking out communities in which to establish church centers for the growing Calvinist mission. Bingham recorded observations made during his twenty-one-year residence in the Hawaiian Islands in a journal (Bingham 1848), which offers a rare glimpse at the project area vicinity during the early 1800s. Bingham made the following observations when he first glimpsed Oahu upon his arrival in 1820, which are applicable to the general cultural landscape of Kapālama and Honolulu *ahupuaʻa* and the greater Kona District:

> Early in the morning of the 14th April, that island rose to our view, and, as we approached rapidly, presented successively its pointed mountains, covered with trees and shrubbery, its well-marked, extinguished craters near its shores, its grass covered hills, and more fertile valleys, its dingy thatched villages, its cocoanut groves, its fort and harbor, and its swarthy inhabitants in throngs. . . We cast anchor in the roadstead abreast of Honolulu village, on the south side of the island, about 17 miles from the eastern extremity. (ibid.:92)

Shortly after their arrival, they scaled Punchbowl Hill and made the reported the following details from the view:

> From the highest part of the rim we had a beautiful view of the village and valley of Honolulu, the harbor and ocean, and of the principal mountains of the island. On the east were the plain and groves of Waikiki, with its amphitheatre of hills. . . Below us, on the south and west, spread the plain of Honolulu, having its fish-ponds and salt making pools along the sea-shore, the village and for between us and the harbor, and the valley stretching a few miles north into the interior, which presented its scattered habitations and numerous beds of *kalo* (arum esculentum) in tis various stages of growth, with its large green leaves, beautifully embossed on the silvery water, in which it flourishes. Through this valley, several streams descending from the mountains in the interior, wind their way, some six or seven miles, watering and overflowing by means of numerous artificial canals, the bottoms of kalo patches, and then, by one mouth, fall into the peaceful harbor. (ibid.:93)

Another Missionary, William Ellis also visited the islands and documented his experience; including the following excerpt regarding the geology of Honolulu:

> The plain of Honoruru exhibits in a singular manner the extent and effects of volcanic agency; it is not less than nine or ten miles in length, and, in some parts, two miles from the sea to the foot of the mountains; the whole plain is covered with a rich alluvial soil, frequently two or three feet deep; beneath this, a layer of fine volcanic ash and cinders extends to the depth of fourteen or sixteen feet; these ashes lie upon a stratum of solid rock by no means volcanic, but evidently calcareous, and apparently a kind of sediment deposited by the sea, in which branches of white coral, bones of fish and animals, and several varieties of marine shells, are often found. A number of wells have been recently dug in different parts of the plain, in which, after penetrating through the calcareous rock, sometimes twelve or thirteen feet, good clear water has been always found: the water in all these wells is perfectly free from any salt or brackish taste, though it invariably rises and falls with the tide, which would lead to the supposition that it is connected with the waters of the adjacent ocean, from which the wells are from 100 yards to three quarters of a mile distant. The rock is always hard and compact near the surface, but becomes soft and porous as the depth increases. . . (1917:24)

Ellis made the following observation about the city of Honolulu in 1823:

> The harbor is the best, and indeed the only secure one at all seasons, in the Sandwich Islands, and is more frequented by foreign vessels than any other; seldom having within it less than three or four, and sometimes upward of thirty, lying at anchor at the same time.
>
> The town has also, since the number of shipping has increased, become populous, and is one of the largest in the islands, usually containing 6000 or 7000 inhabitants. It is the frequent residence of the king and principal chiefs, who are much engaged in traffic with foreigners visiting the islands, or residing on shore, for purposes of trade.
>
> There are twelve or fourteen merchants, principally Americans, who have established warehouses on shore for foreign goods, principally piece goods, hardware, crockery, hats and shoes, naval stores, &c., which they retail to the natives for Spanish dollars or sandal wood. (ibid.:27-78)

In 1931, E.S. Handy began making observations to include in an ethnographic study of traditional Hawaiian agricultural activities in the planting of native plants, which were extant on the island prior to European contact. According to Handy (1940), sweet potatoes were also cultivated throughout the island of Oʻahu; while breadfruit plantings were focused on the southerly side of the island. In his chapter on Taro plantings in a section titled "Planting Localities" the following historical descriptions of Honolulu and Kapālama were compiled and published by Handy:

> **Honolulu.** Of the specific section in early days known as Honolulu, Meyer [1834] writes [of his visit in 1830-1832]:
>
> If one were to visit the great plains of Honoruru and see all the beautiful cultivated land in the transverse valleys, that extends onto the plains of Honoruru, and also the tremendous quantity of food plants that are cultivated in the valley of the Pearl river, one might perhaps be persuaded to believe that a great excess of food prevails here, although that is not the case. The taro plantations occupy a great deal of space and yield far less nourishment than our potato and grain fields. In fact, the high price of fresh supplies at the market of Honoruru we might directly ascribe to inadequate cultivation.
>
> Kotzebue, traveling in the islands from 1815 to 1818, was more impressed. He writes:
>
> Woajoo is the most fertile of the Sandwich Islands, from which Owyhee receives a part of the taro necessary for its consumption. The cultivation of the valleys behind Hanarura is remarkable; artificial ponds support, even on the mountains, the taro plantations, which are at the same time fish ponds; and all kinds of useful plants are cultivated on the intervening dams.
>
> Elsewhere Kotzebue describes the method of taro cultivation in greater detail:
>
> The artificial taro fields, which may justly be called taro lakes, excited my attention. Each of them forms a regular square of 160 feet, and is enclosed with stone all round like our basins. . . In the spaces between the fields, which are from three to six feet broad, there are very pleasant shady avenues, and on both sides bananas and sugar cane are planted. . . I have seen whole mountains covered with such fields, through which the water gradually flowed; each sluice formed a small

> cascade, which ran through avenues of sugar cane, or bananas, into the next pond, and afforded an extremely picturesque prospect. (ibid.:77)
>
> **Kapalama.** Kapalama had two streams watering its terrace area, which was almost continuous from Iwilei up to the foothills above School Street, an area measuring about three quarters of a mile in depth inland and in breadth. (ibid.:79)

In addition to his ethnographic work, Handy also produced an annotated map of Oʻahu (reproduced as Figure 7, below), which included planting localities for taro as well as climate details.

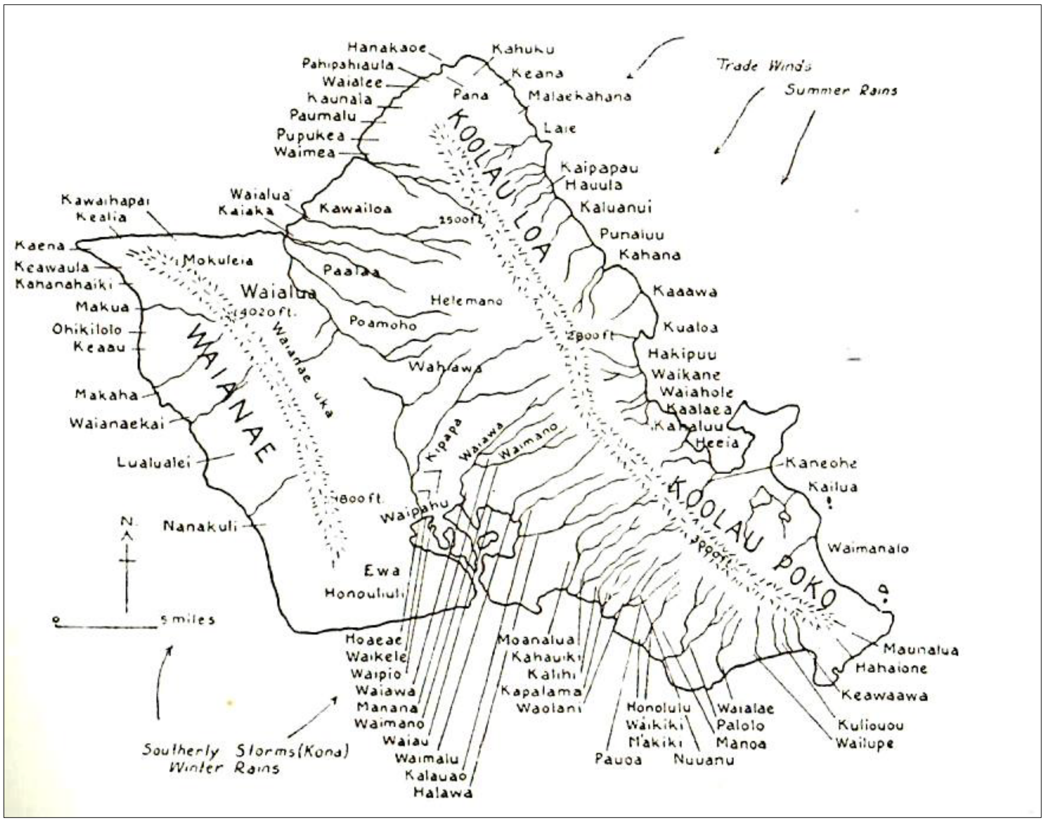


Figure 7. Planting localities for taro, wind direction, and climate in Oʻahu (Handy 1940:75).

In an "Account of Cultivation" within Volume VI of the *Fornander Collection of Hawaiian Antiquities and Folklore* published in 1919, Kapālama is mentioned by name in a discussion on wet planting:

> The growth and fullness [of the taro] in all wet plantings are not the same, the taro is very flourishing and healthy in some places, as in Kapalama, where the taro patch is soft. (Fornander 1919:162)

Between 1838 and 1842, the United States Exploring Expedition under the direction of Commander Charles Wilkes, toured Hawaii and visited Honolulu. In 1840, Wilkes reported that "Saturday in Honolulu is a gala day, and all ages of both sexes devote themselves to amusement" (1849a:51). He also made the following observation of the land within Honolulu Ahupuaʻa:

> Between Waikiki and Honolulu there is a vast collection of salt-ponds, and I was greatly surprised to find the manufacture of it so extensive. It is piled up in large heaps, in which there was, when I saw them, from one to two hundred tons. The salt is now exported to California, China, Oregon, Kamtschatka, and the Russian settlements at Sitka. The natives use it for salting fish and pork, and art which it is said they have long practised [*sic*]. (Wilkes 1845:86)

Wilkes made the following observations during his November 17, 1841 visit to Honolulu harbor:

> Honolulu showed signs of improvement, but I regretted to perceive that during the year the morals of the place seemed to have declined. The number of grog-shops had apparently increased, and the sailors' dancing-halls, with their music, were allowed more license than at our first visit. Yet, as far as the prompt execution of the law went, I did not find the authorities deficient. (1849:258)

In regard to resources and trade across the Hawaiian Islands, Wilkes mentions the ongoing pursuits of the Hawaiians in supplying visiting whaling fleets and that sugar cultivation had begun to take over the for the failed sandalwood trade. He also stated the following:

> The islands produce but little, and their consumption of foreign products is necessarily small. The capabilities of the islands have generally been underrated, for their soil and climate are suitable for raising all tropical productions in considerable quantities, and at a moderate cost. But very little investment of capital has yet taken place, and the business that has induced the establishment of several commercial houses has been more that of transit than for the purpose of supplying the consumption of the islands, or obtaining their exports. (ibid.:261)

Charles de Varigny, a Frenchman who became Kamehameha V's Minister of Finance in 1863 and Minister of Foreign Affairs in 1865, arrived in Honolulu on February 18, 1855. De Varigny made the following observations of Honolulu Harbor at that time:

> Honolulu had to a notable degree the look of an overgrown village of the American Far West, a frontier settlement that had somehow strayed off to the tropics. The white cottages with green blinds, jostling the old native-style houses built on a bamboo framework with roofs of plaited pandanus leaves, had a certain air of pretentiousness amid their gardens of recent vintage and their newly planted trees. . .
>
> Royal capital of the kingdom and seat of the government, Honolulu was at that time a small city of 10,000 inhabitants. A seacoast community, established in an arid plain, where the vegetation was limited to coconut palms and a few gardens whose recently planted saplings struggled with a dry climate and a shortage of irrigation, Honolulu owed its importance only to its harbor, the best in the island chain. . . the town had been and still was at this period the rallying station for the entire whale fishing fleet, which from November to February came there each year for revictualing, repairing gear, and unloading the produce of the fisheries from one vessel to another. Two or three hundred whaling vessels, a great majority American, put into harbor there each winter. To these Honolulu owed its material prosperity. (1981:6)

De Varigny offered the following details regarding Hawaiian agriculture:

> In the plains huge herds of prosperous cattle grazed freely on the always plentiful grass; in the shady valleys taro fields abounded (*Arum esculentium*), the dietary staple of the Kanakas; in the uplands several cereal grains; then here and there a few small plantations of sugarcane or of coffee and arrowroot. (ibid.:7)

Written accounts left by early visitors to the Island of O‘ahu, such as those reproduced above, offer valuable insight into what life may have been like for the earliest residents of Kona. By the 1830s-1850s, fifty or so years after first European contact, the native population had already suffered a significant decline; meanwhile, the Western population kept increasing. Maly summarizes the reasons for the rapid decline of native populations thusly:

> Overall, historic records document the significant effect that western settlement practices had on Hawaiians throughout the islands. Drawing people from isolated native communities into selected village parishes and Hawaiian ports-of-call, had a dramatic, and perhaps unforeseen impact on native residency patterns, health, and social and political affairs. In single epidemics hundreds, and even thousands of Hawaiians died in short periods of time. (1998:36)

The *Māhele ‘Āina* of 1848

By the mid-nineteenth century the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land tenure, and the *Māhele* became the vehicle for determining ownership of native lands. Prior to the *Māhele*, Kapālama Ahupua‘a was a very desirable part of the south shore of O‘ahu because of its agricultural productivity Following his victory over the O‘ahu chiefs around 1795, Kamehameha I farmed and kept the *ahupua‘a* of Kapālama for himself (Kame‘eleihiwa 1992). During the *Māhele*, land interests of the King (Kamehameha III), the high-ranking chiefs, and the low-ranking chiefs, the *konohiki*, were defined. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission (Chinen 1961:13).

During the *Māhele ʻĀina* of 1848, all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands. During the *Māhele*, land interests of the King (Kamehameha III), the high-ranking chiefs (the *aliʻi nui*), and the low-ranking chiefs (the *konohiki*), were defined. The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. To expedite the work of the Land Commission, these lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed (9ibid.:13). All lands awarded during the *Māhele* were subject to the rights of the native tenants therein. Native tenants of the lands that were divided up among the Crown, *Konohiki*, and Government could claim, and acquire title to, *kuleana* parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered the *kuleana* as Land Commission Awards (LCAw.).

In conjunction with the *Māhele ʻĀina* of 1848, the King authorized the issuance of Royal Patent Grants (RP) to applicants for tracts of land, larger than those generally available through the Land Commission. The process for applications was clarified by the "Enabling Act," which was ratified on August 6, 1850. The Act resolved that portions of the Government Lands established during the *Māhele* should be set aside and sold as grants. The stated goal of this program was to enable native tenants, many of whom were not awarded *kuleana* parcels during the *Māhele*, to purchase lands of their own. Despite the stated goal of the grant program, in reality, many of the Government Lands were eventually sold or leased to foreigners.

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawaiʻi to legally set the boundaries of all the *ahupuaʻa* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English.

The earliest map that includes the project area vicinity was drawn in 1851 by A. Bishop (Figure 8). Included on this map are references to the *ʻili* (land subdivision) Kapaepaealii of Kapālama Ahupuaʻa, and some *ʻili* of Honolulu Ahupuaʻa: Kapuiki, Kalualoa, and Kaukahoku, among others. Within the immediate project area vicinity, a *pūnāwai* (spring) and a *kahawai* (stream), specifically Niuhelewai stream, are depicted. The course of Niuhelewai appears to correspond with the southern boundary of Kapālama Ahupuaʻa. The label "Pa o Kalaepohaku" appears along a dashed line to the north of the project area, which can be interpreted as a depiction of an underground "cave, pit, [or] cavern," or may be a trail/roadway related to the former location of a stone quarry based on an alternative definition for *pao*, which is "to peck, chisel out, gouge, undermine, erode, bore" (Pukui and Elbert 1986:315). Kalaepohaku itself is the name of another *ʻili* of Kapālama, which was awarded to V. Kamamalu (LCAw. 7713), the majority of the current project area falls within this *ʻili*. Additionally, the Honolulu side of the current project area vicinity is labelled "no Pila"; "no" signifies ownership and Pila is a family name. Pila is listed as the owner of other nearby lands to the south of the project area, as are Hali and Harbottle. No record could be found for Pila's or Hali's lands in Honolulu. However, William Harbottle, a court favorite of Kamehameha III and husband to Kalaimoku (McKinzie 1986:61), was awarded 8.32 acres in Kapālama in the *ʻili* of Kalaepohaku (LCAw. 2937; RP 3588) and 5.78 acres, in the *ʻili* of Kuipaakea (RP 4539 and 7505). These lots were a portion of lands on Oʻahu that William and his siblings inherited from their father John Harbottle, who had been given the lands by Kamehameha I.

As a result of the *Māhele*, Kapālama Ahupuaʻa was retained as Crown Land by King Kamehameha III. According to the Waihona ʻAina *Māhele* database, 190 *kuleana* claims were made within Kapālama, 102 of which were awarded. Of these LCAw. awarded, thirteen were located within the *ʻili* of Kalaepohaku and two in the *ʻili* of Kapuuiki. An 1885 map of Kapālama Ahupuaʻa by J.F. Brown (Registered Map No. 1149) provides detailed documentation regarding land ownership within the immediate project area vicinity and beyond into Kapālama and Honolulu *ahupuaʻa*. As can be seen in Figure 9, the southwestern portion of the current project area crosses the southern Kapālama boundary and extends into the *ʻili* of Puuiki in Honolulu. A 15.45-acre *ʻāpana* of LCAw. 10806, awarded to Kamehameha III in Puuiki (Kapuuiki), encompasses this southwestern extension of the current project area. LCAw. 10806 was a substantial award that included house lots, farmland, and fishponds throughout Oʻahu, Maui, and Kauaʻi. This particular *ʻāpana* was not assigned a discrete number like most of the other *ʻāpana* associated with LCAw. 10806; rather, it is listed simultaneously in the *Māhele* records (Native Register and Native Testimony) as LCAw. 10806 and LCAw. 6732, with Nuuanu as an additional claimant. Interestingly, a separate LCAw. 6732 to Nuuanu appears adjacent to the east of LCAw. 10806 on the 1885 map (see Figure 9).

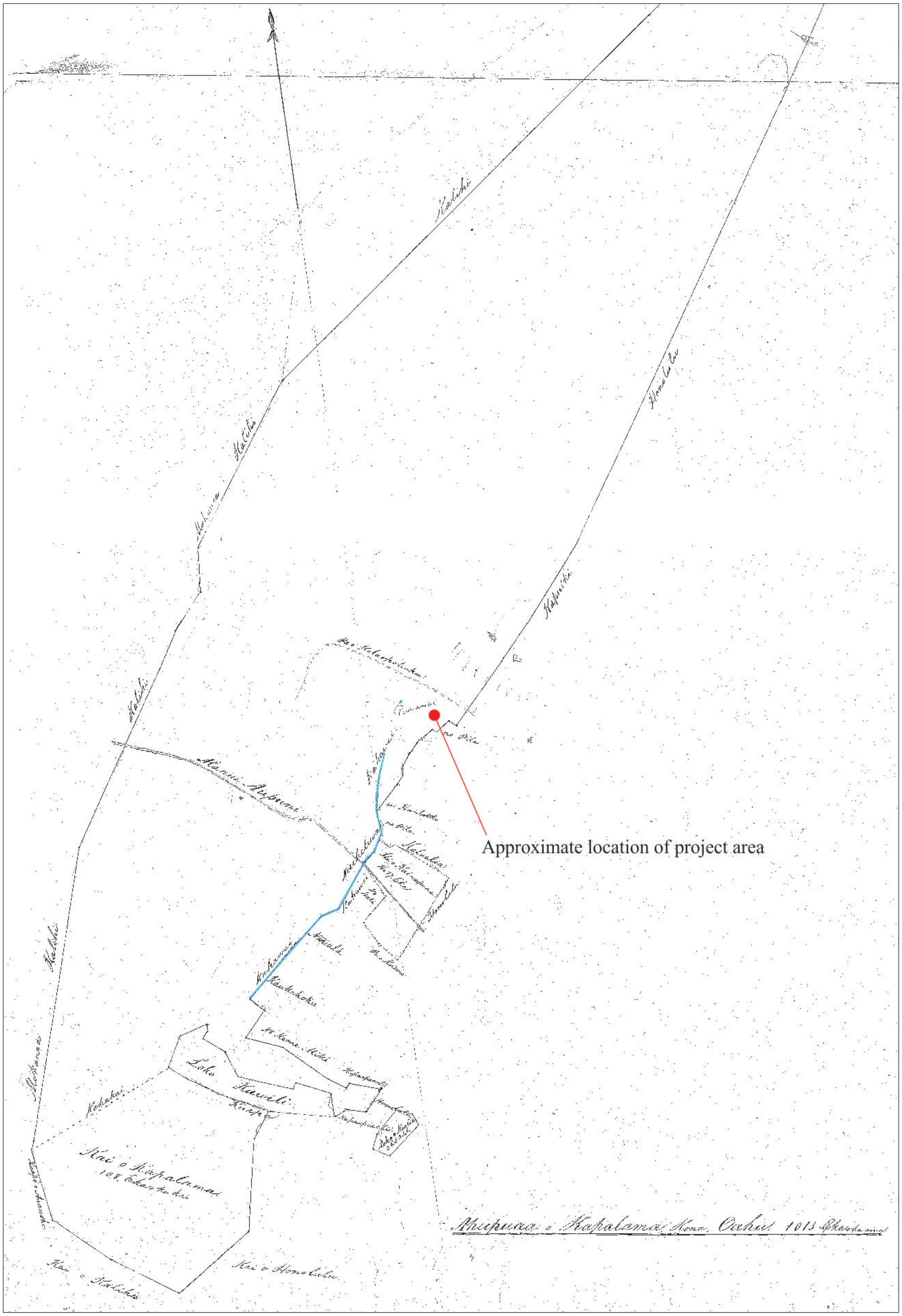


Figure 8. Reg. Map No. 76 showing project area vicinity and water features highlighted in blue (ca. 1851).

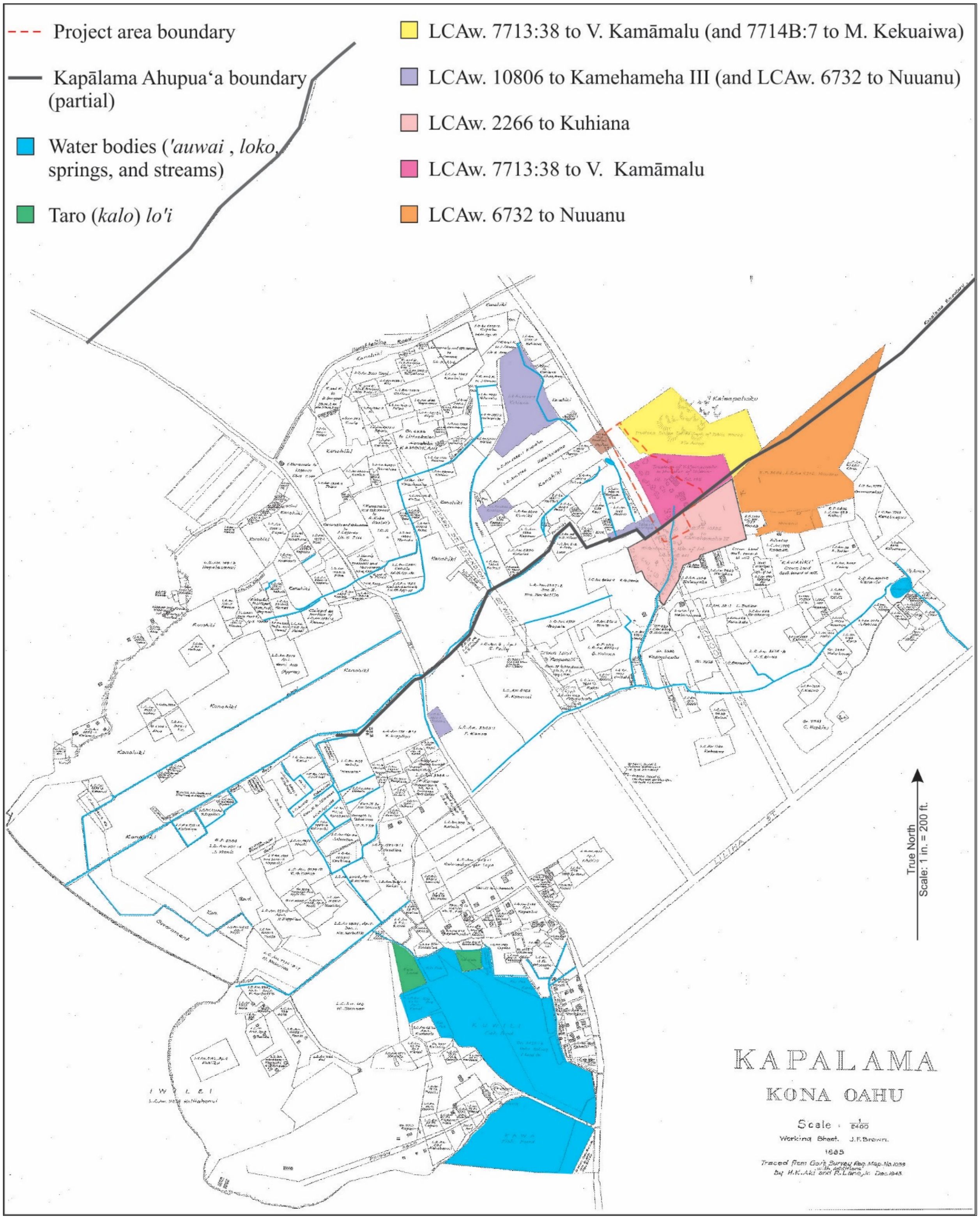


Figure 9. Reg. Map No. 1039 of Kapālama Ahupua‘a showing the current project area and other landmarks referenced in the text. (ca. 1885).

A small extension of LCAw. 2266:2 awarded to Kuhiana falls within the current project area, just north of the aforementioned portion of the project area situated within LCAw. 10806 (see Figure 9). A review of *Māhele* records revealed that *ʻāpana* 2 was a *loʻi i loko*, a combination fishpond and taro plot.

Additional information regarding land tenure within the current project area can be gleaned from a 1931 Copy of Survey Furnished (CSF) map (No. 5803; Figure 10), which goes into further detail than the 1885 map. For instance, the majority of the project area was originally a portion of LCAw. 7713:38 awarded to Victoria Kamāmalu. The central project area was later transferred by her Trustee to the Minister of the Interior (March 14, 1866). A portion of LCAw. 7713:38, situated in the northwest extension of the project area, was initially transferred from the Trustees of the Bishop Estate to the Superintendent of Public Works (October 22, 1901) and later to the Territory of Hawaii (February 28, 1905). Two slivers of land on either side of this parcel fall within the current project area and are listed originally as portions of both LCAw. 7713:38 to V. Kamāmalu and LCAw. 7714B:7 to M. Kekuaiwa, which were also transferred from the Bishop Estate to the Territory of Hawaii on February 28, 1905 (Lots B and C to the south) and February 14, 1914 (to the north). LCAw. 7714B was a sizeable award that included *ʻāpana* on Maui, Hawaiʻi, Lanaʻi, and Kauaʻi awarded to two claimants: M. Kekuanaoa and Moses Kekuaiwa. Moses Kekuaiwa was Kamehameha I's grandson and upon his death, his lands passed to his sister, Victoria Kamāmalu, which may explain the double listing that appears on the CSF map. The CSF map also reveals a tiny portion of LCAw. 1369:1 awarded to Kaukini, listed in the Native Register within the *ʻili* of Kalaepohaku, and comprised of two *loʻi* and a house (*kahua hale*). Lastly, the southernmost extension of the project area, formerly LCAw. 10806 (as discussed above), is listed as a portion of a deed from H.A. Widemann to the Interior Minister June 23, 1865.

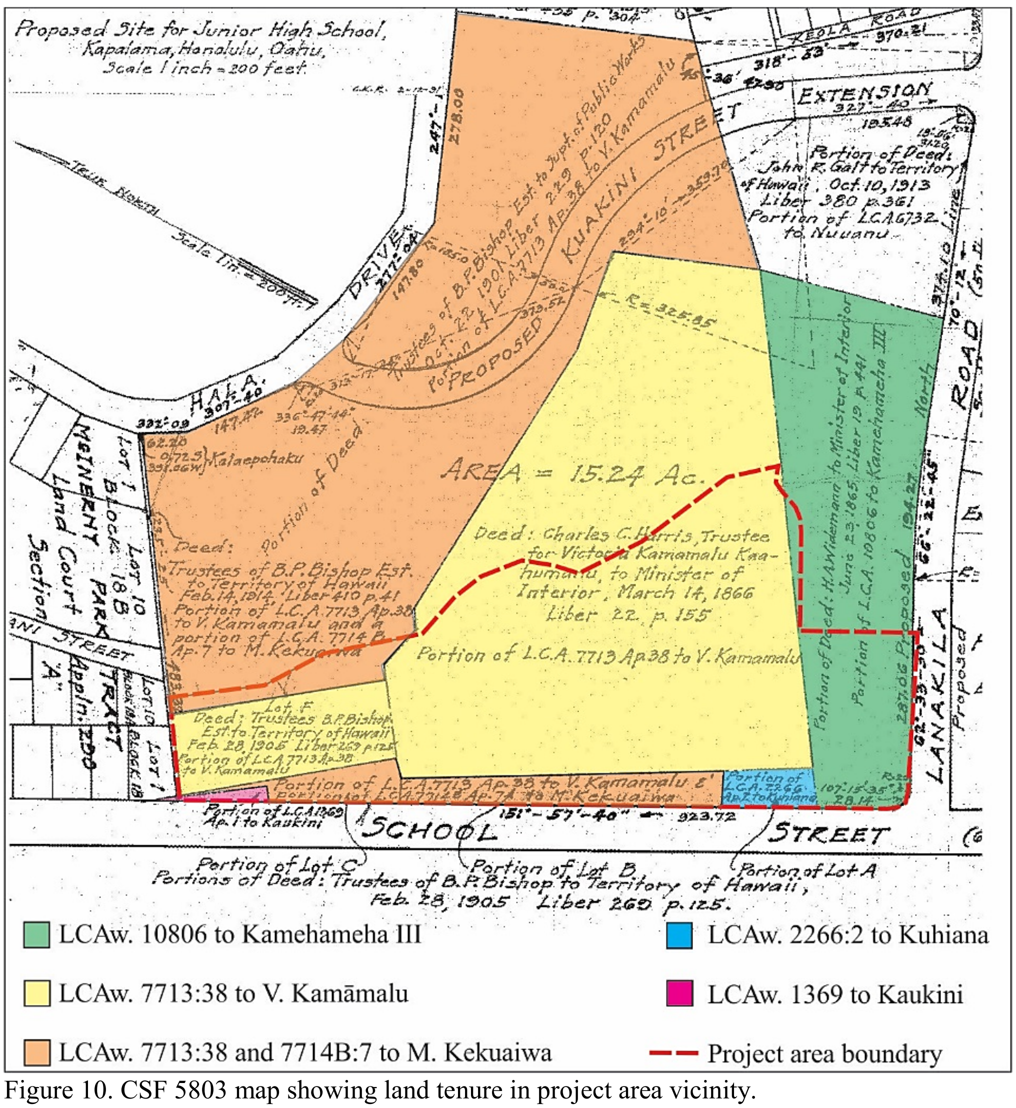


Figure 10. CSF 5803 map showing land tenure in project area vicinity.

As depicted in Figure 9, the project area vicinity was a patchwork of *konohiki* lands and *kuleana* with *lo'i* clustered near numerous *'auwai* and streams with *loko* (fishponds) along the coastline. Thus, traditional settlement practices continued into the late nineteenth century in the project area vicinity. Also on the 1885 map, three structures are visible in the central portion of the project area. These buildings were part of a medical facility dedicated to the care of the mentally ill, known as the Oahu Insane Asylum, which will be discussed in detail below.

The Oahu Insane Asylum (1866–1930)

In 1862, under Kamehameha IV, the Legislature passed *He Kanawai e hoonohonoho ana I hale e malama a e lapuu i na pupule* (An Act to establish an Insane Asylum) into law, authorizing the establishment of a mental hospital for "the reception of all insane persons" (1862:32 Section 1). The law also granted the following:

> Section 3. The Judges of the Supreme, Circuit, police, and District Courts, shall have the power to commit any person to the said Hospital on a satisfactory complaint being made before them that such person is insane, and that the public safety requires his restraint until he becomes of sane mind, or is ordered to be discharged as hereinafter provided. . .
>
> Section 7. Whenever the Physician of the Hospital shall certify in writing to the Minister of the Interior, that any person committed to the Hospital has recovered from his insanity, and is of sound mind, the Minister aforesaid shall have the power to discharge said person. (ibid.:31)

Five months after the act became law, the following sentiments were published in the periodical, *The Polynesian*:

> Undoubtedly the Government has had many full as pressing calls upon its resources. . . But five months are a considerable space of time, when the wants of this helpless, God-and-man-abandoned class of mortals are taken into consideration. Not the first stone has yet been laid, and we are not sure that even a site has been selected. We advocated the measure warmly when on its passage we applauded it freely when passed, we bore the jibes of our contemporary with composure, and we have waited patiently for a beginning. We now respectfully urge the claims of the insane upon the attention of the Government. Neither the Station House nor the Prison are proper places for their safe keeping or medical treatment, and we hope therefore soon to be able to applaud the Executive for its attention, as we praised the Legislature for the enactment. (January 31,1863:2 c.2)

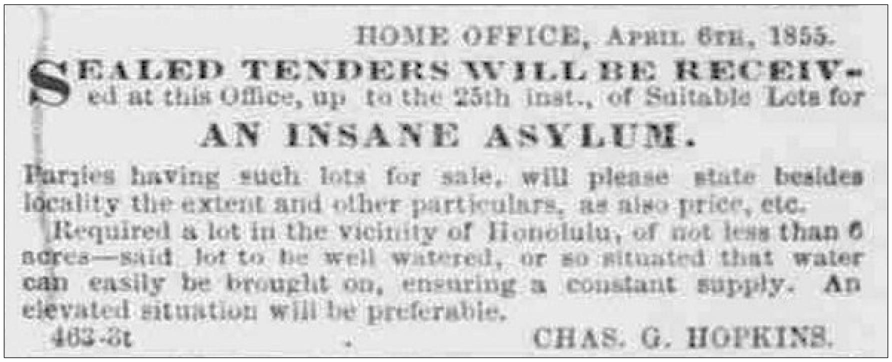
A month later, the need for a proper facility for the mentally disturbed was still great, as can be seen in the following excerpt about the Oahu Prison from an article titled "A Week in Honolulu" published in *The Polynesian*:

> Few people visit the Oahu prison, yet there is not an institution in the land that would better repay a visit. It is unsurpassed in the order, neatness, and even beauty, which characterize it in every detail. It has two serious drawbacks, however. . . The other is the being obliged to provide for lunatics and madmen within its walls, disturbing the rest of the prisoners, "making night hideous" with their ravings, and turning the Hospital of the prison into an insane asylum. We hope the Government will adopt some speedy means to remove. . . the frantic inmates within. Sound policy suggests and humanity demands it. . . an insane asylum, for which there is an appropriation, might be erected on some portion of the large grounds now belonging to the Queen's Hospital. (February 28,1863:3 c.1)

Another article published in *The Pacific Commercial Advertiser* (PCA) in 1864 provided the following update:

> Insane Asylum: Some steps are being taken on the part of the Government for the selection of a site on which to erect an Insane Asylum— an institution needed now more than anything else. The most proper location for it would undoubtedly be in the vicinity of the jail. . . The force always in attendance to guard and overlook the prison, can without much inconvenience be brought in to assist either to guard or keep the asylum when required. It has been suggested to locate it near the Queen's Hospital. But it does not appear exactly proper to place it near a sanitary institution, where its proximity may work injuriously to the patients of the hospital. Natives have a natural dread of crazy people, especially foreigners, and one result of such a location of it might be, that it would prevent them from voluntarily going there to be cured of their diseases. The former spot has so many recommendations and advantages, that we trust it may be selected, even if land has to be purchased for the purpose. (February 4, 1864:2 c.3)

The initial appropriation set aside for the construction of the Asylum in 1862 totaled $7,000 (PCA October 15, 1864:2). However, appropriations increased to $12,000 for an insane asylum as a result of the passage of the 1864 bill (PCA January 14, 1865: 2). Within a year, a notice appeared, which is reproduced as Figure 11, below.



HOME OFFICE, April 6th, 1855.

SEALED TENDERS WILL BE RECEIVed at this Office, up to the 25th inst., of Suitable Lots for

AN INSANE ASYLUM.

Parties having such lots for sale, will please state besides locality the extent and other particulars, as also price, etc.

Required a lot in the vicinity of Honolulu, of not less than 6 acres—said lot to be well watered, or so situated that water can easily be brought on, ensuring a constant supply. An elevated situation will be preferable.

463-3t CHAS. G. HOPKINS.

Figure 11. Notice seeking land for the asylum (PCA April 15, 1865:2).

A few months later, a strongly worded letter to the editor penned by an anonymous contributor read thusly:

> The Gazette tells us that the property of Mr. Widemann, in Kapalama, has been purchased, upon which to erect an Insane Asylum. Let the purchasers be the first inmates, for a worse selection, in my opinion, and others with whom I have conversed, could not have been made. Through the summer months it is parched and dry, and in the winter months a perfect bog. The first requisite in an asylum for the insane should be a constant supply of pure water, both for sanitary and culinary purposes, for the first more especially. Any tyro knows the benefit of the shower bath to the insane.
>
> The seller either got a big advance on the sum paid for the property within a twelve month, (for which I don't blame him,) or found it undesirable as a residence. If the price was what moved the purchasers, it is a culpable neglect of duty, as property more desirable could have been secured with a little research, and if undesirable for a residence of a family, it surely cannot be very desirable for an Insane Asylum.
>
> Honolulu, June 15th, 1865 (PCA June 17, 1865:3 c.4)

A search of *The Hawaiian Gazette* (HG) failed to turn up the aforementioned sale of Mr. Widemann's property. However, a further search of historical periodicals revealed H. A. Widemann as the purchaser in a real estate sale of "the dwelling and premises of J. E. Barnard, situated in Palama" sold "at public auction for $ 2,160. . . Four acres of taro land adjoining sold for $150 per acre" (PCA December 3, 1864:2 c.4). Interestingly, H. A. Widemann appears in another notice dated June 16, 1865 that informs of the purchase of a lot of land by the Minister of the Interior for the establishment of an insane asylum; a notice submitted by the Chief Clerk of the Office of the Interior who is none other than H.A. Widemann, himself (PCA June 24, 1865:4 c.3). The notice requests that the sheriffs and magistrates of all the Hawaiian Islands relay any information concerning such lunatics within their districts, "as are likely to require accommodation" within the asylum since the Interior Department was "about to erect suitable buildings thereon for the reception and safe-keeping of lunatics" (ibid.).

Per the Report of the Minister of Finance to the Legislature of 1866 dated April 25, 1866 and published in the PCA, the allotted $12, 000 for the asylum were spent thusly:

> The Insane Asylum is just being pushed to completion, and the disbursements in that regard have been as follows:

Amount paid for house and lot			$3,500
"	"	Carpenters, painters, etc.,	440 84
"	"	T.C. Heuck for lumber and labor	2,000
"	"	" " "	2,010 85
"	"	C.L. Richards & Co. for stove and fixtures	130
Paid to Contractor wherewith to pay labor and finish the work			3,918 31
			$12, 000 00 (PCA May 5, 1866:4 c.3)

According to an article published in the PCA in 1866 summarizing the Assembly of the Hawaiian Legislature, a resolution was introduced for the Minister of the Interior to "set apart some room in the Insane Asylum for the purpose of taking care of old women and men who have no children;" and for the Minister of Finance to set aside "the sum of $3,000 for their support" (PCA June 9, 1866:1 c.4).

Despite the decision of the legislature and subsequent appropriations that began in 1862, the Oahu Insane asylum did not open until September of 1866 (Schmitt 1956). Since its inception, “the hospital has been maintained at government expense” (Schwallie in Hurd 1916:873), originally under the Board of Health. The original Oahu Insane Asylum was located at the corner of School and Lanakila Street, a large portion of which coincides with the current project area. Registered Map No. 1149, which is reproduced as Figure 12 below depicts the plans for the asylum premises (including locations and function of many of the buildings within the facility) ca. 1885. A mention of the land transfer from Widemann to the Minister of the Interior also appears on this map (as in the 1885 map of Kapālama and the 1931 CSF map referenced above; see Figures 9 and 10). Figure 13 shows the Asylum Premises ten years later, ca. 1895.

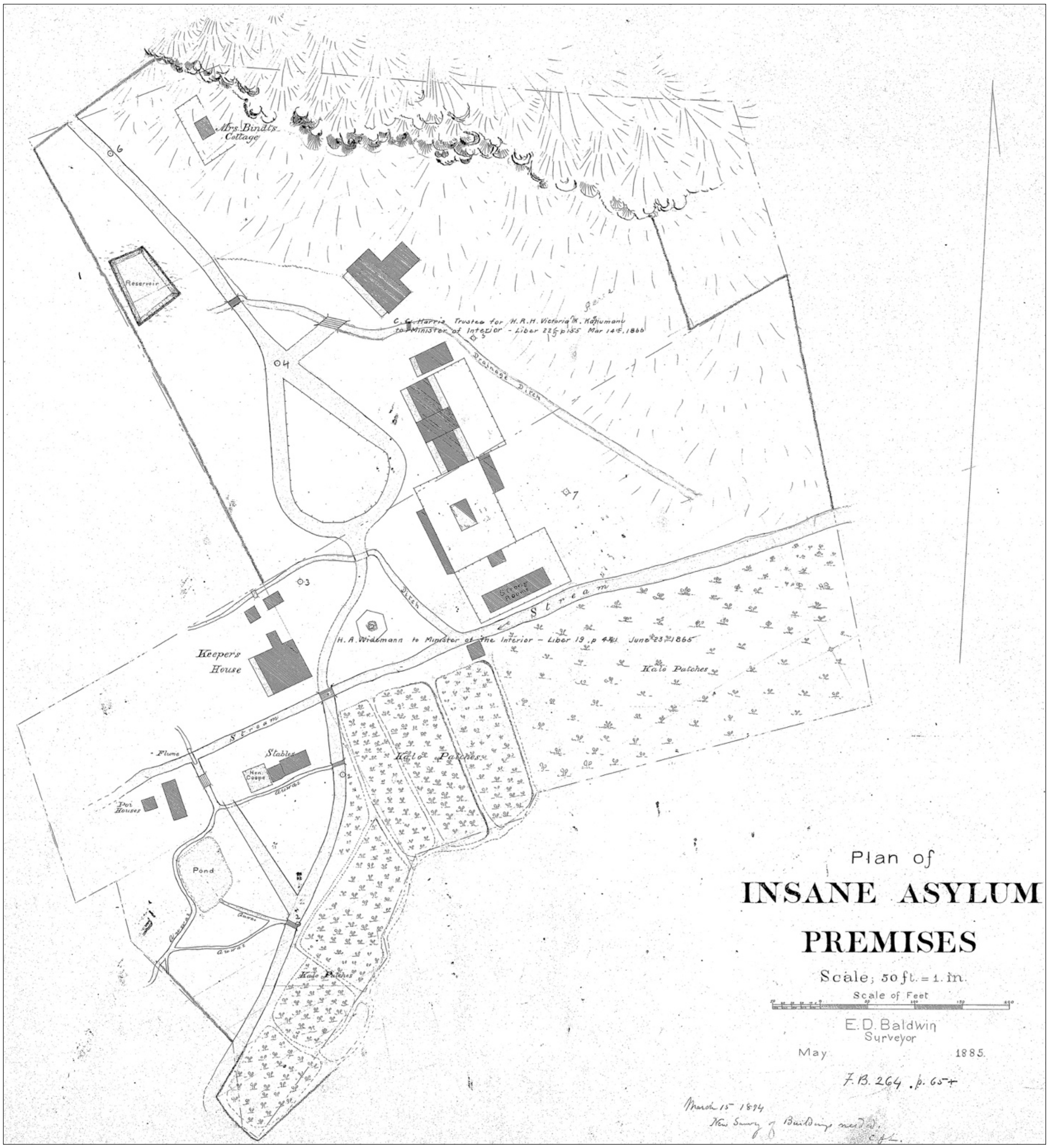


Figure 12. Registered Map No. 1149, note the reference to Widemann’s sale to the Minister of Interior near center.

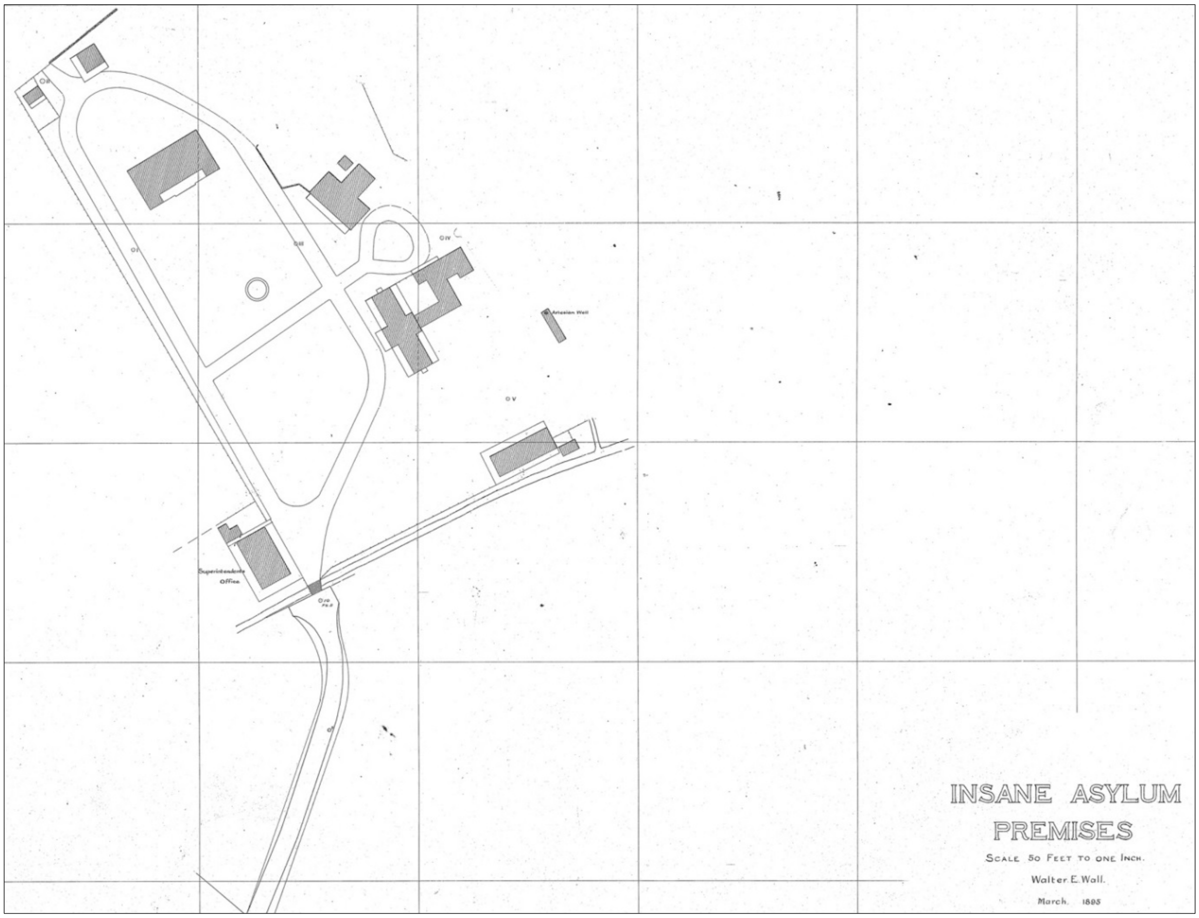


Figure 13. Registered Map No. 1835 of the asylum premises ca. 1895.

By 1895, two additional buildings were constructed, which corroborates a letter dated May 8, 1892 from the Minister of Interior accepting a bid of $974 to erect a new building at the asylum (Hawaii State Archives [HSA]; Interior Department-Lands, Letter). The facility was also referred to as the "Kalihi Insane Asylum" in periodicals and some official documents as seen in some of the excerpts from Historic newspapers reproduced in the following pages.

The first patients at the Oahu Insane Asylum were six individuals who were transferred from the prison, where the mentally afflicted were sent "to mingle with the felons and prisoners of all kinds" (Kimmich 1956:345) prior to the establishment of a suitable facility for the mentally ill. Dr. Robert A. Kimmich's 1956 article "100 Years of Hawaiian Psychiatry", recounts that the annual report of 1867 included a total of 62 admissions for the year, which included the discharge of 17 "recovered" patients, and that the average age of the patients was forty years (ibid.:345). A notice published in the PCA under the column titled "Notes of the Week" outlined the asylum's visitation policy and patient population in 1867 thusly:

> OFFICIAL:—The Minister of the Interior publishes the following notice in regard to the Insane Asylum at Palama:
>
> > Persons wanting to visit relations or friends in the Insane Asylum, are hereby informed that they will be admitted on Saturdays from 1 to 5 o'clock P.M. only. Admission at any other time will be granted upon a permit from Dr. Hoffmann, Physician to the Asylum. Visitors to the Asylum are hereby strictly enjoined not to give to the patients any matches, knives or tobacco.
>
> This notice is very proper, and has been called out by the promiscuous visiting which has heretofore been permitted, to people who went there from curiosity or to see their friends and relatives, much to the annoyance of Mr. Davison, the efficient manager of the Asylum, and to the detriment of the system of treatment adopted by Dr. Hoffmann. There are some fifty patients there at present. (PCA June 29, 1867:3 c.5)

An article published in the PCA in early 1883 after a visit to the facility by the press and officers of the government, boasted of a new addition to the Kalihi Insane Asylum and the favorable overall conditions there. It offers a glimpse into what the subject property was like during the early years of the asylum and is reproduced below:

THE KALIHI INSANE ASYLUM

> The new Addition to the Insane hospital, for which $6,000 was appropriated by the Government, is a credit to the nation and admirably exemplifies the generous philanthropy of the country and Government. . . The people of Hawaii are to be congratulated for their progressiveness in as much as many larger and wealthier commonwealths have almost neglected to provide suitable refuges for the unfortunate. . .
>
> In contrast with the old buildings, the new structure is a vast improvement. It is large and capacious. The rooms are of good dimensions and well ventilated. Each is furnished neatly and splendidly adapted to the comfort and convalescence of patients. In comparison with similar buildings in Europe and America this is perhaps not so ornamental and much less expensive; but for utility, convenience and adaptability to the greatest essential needs of such an institution it compares favorably with the best in existence. It is large enough to accommodate twenty-five patients without crowding. Besides, there is a good-sized sitting room where those who have recovered sufficiently may congregate comfortably to pass the time in reading or conversation. The arrangement of this room particularly illustrates the happy taste and wise judgement of Dr. Hagan, who has indeed planned the whole structure.
>
> That gentlemen's interest and solicitude for the well being of those entrusted to his care and treatment, and his comprehensive knowledge of the wants and necessaries appertaining to everything connected with his charge, was deeply impressed on the officers of the Government and members of the Press. . . The Doctor conducted his visitors from room to room, explained everything in detail, and courteously led them to examine the dilapidated old sheds with a prison-pen aspect, which have hitherto been the only shelter of the poor objects of pity and charity.
>
> The old buildings are decayed and out of date. In no particular are they adequate to the rapidly increasing demands and growing popularity and importance of the institution. There are at present fifty-two patients, of which twenty-two are natives, six Americans, six Englishmen, two East Indians, and fourteen Chinamen. . . Of late the mortality has been somewhat great among the inmates of the Asylum, but this is readily accounted for by the circumstance that many of the deceased were very old.
>
> Great care is taken on the part of the doctor and nurses to prevent any escape of those who are dangerous in the community by reason of their afflictions. At the same time, no violence is resorted to except in cases of absolute necessity, and all possible freedom is permitted. Those who are capable, physically, of light labor are kept busy among the taro patches, or about the garden ground, that their minds, which are generally the sole seat of the disease, may be gradually distracted from their illusions by continual occupations. As soon as any show the signs of absolute recovery they are permitted to depart on probation for a period, and if they prove to be cured then, they are finally discharged, but if the malady returns the patient is brought back.
>
> . . . All [patients] are cleaned and provided with a suitable diet. . . Sentries guard them perpetually from accident or escape, both by day and by night. None are permitted to escape for a moment from the observation of these vigilant guards. A few must be confined in their rooms on account of the extreme violence of their disorder, but most of those even, who are incompetent to perform the slightest work are allowed to walk freely about.
>
> The grounds are neat, carefully laid out and beautiful. A fragrant air pervades all the environments; the sight is healthful, somewhat sequestered and in all respects advantageously situated.
>
> . . . It is a place where relatives can be sent, who are unfortunate, without begetting misgivings in the sympathizing bosoms of their nearest friends. It partakes more of the nature of a hospital and a home than of a mere asylum. . .
>
> We can safely say that the new structure is the very best that could be possibly built from the funds appropriated for it, and an examination will convince all that it entirely meets requirements. (PCA January 13, 1883:4 c.4)

In late 1898, the issue of overcrowding at the asylum, which had then become known as the Territorial Insane Asylum, prompted the construction of a new building to accommodate all the patients at the facility. An article appeared in *The Evening Bulletin* on December 24, 1898, which reported that an item for the new building had been included in an Appropriations bill that had passed the joint committee of both houses; however, the funding appeared to have gotten "lost in the shuffle" (ibid.:1 c.2). A few days later, George Mason, Clerk of the Senate, published an Editor Bulletin titled "Not Lost in the Shuffle" in the same periodical in an effort to set the record straight. Mason stated that "special committees were appointed to visit the place and make recommendations" in response to the "urgency of more accommodations at the Asylum". He continues:

> On March 21st [1898] the Senate Committee reported in part:
>
> "The Asylum has a capacity for 98 inmates. At present they have 106 inmates and the number has been steadily increasing. In order to make room for them some of the guards have been obliged to give up their rooms and sleep in town or somewhere off the place. There is a great need for new and properly constructed cells for the bad cases of insanity who have to be confined separately, especially at night. The buildings are all of wood, and the principal building is becoming much decayed in parts. Your committee, after consulting with the Board of Health in regard to the matter, recommend that the Legislature appropriate $25,000 for a new fire-proof building to be built of concrete with an iron roof. We also recommend that the Legislature appropriate $2,600 for the purchase and erection of an electric plant at the Asylum. We could also recommend that an additional amount be appropriated for the 'maintenance of the Asylum' and that it be increased to $33,600. It will be necessary to make some changes on the premises, such as fencing etc., that will require this increase."
>
> This report was signed by Senators Baldwin, Wright, and Rice, and it was acted on March 3, when on motion of Senator Baldwin the item for maintenance of the Asylum was raised from $20,000 to $33,600 as suggested by the Committee." (December 27, 1898:4 c.2)

Apparently, the item for the electric light plan was indeed inserted in the Appropriations bill and passed. However, the Senate made a unanimous decision not to include the item for the new main building in the Appropriations bill because the new building qualified as a "permanent improvement" and "belonged in the Loan Bill, which at the time the Government had not presented" (ibid.:4 c.3) Unfortunately, it appears that the item was forgotten entirely despite the Senate's intentions to secure the funding and proceed with construction.

Another resource that provides valuable descriptions of the current project area when it was the site of the Territorial Insane Asylum is an article published in *The Honolulu Republican*: (HR) titled "Quarters Provided for Hawaii's Insane: The Physician's Report Gives Descriptions of Wards" on February 7, 1901. Dr. George Herbert submitted the Physician's Report to the Board of Health, which showed the institution to be "in first class condition" (HR February 7, 1901:1 c.7). The Physician's Report presents details about patient care including specifics regarding their diets, daily life, asylum personnel, and treatment results, as well as thorough descriptions of the six wards and associated outbuildings. Excerpts from this article pertaining to the ward buildings, outbuildings, and grounds are reproduced in Figure 14 below.

Despite the glowing depictions of the facility in the aforementioned articles, the early decades of the Asylum were fraught with reports of mistreatment of patients and the lack of trained professionals for the care and management of the hospital. Kimmich summarized the early struggles at the facility as follows: "The hospital had a somewhat stormy history but managed to fulfill an increasingly large function in the care and isolation of the mentally ill" (1956:345). For instance, in 1887 the Minister of the Interior appointed a special commission to investigate the management of the asylum. The results of the committee's investigation, including the specific charges/complaints addressed, was published in *The Daily Bulletin* (September 27, 1887:3 c.2-4) and is reproduced as Figure 15, below.

During the early 1900s, more stormy history manifested that prompted four Grand Jury investigations per an article titled "All Hope Abandon Ye Who Enter Hawaii's Mad-House" published in the HR on October 27, 1901. The final Grand Jury report was published in the HR earlier that same year. Among their resultant recommendations was that the asylum should employ "a resident physician, a specialist if possible, whose entire time could be given to the study and treatment of the inmates" based on the model set by "all State and Territorial Asylums" in the United States (HR March 6, 1901:1 c.1). At the time of their investigation, there were 130 patients at the asylum and most them (90 percent) consisted of "a cosmopolitan throng of unfortunates unknown to anyone up to the day they come up to claim public wardship on account of their deplorable condition, many of whom are unable to make themselves understood in English" (ibid.:1 c.2).

Oahu Insane Asylum at the Present Time.

January 1st, 1901.

Buildings—There are at the present time six (6) Wards in the Asylum as follows:

No. 1 Ward—A wooden building, size 28 feet 6 inches by 72 feet 6 inches, with accommodations or cells (8x10) for 18 patients. Each cell has one window and one door, the windows and upper panels of the doors are covered with strong wire netting on the inside, and mosquito proof netting on the outside. One extra large cell is set apart to be used as a hospital. There are at the present time 17 patients in this Ward. Each patient is supplied with a mattress, pillow, mat and double blanket, as nearly all the patients in this Ward are violent or destructive, we do not supply them with bedsteads.

No. 2 Ward—This is the old original building erected in 1866 and remodeled in 1887. Size 40 feet by 100 feet. It consists of one large dormitory and three cells. At present there are 34 patients in this Ward, 32 of them sleep in the dormitory and two others who are not to be trusted sleep in the cells. These patients are harmless old Chronics and with the exception of the two in the cells are all furnished with an iron bedstead, mattress, pillow, blanket and bed linen.

No. 3 Ward—Is a wooden building 64 feet 6 inches by 64 feet 6 inches in which there are a good many Chronic cases whom we cannot trust in No. 2 Ward, at the same time there are no such violent and dangerous patients here as in No. 1. In this Ward there are 32 cells each with a ventilator let into the wall close up to the ceiling and fitted with an electric light which is put out by means of a switch outside the door of the cell. Each door is fitted with a small wicket so that by turning on the light and opening the wicket the patient can be observed without opening the door. The Ward at the present time is full. Each patient is supplied with mattress, mat and pillow and blanket, except in the case of 4 of the most rational patients who have, in addition to the above, an iron bedstead each, and bed linen.

No. 4 Ward—This is a wooden building size 51 feet by 92 feet 6 inches and is used exclusively for female patients. There are accommodations for 19 patients only, the rest of the building being taken up by a large dining room, a bath room, water closets, etc. The cells are fitted with electric lights controlled by switches on the outside of the doors of the cells. Each cell is well ventilated by a ventilator let into the wall close to the ceiling. There is also a device to be used in case of fire, by which all the cell doors are unlocked simultaneously. There are at the present [illegible] patients in this Ward who have to be quartered as follows owing to dearth of accommodations. In the dining room which we have been compelled to turn into a dormitory there are three and in two other cells there are two in each. The balance, fourteen, are each in a separate cell. The majority of these patients we are able to furnish with an iron bedstead, mattress and bed linen. The remainder amounting to ten either refuse to use a bedstead or are not to be trusted with one. The crowding here is not proper and should be avoided by adding wings to the building.

No. 5 Ward—Is a small cottage 32 feet by 30 feet which is used as a private Ward or Hospital. The cottage contains two bedrooms, a bathroom and closet and is kept furnished with two iron bedsteads, mattresses, pillows and bed linen, two tables and two chairs. The rooms are mosquito proof, the windows and doors being lined with heavy wire netting on the inside and mosquito netting on the outside. Each room is well ventilated through the ceiling so that all the doors can be locked and there still remains abundance of fresh air inside.

No. 6 Ward—This is a building which has been put in temporary use as a ward. I believe it was originally intended to be used as a power house from which to supply the Asylum with electric light. Owing to the dearth of accommodations for the patients continually arriving, it has been turned into a Ward, into which are promoted the best behaved patients from No. 1 and No. 3. The size of the building is 30 feet by 70 feet, and contains accommodations for twenty patients. Each cell is thoroughly ventilated and mosquito proof, the upper panels of the doors being heavy wire netting on the inside and mosquito netting on the outside. Each cell is fitted with a mosquito proof ventilator close to the ceiling and let into the wall of the building. Each patient in this Ward is supplied with an iron bedstead, mattress and pillow and bedding. At the present time there are sixteen patients in this Ward. In addition to the buildings mentioned above is the Executive building with assistant superintendent's room, office and dispensary, parlor, three bedrooms, dining room, pantry and kitchen. At the opposite end of the grounds is a cottage 20 feet by 28 feet, containing the female nurses' quarters. Also a cottage 16 feet by 24 feet containing the captains' quarters. Cottage 18 feet by [illegible] feet containing guard's quarters, male patient's bathrooms with upright boiler baths, etc. Patient's kitchen and dining room. This is an addition built onto and at the back of No. 2 Ward, one part of which is the kitchen where the patient's meals are cooked, and the other the dining room where the guards and the trustworthy patients dine. The kitchen and dining room are divided by a partition in which there is a sliding window, the panels of which are fitted with heavy wire netting. This is kept closed except at meal times when the food is passed through from the kitchen.

Outbuildings—Carpenter's shop, servant's quarters, stables, wash-house and poi house.

Figure 14. Excerpts from Physician's Report published in the HR under the headline "Quarters Provided for Hawaii's Insane" on February 7, 1901.

To His Excellency L. A. Thurston, Minister of the Interior:

DEAR SIR:—In pursuance of your letter of instructions, dated Department of Interior, August 5, 1887, we have examined Oahu Insane Asylum and have investigated carefully the charges preferred against the Manager and keepers. We have also inquired into the management of the asylum, and the treatment of the patients confined there, and do hereby submit the following report and suggestions:

First, as to the charges preferred againrt the Manager and keepers.

Charge No. 1. That improper relations exist between the keepers and female patients.

We have not found this charge substantiated in any single instance.

Charge No. 2. That the keepers abuse and maltreat, and do dot give proper attention and care to the patients.

In some cases the keepers do not give proper care and attention to the patients. On one occasion, a drunken keeper struck two of the patients, but he was immediately discharged. As none of them have ever had any particular training, or even proper instructions as regards the care of the insane, it is hardly to be expected that they should perform their duties properly or intelligently.

Charge No. 3. That the keepers are allowed to entertain lewd women in the asylum.

One keeper has been allowed to have his mistress who has lived with him the past two years as his wife, and other keepers their wives with them at night when they were on duty. As it has been the custom of the keepers, who are native Hawaiians, to have their wives with them when they were on duty at night, and as this keeper's mistress lived with him, the manager thought there was nothing wrong in allowing her to come.

Charge No. 4. That visitors are allowed access to the Asylum without restraint, to the injury of the patients.

Visitors are never allowed around the Asylum, unless accompanied by the manager or attending physician.

Charge No. 5. That the manager does not maintain discipline or properly attend to his duties.

We find the management very poor in every department of the Asylum; but the fault is very largely with the Government, for no instructions have ever been given either to the manager or attending physician, as regards their duties or the relations that they should observe, one to another.

Charge No. 6. That the manager employs patients in doing work upon his private lands, instead of upon the lands of the Asylum.

The spring from which all of the drinking water of the Asylum is obtained is situated on a lot adjoining the Asylum premises, and belongs to private individuals. The manager leased this lot, that he might controll the water right. He has cultivated grass upon it, with the help of the patients, and sold it to pay the rental. He has also cultivated taro, which is not yet ripe, with the same help and intends using it for the institution. He has also employed the patients, to some extent, upon other lands that he has near the Asylum.

Charge No. 7. That the manager appropriates provisions, which are supplied by the Government for the use of the patients, for the use of his own private visitors, at times leaving the patients an insufficient quantity of food.

We do not find that the manager has appropriated provisions for his own private table that should go to the patients, or that he entertains visitors beyond a reasonable exercise of hospitality.

Second, as to the condition of the buildings of the asylum. The buildings are all in a very poor condition, and are in no way suited for the purpose for which they are used. They are past repair and are infested with vermin. The kitchen and store rooms, which are presided over by prisoners from Oahu prison who do all of the cooking, were in a filthy condition. The different rooms through the buildings were not as neatly kept as they might be, and the bedding was scant and in bad condition.

Third, as to the care and treatment of patients.

In the first place, there are not enough attendants to properly care to patients, and those that are there, have never had the proper instruction or training to enable them to perform their duties as they should. There are no female attendants at all, and the dressing, undressing, and bathing of female patients, is done by Hawaiian men, no matter what the nationality of the patient may be. A large portion of the patients are kept in an airing court during the day, which is hot and uncomfortable. Violent cases are stripped of their clothing, and put into a stone cell, and kept there a day or two, with nothing to lie upon, except the stone floor, and with very little to eat. As the attending physician is at the Asylum but a few hours a day, the manager or keeper may confine a violent patient, and keep him confined as long as they see fit.

During our visit, the patients were quiet and well-behaved, obeying at once the orders of the manager or attending physician. The food was, for the most part, good, and of sufficient quantity; but some of it was bad. The patients are allowed to sit around anywhere and eat, as there is no dining room or dining room furniture.

The dispensary of the Asylum has not been found. There are no drugs, surgical instruments, or proper appliances for restraining violent cases, except the stone cell, in which the patients are liable to injure themselves seriously. Fortunately there has never been much sickness at the Asylum; if there had, there is literally nothing there to treat them with, and the patients could get well, or die, just as they chose.

In view of the existence condition of things, we do hereby make the following suggestions:—

First—That a medical superintendent be appointed, who shall have full control of the Institution, and be responsible for the management. He should reside at the Asylum and should have the power to appoint and dismiss any of the officers under him.

Second—That the Superintendent should have the following assistants: A purveyor, or steward, who should have the immediate duty of buying supplies, the care and issuing of stores, the control of the kitchen department, and the general care of the buildings and grounds, under the direction of the Superintendent; a matron, one female nurse; seven male attendants, one chief cook and as many assistant cooks as may be needed, and such other officers or assistants as the Superintendent may deem necessary for the proper management of the Asylum.

Third—That a substantial fireproof building be built, after the most approved plans for asylums, for the accommodation of 125 patients, and fully equipped, and also a separate residence be built upon the grounds for the Superintendent.

Fourth—That water be laid on to the Asylum grounds. All the water that there now is in the institution has to be obtained from the spring before mentioned, and that is some distance from the buildings. In case of fire, the buildings, would have to burn down, and lives would surely be lost; and, again, for cleanliness, a large quantity of water should be used, which now cannot be had.

Fifth—A padded room should be at once constructed, for the protection of violent cases.

Sixth—That a Board of Inspectors be appointed, to serve without pay, who shall visit the Asylum at stated intervals, and report to the Department its findings.

Seventh—That prisoners from Oahu Prison, who work at the Asylum, be at once withdrawn, and their places filled by responsible persons. Their influence is bad upon the patients, and they do not do their work properly.

The locks upon the doors of the patients' rooms are all different and have to be unlocked by different keys. This should be at once remedied, for in case of fire at night, the patients could never all be gotten out alive.

While all of these suggestions can not be acted upon at once, some of them can and should be attended to immediately. The appointment of a medical superintendent and his corps of assistants, and the laying on of water pipes, are matters which should not be delayed a moment, as they are of utmost importance.

The necessity for a well equipped Insane Asylum in this Kingdom is great. Isolated as we are from the rest of the world, with an ever increasing foreign population, the proper means for the care of this unfortunate class, which of late years has been rapidly increasing, is of paramount importance. In this age of strife and competition, when everyone has to work to his utmost to obtain and hold a position in the world, it takes only a trifling reverse of the wheel of fortune, acting upon an over-wrought nervous system, to unbalance the mind, that most wonderful of all wonderful creations, and the most delicately arranged, and cast it into a living tomb to await the day when nature would claim the rest of a being, which had perhaps years before gone out of existence. With proper care and attention at the critical moment the individual might, many times, be saved and placed back into the world to take his position in society, as before.

We do not know when some one near and dear to us, or even we ourselves, may, through some unexpected and unfortunate train of circumstances, have to claim the benefits and protection of an institution of this character, and the importance of having such an institution fully equipped and ably managed would then be realized.

Trusting that this report and these suggestions may meet with your approval, we are, very respectfully, yours,

S. B. DOLE,
H. WATERHOUSE,
G. H. MARTIN, M. D.

P. S.—We have expended for clerical assistance $25.

Supplementary report of Committee of Investigation of the Insane Asylum:

We further recommend that Section 3, of an Act to establish an Insane Asylum, approved the 23d day of August, A. D. 1862, be amended by striking out the words "police and district," in the first and second lines, and by inserting the word "and" between the words "Supreme" and "Circuit" in the first line.

S. B. DOLE,
For the Committee.

Honolulu, Sept. 16, 1887.

Figure 15. Committee of Investigation of the Insane Asylum report published in *The Daily Bulletin* under the headline "Insane Asylum Management Condemned" on September 27, 1887.

As a result of the challenges in ascertaining “antecedents, family history, and heredity” from such patients, the Grand Jury recommended that “a half-way station” be established “where newcomers can be held on probation” and undergo evaluation to determine insanity “before being subjected to the strain of surroundings in the Asylum itself” (HR March 6, 1901:1 c.2). The Grand Jury goes on to suggest “there is ample room and sufficiently remote on the Asylum reservation for such a receiving station” (ibid.). Further, the Grand Jury also ascertained in their report that a $30, 000 appropriation had been made in early 1900 by the Council of State but never awarded because “the funds of the Government have been so depleted by reason of the plague and other causes” (ibid.:1 c.1).

The Grand Jury report also documented that a building known as Ward No. 2 was found to be “in a very bad condition and quite beyond repair” while the other buildings were ruled to be “in a fair condition”, with the exception of Ward No. 6, “a building erected for some other purpose but pressed into service owing to the want of room” (ibid.). As a result, they recommended that both Wards 2 and 6 “absolutely needed” to be replaced with a new ward. The Grand Jury went on to condemn the restroom facilities as “primitive” stating that they are “nothing more or less than old fashioned privies with open vaults” (ibid.); in addition to overcrowding in the women’s ward, which at that time held 31 patients but was meant to accommodate only 19; as well as the lack of “an automatic device whereby all the cells or rooms can be thrown open at once in case of fire” (ibid.) in all of the wards (only the women’s ward had such a device in place). Figures 16-18 depict the project area around this time.

Figure 16. Reg. Map No. 2374 showing the project area ca. 1902.

Figure 17. Early wooden Asylum buildings and grounds (HSA PP-40-7-010; no date).

Figure 18. Early wooden Asylum buildings and grounds (HSA PP-40-7-030; no date).

A review of Historic Period periodicals reveals numerous references to the placement and operation of a rock crusher at the quarry located near the facility (*The Independent* October 11, 1901:1 c.1; PCA October 11, 1901:1 c.3). The ill-placed quarry venture incited arguments between the Board of Health and the Department of Public Works, beginning in 1901 that would last for years; referred to as the "Insane Asylum Controversy" (PCA October 18, 1901:1 c.1) and the "rock-crusher controversy" (HR November 2, 1901:1 c.7). The Grand Jury's final report of 1901 also weighed in on the controversy, and made the following suggestion:

> The stone crushing plant should be peremptorily removed from the vicinity, even at a large cost and much trouble as we believe that the unfortunates of the Asylum are entitled to every possible chance, facility and remedy to recover., which we believe is denied them in a large measure so long as the roar of the stone crusher and explosions in blasting are continued in the immediate vicinity. (ibid.)

Despite the Grand Jury recommendation, the quarry was set up on Bishop Estate lands after some difficulty and apparently provided the best rock for road construction in the islands, which set in motion an effort to relocate the asylum elsewhere so that the quarry could continue its operations (ibid.). In 1902, the Board of Health decided to relocate the Asylum upon government land rather than invest government funds in the rebuilding of the original facility. According to an article titled "Need of a New Asylum — Legislature Will Be Asked to Act" published in the PCA, Mr. Dole (Governor)

> was heartily in favor of the removal of the asylum from its present site, and stated that the six acres of asylum ground had become valuable, and the money obtained for it could be used in the construction of new buildings A new asylum and a reformatory were, in his opinion, two projects which the Board of Health should strongly recommend to the next legislature." (PCA May 29, 1902:12 c.1)

In 1903, an article titled "A new Site for Asylum — Insane Wards Will Be Moved Nearer the Sea" published in the PCA reported that the matter of the rock crusher disturbance was finally settled by deciding to relocate the asylum and temporarily shutting down the crusher until such time as a new location had been secured (PCA July 10, 1903:3 c.2). The same article describes the original facility as "in a tumbledown condition, the roofs of some of them having been battered in by the rocks thrown from the blasts in the adjoining stone quarry" (ibid.). As previously mentioned, the continued operation of the quarry was chosen over rebuilding the asylum in situ because "the rock at the government quarry is the best to be found on the island as well as the most easily accessible" (ibid.).

According to an article written by the Chairman of the Insane Asylum Committee and published in the PCA in 1903,

> The site at Kalihi reported the other day as having been as good as selected did not seem to meet with any favor. It was objected to it that, being in the path of city expansion as well as lying between Honolulu and the Pearl Harbor naval station, the location would ultimately come to lack the desirable quality of privacy. With the railway on one side and the electric car line on the other it would not have the essential element of quietness. . .
>
> The Asylum committee was advised to keep an eye out for a site and ascertain what government land might be available therefor. (PCA July 16, 1903:2 c.2)

Per a letter from the secretary of the Board of Health to the Secretary of the Territorial Board of Public Institutions dated June 4, 1903 (HSA Governor Dole Series, Letter), the maintenance and control of the Insane Asylum was transferred from the Board of Health to the Territorial Board of Public Institutions. In 1904, the Insane Asylum committee appears to have approved plans for the construction of a physician's cottage at the facility (HG March 11,1904:5 c.6). The same notice mentions an extension to School Street, which would "run along the margin of the Asylum grounds instead of cutting through their midst" (ibid.).

In addition to the challenges in securing funding for new buildings and the rock-crusher controversy, the Territorial Insane Asylum was plagued by another legal battle regarding the contract to construct new buildings at the facility. This headline grabbing (PCA December 21, 1904:1 c.1; January 20, 1905:5 c.1) litigious struggle between the Superintendent of Public Works Mr. Holloway and the contractor, American-Hawaiian Engineering and Construction Company. This legal battle involved the architect, the Governor, and the Attorney General, among others; and left a long paper trail, from 1904 thru 1906, that is currently housed at the Hawaii state archive (HSA Executive Governor Files 2-8, letters). Awarded in early 1904, the contract languished in the court system for months as the contractors refused to submit to arbitration (PCA December 20, 1904:1 c.1). Much of the controversy hinged upon ambiguity concerning the type of concrete blocks that would be used in the construction of the main building.

Both parties made allegations of fraud, which were followed by still more accusations and denials. Two years later the feud was settled, according to a notice published in the PCA under the heading "Local Brevities" that reads thusly:

> The American-Hawaiian Engineering & Construction Co. yesterday brought the Insane Asylum contract row to a close by paying a forfeit of $500 to the Territory for failure to carry out its contract in constructing the new buildings for the asylum. As the appropriation has expired, the Legislature must make a new appropriation before the construction work can again be carried on. (PCA August 8, 1906:9 c.2)

In 1907, the appropriation for the new buildings at the Asylum were renewed due to persistent overcrowding and in particular, the need for "a new building for men, a new dining room and a new kitchen" (PCA March 7, 1907:6 c.1). The suggestion presented by the Board of Health was that the $52, 459 balance of the appropriation should be applied to the construction of the new buildings and furnishings, and that any remainder be applied to the establishment of an infirmary annex (ibid.).

In 1916, the superintendent of the Asylum, W.A. Schwallie, M.D., stated in an essay titled "The Care of the Insane in the Hawaiian Islands" that he had been unable to find details about the buildings of the Asylum prior to 1910. However, during that year, he reported that the following structures were built:

> one cottage of four rooms, a concrete fireproof laundry, an annex of 18 small rooms to receive overflow from Ward 3, and a concrete fireproof bath-house for men. Ground was cleared and foundations prepared for a similar bath-house for women. (Schwallie in Hurd 1916:874)

Schwallie continued:

> According to the report of the superintendent for 1912, the attendants are nearly all Hawaiians, the ratio of attendants to patients being 1 to 25. . .
>
> None but the sick are allowed in their rooms during the day time, and most of the rooms have large openings admitting air and light freely. Only the violent are restrained at all, and these only intermittently as occasion arises. Treatment consists of kindly judicious care, plain, nourishing food, harmonious surroundings, and abundance of fresh air, non-restraint, hydrotherapy, and "a little drugging." A few acres of taro and sweet potatoes, cultivated by means of patient labor, supply some 50 tons of food for the institution yearly.
>
> Painting and repairing of buildings, caring for the grounds and much of the rough laundry work are done by the inmates.
>
> The Legislature of 1912 appropriated $10,000 for new buildings to relieve the crowded condition of the female ward. (ibid.)

Schwallie also provided the following details of the average patient population over the years: an average of 28 patients from 1872-1874, 140 patients in 1900, and 309 persons cared for with a daily average of 225 during 1910 (ibid.:873). In addition, "the total number of patients under care and treatment and admitted during the year ending June 30, 1914, was 431" (ibid.:875).

Based on an article published in the HG in the summer of 1913, the new fireproof building with accommodations for 120 patients was completed and ready for the transfer of the patients from the original facility (HG June 20, 1913:2 c.4). Specifically, the two-story building was constructed of reinforced concrete surrounded with screened lanais, a Spanish tile roof, and a superimposed ventilating cover along the entire roof ridge to cool the building (Figure 19). This new building was dedicated to the housing of patients in addition to containing a laboratory and operating room. Further,

> The building was built at a total cost of $43,000, the legislature having appropriated $50,000 for the work. Out of the balance the sum of $3000 has already been expended in furnishing the building, leaving a surplus of $4000.
>
> Superintendent Schwallie has already arranged for the erection of a modern, sanitary dining room adjoining the new building. The cost of this will be met from the $4,000 surplus. (ibid.)

Superintendent Schwallie (1916) also wrote of the aforementioned dining room in his essay, stating that it was exclusively for men and measures 40 by 60 feet and is located between the new building and the kitchen.

Figure 19. New building completed in 1913 (HSA Gov. Frear Files).

The new, roughly U-shaped structure is clearly visible on a 1923 Registered Map (Figure 20) along with other new additions to the facility. According to the *Annual Report of the Department of the Interior for 1923*, the total number of patients under care and treatment between June 30 1922 and June 30, 1923 was 432 individuals (comprised of 325 males and 123 females), of these 81 males and 34 females were admitted during the year (Department of the Interior 1924:89). A total of 32 patients were discharged "recovered" and another 32 patients were discharged "improved", while 30 patients died during the year (ibid.).

As previously mentioned, the search for a new location for the Oahu Insane Asylum began in 1901 as a means of solving the rock-crusher controversy and removing the mentally ill further from town. In late 1928 a site in Kaneohe was selected as the location for the new Insane Asylum. The new 524-bed facility known officially as the Territorial Hospital opened in 1930 (Kimmich 1956:346). The United States Army assisted in the relocation of the patients from the Oahu Insane Asylum Facility, using a military convoy to convey the patients from one facility to another on January 6, 1930 (Figure 21). A review of historical photographs at the State Archives reveals many onlookers gathered along the streets of Honolulu to observe the convoy as it moved the patients over the Pali to their new home in Kaneohe (Figure 22).

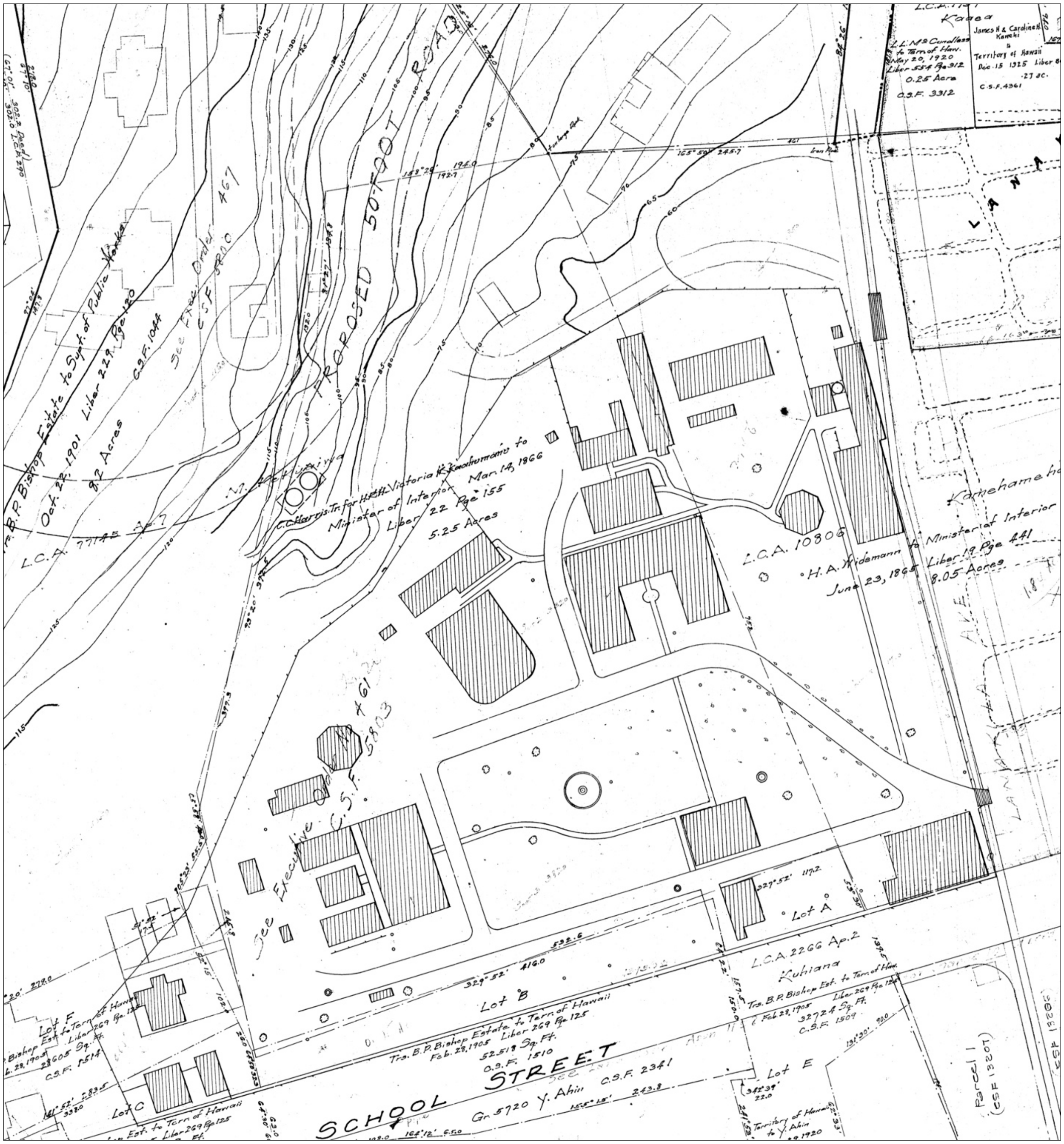


Figure 20. 1923 Registered Map No. 2571 showing the new main building completed in 1913.

Figure 21. Asylum patients waiting for military transport to new Territorial Hospital (HSA PP-41-4-08).

Figure 22. "Spectators gathering by the front gate awaiting the start of the convoy from this hospital on School street to the new location in Kaneohe" (HSA PP-40-4-003).

The Current Project Area After the Relocation of the Oahu Insane Asylum 1930-1972

Over the ensuing years, after the relocation of the patients to Kaneohe, the Oahu Insane Asylum buildings languished within the current project area. Various uses were proposed for the buildings of the facility. For instance, in 1931, shortly after the Asylum was vacated, the property was selected as a proposed site for a junior high school (see Figure 10). Then in 1939, the finance committee of the board of supervisors suggested that the main building be renovated for use as a city-county hospital (the *Honolulu Advertiser* [HA] October 27, 1939:1 c.3). The reported cost for the renovations necessary to transition the building into a city hospital was estimated at $110,000 and included "new floors, ceilings, water systems, plumbing, millwork a new kitchen and other items" (HA March 1, 1940:1 c.1). Despite their intentions to not let the building fall into ruin, the building was hardly more than a concrete shell and it appears any efforts to rehabilitate the structure were abandoned.

On November 15, 1948 Governor Stainback signed Executive Order No. 1274, which set aside public land to house civilian defense workers and their families in the wake of the Honolulu housing shortage: The housing shortage in Honolulu began in 1930s and was exacerbated by the influx of servicemen and their families during World War II. The following is an excerpt from this order:

> **LANAKILA EMERGENCY HOMES**
>
> Kalaeophoaku and Kapalama, Honolulu, Oahu
>
> Being land situate[sic] at the north corner of School Street and Lanakila Avenue to be set aside by Governor's Executive Order under the control and management of the Hawaii Housing Authority as a site for the Lanakila Emergency Homes
>
> Being a portion of the old Insane Asylum premises including the following parcels of land:
>
> Portion Deed: H.A. Widemann to Minister of Interior. . . being a portion of L.C.Aw. 10806 to Kamehameha III (Land Office Deed No. 33).
>
> B- Deed: Charles C. Harris, trustee for Victoria Kamamalu Kaahumanu to Minister of Interior. . . being a portion of L.C.Aw. 7713 apana 38 to V. Kamamalu (Land Office Deed 33-A).
>
> C- Portion of Deed: Trustees of the B. P. Bishop Estate to the Superintendent of Public Works. . . Being portions of L.C.Aw. 7713 apana 38. . . and L.C.Aw. 7714-B apana 7 to M. Kekuaiwa (Land Office Deed 831).
>
> D-Portion of Deed: Trustees of the B. P. Bishop Estate to Territory of Hawaii. . . being portions of L.C.Aw. 7713 apana 38. . . L.C.Aw. 7714-B apana 7. . . L.C.Aw. 1369 apana 1 to Kaukini and L.C.Aw. 2266 apana 2 to Kuhiana (Land Office Deed 1066).
>
> E-Portion of Deed: John R. Galt to Territory of Hawaii. . . being a portion of L.C.Aw. 6732 to Nuuanu (Land Office Deed 1726).
>
> F- Deed: Trustees of the B. P. Bishop Estate to Territory of Hawaii. . . being portions of L.C.Aw. 7713 apana 38. . . and L.C.Aw. 7714-B apana 7. . . (Land Office Deed 1735). . .
>
> AREA 13.44 ACRES
>
> Subject, however, to an easement for the free flowage of water over and through the Kapalama Drainage Ditch as shown on the plan attached hereto [Figure 23] and made a part hereof. (HSA: Lt. Gov. files 265-7 vol.8)

The Lanakila Emergency Homes were part of a program put forth by the governor's joint emergency housing committee, in which 2,000 emergency houses and 11,000 permanent family houses were called for (March 7, 1946:11 c.2). During World War II, nearby Lanakila park was the site of an army signal corps camp. According to a 1946 article,

> Originally recommended by the governor's emergency housing committee for housing use, the army buildings would provide an estimated 200 dwelling units.
>
> If finally approved, the project will be financed with territorial funds to provide housing for non-veteran distress cases.
>
> **Next to Asylum**
>
> The buildings are located on territorial and county lands adjacent to the abandoned territorial insane asylum building on School street.

The department of public works now is negotiating with the army for the return of the property to the city-county parks board, without restoration of the park area, to permit use of the buildings for housing.

Archibald S. Guild, executive director of the Hawaii Housing Authority, has recommended that the buildings be moved from the park to the asylum grounds.

Would Move Building

He also has urged that the asylum building, a cement structure, be converted for office space use by the territorial government agencies. He described it as unsuitable for housing use.

The final approval must be given by Governor Stainback. Funds will have to come from the M-day fund or the governor's contingent fund. (HA May 10, 1946:2 c.7)

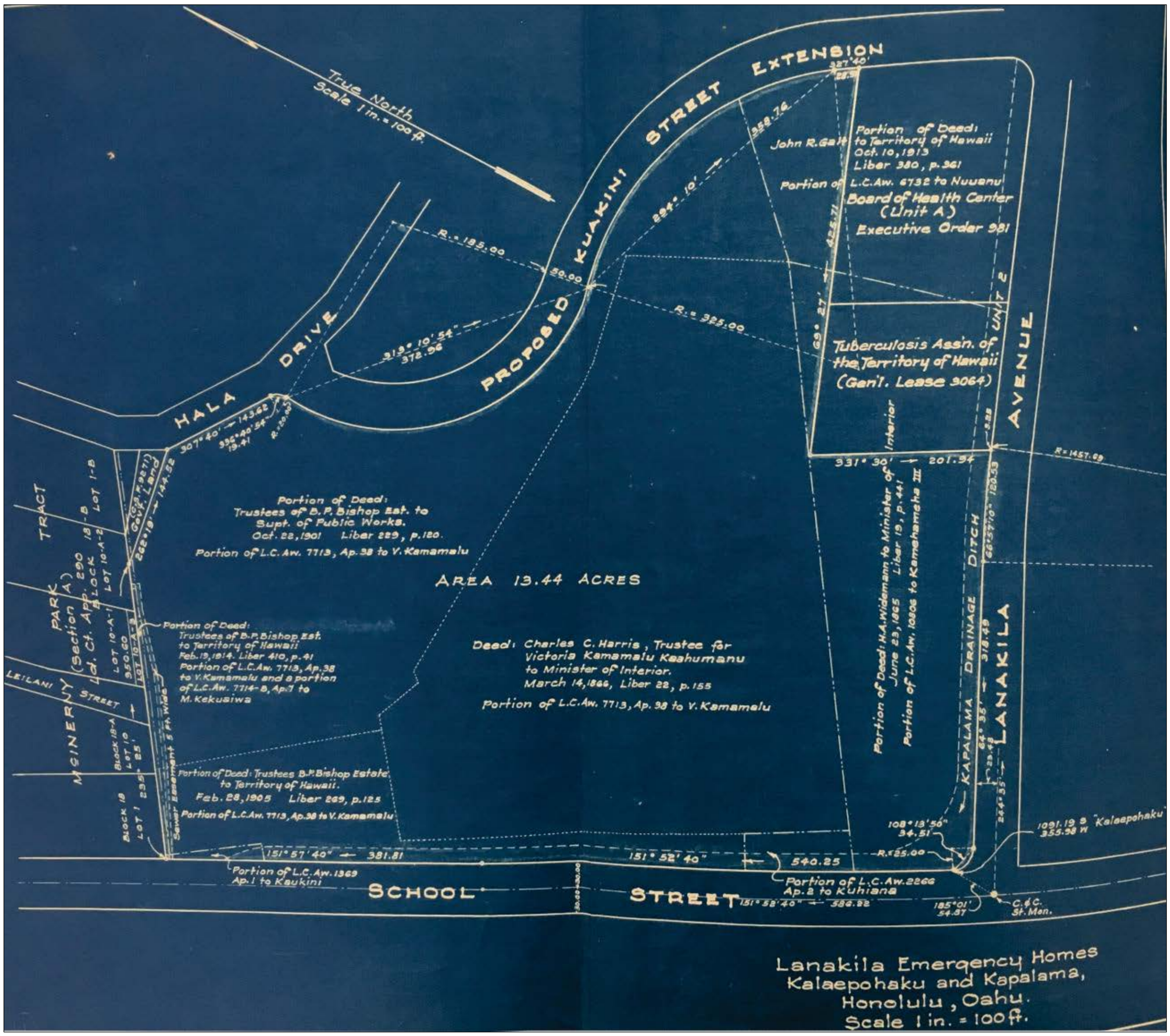


Figure 23. 1948 plan for the then-proposed Lanakila Emergency Homes (CSF 10,597 HSA Lt. Gov. files 265-7 vol.8).

According to a July 1946 article published in the HA, the territorial department of public works had announced that a permit application for the purchase of materials associated with the proposed construction of Emergency housing on the Asylum grounds had been filed with the civilian production administration (HA July 19, 1946:2 c.2). In addition, the public works department reported that it had purchased 18 former army buildings located at the former asylum site (for $3, 200) that would be converted into dwellings along with former barracks located in nearby Lanakila Park, which would be moved to the housing area, to accommodate 61 families (ibid.). The article continues thusly:

> During the negotiations for the return of the area to the territory, the army offered the structures on the site to the territory for $25,000.
>
> The territory, however, declined the offer stating that some of the buildings were unsuited for use, according to Ben F. Rush, superintendent of public works.
>
> Instead the territory offered $6,000 for the structures but this figure was reported unacceptable to the army. In a compromise, the territory selected several of the army buildings and paid $3,200 for them.
>
> The remaining structures will be put up for public sale.
>
> Mr. rush said that many of the buildings had been ruined by vandals. He said the floors were torn up, electrical fixtures smashed, walls kicked out and ceilings damaged. (ibid.)

In September of that same year, Walker-Moody Construction Co., Ltd., was awarded the contract for the Lanakila emergency housing project (HA September 25, 1946:13 c.5). Walker Moody was the lowest bidder, coming in at $189, 105:

> The contract calls for the revamping of several former army barracks in the old territorial insane asylum grounds at School and Lanakila streets into 65 family housing units.
>
> The majority of the housing units call for three bedrooms, kitchen, bathroom and living room.
>
> Nineteen units will also be constructed in the concrete building on the grounds which was a former administration building for the old asylum, territorial officials said.
>
> However, work on these 19 units will be done by the territory, it was pointed out.
>
> The contract calls for the completion of the 65 units by 120 days. (HA September 25, 1946:13 c.5)

The Hawaii Housing Authority (HHA), predecessor to HPHA, began construction of the 88-unit Lanakila Emergency Homes in 1946 (Department of the Interior 1946:26). By February of 1947, nineteen families were housed in the concrete former Asylum building, and eleven three-bedroom apartments were ready for immediate family occupancy (February 26, 1947:8 c.4). Governor Stainback had allocated funds for the HHA to continue construction, and the HHA expected to complete the remainder of the work within 30 days (by late March 1947), which would entail a total of 69 units (ibid.).

After the war, the population of O‘ahu continued to grow exponentially and the housing shortage was still felt acutely. Thus, by 1948 over 4,500 units spread across sixteen housing projects on O‘ahu and Big Island were under the management of HHA (Fung Associates 2011). The passage of the United States Housing Act of 1949, initiated a shift from new construction to the federally funded redevelopment of extant slums. With the emphasis on urban renewal and the rise of the Honolulu Redevelopment Agency (HRA), low-income housing development projects stopped receiving federal funding. In February of 1951, HHA approved construction of twenty to twenty-four permanent housing units, of four and five-bedrooms each, to accommodate large families at the Lanakila Emergency Homes (HA February 15, 1951:1 c.8). This action was a response to “Advertiser revelations last month of housing conditions existing in a private 140 unit area in Kalihi” (ibid.). The article goes on to mention that a family of thirteen were residing in an abandoned army latrine and that they were evicted from their home after a board of health investigation resulted in the unit being condemned (ibid.).

In the summer of 1951, Walker-Moody secured the $343,000 contract for the proposed construction of twenty-eight, concrete, four and five-bedroom, one-and-a-half-bathroom apartments. At the time, the housing project was known as Lanakila Homes, but to avoid confusion with the Lanakila Homes housing project in Hilo, the permanent housing project at the site of the former Lanakila Emergency Housing area became known as Puahala Homes. The Territory of Hawaii funded the construction of Puahala Homes, located adjacent to the current project area. which were expanded to 101 units in 1959 (Fung Associates 2011).

An aerial photograph from 1952 (Figure 24) shows some of the former Asylum buildings still extant within the current project area, as well as the former army buildings associated with the Lanakila Emergency Homes. In comparison, a 1959 aerial photograph (Figure 25) clearly shows the demolition of the main U-shaped Asylum building and much of the Lanakila Emergency housing buildings, in addition to evidence of the expansion of Puahala Homes just beyond the current project area.

Figure 24. April 3, 1952 USGS aerial photograph showing the current project area outlined in red.

Figure 25. April 3, 1959 USGS aerial photograph showing the current project area outlined in red.

The earliest record found during a review of Building Department permit applications for the City and County of Honolulu is dated January 15, 1953, and mentions a new 4,200 square-foot shop building built of structural steel with a concrete floor and galvanized steel roof located within the north-central portion of the current project area. This building was designed by Edwin Bauer and intended as a maintenance shop for Puahala Homes and is extant on the property today. The approved building permit for a second extant building within the project area dated April 25, 1955 was for a one-story fire proof 7,700 square-foot (151 feet by 51 feet) concrete structure with an asbestos shingle roof; also designed by Edwin Bauer and constructed by Walker-Moody Construction Co. Ltd. This large rectangular building is clearly depicted in the 1959 aerial (see Figure 25) and the more recent satellite image of the project area (see Figure 3).

Another approved permit application dated July 10, 1975 documents the moving and posting of a classroom building for use as an office building from Kamiloike Elementary School to 1610 Lanakila Avenue, which falls within the southwest corner of the current project area. However, a month later, another approved permit application for the demolition of an office dated August 11, 1975 lists the same construction address.

PRIOR STUDIES

The earliest archaeological study in the vicinity of the current project area appears to be that of Thomas G. Thrum, who created a list of the *heiau* of ancient Hawai‘i in the early 1900s. Thrum published his list of *heiau* in a series of entries in the *Hawaiian Almanac and Annual,* beginning with the 1907 edition. Of his investigations, Thrum noted the following in a preliminary paper titled “Tales from the Temples” published in the 1907 annual:

> This much is being realized, and expressions of regret have been freely made, that we are at least fifty years too late in entering upon these investigations for a complete knowledge of the matter, for there are no natives now living that have more than hear-say information on the subject, not a little

> of which proves conflicting if not contradictory . . . While these difficulties may delay the result of our study of the subject, there is nevertheless much material of deep interest attending the search and listing of the temples of these islands that warrants a record thereof for reference and preservation. (1906:49-50)

Thrum and his associates compiled information on ninety-six *heiau* located throughout O‘ahu (Thrum 1908:42). One must take into consideration that Thrum listed *heiau* that had already been destroyed prior to his data collection efforts in the early 1900s. Of the *heiau* in Honolulu and its vicinity specifically, Thrum stated the following:

> . . . it is to be said that the patient delver finds a liberal reward, but of all the temples that have come down to us in name by historian none now remain, and but one is left of those famed in tradition. S.M. Kamakau left the names of several heiaus and the locations of others that have kept us busy identifying in this Nuuanu, Wakea first built heiaus for the gods, viz.: Kupuanuu, Kupualani, Pakaalana-lalo, and luna, in the valley of Waolani, on the ridge joining Kapalama overlooking the valley of Keanaakamano, and some overlooking Nuuanu. These heiaus are said to have been the places of the eepa people and the many wizards residing at Waiolani. (1906:56)

The only mention of a *heiau* or *heiau* sites within the project area vicinity are: Puea located in Palama, “a noted place to which offerings were taken; probably only a sacred shrine. Long since removed;” and Oomaunahele and Paepaenuileimoku, “Names of Kapalama heiaus known only in tradition” (Thrum 1908:41).

The earliest formal archaeological survey of O’ahu was conducted by J. Gilbert McAllister on behalf of the Bishop Museum during nine months in 1930. McAllister’s purpose was “to collect information regarding the archaeology of Oahu” (McAllister 1933:3) and he made it clear that his investigation was a beginning rather than a complete account of all the cultural resources on O‘ahu. McAllister also made the following statement regarding the state of cultural resources on Oahu at the time, in his introduction:

> As the archaeological remains are those of the people found in Hawaii by the early voyagers, contact with Hawaiians was an indispensable part of the work. Not only are the sites being destroyed by the changes wrought by European culture, but with the introduction of exotic vegetation many sites have been completely hidden. Such remains would be as good as lost, were it not for the knowledge of them still treasured by old residents (*kamaaina*) of Oahu. With the passing of these old people most of this information will disappear. (ibid.)

McAllister’s only mention of Kapālama is listed thusly, “Site 71. Kapalama. Another region about which it is now difficult to obtain information” (1933:88). This statement is then followed by a reproduction of the etymology of Kapālama as put forth by Malo (1903) and the *heiau* reported by Thrum (1908) in the 1909 Almanac and Annual, previously discussed above.

During the decades that followed McAllister’s initial survey of O‘ahu, no archaeological studies of Kapālama Ahupua‘a were produced. Relatively few archaeological studies have been conducted within the immediate vicinity of the current project area. However, since the 2000s, a handful of studies have been conducted near the current project area (Table 1), the locations of which are presented in Figure 26, below.

Table 1. Previous archaeological studies.

Year	***Author***	***Type of Study***
2007	O’Hare et al.	Field Inspection
2008	Hammatt and Chiogioji	Archeological Inventory Survey
2012	Hunkin et al.	Monitoring
2013	Hunkin and Hammatt	Monitoring
2016	Yucha and Hammatt	Archaeological Inventory Survey

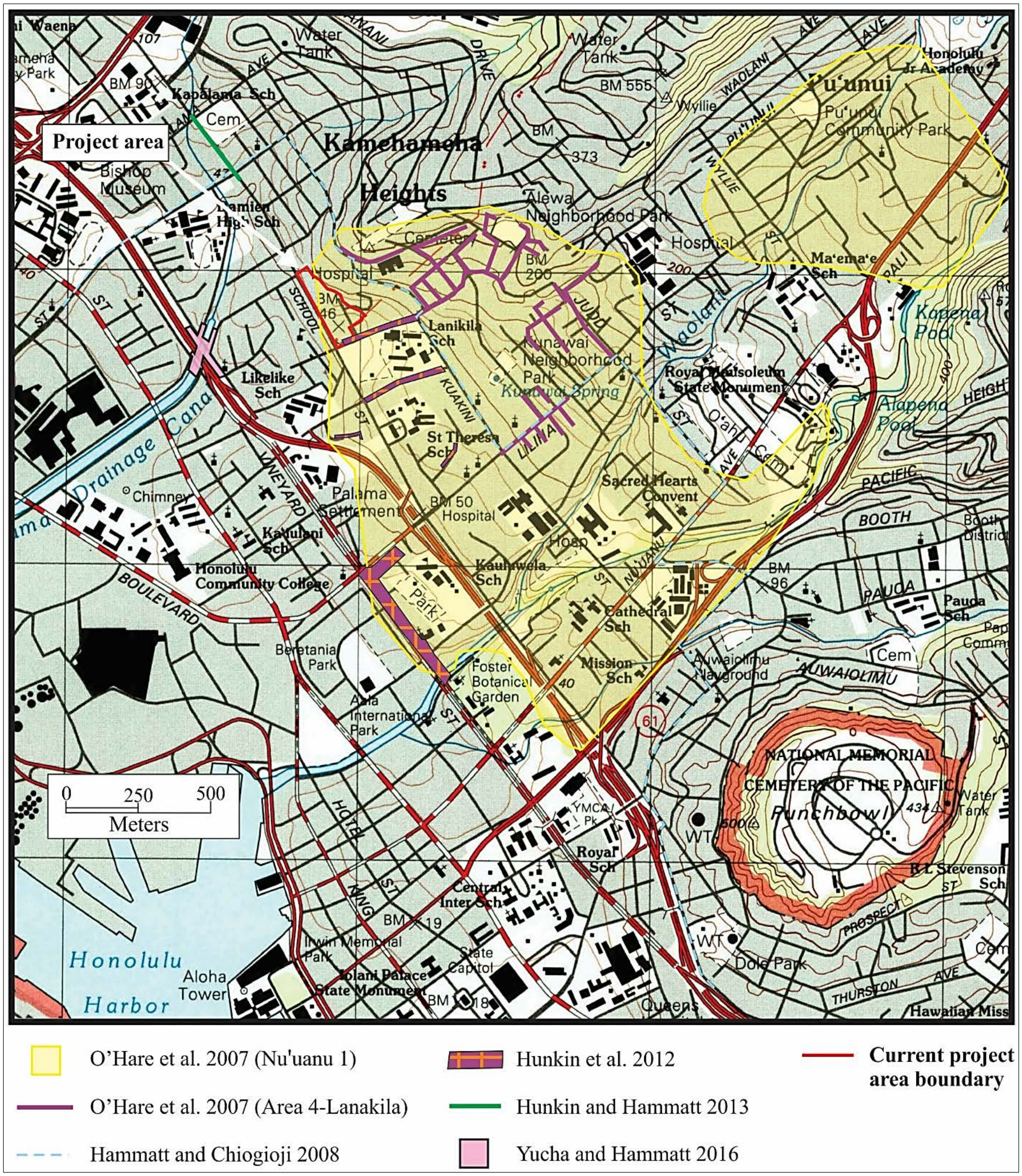


Figure 26. Previous archeological studies conducted in the vicinity of the current project area.

In 2007, Cultural Surveys Hawai'i (CSH) conducted a field inspection and literature review for the Nu'uanu portion of the Kalihi/Nu'uanu Sewer Rehabilitation Project (O'Hare et al. 2007). The southern 2/3 of the current project area fall within a portion of the expansive 1,028 Nu'uanu 1 project area; while linear sections referred to as Area 4-Lanakila were also located nearby, to the west and south of the current project area (see Figure 26). Although no new sites were identified CSH suggested that on-site monitoring be conducted of all excavations exceeding a depth of one foot. In 2012, CSH conducted archaeological monitoring (Hunkin et al. 2012) of five discrete areas within Area 4-Lanakila. One of these areas extended into the southernmost portion of the current project area (see Figure 26). No historic properties or cultural resources were identified as a result of their monitoring activities.

In 2006, CSH conducted an Archaeological Inventory Survey (AIS) for a proposed 24-inch water main in Nuʻuanu and Kapālama (Hammatt and Chiogioji 2008) The 3.6-mile long corridor was confined to extant roadways, a portion of which extended along North Kuakini Street and Hala Drive, to the east of the current project area (see Figure 26). As a result of their study, two historic properties were identified: the Judd street and Nuʻuanu Street bridges; and a combination of on-site and on-call monitoring was recommended for portions of the corridor.

In 2013, CSH conducted archaeological monitoring of for the installation of two water lines, a portion of the Kalihi Valley Sewer System Improvement Project (Hunkin and Hammatt 2013), located along School Street to the northwest of the current project area (see Figure 26). Their linear study area was situated in close proximity to three known cemeteries, but no historic properties or human remains were identified during monitoring activities.

In 2014, CSH conducted a 2.2-acre AIS for the Holana Bridge Replacement Project (Yucha and Hammatt 2016). As a result of their study, two SIHP Sites were identified, the Holana Street Bridge (SIHP Site 50-80-14-7807), which was determined as lacking significance; and the Kapālama Drainage Canal (SIHP Site 50-80-14-7808), which was constructed in 1939 and determined significant under Criteria A and C. The recommended treatment for Site 7808 was mitigation (ibid.).

Regarding the current project area, in 1995, the HHA, with funding from the U.S. Department of Housing and Urban Development (HUD), proposed building a new 2,880 square-foot Family Investment Center within what is now the project area. Following a site inspection on March 23, 1995, HHA sent a March 24, 1995 letter to DLNR-SHPD/ State Historic Preservation Officer (SHPO) stating a determination that the proposed project would have no effect on properties listed in or eligible for the NRHP (on file at DLNR-SHPD). A June 5, 1995 letter from DLNR-SHPD/SHPO concurred with HHA's determination and stated that "A review of our records shows that there are no known historic sites at the project location. Aerial photographs from the 1970s show that the parcel has been cleared and modified making the presence of historic sites unlikely. Thus, we believe that this action will have 'no effect' on historic sites." (SHPD/DLNR Log No. 14731, Doc No. 9505EJ12).

Furthermore, both archaeological (Crowell 2017) and architectural (Fung Associates 2017) studies were conducted to identify potential historic properties within the current project area. The archaeological study (Crowell 2017) resulted in negative findings with respect to the identification of historic properties; and while the architectural study found five buildings over fifty years of age, they concluded that "(s)hould a project be proposed that could potentially have an adverse effect upon these buildings, documentation according to Historic American Buildings Survey (HABS) standards and interpretation would appear to be reasonable mitigation.

3. CONSULTATION

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the project area is vital because these individuals ascribe meaning and value to traditional resources and practices. Community members may also possess traditional knowledge and beliefs of a place that are unavailable elsewhere in the historical or cultural record. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area.

As part of the current investigation the primary author contacted Leimomi Khan, Pelekikena (President) of the Kalihi-Palama Hawaiian Civic Club. Ms. Khan then forwarded a request for information regarding any knowledge of traditional cultural practices associated with the subject parcel prepared by the primary author to each of the Civic Club Members via email. No response was received from any of the Civic Club members and a follow-up communication with Ms. Khan revealed no further leads for sources of such information. In addition, the primary author attempted to contact Leimana Damate, Executive Director of the ʻAhu Moku Advisory Committee but did not receive a response to repeated request for assistance in locating individuals who might have information regarding traditional cultural practices within the current project area.

There was no information provided nor were any individuals found during the consultation process relative to the identification of traditional cultural properties or practices associated with the current project area. A complete copy of the current study has been sent to the Office of Hawaiian Affairs (OHA) for their comment.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are nature features of the landscape and historic sites, including traditional cultural properties. In the Hawai‘i Revised Statutes–Chapter 6E the following definition is provided.

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of "traditional cultural property" is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. While "cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. The significance of traditional cultural properties should be determined by the community that values them. However, in the Hawaiian Islands the identification and significance evaluation of "traditional cultural properties" as defined above presents an inherent challenge, for the concept of boundaries runs counter to the traditional Hawaiian belief system. The sacredness of a feature is often cosmologically tied to the rest of the landscape as well as other features within it. Thus, to limit a traditional cultural property to a specifically defined area may separate the location from what makes it significant in the first place.

Although inadequate and offensive to some, the concept of boundaries remains the regulatory benchmark for defining and assessing traditional cultural properties. The current study utilized the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset, because the OEQC guidelines do not contain criteria for assessing the significance of traditional cultural properties. To be significant, the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or is likely to yield, information important for research on prehistory or history;

e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, traditional cultural properties, by definition, would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa‘akai O Ka‘āina* v. Land Use Commission court case. The court decision established a three-step process for the evaluation of such potential impacts. The first step is to identify any valued cultural, historical, or natural resources that may be present, and the extent to which any traditional and customary native Hawaiian rights are exercised. The second step is to identify the extent to which those resources and rights will be affected or impaired. And the third step is to specify any mitigation actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

No archaeological sites were identified within the current project area as a result of the field inspection (Crowell 2017). These negative findings combined with the lack of information regarding traditional cultural practices related to the subject parcel are not unexpected; as the current project area was the site of an institution dedicated to the treatment of the mentally ill as early as 1862. The Asylum provided care for the Hawaiian Kingdom and the Territory of Hawaiʻi until 1930. The property then languished and was repurposed by the territorial government and the state government as military barracks and emergency housing. Any traditional cultural practices that may have been practiced within the current project area likely predated the establishment of the Asylum over 150 years ago. Thus, the paucity of traditional knowledge or beliefs related to the subject parcel beyond what can be gleaned from the cultural-historical context presented above is not surprising.

Given the negative findings of the current study with respect to the identification of any traditional cultural practices and properties, or any specific valued cultural, historical, or natural resources, it is our conclusion the redevelopment and continued use of the property will not result in impacts to any traditional cultural properties or practices.

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APPENDIX I
Noise and Vibration Study

HPHA ADMINISTRATIVE OFFICES REDEVELOPMENT PROJECT

NOISE & VIBRATION STUDY

Prepared for

PBR HAWAII AND ASSOCIATES INC.

Prepared by

TERRY A. HAYES ASSOCIATES INC.

NOVEMBER 2017

taha 2015-083

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1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. (TAHA) has completed a Noise Study for the Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment Project. Key findings are listed below.

- Construction activity would result in temporary increases in ambient noise levels in the project area on an intermittent basis. Construction noise levels would exceed the allowable noise levels listed in the Hawaii State Department of Health *Noise Reference Manual Oahu Edition* and the Hawaii Administrative Rules. Therefore, without noise control, the Preferred Alternative and Alternative 2 would result in an adverse effect related to construction noise. The following noise control measures would eliminate adverse effects.

  N1 The project applicant shall obtain a noise permit associated with exceeding a noise level of 78 dBA L_{eq} as discussed in the *Noise Reference Manual Oahu Edition*.

  N2 The project applicant shall obtain a noise permit associated with exceeding the maximum permissible noise levels discussed in the Hawaii Administrative Rules.

  N3 The construction contractor shall use specialty equipment with enclosed engines and/or high-performance mufflers.

  N4 The construction contractor shall locate equipment and staging areas as far from noise-sensitive receivers as practicable.

  N5 The construction contractor shall limit unnecessary idling of equipment.

  N6 The construction contractor shall install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment.

  N7 Prior to the commencement of construction activities, notification shall be provided to the on-site residential uses that discloses the construction schedule, including the various types of activities and equipment that would be occurring throughout the duration of the construction period.

  N8 A “noise disturbance coordinator” shall be established. The noise disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The noise disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall be required to implement reasonable measures such that the complaint is resolved. All notices that are posted at the construction site shall list the telephone number for the noise disturbance coordinator.

- Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods employed. Construction vibration levels would not exceed the relevant standards. Therefore, the Preferred Alternative and Alternative 2 would result in an adverse effect related to construction vibration without vibration control measures. The following vibration control measure would eliminate adverse effects.

  N9 Prior to issuance of a grading/shoring permit, a qualified structural engineer shall survey the existing foundation and structural integrity of off-site buildings that will be located within 11 feet of large bulldozers and similar vibration-generating equipment. The survey shall be submitted to the appropriate mitigation monitor. At the conclusion of vibration causing activities, the qualified structural engineer shall issue a follow-on letter describing damage, if any, to the adjacent buildings. The letter shall identify recommendations for any repair, and certify the completion of any repairs as necessary to confirm the integrity of the foundation and structure of the adjacent buildings.

N10 If the construction plans call for high-vibration construction activities being performed close to structures, the contractor may be required to use alternative procedures that produce lower vibration levels. Examples of high-vibration construction activities include the use of pavement breakers, vibratory compaction, and hoe rams next to sensitive buildings. Alternative procedures shall include the use of non-vibratory compaction in limited areas and concrete saws in place of jackhammers or pavement breakers for demolition.

N11 If piles are required to support new structures, pile driving shall be prohibited in place of cast-in-drilled-hole (CIDH) piles or caissons.

- Stationary noise sources would potentially exceed the Hawaii Administrative Rules maximum permissible noise levels. Therefore, without noise control, the Preferred Alternative and Alternative 2 would result in an adverse effect related to stationary noise. The following noise control measures would eliminate adverse effects.

N12 The project applicant shall require mechanical equipment (e.g., ventilation and air conditioning systems) to be enclosed such that noise levels do not exceed the maximum permissible noise levels listed in the Hawaii Administrative Rules.

- Mobile source noise levels would not exceed the 5-dBA operational mobile source noise criteria. Therefore, the Preferred Alternative and Alternative 2 would not result in adverse effects related to off-site vehicular noise.
- Neither the Preferred Alternative nor Alternative 2 would include significant stationary sources of ground-borne vibration. Vibration would be similar to existing conditions and project-related traffic vibration levels would not be perceptible outside the roadway right-of-way. Therefore, the alternatives would not result in adverse effect related to the operational vibration.

2.0 INTRODUCTION

2.1 PURPOSE

The purpose of this report is to evaluate the potential for noise and vibration impacts associated with the proposed development. Potential noise levels are analyzed for construction and operational activities. Noise control measures for potentially adverse effects are recommended when appropriate to reduce noise and vibration levels.

2.2 PROJECT DESCRIPTION

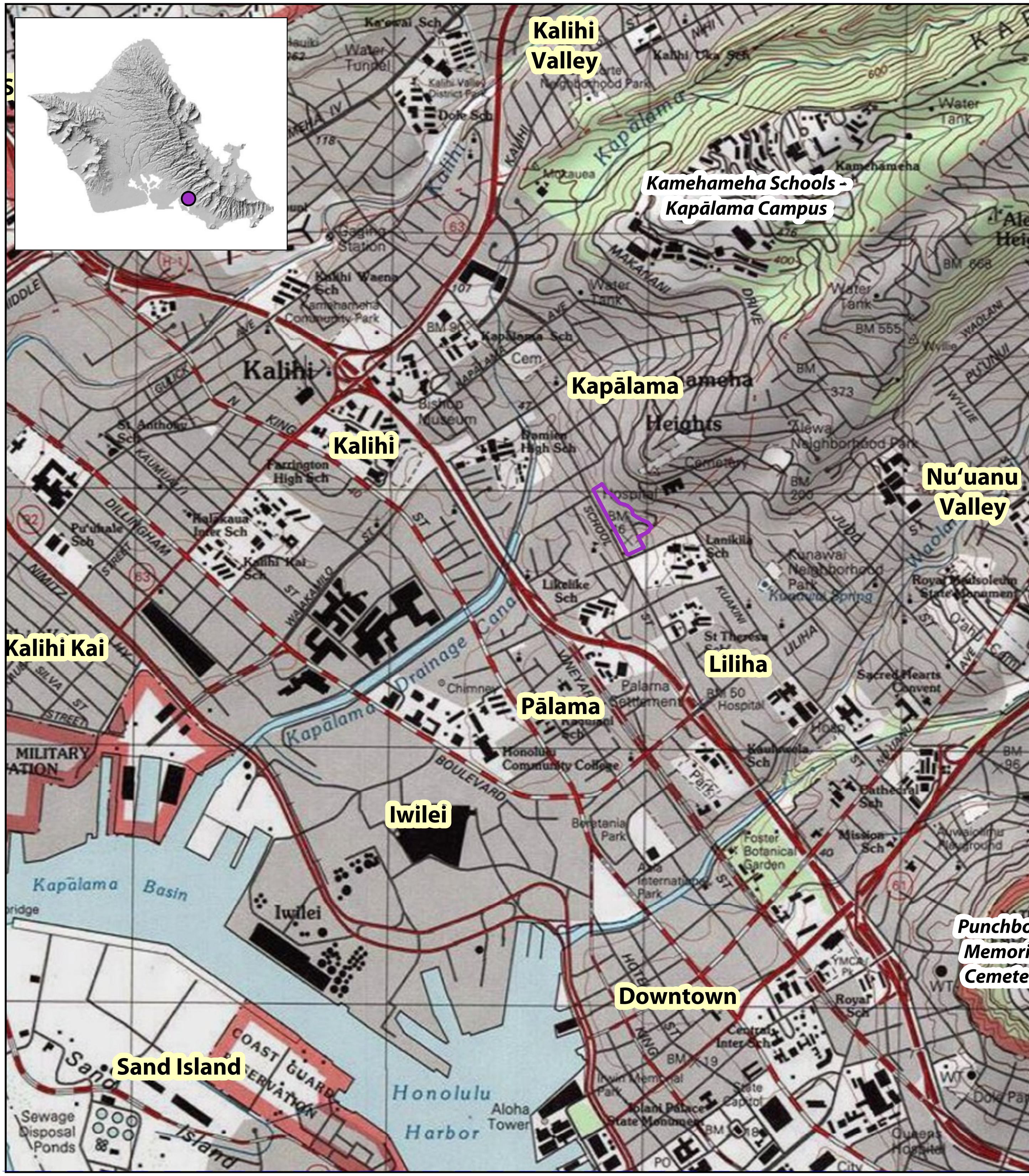
HPHA has partnered with Retirement Housing Foundation under a predevelopment agreement to redevelop the existing HPHA administrative offices into a mixed-use, mixed-income community to increase the amount of affordable housing near bus transit. Vehicle access to the Site is currently from North School Street, Lanakila Avenue, and Ahiahi Street. In order to provide new residential housing, the existing administrative offices of HPHA will be demolished. Proposed elements of the Preferred Alternative include:

- Replacement of HPHA administrative office building;
- Construction 1,000 senior housing rental units;
- Development of 10,000 square feet of ground floor retail space;
- Parking for new HPHA administrative office building and the rental housing units and retail;
- Leadership in Energy and Environmental Design (LEED) certification;
- Vehicle access via existing driveways; and
- Open spaces and new landscaping.

Proposed elements of Alternative 2 include:

- Replacement of HPHA administrative office building;
- Construction of 600 mixed-income (affordable and market-priced) rental units;
- Construction of 400 senior housing rental units;
- Development of 10,000 square feet of ground floor retail space;
- Parking for new HPHA administrative office building and the rental housing units and retail;
- LEED certification;
- Vehicle access via existing driveways; and
- Open spaces and new landscaping.

The project site is located in Honolulu on the island of Oahu. The project site is bounded by North School Street on west and Lanakila Avenue on the south. The H1 Freeway is located approximately 0.25 mile west of the project site and would provide residents living in the future project with access to jobs in Kapolei, Pearl City, Aiea and Pearl Harbor, as well as areas Diamond Head of downtown Honolulu. The location of the Preferred Alternative is shown in **Figure 2-1** and the site plan is shown in **Figure 2-2**.



LEGEND

Project Site

Not to Scale

N

SOURCE: PBR Hawaii & Associates Inc., 2017.

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HPHA Administrative Offices Redevelopment Project
Noise & Vibration Study

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FIGURE 2-1

PROJECT LOCATION

LEGEND

Project Site

Not to Scale

SOURCE: Design Partners Inc., Concordia LLC, and PBR Hawaii & Associates Inc., 2017.

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HPHA Administrative Offices Redevelopment Project
Noise & Vibration Study

PBR Hawaii & Associates Inc.

FIGURE 2-2

SITE PLAN

3.0 NOISE AND VIBRATION CHARACTERISTICS AND REGULATIONS

3.1 NOISE

Characteristics of Sound

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. **Figure 3-1** provides examples of A-weighted noise levels from common sounds.

Noise Definitions

This noise analysis discusses sound levels in terms of Equivalent Noise Level (L_{eq}) and Day-Night Noise Level (L_{dn}).

Equivalent Noise Level (L_{eq}). L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

Day-Night Noise Level (L_{dn}). L_{dn} is basically a 24-hour L_{eq} with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10-dBA penalty for all sound that occurs in the nighttime hours of 10:00 p.m. to 7:00 a.m. The effect of the penalty is that in the calculation of L_{dn}, any event that occurs during the nighttime hours is equivalent to ten of the same event during the daytime hours.

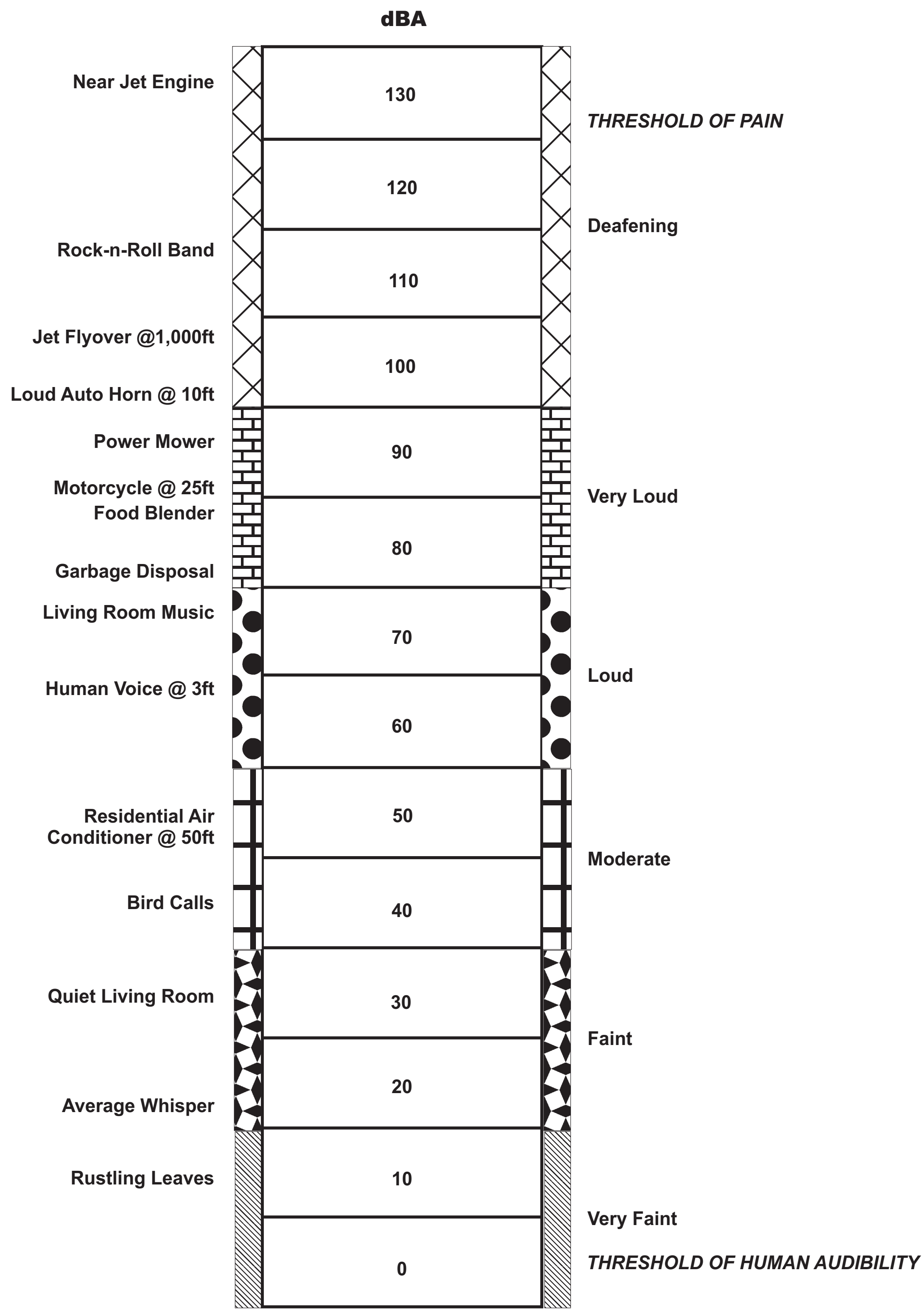
Effects of Noise

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance.



SOURCE: Cowan, James P., *Handbook of Environmental Acoustics*.

FIGURE 3-1

A-WEIGHTED DECIBEL SCALE

For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of the distance.

Generally, noise is most audible when traveling by direct line-of-sight.[1] Barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier (diffraction). Sound barriers can reduce sound levels by up to 20 dBA. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Applicable Regulations

United States Housing and Urban Development (HUD). HUD has a stated goal to provide "a decent home and suitable living environment for every American family." HUD regulations state that acceptable exterior noise levels are 65 L_{dn} or less, normally unacceptable exterior noise levels are between 65 and 75 L_{dn} (to achieve an acceptable status, appropriate sound attenuation measures must be provided), and unacceptable noise levels exceed 75 L_{dn}. HUD's regulations do not contain standards for interior noise levels. Rather, a goal of 45 dBA L_{dn} is set forth and the attenuation requirements are geared towards achieving that goal. It is assumed that with standard construction, any building will provide sufficient attenuation so that if the exterior level is 65 L_{dn} or less, the interior level will be 45 L_{dn} or less. HUD offers three suggestions for mitigating high noise levels on residential projects, including relocation, erecting barriers, and using noise control designs on the building's exterior.

Federal Aviation Administration (FAA). The FAA has published land use compatibility guidelines that can be used to assess potential noise impacts to new development projects.[2] The guidelines indicate that residential land uses exposed to aircraft-related noise levels of less than 65 dBA L_{dn} are compatible with the ambient noise environment. Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor noise level reduction of at least 25 dBA and 30 dBA should be incorporated into building codes and be considered in individual approvals.

Hawaii Statutes. Chapter 342F, of the Hawaii Revised Statutes contains standards and guidelines to address noise pollution. The Department has adopted a state community noise code pursuant to Chapter 91, which recognizes differences in noise level standards in urban and non-urban areas of the State and noise level standards of each county. The community noise codes are the relevant standards for analysis of noise pollution and impacts.

Noise Reference Manual Oahu Edition. The Hawaii State Department of Health *Noise Reference Manual Oahu Edition* discusses local rules for various noise sources. Relevant information includes a discussion of construction noise. A Community Noise Permit is required for construction projects exceeding 78 dBA or that has a total cost of more than $250,000 (based on the value on the building permit). Construction is allowed from 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 6:00 p.m. on Saturdays. The use of certain demolition and construction equipment (such as pile drivers, hydraulic hammers, jackhammers, etc.) is limited to 9:00 a.m. to 5:30 p.m., Monday through Friday. Construction projects exceeding the

[1]Line-of-sight is an unobstructed visual path between the noise source and the noise receptor.
[2]FAA, *1050.1F Desk Reference, Chapter 11 - Noise and Noise-Compatible Land Use*, July 2015.

maximum permissible sound levels (78 dBA) before 7:00 a.m. and after 6:00 p.m., Monday through Friday, or before 9:00 a.m. and after 6:00 p.m. on Saturdays, or at any time on Sundays and holidays are allowed only with an approved Community Noise Variance issued by the State Department of Health.[3]

Hawaii Department of Health (DOH). The Hawaii Administrative Rules (HAR) includes a section on noise control (Title 11 - Department of Health, Chapter 46 – Community Noise Control). The purpose is to define maximum permissible sounds levels, and to provide for the prevention, control, and abatement of noise pollution in Hawaii from stationary noise, construction and agricultural equipment, and industrial activities. The maximum permissible sound levels are shown in **Table 3-1**. Backup alarm devices on construction equipment that is required by federal or State occupational safety and health regulations are exempt from complying with the maximum noise levels. The HAR also state that all construction equipment should include mufflers, except pile hammers and pneumatic hand tools.

The Director of the DOH may grant a permit to operate excessive noise sources that exceed the maximum permissible noise levels. The permit application should include, but is not limited to, an assessment of best available control technology and disclosure of nighttime impacts.

TABLE 3-1: MAXIMUM PERMISSIBLE SOUND LEVELS

Zoning District	Daytime (dBA) (7:00 a.m. to 10:00 p.m.)	Nighttime (dBA) (10:00 p.m. to 7:00 a.m.)
Class A	55	45
Class B	60	50
Class C	70	70

Notes:
Class A: Lands zoned residential, conservation, preservation, public space, open space, or similar type.
Class B: Lands zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type.
Class C: Lands zoned agriculture, country, industrial, or similar type.
The sound levels apply to any excessive noise source emanating within the specified zoning district, and at any point at or beyond the property line.
Noise levels shall not exceed the maximum permissible sound levels for more than ten percent of the time within any twenty minute period, except by permit or variance.
For mixed zoning districts, the primary land use designation shall be used to determine the applicable zoning district.
The maximum permissible sound level for impulsive noise shall be ten dBA above the maximum permissible sound levels.
SOURCE: Hawaii Administrative Rules, Title 11, Chapter 45.

3.2 VIBRATION

Characteristics of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

Vibration Definitions

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe

[3] Hawaii State Department of Health, *Noise Reference Manual*, Oahu Edition, February, 2008.

the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.[4]

Effects of Vibration

High levels of vibration may cause physical personal injury or damage to buildings. However, ground-borne vibration levels rarely affect human health. Instead, most people consider ground-borne vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of ground-borne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to ground-borne vibration (e.g., electron microscopes).

Perceptible Vibration Changes

In contrast to noise, ground-borne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower, well below the threshold of perception for humans which is around 65 RMS.[5] Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

Applicable Regulations

Neither the State of Hawaii nor the City and County of Honolulu has vibration standards. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, engineered concrete and masonry buildings (no plaster) can be exposed to can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage. Non-engineered timber and masonry buildings can be exposed to ground-borne vibration levels of 0.2 inches per second and buildings extremely susceptible to vibration damage can be exposed to ground-borne vibration levels of 0.12 inches per second without experiencing structural damage.[6]

[4]Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.
[5]*Ibid.*
[6]*Ibid*.

4.0 EXISTING SETTING

4.1 EXISTING NOISE ENVIRONMENT

The surrounding area has a mix of mostly low-income rental units and single-family residences; various businesses including several gas stations, restaurants, and civic institutions, including several churches and schools such as Lanakila Elementary School across Lanakila Avenue and Likelike Elementary School across School Street.

Noise generators in the vicinity of the Preferred Alternative include nearby roadways, Honolulu International Airport (HNL) and the H1 Freeway. A suitable location for a 24-hour measurement on the project site was not identified so a series of short-term measurements were used to calculate the L_{dn}. This methodology is described on page D-3 of the FTA *Transit Noise and Vibration Impact Assessment* guidance.[7] A series of 15-minute sound measurements were taken using a Type 1 SoundPro DL Sound Level Meter on Tuesday September 5th, 2017 and September 6th, 2017. Noise monitoring locations are shown in **Figure 4-1**. Measurements were taken adjacent to the project site for three different time periods: peak traffic from 5:00 p.m. to 6:00 p.m., midday from 1:00 p.m. to 2:00 p.m., and evening from 10:00 p.m. to 11:00 p.m.

TABLE 4-1: EXISTING MONITORED NOISE LEVELS

Key to Figure 4-1	Noise Monitoring Location	Noise Level (dBA, L_{eq}) PM Peak Traffic	Midday	Evening	Noise Level (dBA, L_{dn})
1	Residence (1536 Iao Ln.)	n/a	54.3	n/a	n/a
2	Project Boundary (Lanakila Ave.)	68.6	62.8	56.1	61.0
3	Project Boundary (School St.)	71.9	67.7	62.6	65.5
4	Residence (1510 Kokea St.)	n/a	61.0	n/a	n/a
5	Residence (1217 Ahiahi St.)	n/a	58.4	n/a	n/a
6	Maluhia Elderly Housing (1111 Hala Dr.)	n/a	63.3	n/a	n/a

n/a = Not Available. Additional monitoring was not necessary at these locations to establish 24-hour noise levels at the project site.
SOURCE: TAHA, 2017.

[7] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

LEGEND

- Project Site
- Noise Assessment Location (NAL)
- Noise Monitoring Location
- Sensitive Receptor

Approximate Scale

0 1,050 2,100 Feet

N

SOURCE: TAHA, 2017.

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HPHA Administrative Offices Redevelopment Project
Noise & Vibration Study

PBR Hawaii & Associates Inc.

FIGURE 4-1

NOISE MONITORING LOCATIONS, NALS AND SENSITIVE RECEPTORS

4.2 EXISTING VIBRATION ENVIRONMENT

There are no stationary sources of vibration located near the project site. Heavy-duty trucks can generate ground-borne vibrations that vary depending on vehicle type and weight, and pavement conditions. Vibration is a high localized event and typically dissipates within a few feet from the source. Based on site visits, vibration levels from adjacent roadways are not typically perceptible at the project site.

4.3 SENSITIVE RECEPTORS

Sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered sensitive and may warrant unique measures for protection from intruding noise. Sensitive receptors near the project site are listed below in **Table 4-2** and shown in **Figure 4-1**.

TABLE 4-2: SENSITIVE RECEPTORS

Key to Figure 4-1	Sensitive Receptor	Distance (feet)	Location
A	Lanakila Multi-Purpose Senior Center	Adjacent	East of the project site along Lanakila Ave.
B	Residences	Adjacent	North and East of the project site.
C	Lanakila District Park	60	South of the project site at the intersection of Lanakila Ave. and School St.
D	Residences	70	West of the project site across School St.
E	Lanakila Health Center	100	East of the project site along Lanakila Ave.
F	Lanikila Elementary School	150	East of the project site along Lanakila Ave.
G	Residences	150	Southwest of the project site at the intersection of Lanakila Ave. and School St.
H	Calvary Assembly of God	300	West of the project site across School St.
I	Residences	320	West of the project site along Lowell Pl. and Kokea St.
J	Residences	320	Southwest of the project site along School St.
K	Residences	350	North of the project site along Pohaku Pl. and Ahiahi St.
L	Residences	400	East of the project site along Hala Dr.
M	Likelike Elementary School	500	Southwest of the project site across School St.
N	Residences	520	South of the project site along Alaneo St.

SOURCE: TAHA, 2017.

The above sensitive receptors represent the nearest noise sensitive receptors with the potential to be impacted by the Preferred Alternative or Alternative 2. Additional sensitive receptors are located further from the project site in the surrounding community within one-quarter mile of the project site and would be less affected than the above sensitive receptors.

5.0 METHODOLOGY AND SIGNIFICANCE CRITERIA

5.1 METHODOLOGY

The analysis considers construction and operational sources of noise and vibration. The noise level during the construction period at each receptor location was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. Operational noise levels were calculated based on information provided in the traffic study and stationary noise sources located on the project site (e.g., mechanical equipment). To assess future noise levels at the project site future traffic noise was predicted using the HUD Day/Night Noise Level Calculator and traffic volumes. The model calculates the Day/Night Noise Level for roadways by taking into account average vehicle speed, distance to receptor, average daily trips, road gradient, average daily trips (ADT) by vehicle type, and the percentage of ADT that occurs between the hours of 10:00 p.m. to 7:00 a.m. Noise assessment locations (NALs) were selected along each side of the project site to represent noise levels that would be experienced by sensitive receptors.

5.2 SIGNIFICANCE CRITERIA

According to the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) §§ 1500-1508), the determination of a significant impact is a function of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Both short- and long-term effects are relevant. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality and sensitivity of the resource involved; the location of the Preferred Alternative; the duration of the effect (short- or long-term) and other consideration of context. Adverse impacts will vary with the setting of the proposed action and the surrounding area. Specific construction and operational impact criteria are listed below.

Construction Noise Adverse Effect Criteria

The alternatives would result in an adverse construction noise effect if:

- Construction activities occur prior to 7:00 a.m. and after 6:00 p.m., Monday through Friday, or before 9:00 a.m. and after 6:00 p.m. on Saturdays, or at any time on Sundays;
- Noise levels exceed the Hawaii State Department of Health *Noise Reference Manual Oahu Edition* maximum noise level of 78 dBA without first obtaining a noise variance; and/or
- Noise levels exceed the maximum Hawaii Administrative Rules noise levels shown in **Table 3-1** without first obtaining a permit from the Director of the DOH.

Operational Noise Adverse Effect Criteria

The alternatives would result in an adverse operational noise effect if:

- Noise levels at proposed residential land uses exceed the HUD exterior noise standard 65 dBA L_{dn}. If this standard is exceeded, further study is required to demonstrate that interior noise levels would not exceed 45 dBA L_{dn};
- Mobile sources cause a 5-dBA or more noise increase along off-site roadway segments, which is considered a noticeable change in noise levels that would likely evoke a community reaction; and/or

- Stationary source noise levels exceed the maximum Hawaii Administrative Rules noise levels shown in **Table 3-1** without first obtaining a permit from the Director of the Department of Health.

Ground-Borne Vibration Adverse Effect Criteria

The alternatives would result in an adverse vibration effect if:

- Vibration levels exceed 0.3 inches per second at off-site engineered concrete and masonry buildings; and/or
- Vibration levels exceed 0.12 inches per second at historic structures.

6.0 ENVIRONMENTAL EFFECTS

6.1 CONSTRUCTION NOISE

Construction activity would result in temporary increases in ambient noise levels in the project area on an intermittent basis. The following analysis applies to both the Preferred Alternative and Alternative 2.

Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers. Typical noise levels from various types of equipment that may be used during construction are listed in **Table 6-1**. The table shows noise levels at distances of 50 and 100 feet from the construction noise source.

TABLE 6-1: MAXIMUM NOISE LEVELS OF COMMON CONSTRUCTION MACHINES

	Noise Level (dBA)	
Noise Source	**50 Feet /a/**	**100 Feet /a/**
Auger Drill Rig	77.4	71.3
Backhoe	73.6	67.6
Compressor (air)	73.7	67.7
Concrete Mixer Truck	74.8	68.8
Concrete Pump Truck	74.4	68.4
Crane	72.6	66.6
Dozer	77.7	71.7
Dump Truck	72.5	66.5
Excavator	76.7	70.7
Flat Bed Truck	70.3	64.3
Front End Loader	75.1	69.1
Gradall	79.4	73.4
Paver	74.2	68.2
Roller	73.0	67.0
Vibratory Pile Driver	93.8	87.8
Welder / Torch	70.0	64.0

/a/ Assumes a 6-dBA drop-off rate for noise generated by a “point source” and traveling over hard surfaces.
SOURCE: Federal Highway Administration, *Roadway Construction Noise Model, Version 1.1*, 2008.

Project-related construction noise may contribute to an increase in community noise levels. Instead of a quantitative construction noise threshold, HUD encourages the use of quieter construction equipment and methods in population centers. Construction activity would only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturdays. Noise levels would depend on the construction activity, type of equipment, number of pieces of equipment operating, general condition, length of time each piece would operate per day, the presence or absence of noise-attenuating features such as walls or other intervening structures, and the location of construction noise sources relative to sensitive receptors. **Table 6-1** shows the maximum estimated noise levels that would be generated by the construction equipment at 50 feet during the various stages and the estimated duration of construction. Construction activity would be short-term and intermittent and located within a dense urban environment with many existing sources of noise. In addition, Noise Control Measures **N1** through **N8** would minimize potential adverse effects.

Construction Noise Control Measures

N1 The project applicant shall obtain a noise permit associated with exceeding a noise level of 78 dBA L_{eq} as discussed in the *Noise Reference Manual Oahu Edition*.

N2 The project applicant shall obtain a noise permit associated with exceeding the maximum permissible noise levels discussed in the Hawaii Administrative Rules.

N3 The construction contractor shall use specialty equipment with enclosed engines and/or high-performance mufflers.

N4 The construction contractor shall locate equipment and staging areas as far from noise-sensitive receivers as practicable.

N5 The construction contractor shall limit unnecessary idling of equipment.

N6 The construction contractor shall install temporary noise barriers to enclose stationary noise sources, such as compressors, generators, laydown and staging areas, and other noisy equipment.

N7 Prior to the commencement of construction activities, notification shall be provided to the on-site residential uses that discloses the construction schedule, including the various types of activities and equipment that would be occurring throughout the duration of the construction period.

N8 A “noise disturbance coordinator” shall be established. The noise disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The noise disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall be required to implement reasonable measures such that the complaint is resolved. All notices that are posted at the construction site shall list the telephone number for the noise disturbance coordinator.

6.2 CONSTRUCTION VIBRATION

Preferred Alternative

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods employed. The following analysis applies to both the Preferred Alternative and Alternative 2.

As shown in **Table 6-2**, use of heavy equipment (e.g., a large bulldozer or caisson drilling) typically generates vibration levels of 0.089 inches per second at a distance of 25 feet. Impact pile driving has not been ruled out of construction activities at this time and has been conservatively included in the analysis. Impact pile driving would generate a maximum vibration level of 1.518 inches per second or a typical vibration level of 0.644 inches per second.

TABLE 6-2: VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT		
Equipment		**PPV at 25 feet (Inches/Second) /a/**
Pile Driver (impact)	Upper Range	1.518
	Typical	0.644
Caisson Drilling		0.089
Large Bulldozer		0.089
Loaded Trucks		0.076
/a/ Generally, historic buildings can be exposed to ground-borne vibration levels of 0.12 inches per second without experiencing structural damage. **SOURCE**: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.		

In extreme circumstances, equipment-related vibration can cause building damage. A number of structures abut the project site to the north and east, including the Lanakila Multi-Purpose Senior Center, and single and multi-family residences. Site visits suggest that these buildings were constructed using engineered concrete and masonry. Federal guidance indicates that such buildings can withstand up to 0.3 inches per second without experiencing damage.[8] The use of construction equipment that would produce high levels of vibration, such as large bulldozers, jack hammers, and load trucks, could exceed this criterion if occurring within 11 feet of the buildings. Construction activity would only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturdays. In addition, Vibration Control Measures **N9** through **N11** would minimize potential adverse effects associated with damage to adjacent buildings.

There are also several structures built around the 1940s near the project site along School Street and at the corner of Kokea Street and School Street. Based on site visits, these residences appear to be wood framed residences and are located approximately 50 feet to the west of the project site. Federal guidance indicates that such buildings can withstand up to 0.12 inches per second without experiencing damage.[9] Vibration levels from construction equipment such as a large bulldozer would be 0.0031 at 50 feet and there is no potential for vibration to damage historic structures located at a distance of 22 feet or greater. Vibration Control Measures **N9** through **N11** would minimize potential adverse effects associated with damage at the 1940s era residences.

Construction Vibration Control Measures

N9 Prior to issuance of a grading/shoring permit, a qualified structural engineer shall survey the existing foundation and structural integrity of off-site buildings that will be located within 11 feet of large bulldozers and similar vibration-generating equipment. The survey shall be submitted to the appropriate mitigation monitor. At the conclusion of vibration causing activities, the qualified structural engineer shall issue a follow-on letter describing damage, if any, to the adjacent buildings. The letter shall identify recommendations for any repair, and certify the completion of any repairs as necessary to confirm the integrity of the foundation and structure of the adjacent buildings.

N10 If the construction plans call for high-vibration construction activities being performed close to structures, the contractor may be required to use alternative procedures that produce lower vibration levels. Examples of high-vibration construction activities include the use of pavement breakers, vibratory compaction, and hoe rams next to sensitive buildings. Alternative procedures shall include the use of non-vibratory compaction in

[8] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.
[9] *Ibid*.

limited areas and concrete saws in place of jackhammers or pavement breakers for demolition.

N11 If piles are required to support new structures, pile driving shall be prohibited in place of cast-in-drilled-hole (CIDH) piles or caissons.

6.3 OPERATIONAL NOISE

Land Use Compatibility

The surrounding neighborhood has a mix of residential and commercial uses, churches, community services. A detailed land use compatibility analysis was completed to assess noise level at new residential land uses along heavily traveled roadways. **Table 6-3** shows the monitored exterior noise levels and predicted interior noise levels. Monitored noise level along Lanakila Avenue was less than the 65 dbA L_{dn} exterior standard. However, the monitored noise level along School Street was 65.5 dBA L_{dn}, which currently exceed the exterior noise standard. New construction typically provides at least 26 dBA exterior-to-interior noise reduction.[10] With this reduction, it is anticipated that interior noise levels at new residences would be less than the 45 dBA L_{dn} standard. In addition, the project is designed such that the majority of exterior useable space would be centrally located away from off-site sources of noise.

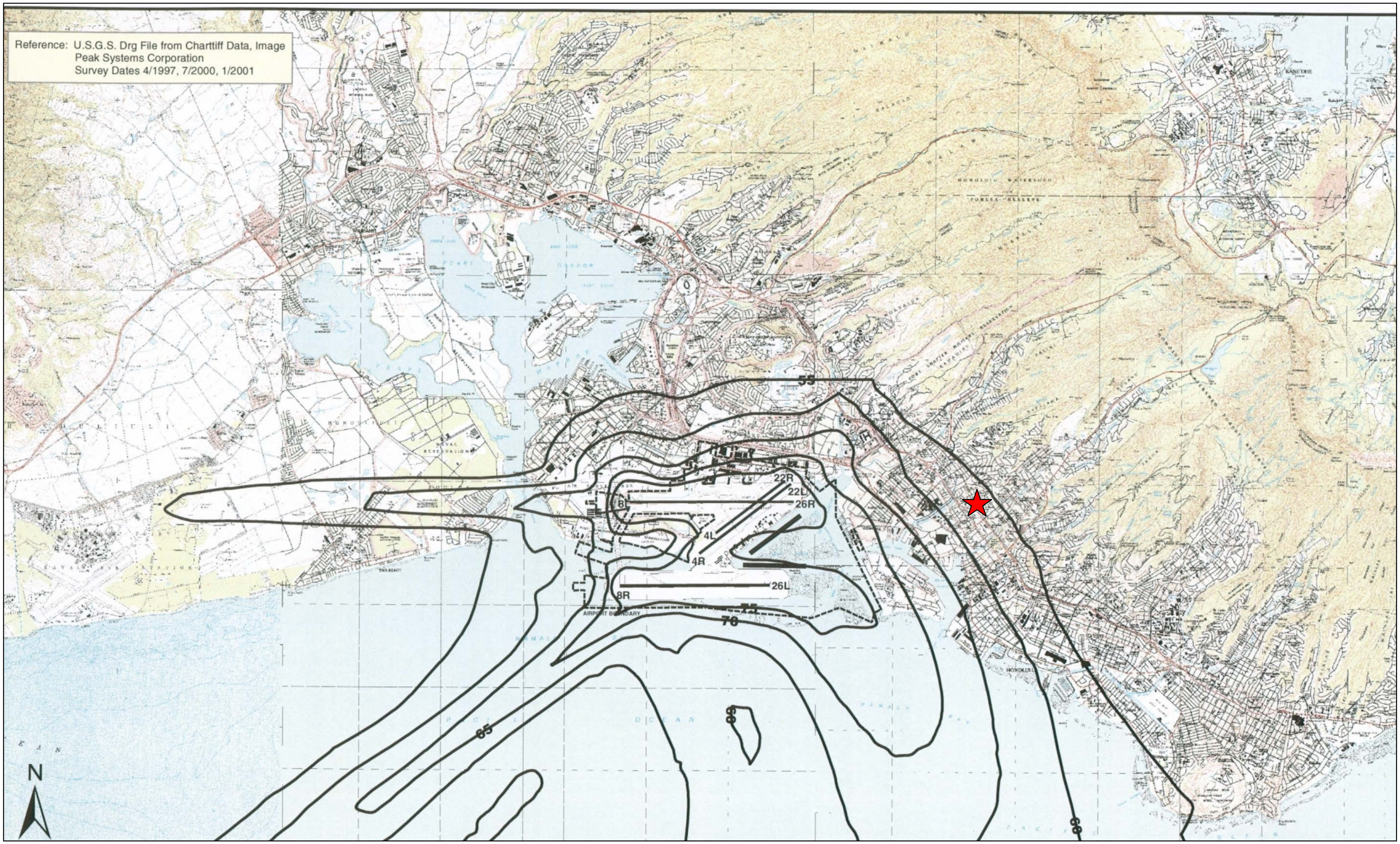
TABLE 6-3: RESIDENTIAL LAND USE COMPATIBILITY ANALYSIS

Roadway Segment	Exterior Noise Level (L_{dn} dBA)	Interior Noise Level (L_{dn} dBA) /a/
Lanakila Ave.	61.0	35.0
School St.	65.5	39.5

/a/ Typical single-pane windows (i.e., 7/16 inches) provide a minimum noise reduction of approximately 26 dBA with windows closed. Window noise reduction can be found in the HUD Noise Notebook, Chapter 4 Supplement, Sound Transmission Class Guidance.
SOURCE: TAHA, 2017; FTA, *Transit Noise and Vibration Impact Assessment Manual*, 2006; HUD, *The Noise Guidebook, Chapter 4 Supplement, Sound Transmission Class Guidance, Page A-25*, March 2009.

The project site is located approximately 2.7 miles from the end of runway 22L and 2.8 miles from the end of Runway 26R of the HNL Airport. This location is within the 55 to 60 dBA L_{dn} noise contour of the HNL 2008 (Forecast) Five Year Noise Exposure Map (**Figure 6-1**). The FAA has published land use compatibility guidelines that can be used to assess potential noise impacts to new development projects.[11] The guidelines indicate that residential land uses exposed to aircraft-related noise levels of less than 65 dBA L_{dn} are compatible with the ambient noise environment. The current HNL noise contours indicate that project site is located in a compatible noise environment related to aircraft activities. In addition, as discussed in Section 4.0 Existing Setting, above, noise monitoring was completed at the project site. The noise monitoring accounted for noise generated by HNL activities in addition to other sources of noise such as roadway traffic. As shown in **Table 6-3**, above, it is estimated the interior noise levels at new residences would range from 35.0 to 39.5 dBA L_{dn}. This would be less than the 45 dBA L_{dn} standard recommended by HUD and residents would not be exposed to excessive 24-hour noise.

[10] HUD, *The Noise Guidebook, Chapter 4 Supplement, Sound Transmission Class Guidance, page A-25*, March 2009.
[11] FAA, *1050.1F Desk Reference, Chapter 11 - Noise and Noise-Compatible Land Use*, July 2015.



LEGEND

Project Site

Not to Scale

SOURCE: State of Hawaii, Department of Transportation, Airports Division, *2008 (Forecast) Five Year Noise Exposure Map*, 2008.

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HPHA Administrative Offices Redevelopment Project
Noise & Vibration Study

PBR Hawaii & Associates Inc.

FIGURE 6-1

HONOLULU INTERNATIONAL AIRPORT
NOISE EXPOSURE MAP

It is acknowledged that single-event noise would be audible at the project site depending on multiple variables, including time of day and type of plane. Single event noise levels represent the noise generated by a single aircraft overflight. Specifically, it is a measure the total noise energy from an overflight at a specific location. When excessive, single event noise activities can cause speech interference, sleep disturbance, and other negative effects. For aircraft noise, single event noise levels are typically about 10 dB higher than the maximum (L_{max}) noise levels. The L_{max} represents the maximum instantaneous noise energy at a specific location. The highest L_{max} monitored at the project site was 87.1 dBA, which results in a single event noise level of approximately 97.1 dBA. During the noise monitoring process, single event noise was not noted as being excessive during day or night time periods. In addition, as previously discussed, it is anticipated that interior noise levels would be consistent with applicable HUD standards for new residential development. While noise mitigation measures may not be mandated in the design of the project, the applicants and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations.

Preferred Alternative Transportation Noise

Traffic will be the dominant noise source during project operation. The Preferred Alternative would generate approximately 2,896 net new vehicles trips, with approximately 357 AM peak hour trips (147 net new AM peak hour trips) and 502 PM peak hour trips (227 net new PM peak hour trips). A comparison between the future year without project and future year with project scenarios was conducted for the analysis. **Table 6-4** shows anticipated noise levels. **Figure 4-1**, above shows the NALs. The Preferred Alternative maximum contribution to increasing noise levels in the year 2029 would occur at NAL 11, with an increase of 0.5 dBA L_{dn} above future without project noise levels. The Preferred Alternative's contribution to mobile source noise levels would be would be less than 5 dBA would not result in an adverse effect related to increasing noise levels at on-site or off-site sensitive receptors.

TABLE 6-4: FUTURE 2029 NOISE LEVELS – PREFERRED ALTERNATIVE

	Estimated dBA, L_{dn}			
NAL	**Future Without Project**	**Future With Project**	**Increase**	**Exceed 5 dBA Increase?**
1	73.1	73.1	0	No
2	68.0	68.0	0	No
3	72.0	72.1	0.1	No
4	57.9	57.9	0	No
5	67.3	67.4	0.1	No
6	71.9	72.0	0.1	No
7	57.5	57.8	0.3	No
8	59.5	59.7	0.2	No
9	63.0	63.1	0.1	No
10	62.8	63.2	0.4	No
11	56.1	56.6	0.5	No
12	74.1	74.1	0	No

SOURCE: TAHA, 2017.

Alternative 2 would generate approximately 4,305 net new vehicles trips, with approximately 535 AM peak hour trips (273 AM net new peak hour trips) and 706 PM peak hour trips (372 PM net new peak hour trips). A comparison between the future year without project and future year with project scenarios was conducted for the analysis.

Table 6-5 shows anticipated noise levels. **Figure 4-1**, above shows the NALs. The Alternative 2 maximum contribution to increasing noise levels in the year 2029 would occur at NAL 7, with an increase of 0.5 dBA L_{dn} above future without project noise levels. Alternative 2's contribution to mobile source noise levels would be would be less than 5 dBA would not result in an adverse effect related to increasing noise levels at on-site or off-site sensitive receptors.

TABLE 6-5: FUTURE 2029 NOISE LEVELS – ALTERNATIVE 2

	Estimated dBA, L_{dn}			
NAL	**Future Without Project**	**Future With Project**	**Increase**	**Exceed 5 dBA Increase?**
1	73.1	73.2	0.1	No
2	68.0	68.0	0	No
3	72.0	72.1	0.1	No
4	57.9	57.9	0	No
5	67.3	67.4	0.1	No
6	71.9	72.0	0.1	No
7	57.5	58.0	0.5	No
8	59.5	59.8	0.3	No
9	63.0	63.2	0.2	No
10	62.8	62.9	0.1	No
11	56.1	56.3	0.2	No
12	74.1	74.1	0	No

SOURCE: TAHA, 2017.

Stationary Noise

The primary stationary source of noise would be the operation of ventilation and air conditioning systems. The precise location of these systems is unknown at this time as detailed site plans have not been developed. Possible locations include street level and rooftops. Mechanical equipment such as ventilation and air conditioning systems typically generate noise levels of approximately 60 dBA L_{eq} at 50 feet without enclosures. Enclosures typically reduce noise levels by at least 10 dBA. Noise generated by mechanical equipment must meet the maximum permissible noise limits shown in **Table 3-1**. Modern developments typically include enclosed or fully shielded from view mechanical equipment. In addition, Noise Control Measure **N12** would ensure noise levels would be consistent with noise regulations.

Operational Noise Control Measures

N12 The project applicant shall require mechanical equipment (e.g., ventilation and air conditioning systems) to be enclosed such that noise levels do not exceed the maximum permissible noise levels listed in the Hawaii Administrative Rules.

6.4 OPERATIONAL VIBRATION

Neither the Preferred Alternative nor Alternative 2 would include significant stationary sources of ground-borne vibration. Operational ground-borne vibration in the project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, project-related traffic vibration levels would not be perceptible outside the roadway right-of-way. Therefore, neither the Preferred Alternative nor Alternative 2 would result in adverse effect related to the operational vibration.

7.0 CUMULATIVE EFFECTS

7.1 Federal

The National Environmental Policy Act (NEPA) requires that any agency proposing a major federal action, which may significantly affect the environment, consider the environmental impacts of the proposed action, any unavoidable adverse environmental impacts, and the relationship between local short term uses and long term productivity of the environment (42 United States Code 4332(c)). There are three types or categories of effect that must be considered during the NEPA process: direct, indirect, and cumulative (40 CFR 1508.25). A direct effect is one which is caused directly by our activities, at the same time, and in the same place. An indirect effect is a reasonably foreseeable effect caused by the proposed action or alternatives, but occurs later in time or are further removed from the project site than a direct effect. “Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate,” and related effects on resources (40 CFR 1508.8(b)). A cumulative effect is an “impact on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions” (40 CFR 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7).

A cumulative effects analysis is required whenever an Environmental Impact Statement is prepared in accordance with NEPA. A project must have a direct and/or indirect effect on a specific resource to exert a cumulative influence. If no direct and/or indirect effect to a specific resource is expected, there is no need to consider cumulative effects to that resource. As previously discussed, neither alternative would result in an adverse noise or vibration effect. Therefore, a cumulative effect would not occur under NEPA regulations.

7.2 State

Section 11-200-2 of the Hawaii Administrative Rules contains the definition of a “cumulative impact” for Environmental Impact Statements. A “cumulative impact” is defined as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Noise and vibration generated by either the Preferred Alternative or Alternative 2 would generally be contained to the project site and unlikely to interact with past, present, and reasonably foreseeable future actions in the immediate vicinity to increase noise and vibration. Project-related vehicle trips would combine with past, present, and reasonably foreseeable future actions to increase traffic noise on the roadway network. **Tables 6-4** and **6-5**, above, include noise levels associated with traffic growth unrelated to the Preferred Alternative and Alternative 2 in year 2029, respectively. The analysis demonstrates that a cumulative increase in traffic volumes would not result in an adverse effect resulting from an off-site mobile noise level increase. Therefore, a cumulative effect would not occur under State regulations.

APPENDIX J

Air Quality Survey

HPHA ADMINISTRATIVE OFFICES REDEVELOPMENT PROJECT

AIR QUALITY STUDY

Prepared for

PBR HAWAII AND ASSOCIATES INC.

Prepared by

TERRY A. HAYES ASSOCIATES INC.

NOVEMBER 2017

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1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. (TAHA) has completed an Air Quality Study for the Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment Project. Key findings are listed below.

- Construction activity would result in temporary emissions from construction vehicle exhaust, as well as fugitive dust emissions due to ground disturbance. Neither the Preferred Alternative nor Alterative 2 would result in an adverse effect related to construction air quality. However, the following control measures are recommended to reduce fugitive dust emissions.

  AQ1 The construction contractor shall use water or suitable chemicals to control fugitive dust in the demolition of any existing buildings or structures, construction operations, the grading of roads, or the clearing of land.

  AQ2 The construction contractor shall apply asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces which may result in fugitive dust.

  AQ3 The construction contractor shall cover all moving, open-bodied trucks transporting materials which may result in fugitive dust.

  AQ4 The construction contractor shall maintain roadways in a clean manner.

  AQ5 The construction contractor shall promptly remove earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means.

Air Quality Control Measures **AQ6** through **AQ9** are recommended to reduce pollutant exposure to residences residing on the project site during construction activities.

  AQ6 Staging areas shall be located away from on-site residential land uses.

  AQ7 On-site electricity shall be obtained from the electrical grid rather than temporary diesel or gasoline generators.

  AQ8 Equipment and vehicle engines shall be maintained in good condition and in proper tune per manufacturers' specifications.

  AQ9 All construction equipment and delivery vehicles shall be turned off when not in use or prohibit idling in excess of five minutes. Haul trucks in particular that stage waiting to be called to remove dirt from the site shall not be allowed to idle while queuing.

- The maximum existing peak hour intersection volume in the project area is 4,893 AM trips at the intersection of Kalihi Street and North School Street. Peak hour volumes at this intersection would be 5,286 vehicles in 2029 under the Preferred Alternatives and 5,317 vehicles under Alternative 2. This represents an increase of approximately eight percent relative to existing conditions. An eight percent incremental increase in intersection volumes would not have the potential to exceed any applicable ambient air quality standards. Therefore, neither the Preferred Alternative nor Alterative 2 would result in adverse effect related to regional operational emissions.

- The Preferred Alternative or Alterative 2 would result indirect greenhouse gas (GHG) emissions through electricity generation at an off-site facility, water distribution to the future structures, and on-road mobile sources associated with vehicle trips. As of April 5, 2017, the CEQ has withdrawn its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act (NEPA) Reviews," for which a Notice of Availability was originally published on August 5, 2016. Therefore, no guidance currently exists for addressing GHG emissions and climate change under NEPA.

- Neither the Preferred Alternative nor Alterative 2 would interfere with the development of clean energy supplies and would not include a substantial on-site source of GHG emissions. The Preferred Alternative or Alterative 2 would locate in-fill development near existing public transportation and shopping areas, thereby reducing mobile source emissions compared to development located outside of urban areas. Energy conservation features and in-fill development benefits would ensure that the neither the Preferred Alternative nor Alterative 2 would result in a significant GHG impact.

2.0 INTRODUCTION

2.1 PURPOSE

The purpose of this report is to evaluate the potential for adverse air quality effects. Air quality emissions are assessed for construction and operational activities. Air quality control measures are recommended when appropriate to reduce emissions. Both short-term construction emissions occurring from activities such as site grading and haul truck trips, and long-term effects related to the ongoing operation are discussed in this section. This analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the quantity of pollutant released into the air, measured in pounds per day (ppd) or tons per year (tpy). "Concentrations" refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

2.2 PROJECT DESCRIPTION

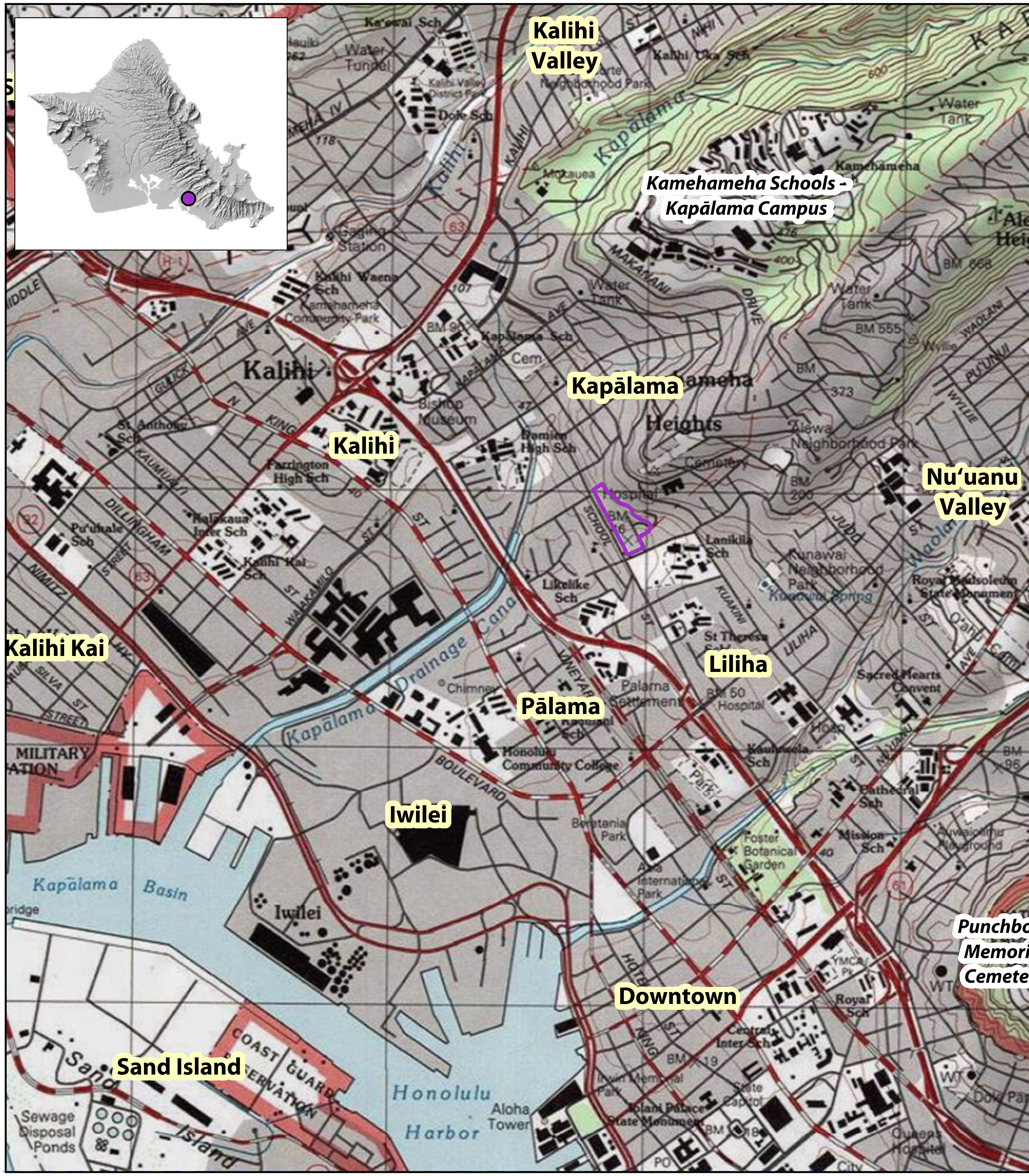
HPHA has partnered with Retirement Housing Foundation under a predevelopment agreement to redevelop the existing HPHA administrative offices into a mixed-use, mixed-income community to increase the amount of affordable housing near bus transit. Vehicle access to the Site is currently from North School Street, Lanakila Avenue, and Ahiahi Street. In order to provide new residential housing, the existing administrative offices of HPHA will be demolished. Proposed elements of the Preferred Alternative include:

- Replacement of HPHA administrative office building;
- Construction 1,000 senior housing rental units;
- Development of 10,000 square feet of ground floor retail space;
- Parking for new HPHA administrative office building and the rental housing units and retail;
- Leadership in Energy and Environmental Design (LEED) certification;
- Vehicle access via existing driveways; and
- Open spaces and new landscaping.

Proposed elements of Alternative 2 include:

- Replacement of HPHA administrative office building;
- Construction of 600 mixed-income (affordable and market-priced) rental units;
- Construction of 400 senior housing rental units;
- Development of 10,000 square feet of ground floor retail space;
- Parking for new HPHA administrative office building and the rental housing units and retail;
- LEED certification;
- Vehicle access via existing driveways; and
- Open spaces and new landscaping.

The project site is located in Honolulu on the island of Oahu. The project site is bounded by North School Street on west and Lanakila Avenue on the south. The H1 Freeway is located approximately 0.25 mile west of the project site and would provide residents living in the future project with access to jobs in Kapolei, Pearl City, Aiea and Pearl Harbor, as well as areas Diamond Head of downtown Honolulu. The location of the project site is shown in **Figure 2-1** and the site plan is shown in **Figure 2-2**.



LEGEND

Project Site

N

Not to Scale

SOURCE: PBR Hawaii & Associates Inc., 2017.

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HPHA Administrative Offices Redevelopment Project
Air Quality Study

PBR Hawaii & Associates Inc.

FIGURE 2-1

PROJECT LOCATION

LEGEND

Project Site

Not to Scale

N

SOURCE: Design Partners Inc., Concordia LLC, and PBR Hawaii & Associates Inc., 2017.

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HPHA Administrative Offices Redevelopment Project
Air Quality Study

PBR Hawaii & Associates Inc.

FIGURE 2-2

SITE PLAN

3.0 TOPICAL BACKGROUND & REGULATORY FRAMEWORK

This section provides an overview of how ambient air quality is characterized and the applicable regulations that have been established to protect public health and the environment, as well as a discussion of GHG emissions, how they contribute to climate change, and the regulatory framework developed to reduce GHG emissions. According to the Hawaii Department of Health (DOH), air pollution is a general term that refers to the presence in the outdoor air of substances in quantities and for durations which may endanger human health or welfare, plant or animal life, or property; or which may reasonably interfere with the comfortable enjoyment of life and property.

Through extensive scientific research, specific chemical substances have been identified as air pollutants that are known to cause adverse health effects and degradation of environmental quality. Concentrations of the following pollutants in ambient air are regulated at the federal and state level to protect public health and the environment. A separate discussion of GHG emissions and climate change is provided subsequently.

3.1 AIR POLLUTANTS

Ozone (O_3). O_3, or smog, is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between reactive organic gases (ROG) and nitrogen oxides (NO_X) in the presence of sunlight. O_3 formation is greatest on warm, windless, sunny days. The main sources of NO_X and ROG, often referred to as O_3 precursors, are combustion processes (including motor vehicle engines) the evaporation of solvents, paints, and fuels, and biogenic sources.

Automobiles are the single largest source of O_3 precursors. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 miles per hour (mph), then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds.

O_3 levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis and emphysema. Chronic exposure to high O_3 levels can permanently damage lung tissue. O_3 can also damage plants and trees, and materials such as rubber and fabrics.

Nitrogen Dioxide (NO_2). NO_2 is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Carbon Monoxide (CO). CO is an odorless, colorless gas formed by the incomplete combustion of fuels. The single largest source of CO is motor vehicles. Emissions are highest during cold starts, hard acceleration, stop-and-go driving, and when a vehicle is moving at low speeds. New findings indicate that CO emissions per mile are lowest at about 45 mph for the average light-duty motor vehicle and begin to increase again at higher speeds. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.

Sulfur Dioxide (SO_2). SO_2 is a colorless acid gas with a pungent odor. It has potential to damage materials and it can have health effects at high concentrations. It is produced by the combustion of sulfur-containing fuels, such as oil, coal and diesel. SO_2 can irritate lung tissue and increase the risk of acute and chronic respiratory disease.

Particulate Matter. Particulate matter refers to a wide range of solid or liquid particles in the atmosphere, including smoke, dust, aerosols, and metallic oxides. Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. $PM_{2.5}$ includes a subgroup of finer particles that have an aerodynamic diameter of 2.5 micrometers or less. Some particulate matter, such as pollen, is naturally occurring. Most particulate matter is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. PM_{10} is of concern because it bypasses the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The U.S. Environmental Protection Agency (USEPA) revised their PM standards to apply only to these fine particles. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Lead (Pb). Pb is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of Pb emissions. The highest levels of Pb in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient Pb concentrations in the air. In the early 1970s, the USEPA set national regulations to gradually reduce the Pb content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants (TACs). In addition to the criteria air pollutants listed above, another group of pollutants, commonly referred to as TACs or hazardous air pollutants can result in health effects that can be quite severe. Many TACs are confirmed or suspected carcinogens, or are known or suspected to cause birth defects or neurological damage. In addition, many TACs can be toxic at very low concentrations. For some chemicals, such as carcinogens, there are no thresholds below which exposure can be considered risk-free.

Industrial facilities and mobile sources are significant sources of TACs. The electronics industry, including semiconductor manufacturing, has the potential to contaminate both air and water due to the highly toxic chlorinated solvents commonly used in semiconductor production processes. Sources of TACs go beyond industry. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene.

Odors and Dust. Other air quality issues of concern include nuisance impacts of odors and dust. Objectionable odors may be associated with a variety of pollutants. Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries and chemical plants. Similarly, nuisance dust may be generated by a variety of sources including quarries, agriculture, grading and construction. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to anger and concern over possible health effects among the public.

3.2 AIR QUALITY REGULATORY FRAMEWORK

Federal Regulations

United States Environmental Protection Agency (USEPA). At the federal level, the USEPA has been charged with implementing national air quality programs. The USEPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and most recently in 1990. The FCAA required the USEPA to establish primary and secondary National Ambient Air Quality Standards (NAAQS)—concentrations of pollutants not to be exceeded—shown below in **Table 3-1**. The NAAQS were devised to protect public health, reduce smog, and prevent degradation of environmental quality. Attainment of the NAAQS is achieved by demonstrating that measured concentrations of criteria pollutants for a region remained below the designated thresholds over a period of three years. The attainment status is shown in **Table 3-1**.

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. USEPA has responsibility to review all state SIPs to determine conformation to the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the USEPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Federal Hazardous Air Pollutant Program. Title III of the FCAAA requires the USEPA to promulgate National Emissions Standards for Hazardous Air Pollutants (NESHAPs). The emissions standards were promulgated in two phases. In the first phase, the USEPA developed technology-based emission standards designed to produce maximum emission reductions. These standards are generally referred to as requiring Maximum Achievable Control Technology (MACT). In the second phase, the USEPA set health risk–based emissions standards to address risks remaining after implementation of the technology-based NESHAP standards. The FCAAA required the USEPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene.

Mobile Source Air Toxics (MSAT). The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources on March 29, 2001. USEPA examined the impacts of existing and newly promulgated mobile source control programs, including: reformulated gasoline; national low emission vehicle standards; Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements; proposed heavy duty engine and vehicle standards; and on-highway diesel fuel sulfur control requirements. The Federal Highway Administration Projects that even with a substantial increase in vehicle miles traveled between 2000 and 2020 that these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 to 65 percent, and will reduce on-highway diesel particulate matter emissions by 87 percent. As a result, USEPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs.

State Regulations

Hawaii Department of Health (DOH). The DOH Clean Air Branch is responsible for air pollution control in the State. The primary services of the branch are provided by its three sections: Engineering, Monitoring, and Enforcement. These sections conduct engineering analysis and permitting, perform monitoring and investigations, and enforce the federal and State air pollution control laws and regulations. The DOH Hawaii Administrative Rules (HAR) includes two chapters representing the Clean Air Branch. Chapter 59 identifies State ambient air quality standards (**Table 3-1**), and Chapter 60 discusses air pollution control methodology. Chapter 60 includes air permitting, sampling, modeling, and fugitive dust and motor vehicle provisions.

Chapter 60 §11-60.1-33 includes the following fugitive dust prohibitions:

- No person shall cause or permit visible fugitive dust to become airborne without taking reasonable precautions. Examples of reasonable precautions are:
  - Use of water or suitable chemicals for control of fugitive dust in the demolition of any buildings or structures, construction operations, the grading of roads, or the clearing of land;
  - Application of asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces which may result in fugitive dust;
  - Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Reasonable containment methods shall be employed during sandblasting or other similar operations;
  - Covering all moving, open-bodied trucks transporting materials which may result in fugitive dust;
  - Conducting agricultural operations, such as tilling of land and the application of fertilizers, in such manner as to reasonably minimize fugitive dust;
  - Maintenance of roadways in a clean manner; and
  - Prompt removal of earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means.

- Except for persons engaged in agricultural operations or persons who can demonstrate to the director that the best practical operation or treatment is being implemented, no person shall cause or permit the discharge of visible fugitive dust beyond the property lot line on which the fugitive dust originates.

TABLE 3-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

Pollutant	Averaging Period	Hawaii Standard	Hawaii Attainment Status	Federal Standard	Federal Attainment Status
Ozone (O_3)	1-hour Average	--	Attainment	--	--
	8-hour Average	0.08 ppm	Attainment	0.070 ppm (137 µg/m^3)	Attainment
Respirable Particulate Matter (PM_{10})	24-hour Average	150 µg/m^3	Attainment	150 µg/m^3	Attainment
	Annual Arithmetic Mean	50 µg/m^3	Attainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour Average	--	--	35 µg/m^3	Attainment
	Annual Arithmetic Mean	--	--	15 µg/m^3	Attainment
Carbon Monoxide (CO)	8-hour Average	4.4 ppm	Attainment	9 ppm (10 mg/m^3)	Attainment
	1-hour Average	9 ppm	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.04 ppm	Attainment	53 ppb (100 µg/m^3)	Attainment
	1-hour Average	--	Attainment	100 ppb (188 µg/m^3)	Unclassified
Sulfur Dioxide (SO_2)	24-hour Average	0.14 ppm	Attainment	--	--
	3-hour Average	0.5 ppm	--	0.5 ppm (1,300 µg/m^3)	--
	1-hour Average	--	--	75 ppb (196 µg/m^3)	Attainment
	Annual Arithmetic Mean	0.03 ppm	Attainment	--	--
Lead (Pb)	30-day average	1.5 µg/m^3	Attainment	--	--
	Calendar Quarter	1.5 µg/m^3	--	1.5 µg/m^3	Attainment
	Rolling 3-Month Average	--	--	0.15 µg/m^3	--
Hydrogen Sulfide (H_2S)	1-hour Average	0.025 ppm	Attainment	--	--

SOURCE: State of Hawaii Department of Health, *State of Hawaii Annual Summary 2015 Air Quality Data*, December 2016.

In regards to motor vehicles, Chapter 60 §11-60.1-34 includes the following:

- No person shall operate a gasoline-powered motor vehicle which emits visible smoke while upon streets, roads, or highways.
- No person shall operate a diesel-powered motor vehicle which emits visible smoke for a period of more than five consecutive seconds while upon streets, roads, or highways.

- No person shall cause, suffer, or allow any engine to be in operation while the motor vehicle is stationary at a loading zone, parking or servicing area, route terminal, or other off street areas, except:
  - During adjustment or repair of the engine at a garage or similar place of repair;
  - During operation of ready-mix trucks, cranes, hoists, and certain bulk carriers, or other auxiliary equipment built onto the vehicle or equipment that require power take-off from the engine, provided that there is no visible discharge of smoke and the equipment is being used and operated for the purposes as originally designed and intended. This exception shall not apply to operations of air conditioning equipment or systems;
  - During the loading or unloading of passengers, not to exceed three minutes; and
  - During the buildup of pressure at the startup and cooling down at the closing down of the engine for a period of not more than three minutes.
- No person shall remove, dismantle, fail to maintain, or otherwise cause to be inoperative any equipment or feature constituting an operational element of the air pollution control system or mechanism of a motor vehicle as required by the provisions of the Act except as permitted or authorized by law.

3.3 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Cumulative GHG emissions are believed to contribute to an increased greenhouse effect and global climate change, which may result in sea level rise, changes in precipitation, habitat, temperature, wildfires, air pollution levels and changes in the frequency and intensity of weather-related-events. While criteria pollutants and TACs are pollutants of regional and local concern, GHG are global pollutants. The primary land-use related GHG are carbon dioxide (CO_2), methane (CH_4) and nitrous oxides (N_2O). The individual pollutant's ability to retain infrared radiation represents its "global warming potential" and is expressed in terms of CO_2 equivalents; therefore, CO_2 is the benchmark having a global warming potential of one. Methane has a global warming potential of 28 and thus has a 28 times greater global warming effect per metric ton of CH_4 than CO_2. N_2O has a global warming potential of 265. GHG emissions are generally expressed in units of annual metric tons of CO_2 equivalents (i.e., $MTCO_2e$/year).

3.4 CLIMATE CHANGE REGULATORY FRAMEWORK

International Regulations

A new international climate change agreement was adopted at the Paris United Nations Framework Convention on Climate Change conference in December 2015. The last two climate conferences in Warsaw (2013) and Lima (2014) decided that countries were to submit their proposed emissions reduction targets for the 2015 conference as "intended nationally determined contributions" prior to the Paris conference. The European Union has committed to an economy-wide, domestic GHG reduction target of 40 percent below 1990 levels by 2030. These targets are set with the goal of limiting global temperature rise to well below 2 degrees Celsius and getting to the 80 percent emission reduction by 2050.

Federal Regulations

The United States Supreme Court ruled in *Massachusetts v. EPA, 127 S.Ct. 1438*, that CO_2 and other GHGs are pollutants under the FCAA, which the USEPA must regulate if it determines they pose an endangerment to public health or welfare. On December 7, 2009, the USEPA made two distinct findings: 1) that the current and projected concentrations of the six key GHGs

(CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations; and 2) that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

On June 23, 2014, the U.S. Supreme Court ruled in *Utility Air Regulatory Group v. EPA* that the USEPA exceeded its statutory authority under the FCAA when it determined that stationary source emissions of GHGs would trigger permitting obligations under the Prevention of Significant Deterioration (PSD) program and Title V of the FCAA. The Court, however, upheld those portions of USEPA's rulemaking that require a source to apply best available control technology (BACT) to GHG emissions where the source would otherwise trigger PSD permitting on account of its emissions of other pollutants. The Supreme Court's decision was limited to USEPA's regulation of GHG emissions under the PSD and Title V provisions of the FCAA, and it left unanswered other questions regarding USEPA's permitting and BACT authority under the PSD program, and the USEPA's efforts to regulate GHG emissions from stationary sources.

State Regulations

In 2007, Hawaii became the second State in the nation to set a binding cap on GHG emissions through Act 234: Hawaii’s Climate Change Law, which declared a policy to reduce GHG emissions statewide to 1990 levels by the year 2020. Act 234 served as the foundation for the Hawaii Greenhouse Gas Program, which was established by the DOH to combat the threat of climate change and sea level rise. This Program utilizes the Air Pollution Control Permit process of DOH’s Clean Air Branch to regulate GHG emissions statewide, in conjunction with other federal and Hawaii State programs to mitigate GHGs. Parts of Act 234 are codified in Chapter 342B (Air Pollution Control) of the Hawaii Revised Statutes.

Senate Bill (SB) 559, which was signed into law on June 8, 2017, expands strategies and mechanisms to reduce GHG emissions in alignment with the principles and goals adopted in the Paris Agreement, discussed above. SB 559 documents the State's commitment to combat climate change by systematically reducing GHG emissions and improving resiliency to climate change aligned with the principles and goals set by the Paris Agreement. It expands on strategies and mechanisms to reduce GHG emissions through the reduction of energy use, adoption of renewable energy, and control of air pollution among all agencies, departments, industries, and sectors, including transportation. SB 559 states that, "Such strategies and mechanisms shall utilize the best available science, technologies, and policies to reduce GHG emissions and shall be closely aligned with the climate change principles and goals adopted in the Paris Agreement and Hawaii's share of obligations within the expectations apportioned to the United States in the Paris Agreement, regardless of federal action. In addition, "The State shall strive to formulate and communicate long-term low greenhouse gas emission development strategies and shall take actions to conserve and enhance long-term sinks and reservoirs of greenhouse gases, by prioritizing the development of parks, greenways, and restoration of native upland and coastal forests and wetlands."

4.0 EXISTING ENVIRONMENTAL SETTING

4.1 AIR POLLUTION CLIMATOLOGY

Air quality in the vicinity of the project site is generally considered to be good due to the presence of northeasterly trade winds that tend to disperse pollutants seaward. As shown in **Table 3-1**, the project area is currently designated as being in attainment of all applicable ambient air quality standards. Air pollutant emissions from nearby sources such as the H1 Freeway, Honolulu International Airport (HNL), and the Honolulu Harbor are blown offshore in the opposite direction of the project site and do not pose environmental concerns with regards to degradation of air quality.

4.2 LOCAL CLIMATE

The annual average temperature in the project area is 75.3 degrees Fahrenheit (ºF). The project area experiences an average winter temperature of approximately 72.6ºF and an average summer temperature of approximately 77.7ºF. Annual average wind speed in the project area is approximately 11.5 mph. Total precipitations in the project area averages approximately 26.4 inches annually. Precipitation averages approximately 11.0 inches during the winter, approximately 6.8 inches during the spring, approximately 6.3 inches during the fall, and 2.3 inches during the summer.[1]

4.3 AIR MONITORING DATA

The Island of Oahu has four active air monitoring stations, with the nearest air monitoring station to the project area being in Honolulu at 1250 Punchbowl Street on the top of the DOH building, which is located approximately one mile south-southeast of the project site. The Honolulu monitoring station measures concentrations of CO, SO_2, PM_{10}, and $PM_{2.5}$. The most recent period of air monitoring data available is from 2013–2015, which was published in the *State of Hawaii Annual Summary 2015 Air Quality Data* Report.[2] During the period from 2013 to 2015, the Honolulu monitoring station did not record any violations of the NAAQS for CO, SO_2, PM_{10}, or $PM_{2.5}$ over any averaging period, as shown in **Table 4-1**. The results of the monitoring period reflect consistency with the attainment designations presented in **Table 3-1** and the general perception that regional air quality in the vicinity of Honolulu is healthy.

TABLE 4-1: HONOLULU AIR MONITORING DATA SUMMARY

Pollutant	Standard	Maximum 2013	Maximum 2014	Maximum 2015
CO	9.0 ppm (1-hour) 4.4 ppm (8-hour)	1.6 ppm 1.2 ppm	2.0 ppm 1.0 ppm	1.4 ppm 1.0 ppm
SO_2	0.075 ppm (1-hour) 0.500 ppm (3-hour) 0.140 ppm (24-hour)	0.022 ppm 0.017 ppm 0.005 ppm	0.018 ppm 0.015 ppm 0.008 ppm	0.010 ppm 0.007 ppm 0.003 ppm
PM_{10}	150 μg/m^3 (24-hour) 50 μg/m^3 (Annual)	35 μg/m^3 11μg/m^3	30μg/m^3 13μg/m^3	36 μg/m^3 12 μg/m^3
$PM_{2.5}$	35 μg/m^3 (24-hour) 15 μg/m^3 (Annual)	18 μg/m^3 5.3 μg/m^3	12μg/m^3 4.4 μg/m^3	17 μg/m^3 3.7 μg/m^3

SOURCE: State of Hawaii Department of Health, *State of Hawaii Annual Summary 2015 Air Quality Data*, December 2016.

[1]Western Regional Climate Center, *Historical Climate Information*, http://www.wrcc.dri.edu, October 30, 2017.
[2]State of Hawaii Department of Health, *State of Hawaii Annual Summary 2015 Air Quality Data*, October 30, 2017.

4.4 SENSITIVE RECEPTORS

Sensitive land uses are locations where people reside or where the presence of substantial air pollutant concentrations could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered sensitive and may warrant unique measures for protection from pollutant emissions. Sensitive receptors near the project site are shown in **Table 4-2**.

TABLE 4-2: SENSITIVE RECEPTORS

Sensitive Receptor	Distance (feet)	Location
Lanakila Senior Center	Adjacent	East of the project site along Lanakila Ave.
Lanakila Health Center	Adjacent	East of the project site along Lanakila Ave.
Residences	Adjacent	North and East of the project site
Residences	70	West of the project site across School St.
Lanikila Elementary School	150	East of the project site along Lanakila Ave.
Calvary Assembly of God	300	West of the project site across School St.
Residences	320	West of the project site Along Lowell Pl. and Kokea St.
Residences	320	Southwest of the project site along School St.
Residences	350	North of the project site along Pohaku Pl. and Ahiahi St.
Residences	400	East of the project site along Hala Dr.
Likelike Elementary School	500	Southwest of the project site across School St.
Residences	520	South of the project site along Alaneo St.

SOURCE: TAHA, 2017.

The above sensitive receptors represent the nearest receptors sensitive to detriment of local air quality. Additional sensitive receptors are located further from the project site in the surrounding community within one-quarter mile of the project site and would be less affected than the above sensitive receptors.

5.0 SIGNIFICANCE CRITERIA

According to the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations (CFR) §§ 1500-1508), the determination of a significant impact is a function of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Both short- and long-term effects are relevant. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality and sensitivity of the resource involved; the location of the project; the duration of the effect (short- or long-term) and other consideration of context. Adverse effects will vary with the setting of the proposed action and the surrounding area.

6.0 ENVIRONMENTAL EFFECTS

6.1 CONSTRUCTION AIR POLLUTANT EMISSIONS

Prior to construction, existing structures on the project site would be demolished and the associated materials would be removed. It is possible that the existing structures may contain asbestos, and all demolition projects within the State of Hawaii must notify the DOH prior to commencement of activities. Accordingly, demolition activities associated with the project would be subject to the requirements of Title 11 of the HAR, DOH, Chapter 501, "Asbestos Requirements." The project would complete an Asbestos Renovation/Demolition Survey to determine the potential for the presence of asbestos-containing materials (ACM). Additionally, all demolition and construction activities would adhere to the provisions of the Hawaii DOH Construction & Demolition (C&D) Waste Disposal General Guidance to ensure proper handling of potentially contaminated materials.

Construction activity would generate emissions through the use of heavy-duty construction equipment and through vehicle trips generated by construction workers traveling to and from the project site. Fugitive dust emissions would primarily result from site preparation (e.g., grading) activities. N_20 emissions would primarily result from the use of construction equipment. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions.

Construction activity would occur over the entire six-acre project site. A project site of this size would typically require an equipment inventory including a maximum of two scrapers and two graders to level the surface. This equipment inventory would potentially disturb up to three acres of the project site on a given day and generate up to 10 pounds per day of fugitive dust emissions. Construction emissions would be temporary and are not considered adverse. It is recommended that Air Quality Control Measures **AQ1** through **AQ5** be implemented to ensure accordance with the HAR. Air Quality Control Measures **AQ6** through **AQ9** are recommended to reduce pollutant exposure to residences residing on the project site during construction activities.

Construction Air Quality Control Measures

AQ1 The construction contractor shall use water or suitable chemicals to control fugitive dust in the demolition of any existing buildings or structures, construction operations, the grading of roads, or the clearing of land.

AQ2 The construction contractor shall apply asphalt, water, or suitable chemicals on roads, material stockpiles, and other surfaces which may result in fugitive dust.

AQ3 The construction contractor shall cover all moving, open-bodied trucks transporting materials which may result in fugitive dust.

AQ4 The construction contractor shall maintain roadways in a clean manner.

AQ5 The construction contractor shall promptly remove earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means.

AQ6 Staging areas shall be located away from on-site residential land uses.

AQ7 On-site electricity shall be obtained from the electrical grid rather than temporary diesel or gasoline generators.

AQ8 Equipment and vehicle engines shall be maintained in good condition and in proper tune per manufacturers' specifications.

AQ9 All construction equipment and delivery vehicles shall be turned off when not in use or prohibit idling in excess of five minutes. Haul trucks in particular that stage waiting to be called to remove dirt from the site shall not be allowed to idle while queuing.

6.2 OPERATIONAL AIR POLLUTANT EMISSIONS

Clean Air Act Requirements

Conformity is a requirement of the FCAA (Section 176(c), at 42 United States Code (U.S.C.) 7506(c)), to ensure that federal actions are consistent with the SIP to achieve and maintain NAAQS. Conformity only applies in areas that are designated nonattainment or maintenance for criteria pollutants. The project site is located in an Attainment/Unclassified area for all NAAQS. Therefore, conformity requirements do not apply.

Neither the Preferred Alternative nor Alternative 2 include a source of direct pollutant emissions. Indirect source of emissions include off-site electrical generation activities (if the energy source is non-renewable) and tailpipe emissions from on-road vehicles. As explained above, there is no nexus for estimating operational emissions. In addition, absent of the General Conformity Assessment, there are no significance criteria to be used for assessing adverse effects. Neither the Preferred Alternative nor Alternative 2 would result in an adverse effect related to operational emissions.

The USEPA has published guidance on prevention of CO "hot spots" at congested intersections resulting from idling and slow-moving vehicles. The guidance focuses on the avoidance of localized spikes in CO concentrations causing violations of the ambient air quality standards. According to the Transportation Assessment, the Preferred Alternative would introduce 2,896 net new daily vehicle trips to the project area, including 147 trips during the AM peak hour and 227 trips during the PM peak hour. Alternative 2 would introduce 4,305 net new daily vehicle trips to the project area, including 273 trips during the AM peak hour and 372 trips during the PM peak hour. According to the Transportation Assessment, the maximum existing peak hour intersection volume in the project area is 4,893 AM trips at the intersection of Kalihi Street and North School Street. Peak hour volumes at this intersection would be 5,286 vehicles in 2029 under the Preferred Alternatives and 5,317 vehicles under Alternative 2.[3]

In response to the guidance promulgated by the USEPA, numerous regulatory agencies throughout the country undertook research to determine the types of intersections that may pose air quality concerns with regards to CO hot spots. Since the island of Oahu has always been in attainment of the ambient air quality standards, local regulatory agencies did not have a need to conduct research to satisfy the SIP requirements. However, mobile source emissions of CO are of particular concern in California, where the South Coast Air Quality Management (SCAQMD) engaged in extensive research to demonstrate how the CO NAAQS could be attained for the region.

Research published in 2003 by the SCAQMD involved air dispersion modeling of mobile CO emissions at some of the busiest intersections in southern California. Results of the CO

[3] Fehr & Peers, *Transportation Assessment for HPA Project*, November 2017.

dispersion modeling exercise determined that an intersection experiencing a peak hour volume of approximately 10,000 vehicles per hour—about twice the maximum within the project area—would generate a maximum 1-hour CO concentration of approximately 4.6 ppm.[4] The applicable 1-hour average CO ambient air quality standard is 9.0 ppm. Therefore, the maximum intersection volume in the project area following full buildout is approximately 25 percent of the volume that could potentially exceed the State 1-hour standard for CO.

Additionally, the maximum background 1-hour CO concentration measured in the vicinity of the project area was 1.4 ppm in 2015, which is approximately one-sixth of the applicable State 1-hour standard for CO. According to the Transportation Assessment, the maximum existing peak hour intersection volume in the project area is 4,893 AM trips at the intersection of Kalihi Street and North School Street. Peak hour volumes at this intersection would be 5,286 vehicles in 2029 under the Preferred Alternatives and 5,317 vehicles under Alternative 2. This represents an increase of approximately eight percent relative to existing conditions. This incremental increase in maximum peak hour traffic volumes would not have the potential to increase maximum 1-hour CO concentrations in the project area by six times current levels. Therefore, neither the Preferred Alternative nor Alternative 2 would result in potential CO hot spots within the project area.

Residential Exposure

The Preferred Alternative and Alternative 2 would introduce new residential receptors to the project area that could potentially be adversely affected by existing sources of air pollution. For instance, the H1 Freeway is located approximately 1,350 feet west of the project site. According to the most recently available data obtained by the State in 2016, annual average daily traffic on the segment of the H1 Freeway in closest proximity to the project site was approximately 193,400 vehicles.[5] Research conducted in the State of California determined that air pollution near freeways decreased by approximately 70 percent at a distance of 500 feet from the source, prompting the California Air Resource Board (CARB) to publish a recommended screening distance of 500 feet for siting new residences in proximity to freeways without mitigation.[6] The proposed site is located at a distance from the H1 freeway over twice the California recommended screening threshold. According to research published by the SCAQMD, air pollution generated by mobile sources on the H1 Freeway would diminish by more than 80 percent before reaching the project site.[7] Additional, surface winds are generally around 13 to 24 miles per hour from the northeast at the project site, which results in emissions from the H1 Freeway blowing away from the project site. Therefore, long-term habitation of future residences on the project site would not have the potential to expose occupants to unacceptable levels of air pollution and no adverse effects would occur.

The project site is located approximately 2.7 miles from HNL. Air quality in the vicinity of the project site is generally considered to be good due to the presence of northeasterly trade winds that tend to disperse pollutants seaward. Air pollutant emissions from HNL are typically blown offshore in the opposite direction of the project site and do not pose a significant exposure concern. As shown in **Table 3-1**, the project area is currently designated as being in attainment

[4]South Coast Air Quality Management District, *Final 2003 AQMP Appendix V: Modeling and Attainment Demonstrations*, August 2003.

[5]Hawaii Department of Transportation, *AADTMap – AADT2016*, https://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=39e4d804242740a89d3fd0bc76d8d7de.

[6]California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.

[7]South Coast Air Quality Management District, *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning – Chapter 2: Air Quality Issues Regarding Land Use*, May 2005.

of all applicable ambient air quality standards. Monitored data shown in **Table 3-2** demonstrates that pollutant concentrations are well below pollutant standards. The monitoring station at 1250 Punchbowl Street is less than one mile from the project site and can be used as indicator of a potential adverse effect from HNL, which has been demonstrated to be low.

GHG Emissions

As of April 5, 2017, the CEQ has withdrawn its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act (NEPA) Reviews," for which a Notice of Availability was originally published on August 5, 2016. Therefore, no guidance currently exists for addressing GHG emissions and climate change under NEPA. The USEPA has not issued explicit guidance or methods to conduct project-level GHG emissions analysis. Similar to criteria pollutant emissions, neither the Preferred Alternative nor Alternative 2 would include a source of direct pollutant emissions.

The State, through Act 234 and SB 559, has acknowledged that GHG emissions are a statewide impact. The project would create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project. The project will require a maximum of 3.1 megawatts of power which would lead to indirect generation of GHG emissions. Hawaii is committed to renewable energy production, which does not generate GHG emissions. In 2016, 25.8 percent of energy produced by the Hawaiian Electric Companies was renewable. Hawaii has enacted a law that mandates that all of the State's electricity comes from renewable sources no later than 2045. The project is anticipated to be built in 2028. Project-related indirect emissions would decline between 2028 and 2045 as the State moves toward a fully renewable supply of energy.

Project emissions have been conservatively estimated using existing generation information and emission rates. The 2015 Hawaii State Electricity Profile indicates that approximately 1,600 pounds of carbon dioxide is emitted per megawatt-hour of electricity used. The analysis assumes that the average daily power use, including nighttime hours, at the project site would be 50 percent of the maximum power load. The indirect emissions from electricity use would be approximately 3,557 metric tons per year. These emissions would quickly decrease through 2045 as the State becomes fully reliant on renewable energy. Hawaiian Electric has stated there is existing capacity to service the project. The project would not interfere with the development of clean energy supplies and would not include a substantial on-site source of GHG emissions. The Preferred Alternative and Alternative 2 would locate in-fill development near existing public transportation and shopping areas, thereby reducing mobile source emissions compared to development located outside of urban areas. For example, the trip generation analysis anticipates that walking/biking trips would reduce passenger vehicle trips by 10 percent, residential-related transit trips would reduce passenger vehicle trips by 15 percent, and retail-related transit trips would reduce passenger vehicle trips by 10 percent. Energy conservation features and in-fill development benefits would ensure that neither the Preferred Alternative nor Alternative 2 would result in a significant GHG impact.

7.0 CUMULATIVE EFFECTS

7.1 Federal

The NEPA requires that any agency proposing a major federal action, which may significantly affect the environment, consider the environmental impacts of the proposed action, any unavoidable adverse environmental impacts, and the relationship between local short term uses and long term productivity of the environment (42 U.S.C. 4332(c)). There are three types or categories of effect that must be considered during the NEPA process: direct, indirect, and cumulative (40 CFR 1508.25). A direct effect is one which is caused directly by our activities, at the same time, and in the same place. An indirect effect is a reasonably foreseeable effect caused by the proposed action or alternatives, but that occurs later in time or is further removed from the project site than a direct effect. "Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate," and related effects on resources (40 CFR 1508.8(b)).

A cumulative effect is an "impact on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7). A cumulative effects analysis is required whenever an Environmental Assessment or Environmental Impact Statement is prepared. A project must have a direct and/or indirect effect on a specific resource to exert a cumulative influence. If no direct and/or indirect effect to a specific resource is expected, there is no need to consider cumulative effects to that resource. As previously discussed, neither the Preferred Alternative nor Alternative 2 would result in an adverse air quality effect. No further analysis is necessary. Therefore, a cumulative effect would not occur under NEPA regulations.

7.2 State

Section 11-200-2 of the HAR contains the definition of a "cumulative impact" for Environmental Impact Statements. A "cumulative impact" is defined as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

By its very nature, air pollution is largely a cumulative impact. Ambient air quality standards are violated or approach nonattainment levels due to past development that has formed the urban fabric, and attainment of standards can be jeopardized by increasing emissions-generating activity in the region. As shown in **Table 3-2**, above, monitored air quality concentrations are well below the NAAQS, which are health-based standards established by the USEPA. In addition, the proposed site is located in an Attainment/Unclassified area for all NAAQS. The regional air quality in the vicinity of Honolulu is considered to be healthy. There is no existing cumulative air quality impact, and there is no potential for the project to significantly contribute to a future air quality impact.

The State, through Act 234 and SB 559, has acknowledged that GHG emissions are a statewide impact. Emissions generated by the Preferred Alternative or Alternative 2 in combination with past, present, and reasonably probable future related projects could contribute to this impact. Although climate change is cumulative in nature, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. The project would create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project. The project would not interfere with the development of clean energy supplies and would not include a substantial on-site source of GHG emissions. The Preferred Alternative or Alternative 2 would locate in-fill development near existing public transportation and shopping areas, thereby reducing mobile source emissions compared to development located outside of urban areas. For example, the trip generation analysis anticipates that walking/biking trips would reduce passenger vehicle trips by 10 percent, residential-related transit trips would reduce passenger vehicle trips by 15 percent, and retail-related transit trips would reduce passenger vehicle trips by 10 percent. Energy conservation features and in-fill development benefits would ensure that neither the Preferred Alternative nor Alternative 2 would contribute to a cumulative GHG impact.

APPENDIX K

Economic & Fiscal Impact Assessment

ECONOMIC AND FISCAL IMPACT ASSESSMENT, SCHOOL STREET REDEVELOPMENT PROJECT

October 2017

Prepared for:

PBR Hawaiʻi and Associates, Inc.
Retirement Housing Corporation
Hawaiʻi Public Housing Authority

BELT COLLINS

Belt Collins Hawaii LLC

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Acronyms and Abbreviations

ACS	American Community Survey
CT	Census Tract
DBEDT	Department of Business, Economic Development and Tourism, State of Hawaiʻi
DLIR	Department of Labor and Industrial Relations, State of Hawaiʻi
HPHA	Hawaiʻi Public Housing Authority
RHF	Retirement Housing Foundation
US	United States
ZCTA	Zip Code Tabulation Area (for Census)

1. Introduction

1.1 The Project

The Hawaiʻi Public Housing Authority (HPHA) has its offices and some workshop facilities along School Street in the Kalihi-Pālama area of Honolulu. The State-owned parcel – (1) 1-6-009:003 – covers 12.481 acres. It includes the 120-unit Puahala Homes project as well as the redevelopment site. HPHA proposes to renovate the non-residential part of the parcel, replacing existing buildings with new offices and senior housing facilities. Approximately 10,000 square feet in the senior housing would be available for retail use. (Puahala Homes would remain on the parcel.) Figures 1-1 to 1-3 show the location of the project, the current footprint of HPHA buildings, and a conceptual map of the proposed new development.

During construction, HPHA will need to remove its existing operations. During the office construction period, staff offices and work areas will be moved offsite. No change in staff personnel counts is anticipated. After the new offices are built, most of the staff currently based on site will likely return to the School Street site, while the remainder will be based at other HPHA facilities.

1.2 Scope and Objective of this Report

This report is prepared as an account of economic and fiscal impacts of the Project, for inclusion in an Environmental Impact Statement (EIS). It deals with economic and fiscal impacts of the project on the nearby community and on the county and state.

Information about the project has been provided by the development team, which has developed plans based on HPHA's needs, site conditions, and discussions with stakeholders. Demographic information draws mainly on data collected by the United States (U.S.) Bureau of the Census. HPHA has shared some information concerning its residents as well. The report also draws on discussions with HPHA project managers and stakeholders associated with other projects where redevelopment may have changed the character and demographics of the local area. The economic analysis follows modeling and forecasts developed and refined by the State of Hawaiʻi Department of Business, Economic Development and Tourism (DBEDT).

The report has three sections:

- This introduction deals with the project and the scope of the report;
- The second section provides brief accounts of the project site and the surrounding community, with an emphasis on the senior population that may be served by new housing on-site and nearby health facilities.
- The third section provides analysis of the economic and fiscal impacts of the project in relation to the surrounding community and local government.

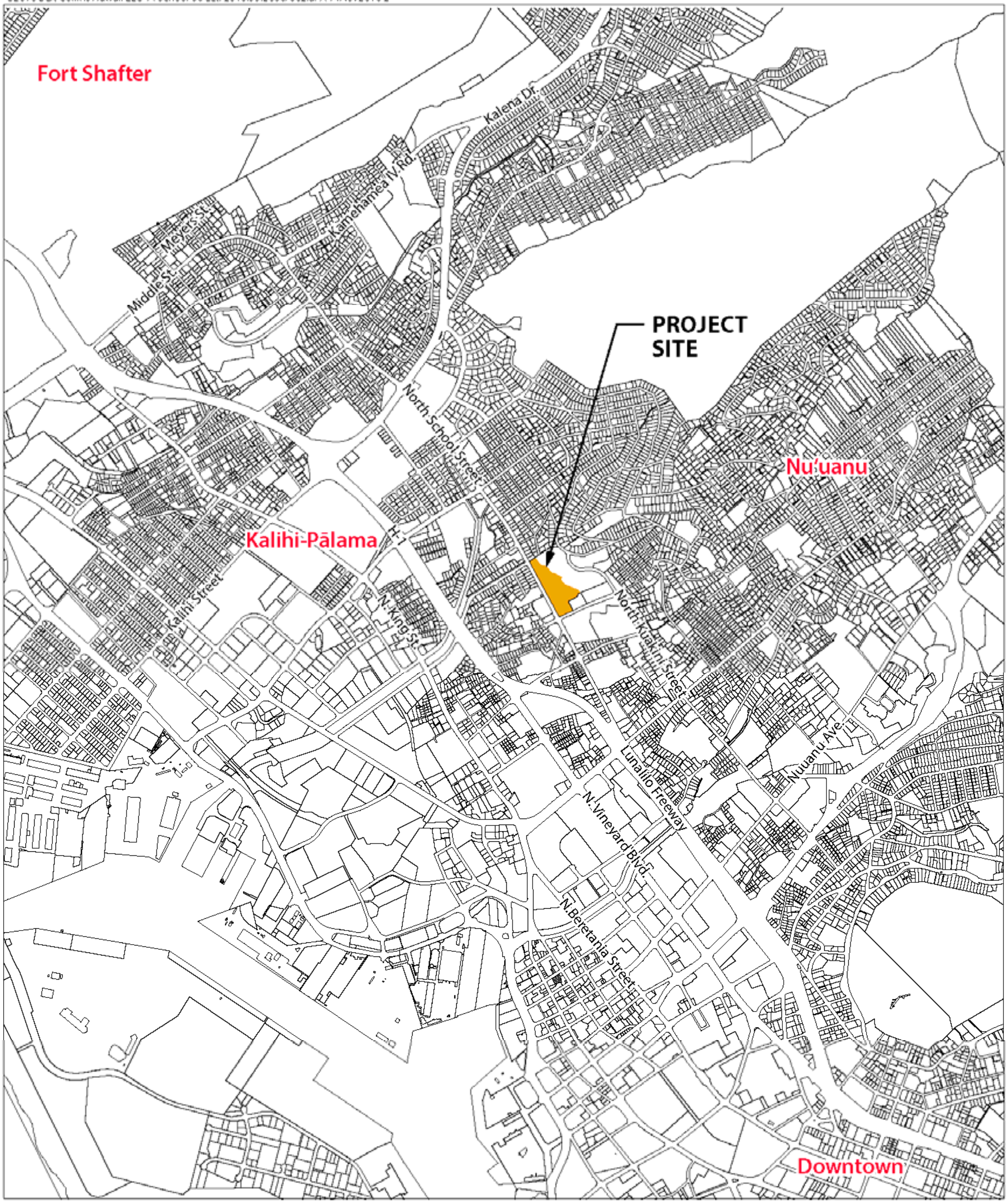

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Figure 1-1
VICINITY MAP
School Street Redevelopment
Economic and Fiscal Analysis
November 2016

Figure 1-2: Existing Footprint, HPHA Facilities at the Project Site

SOURCE: PBR Hawaiʻi, 2017, Figure 2. The yellow outline is the project site.

Figure 1-3: Proposed Redevelopment Footprint

SOURCE: PBR Hawaii, 2017, Figure 7.

1.3 Summary of Findings

The School Street Redevelopment project will transform a campus of older office buildings and maintenance workshops, replacing it with new offices for the Hawaiʻi Public Housing Authority and, in time, some 800 senior housing units. When built, the project will provide housing for approximately 1,000 senior residents.

Construction will occur over approximately nine years, with timing subject to the availability of funds for affordable housing construction. A total of approximately 847 person-years of direct construction employment is expected, supporting another 1,102 person-years of indirect and induced employment in the Hawaiʻi economy. (These figures cover nine years' time, so the annual average would be about 94 direct jobs and 122 indirect and induced jobs.)[1]

Operations jobs in the new buildings operated by Retirement Housing Foundation would increase as each phase is built, and could amount to approximately 72 annual jobs after the project is completed.

[1] Estimates are based on construction costs, not total development costs.

Fiscal impacts would consist of tax revenues for the State of Hawaiʻi and the City and County of Honolulu. These are estimated as totaling about $9.5 million from 2020 through 2032, and as amounting to about a half million dollars annually afterwards.[2]

[2] All dollar values in this report are in constant 2016 dollars. Information supplied by Retirement Housing Corporation was converted to constant dollars by Belt Collins Hawaii LLC.

2. Existing Conditions

2.1 HPHA

HPHA is the major provider of housing for low-income persons and families in Hawaiʻi. It is the sole state low-income housing operator and source of housing vouchers. County governments have much smaller stocks of housing and vouchers. It has some 6,200 units and can provide vouchers or rent support for an additional 2,500 low-income households.[3] HPHA has approximately 300 employees. Contracts for management, maintenance and repair work at half of its sites are operated by private parties.

HPHA has sought ways to draw on public-private partnerships in recent years to redevelop its aging housing stock. In 2002, it transferred Pālolo Homes to Mutual Housing, since that non-profit could seek funds for rehabilitation not available to HPHA for projects initially built by the State of Hawaiʻi without federal support. More recently, it has negotiated redevelopment and management of Kūhiō Park Terrace and Mayor Wright Housing, both in the Kalihi-Pālama area. Redevelopment of the School Street campus for new offices and senior housing follows on a consistent program to improve and increase the agency's housing stock despite very limited state and federal funds for redevelopment.

HPHA's work began in Kalihi-Pālama, with the opening of Kamehameha Homes by 1941. Its family housing projects on Oʻahu are highly concentrated on the west side of Honolulu. Projects for elderly and disabled persons are more dispersed, although two such projects, Hale Poʻai and Hāliʻa Hale are located across School Street from the project site.[4] Figure 2-1 shows the location of HPHA housing projects in the area near the project site.

2.2 The Project Site

The project site includes a mix of offices and maintenance shops that serve as the HPHA headquarters. It also includes access routes to the nearby Puohala housing complex. Parking on site is shared with the Lanakila Senior Center, adjacent to the HPHA property.

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3 Hawaiʻi Public Housing Authority, *Annual Report Fiscal Year 2014-2015.* Posted at http://www.hpha.hawaii.gov/reportsstudies/reports/2015%20HPHA%20Annual%20Report.pdf, and viewed on November 9, 2016.

4 The Puahala projects have a combined total of some 120 units. Available unit counts depend on ongoing work to refurbish HPHA's housing stock. The elderly projects across School Street are newer. They include some 247 units.

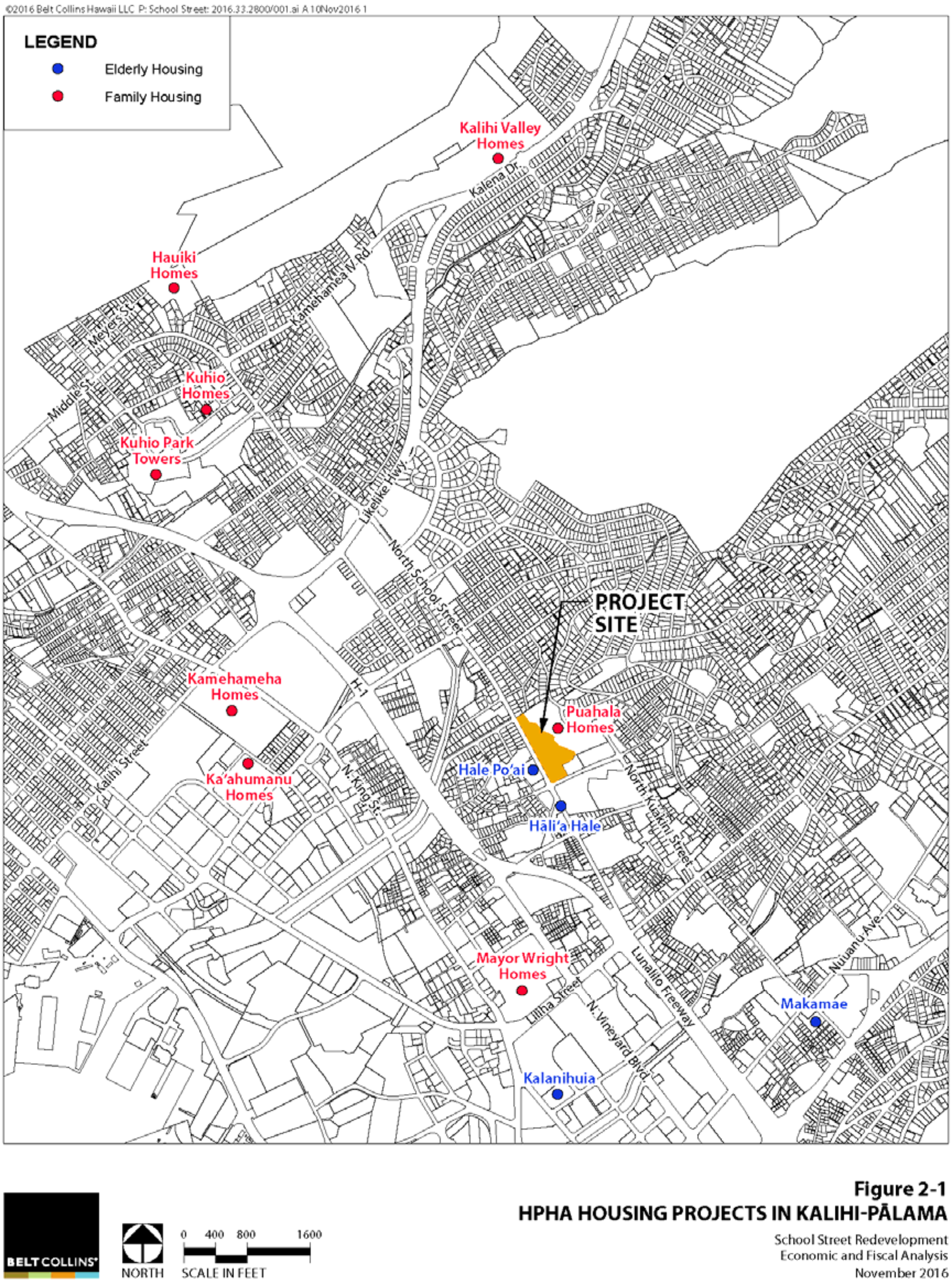

Figure 2-1
HPHA HOUSING PROJECTS IN KALIHI-PĀLAMA
School Street Redevelopment
Economic and Fiscal Analysis
November 2016

2.3 Kalihi-Pālama

2.3.1 Demography

Recent demographic information is available from the American Community Survey (ACS), a series of samples drawn over five years, from 2010 through 2014. The project is in Census Tract (CT) 48, and is adjacent to CT 49 (across Lanakila Avenue). Much of the Kalihi-Pālama area is within the 96817 Zip Code Tabulation Area (ZCTA).[5]

The demographic data cover residents in households. CT 48 also includes a population, estimated as 728 persons, in group quarters such as dormitories or hospitals. That amount, nearly 10 percent of the CT population, is a far higher share than is found island-wide or in the adjacent CT49, where the share is less than four percent. (Much of the CT 48 group quarters population consists of Kamehameha Schools students lodging on campus.) The group quarters population is not included in Table 3-1 and later tables concerning the resident population.

Table 2-1 shows that:

- The population in Kalihi-Pālama is older, on average, than the island's population:
  - The median age in the ZCTA is much higher than that of the island's population;
  - Senior citizens (age 65 or older) account for 22 percent of the ZCTA population, but only 15 percent of the island population.
- The racial mix in the area includes a higher share of Asians than island-wide. CT 48 also includes a higher share of Native Hawaiians and Pacific Islanders. The share of the population born in the state of Hawaiʻi is higher in CT 48 than in the immediately surrounding area or island-wide.

2.3.2 Housing

Kalihi-Pālama has been a site of urban expansion and renewal, at the beginning of the twentieth century – after the Chinatown fire that dislocated residents of that area – and after World War II, when HPHA's new projects spread through the area. In recent years, there has been little change. A large share of the ZCTA area's residents are renters. (See Table 2-2.) Crowding in small housing units occurs more often than island-wide. On the other hand, residents are less likely to spend a large share of their income on housing costs.

Data for CT 48 are more complex. The owner-occupied share of housing is close to the City and County average. Household sizes are larger than in the rest of Kalihi-Pālama. The median household income is nearly the same as for the island as a whole, unlike the rest of the surrounding community.

[5] Smaller Census geographies – block groups and blocks – exist for the 2010 Census, but are not available for ACS data.

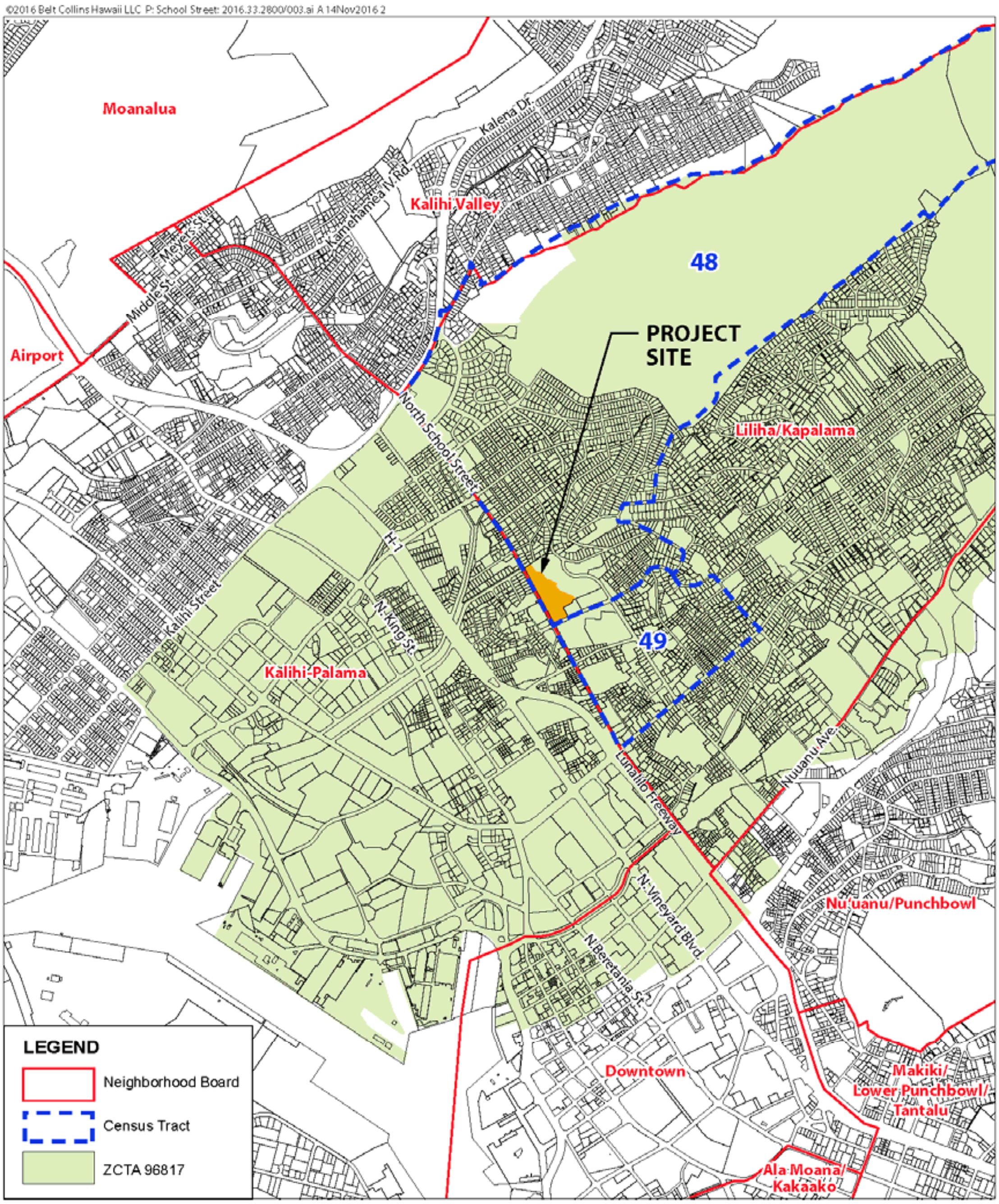

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Figure 2-2
CENSUS GEOGRAPHY

School Street Redevelopment
Economic and Fiscal Analysis
November 2016

Table 2-1: Demographic Characteristics, 2014 Five-Year ACS

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
Population				
Total Population	975,690	55,601	6,815	3,295
Under 5 years	63,691	2,466	340	167
5 to 9 years	57,223	2,968	491	155
10 to 14 years	58,239	3,022	403	147
15 to 19 years	57,388	2,630	260	207
65 to 74 years	76,422	5,382	559	286
75 to 84 years	46,211	3,974	416	159
85 years and over	25,220	2,709	374	123
Median age (years)	37.2	44.4	42.8	43.0
Race (alone or in combination)				
White	37.9%	19.9%	20.5%	18.1%
Black or African American	4.0%	2.3%	1.8%	0.8%
American Indian and Alaska Native	2.1%	1.8%	2.7%	0.7%
Asian	60.9%	76.8%	67.6%	83.1%
Native Hawaiian and Other Pacific Islander	23.7%	18.4%	36.9%	18.9%
Some other race	2.5%	2.1%	3.9%	2.5%
Average Number of Race Identifications/Person	1.31	1.21	1.33	1.24
Hispanic (of any race)	8.9%	5.8%	9.2%	7.7%
Place of Birth				
Hawai'i	53.5%	50.2%	62.7%	50.3%
Other state	23.5%	11.2%	9.7%	5.5%
US Island	3.6%	3.3%	4.8%	3.8%
Foreign born	19.4%	35.3%	22.8%	40.5%

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

Table 2-2: Housing Characteristics, 2014 Five-Year ACS

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
Housing and Households				
Total housing units	339,830	20,247	1,823	1,018
Occupied housing units	310,141	18,977	1,664	918
Vacant housing units	29,689	1,270	159	100
HOUSEHOLDS BY TYPE				
Total households	310,141	18,977	1,664	918
Households with one or more people under 18 years	106,347	5,047	608	320
Households with one or more people 65 years and over	99,009	8,011	796	305
Average household size	3.03	2.82	3.66	3.45
Median household income (dollars)	73,581	53,282	71,276	55,595
HOUSING TENURE				
Occupied housing units	310,141	18,977	1,664	918
Owner-occupied	54.9%	40.4%	54.5%	47.3%
Renter-occupied	45.1%	59.6%	45.5%	52.7%
Average household size of owner-occupied unit	3.22	3.07	3.48	3.79
Average household size of renter-occupied unit	2.80	2.64	3.87	3.14
OCCUPANTS PER ROOM				
Occupied housing units	310,141	18,977	1,664	918
1.00 or less	91.4%	87.6%	86.4%	87.3%
1.01 to 1.50	5.7%	7.3%	9.7%	9.6%
1.51 or more	2.9%	5.1%	3.9%	3.2%
HOUSING COSTS				
Share of households paying > 35% of income for housing (for households with rent or mortgage data)				
Owners	26.6%	21.4%	17.6%	31.8%
Renters	51.9%	38.6%	34.8%	54.7%

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

2.3.3 Economy

The Census provides information about the economic characteristics of residents and about the number of jobs in the Kalihi-Pālama area. Tables 2-3 to 2-5 address residents' economic situation. The share of adults in the labor force is lower in the area (61.7% for the ZCTA) than island-wide (88.7%). This is not due to unemployment: the unemployed form a slightly smaller part of the civilian labor force in Kalihi-Pālama than in the City and County as a whole. Instead, it reflects the older population of the area.

Commuting travel times are shorter than for the island as a whole, and many workers from Kalihi-Pālama rely on public transportation. However, 60 percent of the CT 48 workforce drove to work alone. This is close to the island-wide share.

Table 2-5 shows that the incidence of poverty is higher in Kalihi-Pālama than island-wide. In CTs 48 and 49, fewer seniors have incomes below the poverty line than for the area as a whole.

Table 2-3: Economic Characteristics of the Resident Population, 2014 Five-Year ACS

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
EMPLOYMENT STATUS				
Population 16 years and over	519,554	46,528	5,513	2,788
In labor force	480,618	28,657	3,341	1,746
Civilian labor force	452,324	28,292	3,330	1,746
Percent Unemployed	5.9%	5.6%	5.8%	4.6%

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

Table 2-4: Commuting Patterns, 2014 Five-Year ACS

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
COMMUTING TO WORK				
Workers 16 years and over	480,392	26,541	3,050	1,647
Car, truck, or van -- drove alone	64.2%	48.3%	60.4%	45.7%
Car, truck, or van -- carpooled	14.7%	15.2%	13.6%	18.8%
Public transportation (excluding taxicab)	8.4%	18.7%	11.9%	19.2%
Walked	5.2%	9.7%	4.4%	7.4%
Other means	4.0%	5.3%	6.1%	5.1%
Worked at home	3.5%	2.7%	3.5%	3.8%
Mean travel time to work (minutes)	27.6	21.5	23.6	23.7

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

Table 2-5: Incidence of Poverty, 2014 Five-Year ACS

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
PERCENTAGE OF PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL				
All people	9.8%	16.0%	14.9%	10.8%
Under 18 years	13.0%	22.6%	19.2%	17.9%
18 to 64 years	9.3%	14.6%	15.8%	9.7%
65 years and over	7.0%	14.1%	7.1%	6.7%

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

The Census also tracks sources of income and health insurance, as shown in Table 2-6. In CT 48, reliance on Social Security and retirement income occurs more often than in the other areas. Similarly, while only 7.4 percent of households depend on cash public assistance, the share, and the amount of such assistance, is high compared to the island and zip code area.

The number of jobs in Kalihi-Pālama has declined from a high of nearly 37,000 in 2004 to about 31,750 in 2014, as shown in Figure 2-3.[6] The largest industry in the area is health care, followed by retail trade, accommodation and food services, and administration and support services. (Table 2-7 orders industries by the local share of jobs in each industry.) Many of the administrative and support service jobs are probably based in the HPHA offices and shops on the project site.

[6] Data on local employment is from tables showing the number of "establishments" in an area, sorted by the number of employees. The employee numbers are presented in ranges (e.g., five to nine employees). Total employment is estimated here by taking the midpoint of each range times the number of establishments in that range. For the largest cell, establishments with 1,000 employees or more, an estimate of 1,500 workers was used. In Kalihi-Pālama, no firm of this size has been recorded since 2005.

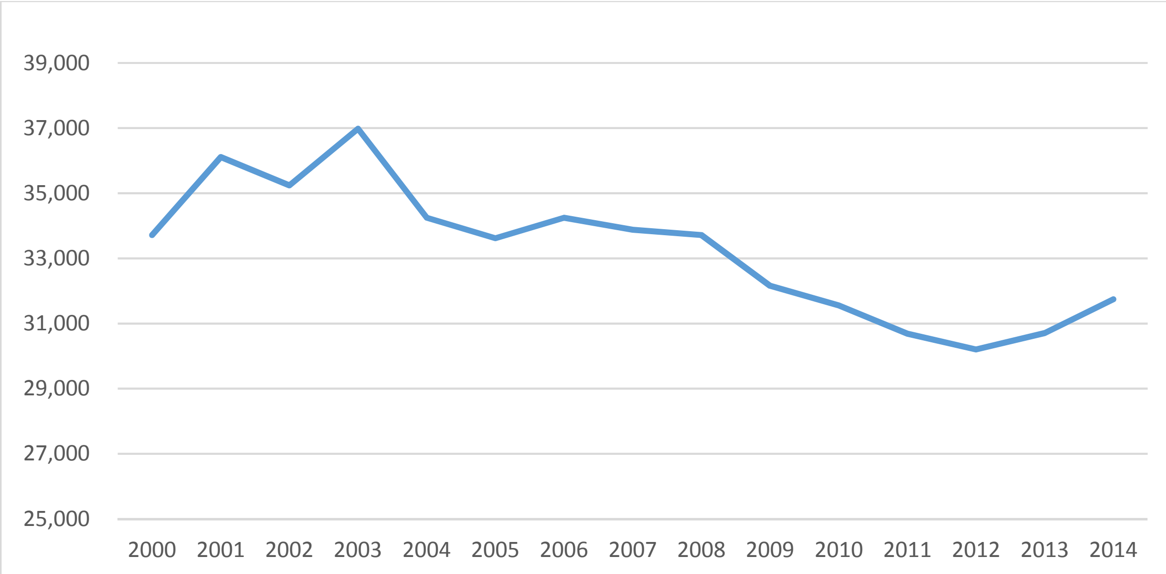
These estimates may miss some local jobs if those are listed at a headquarters outside the local area. The Zip Code Business Patterns tables help to show trends, but are not highly accurate.

Table 2-6: Household Income and Health Coverage

	City and County of Honolulu	ZCTA 96817 Pālama Iwilei	CT 48 Kameha-meha Heights	CT 49 Lanakila
Households with Income from Different Sources				
With earnings	82.8%	73.0%	75.2%	82.2%
Mean earnings (dollars)	86,495	75,179	81,768	69,535
With Social Security	31.9%	40.4%	47.2%	31.0%
Mean Social Security income (dollars)	18,434	16,769	17,904	15,280
With retirement income	23.2%	22.0%	27.3%	20.9%
Mean retirement income (dollars)	28,882	26,763	27,263	18,860
With Supplemental Security Income	3.8%	6.8%	2.7%	3.4%
Mean Supplemental Security Income (dollars)	9,168	8,584	8,662	8,842
With cash public assistance income	3.3%	4.5%	7.4%	2.6%
Mean cash public assistance income (dollars)	5,039	4,226	7,511	3,496
With Food Stamp/SNAP benefits in the past 12 months	9.2%	17.1%	13.7%	12.7%
Health Insurance Coverage				
Civilian noninstitutionalized population	926,743	54,295	6,653	3,202
With health insurance coverage	94.4%	93.3%	95.4%	92.9%
With private health insurance	79.2%	69.0%	72.4%	69.6%
With public coverage	29.5%	38.7%	35.5%	33.6%
No health insurance coverage	5.6%	6.7%	4.6%	7.1%

Source: U.S. Census, American Community Survey, five-year data profiles, downloaded from http://census.hawaii.gov/acs/acs-2014/.

Figure 2-3: Employment by Establishments in ZCTA 96817, 2000-2014



Source: U.S. Census, *Zip Code Business Patterns*.

Table 2-7: Employment in ZCTA 96917, by Industry, 2014

Industry	Estimated Jobs	Share of Local Jobs
Agriculture, Forestry, Fishing and Hunting	25	0%
Real Estate and Rental and Leasing	413	1%
Arts, Entertainment, and Recreation	484	2%
Information	507	2%
Management of Companies and Enterprises	751	2%
Educational Services	922	3%
Manufacturing	1,303	4%
Finance and Insurance	1,420	4%
Professional, Scientific, and Technical Services	1,533	5%
Other Services (except Public Administration)	1,783	6%
Transportation and Warehousing	1,937	6%
Construction	1,952	6%
Wholesale Trade	2,448	8%
Administrative and Support and Waste Management and Remediation Services	2,774	9%
Accommodation and Food Services	3,359	11%
Retail Trade	4,296	14%
Health Care and Social Assistance	5,843	18%

Source: U.S. Census, *Zip Code Business Patterns.*

3. Economic and Fiscal Impacts

3.1 Introduction

The impact assessment derives from information about the project supplied by PBR Hawaiʻi and Retirement Housing Foundation (RHF), public information about HPHA and its operations, and models developed by the Hawaiʻi State Department of Business, Economic Development and Tourism (DBEDT) to describe Hawaiʻi's economy and project its trends in future years.

The project provides new offices for existing employees of HPHA and new housing for Hawaiʻi residents. It is not intended or likely to attract people from outside Hawaiʻi, for housing or employment. As a result, the impact of the project is largely due to construction of new housing units.

HPHA and RHF have reached a pre-development agreement, under which RHF is conducting studies and developing plans for the project. The Environmental Impact Statement Preparation Notice (EISPN) was published in August 2017.[7] It identified three residential development alternatives as well as a no action alternative. In all cases, the residential housing would largely consist of low-income units, at subsidized rents, and a small number of market units. The development alternatives include:

- 1,000 units, with 60 percent for families and 40 percent for seniors;
- 1,000 units, with 40 percent for families and 60 percent for seniors; and
- 800 units for seniors.

An alternative with 1,000 units for seniors has also been considered. Based on discussions with PBR and RHF staff, Belt Collins Hawaii LLC is considering the 800 senior unit alternative for analysis in this report.

Construction and occupancy will occur in four phases:

1. Once environmental reviews and permitting are completed, the project site will be mass graded, and the new administrative offices will be built.
2. A residential tower, with some 250 units, will be built next to the offices.
3. A second residential tower, again with 250 units, would follow.
4. The third residential tower, located towards Lanakila Street on the east side of the property, would have 300 units and include the retail component of the project.

The timing of construction will depend on agreements between HPHA and the developer, and on the availability of funding. Low income housing tax credits are limited in Hawaiʻi; the timing shown in Table 3-1 follows from the expectation that the project will be able to draw on tax credits in alternate even-numbered years, with the HPHA Mayor Wright project using tax credits in the interim odd-numbered years.

Dollar figures in Table 3-1 and later tables are constant 2016 dollars: inflation is not shown. All figures are for millions of dollars.

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[7] PBR Hawaiʻi and Associates, Inc. *Hawaiʻi Public Housing Authority Administrative Offices (School Street) Redevelopment Environmental Impact Statement Preparation Notice.* Posted at http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-08-23-OA-EISPN-HPHA-Administrative-Offices-School-Street-Redevelopment.pdf

Table 3-1: Estimated Construction Schedule

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Construction cost (Million $s)	1.0	8.0	8.1	22.3	22.4	25.5	25.6	36.4	36.5	
Structures under Construciton		HPHA offices		Tower 1		Tower 2		Tower 3		
New Units Built (by beginning of year)				Offices		250		250		300

NOTE: Construction costs are estimated by Belt Collins Hawaii LLC based on discussions with RHF and PBR Hawaiʻi. These figures must be considered to be preliminary estimates.

3.2 Resident Population and Housing

3.2.1 On-site Impacts

Currently, no housing is located on the site. New housing would be built in phases. A mix of affordable and market senior units is proposed. Most housing units will be one-bedroom apartments, although about 15 percent of the total unit count is likely to consist of two-bedroom units. For this report, it is assumed that 20 percent of units would be rented at market rates, and the rest provided for reduced rents based on tenants' income, under government subsidies.

Since the units would be for seniors, household sizes would be small and few or no children of school age would live in the project. Household sizes are estimated as, on average, 1.2 persons in one-bedroom units and 2.1 persons in two-bedroom units. Figure 3-2 estimates on-site population on the assumption that 92 percent of the units would be occupied within the first year of occupancy, and occupancy would reach 97 percent in later years.

Table 3-2: Population Living On-Site

	2025	2026	2027	2028	2029	2030
Population living on-site						
Housing units	250	250	500	500	800	800
One bedroom[1]	213	213	425	425	680	680
Two bedroom[1]	37	37	75	75	120	120
Likely occupancy (units)[2]	230	223	453	485	761	776
OCCUPANCY						
One bedroom[3]	235	247	482	495	776	792
Two bedroom[4]	71	75	149	153	240	244
Likely Occupancy (persons)	306	323	631	647	1,016	1,036

NOTES: Occupancy and average unit populations estimated by Belt Collins Hawaii LLC based on housing studies of the Honolulu market showing high demand for senior units.

1 In each phase, 85% of units are expected to be one-bedroom units, and 15% two-bedroom units.

2 Occupancy expected to be 92% in first year of each phase, 97% in later years

3 For one-bedroom units, average occupancy expected to be 1.2 persons.

4 For two-bedroom units, average occupancy expected to be 2.1 persons.

SOURCES: U.S. Census: American Community Study census data through 2015; SMS Research & Marketing Services 2016; Cassiday, 2016.

3.2.2 Wider Impacts

No housing units will be demolished in the course of construction. Access to nearby housing in Puohala Homes may need to be rerouted, but this housing will remain occupied during and after construction of the project.

Some 800 units will constitute a sizeable addition to the senior housing inventory. Statewide, a recent study estimates need for 2,160 additional units for elderly and frail elderly persons by 2020, i.e., before the first phase of the project will be available.[8] Of that number, 1,271 units would be needed on Oʻahu. About 40% of the Oʻahu senior respondents in need of housing have incomes below 80 percent of the area median.

HPHA's low-income senior housing facilities have closed waitlists. Other senior and family affordable housing projects typically have waitlists estimated as two to five years. In short, there is little or no supply available to respond to market demand for subsidized housing. The supply of market rentals is not so tight, but still limited.[9]

As the SMS study notes, demand could be much greater, since Hawaiʻi's elder population is over 300,000 persons, of whom more than 90,000 have a disability but are not in institutional quarters. Multigenerational households are common in Hawaiʻi, so many elders live with their children, whether as household heads or dependents. Given the high cost of housing, formation of new households can be difficult. Some seniors may move into their own housing units so their children can live in and own the family home.

New affordable housing has been developed on Oʻahu in recent years, but new supply has consistently been smaller than demand. Provision of new units in Kalihi-Pālama over a period of five or more years will help to address the problem, but occupancies will continue to be tight.

HPHA is exploring redevelopment of Mayor Wright Homes with a separate private partner; other such ventures could follow, yielding new subsidized and market housing on the west side of Honolulu. If funding permits a continuing effort to redevelop older housing projects with more housing on-site, the cumulative impact could be a significant reduction in the demand for housing on Oʻahu.

3.3 Employment

Employment impacts will be associated with construction and with operations at the project site. Construction employment occurs for a limited period. Operations will increase in size as the project's phases are completed and then continue for many years.

For both construction and operations, it is possible to estimate direct employment and, separately, indirect and induced employment. Direct construction employment is the employment needed to build the facility. Indirect employment occurs as construction firms purchase materials and supplies in the local economy. Induced employment occurs as construction workers spend their wages in the local

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8 SMS Research, 2016, tables 30 and 47.

9 *Oʻahu Housing Guide*, maintained by Catholic Charities for Elderly Affairs, City and County of Honolulu. List posted with regular updates. Consulted in September 2017 at http://www.elderlyaffairs.com/Portals/_AgencySite/docs/OHG_Detailed_Sept.2017.pdf.

economy. In the following tables, jobs are associated with particular years. Induced employment may occur over a longer time, but it is convenient to show direct, indirect and induced employment as arising at the time the construction spending or direct operations spending occurs.

3.3.1 Construction Jobs and Wages

Direct construction jobs can be estimated, at this early point, from total construction spending, as shown in Table 3-3. The jobs shown are "person-years" – the equivalent of a full-time job over the course of a year. Many specialized construction jobs take less time, so a single "person-year" may cover tasks by various workers in a year. Construction work includes work at construction offices and base yards, so some construction jobs will occur away from the project site.

Indirect and induced jobs are estimated from the State of Hawaiʻi's Input-Output Model, that correlates spending and jobs in particular industries with their impacts in other sectors. The model is regularly updated by the Department of Business, Economic Development and Tourism (DBEDT) Research and Economic Analysis Division.[10]

Wages are also shown in the table. Wages are estimated on the basis of current average industry wages.[11] The actual wages paid in future years will be affected by inflation. Also, work on this State of Hawaiʻi project will presumably be subject to Hawaiʻi Revised Statutes (HRS) Section 104 requirements, that call for work at prevailing wages. For indirect and induced jobs, the impact is throughout the economy, so the average wage for jobs on Oʻahu is used to calculate total indirect and induced wages.

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[10] DBEDT, *The Hawaiʻi State Input-Output Study: 2012 Benchmark Report.* Posted at http://files.hawaii.gov/dbedt/economic/reports/IO/2012_state_io_study.pdf. Consulted in August 2017.

[11] Hawaiʻi State Department of Labor and Industrial Relations (DLIR), 2017: survey of Honolulu wages by occupation for 2016, posted at https://www.hiwi.org/admin/gsipub/htmlarea/uploads/OESwages-2016.xls; consulted in August, 2017.

Table 3-3: Construction-Related Jobs and Wages

	2021	2022	2023	2024	2025	2026	2027	2028	Total
Construction-Related Jobs									
Construction Spending ($ mill)	$8.0	$8.1	$22.3	$22.4	$25.5	$25.6	$36.4	$36.5	$185.8
Jobs (person-years) [1]	36	37	102	102	116	117	166	166	847
Indirect and Induced Construction-Related Jobs [2]	47.4	48	132	133	151	152	216	216	1,102
Total Direct, Indirect and Induced Jobs	84	85	234	235	267	268	382	383	1,949
Direct Wages ($ mill) [3]	$2.4	$2.5	$6.7	$6.8	$7.7	$7.7	$11.0	$11.0	$55.9
Indirect and Induced Wages ($ mill) [4]	$2.4	$2.5	$6.8	$6.8	$7.7	$7.7	$11.0	$11.0	$56.2
Total Wages	$4.8	$4.9	$13.5	$13.6	$15.4	$15.5	$22.0	$22.1	$112.1

NOTES: Estimated by Belt Collins Hawaii LLC from preliminary construction cost estimates. All dollar figures are constant 2016 dollars.

1 Based on recent construction spending and employment, some 4.56 jobs are anticipated for every million dollars of construction spending.

2 Estimated from Type II multiplier for the construction industry (2.3 – i.e., for every direct construction job, another 1.3 jobs are created in the economy).

3 Estimated based on 2016 industry average wage, $66,330.

4 Estimated from 2016 average wage, all industries, $51,080.

SOURCES: DBEDT, 2016, 2017; DLIR, 2017.

3.3.2 Operations Jobs and Wages

Two sorts of operations will occur on the School Street site. First, HPHA offices will continue to be manned, in the new facility. The project is not anticipated to affect the number of HPHA administrative positions, so these are not estimated for this report. Next, RHF will operate senior housing on-site. Employment for these operations has been estimated by Belt Collins Hawaii LLC on the basis of input from RHF.

Once the senior housing is built, RHF will have a manager on-site, with office and janitorial, maintenance and grounds staff. Service coordinators will conduct outreach activities with the tenants. In addition, contract hires will staff events and provide specialized services such as elevator repairs. Table 3-4 estimates operations jobs. Wages are estimated from occupational averages. As with construction, indirect and induced employment impacts are estimated in relation to operations occupational employment.

The retail area is within the last phase of development. For this report, it is expected to be 50 percent occupied in the first year after opening, then 70 percent by the second year, and then 90 percent in the third and later years.

3.3.3 Labor Market Impacts

The unemployment rate in Hawaiʻi —2.7 percent, as of mid-2017 --is low compared both to recent history and to other states.[12] In this situation, large new developments may create demand for labor from outside the state, attracting workers and their families from outside Hawaiʻi.

The School Street Redevelopment project is too small to bring a significant change in labor demand. From mid-2016 to mid-2017, the number of jobs in construction and related industries declined by about 1,300 jobs: even in a time of high employment, some construction workers remain un- or underemployed.

The operations jobs at the project are few in number and could be filled by local jobseekers.

The project will not affect the Hawaiʻi labor market.

[12] https://labor.hawaii.gov/wp-content/uploads/2017/08/20170817July-UI-Rate-PR.pdf

Table 3-4: Operations-Related Jobs and Wages

	2025	2026	2027	2028	2029	2030	2031	2032
Operations Jobs								
RHF staff	9	9	19	19	30	30	30	30
Contractors	2	2	4	4	7	7	7	7
Retail						20	28	36
Total Direct Jobs	11	11	23	23	36	56	64	72
Indirect and Induced Jobs								
RHF staff	5	5	10	10	16	16	16	16
Contractors	1	1	3	3	4	4	4	4
Retail						9	13	17
Total Indirect and Induced Jobs	6	6	13	13	20	30	33	37
Total Operations-Related Jobs	18	18	35	35	57	86	98	109
Wages (mill $)								
Direct Jobs	$0.5	$0.5	$1.0	$1.0	$1.5	$2.2	$2.5	$2.8
Indirect and Induced Jobs	$0.3	$0.3	$0.6	$0.6	$1.0	$1.5	$1.7	$1.9
Total	$0.8	$0.8	$1.6	$1.6	$2.6	$3.7	$4.2	$4.7

NOTES: Estimated by Belt Collins Hawaii LLC based on input from RHF. Employment is expected to increase with the units available on-site.

SOURCES: DBEDT, 2017, DLIR, 2017.

3.4 Fiscal Impacts

Fiscal impacts arise as a project either creates new costs for government agencies or brings in new revenues. No such costs are expected, since the project will not attract new residents to Hawaiʻi or otherwise increase demand for public services. Revenues will come to the State and the City and County of Honolulu through taxation, as estimated in Table 3-5.

Construction-related fiscal impacts are tied to construction spending, and come to an end as the construction period ends. Operations-related impacts increase as the phases of the project are built, and then continue for many years.

Impacts on HPHA operations due to displacement from the School Street property and the return of administrative jobs to the new offices on the site are not included in the analysis for this report.

Under Hawaiʻi law, affordable housing development is not subject to excise tax, so no excise taxes are due on direct construction spending. Excise taxes are, however, charged on workers' expenditures. When market-rate units are rented, excise taxes would also be levied on rental income.

From the beginning of construction to 2032, the total fiscal impact of the project is estimated as approximately $9.5 million. In later years, the State would continue to receive approximately a half million dollars a year from excise and income taxes, and the City and County would receive a modest amount if the retail areas on-site are subject to real property tax, as shown in Table 3-5.

3.5 Mitigation Measures

The School Street Redevelopment project will have no adverse economic or fiscal impacts. Consequently, no mitigation measures are needed for such impacts.

Table 3-5: Fiscal Impacts

All dollar values are in millions of constant dollars	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Inputs:										
Construction Cost	$22.3	$22.4	$25.5	$25.6	$36.4	$36.5	$0.0	$0.0	$0.0	$0.0
Wages (Direct, Indirect and Induced)										
Construction	$13.5	$13.6	$15.4	$15.5	$22.0	$0.0	$0.0	$0.0	$0.0	$0.0
Operations			$0.8	$0.8	$1.6	$1.6	$2.6	$3.7	$4.2	$4.7
Occupied SF Retail							5,000	7,000	9,000	9,000
Construction-Related Revenues										
Corporate income tax (1)	$0.04	$0.04	$0.04	$0.04	$0.06	$0.06	$0.00	$0.00	$0.00	$0.00
Personal income tax (2)	$0.69	$0.70	$0.79	$0.80	$1.13	$0.00	$0.00	$0.00	$0.00	$0.00
Excise tax										
on workers' spending (3)	$0.39	$0.39	$0.44	$0.45	$0.63	$0.00	$0.00	$0.00	$0.00	$0.00
Operations-Related Revenues										
Personal income tax (2)	$0.00	$0.00	$0.04	$0.04	$0.08	$0.08	$0.13	$0.19	$0.22	$0.24
Excise tax										
on workers spending (3)	$0.00	$0.00	$0.02	$0.02	$0.05	$0.05	$0.07	$0.11	$0.11	$0.12
on retail at site (4)								$0.06	$0.09	$0.12
Real Property Tax (on retail only) (5))									$0.03	$0.04
to State of Hawai'i										
Income taxes	$0.73	$0.74	$0.88	$0.88	$1.28	$0.14	$0.13	$0.19	$0.22	$0.24
Excise tax (6)	$0.35	$0.35	$0.42	$0.42	$0.61	$0.04	$0.07	$0.15	$0.20	$0.24
	$1.08	$1.08	$1.30	$1.30	$1.88	$0.18	$0.20	$0.34	$0.42	$0.49
to City and County of Honolulu										
Real Property taxes									$0.03	$0.04
Excise Tax (6)	$0.04	$0.04	$0.05	$0.05	$0.07	$0.00	$0.01	$0.02	$0.00	$0.00
	$0.04	$0.04	$0.05	$0.05	$0.07	$0.00	$0.01	$0.02	$0.03	$0.04
Total, State and City and County:	$1.12	$1.13	$1.35	$1.35	$1.96	$0.19	$0.20	$0.36	$0.45	$0.52

NOTES:

1 Estimated as 0.17% of total income, i.e., construction costs.

2 Estimated as 5.1% of wages.

3 Estimated as 4.5% (through 2030), then as 4.0% of taxable cash flows. For personal income, 64% of wages estimated as disposible and taxable.

4 Once retail is built, space is expected to be 50% full in first year, 70% in second, and 90% in later years. Annual sales projected as $300/gross square foot per year. Excise tax estimated as 4.5% through 2030, and 4.0% in later years.

5 Based on review of small commerical properties in the neighborhood, average tax paid estimated as $5.55 per occupied square foot.

6 Through 2030, the City and County of Honolulu receives $0.49 for every $4.50 in excise tax, and the State receives $4.00 plus $0.01 for handling. After 2030, excise taxes are assumed to consist only of the 4% tax to the State.

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APPENDIX L
Transportation Impact Analysis Report

FEHR PEERS

Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment

Draft Transportation Impact Analysis Report

Prepared for: PBR Hawaii
November 14, 2017
SD15-0192.01

DRAFT REPORT

Transportation Impact Analysis for the Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment

Prepared for:
PBR Hawaii

November 14, 2017

SD15-0192.01

FEHR PEERS

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Appendices

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1.0 EXECUTIVE SUMMARY

This report presents the results of the transportation impact analysis report (TIAR) for the proposed Hawai`i Public Housing Authority (HPHA) Administrative Offices redevelopment in the Lanakila neighborhood on the island of Oahu. The proposed project would replace existing HPHA Administrative Office property into a mixed-use development comprising residential, office, and retail uses. The project will include up to 800 residential units, replacement of the existing HPHA Administrative Office Building, and up to 10,000 square feet (s.f.) of retail and commercial uses. While only 800 all-Senior units is proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

The project site is bounded by N School Street on the makai side and Lanakila Avenue on the Diamond Head side. The project is projected to be fully constructed and occupied by Year 2029.

The impacts of the proposed project to the surrounding transportation system were evaluated following guidelines established by the City & County of Honolulu Department of Planning & Permitting (DPP) Traffic Review Branch (TRB) and the Hawaii Depart of Transportation – Highways Division (HDOT). The operations of 14 existing key intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2016), as well as for Future (2029) conditions without and with the project.

The project's trip generation estimates were developed using MainStreet, a web application developed by Fehr & Peers that uses the Mixed-Use (MXD+) Trip Generation Model. This MXD model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain to the project site, as well as external transit, walk and vehicle mode splits. The vehicle trip reductions (i.e. walking, biking, transit) and internalization are approximately 45 percent of the total trips. Based on this method, the proposed project is estimated to generate the following net new vehicle trips:

- <u>1,000 Senior Units:</u> a total of 2,869 daily trips, including 147 trips during the AM peak hour (47 inbound/100 outbound), and 227 trips during the PM peak hour (125 inbound/102 outbound)
- <u>600 Non-Age Restricted & 400 Senior Units:</u> a total of 4,305 daily trips, including 272 during the AM peak hour (54 inbound/215 outbound), and 372 trips during the PM peak hour (236 inbound/136 outbound)

Table ES-1, shows the intersection impacts and under which project scenario those impacts would be triggered, the type of project impact (i.e. cumulative or project specific), and the recommended mitigation measures to mitigate those impacts.

TABLE ES-1: PROJECT IMPACTS

Intersection	Future Plus 1,000 Senior	Future Plus 600 Non-Age Restricted & 400 Senior	Impact Type	Potential Traffic Mitigation Measures
1. N School Street/Kalihi Street	X	X	Cumulative	Optimize signal timings or change westbound left-turn phasing to "protected permitted" phasing
5. N School Street/HPHA Driveway	X	X	Project Specific	Install a traffic signal.
10. N School Street/Palama Street – Alaneo Street	X	X	Cumulative	Restripe the northbound and southbound approaches on Palama Street and Alaneo Street to include a separate left and shared through/right lane.
11. Vineyard Boulevard/Liliha Street	X	X	Cumulative	Add a second eastbound left-turn lane on N Vineyard Boulevard

Source: Fehr & Peers, 2017

All four (4) impacts would be triggered under both project scenarios. To reduce the project's transportation impact, the implementation of travel demand management (TDM) strategies is recommended to reduce the number of vehicle trips and increase the use of alternative modes. TDM strategies that could be considered include incentivizing residents and employees to carpool and take transit, providing secure on-site bicycle storage facilities, and developing parking management plans. A final TDM program should be developed in consultation with DPP staff.

Overall, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes, and the safety enhancements described above. The project is also expected to not conflict with any existing facilities and planned improvements. Thus, the project's impacts to pedestrian, bicycle, and transit facilities and services are therefore considered.

2.0 INTRODUCTION

This transportation impact analysis report (TIAR) presents the results of the study conducted by Fehr & Peers for the redevelopment of the Hawaii Public Housing Authority (HPHA) Administrative Offices in the Lanakila neighborhood on the island of Oahu. The purpose of this analysis is to identify the impacts of the proposed project on the surrounding transportation system. The TIAR includes a description of the assumptions and methods used to conduct the study, as well as a discussion of the results. This TIAR was conducted in accordance with the guidelines and standards of the affected government agencies. **Figure 1** illustrates the study area, and **Figure 2** illustrates the proposed conceptual site plan.

2.1 PROJECT DESCRIPTION

The proposed project is the redevelopment of the existing HPHA Administrative Office property into a mixed-use development comprising residential, office, and retail uses. The project will include up to 800 residential units, replacement of the existing HPHA Administrative Office Building, and up to 10,000 square feet (s.f.) of retail and commercial uses. While only 800 all-Senior units is proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

The project site is bounded by N School Street on the makai side and Lanakila Avenue on the Diamond Head side. The project is projected to be fully constructed and occupied by Year 2029.

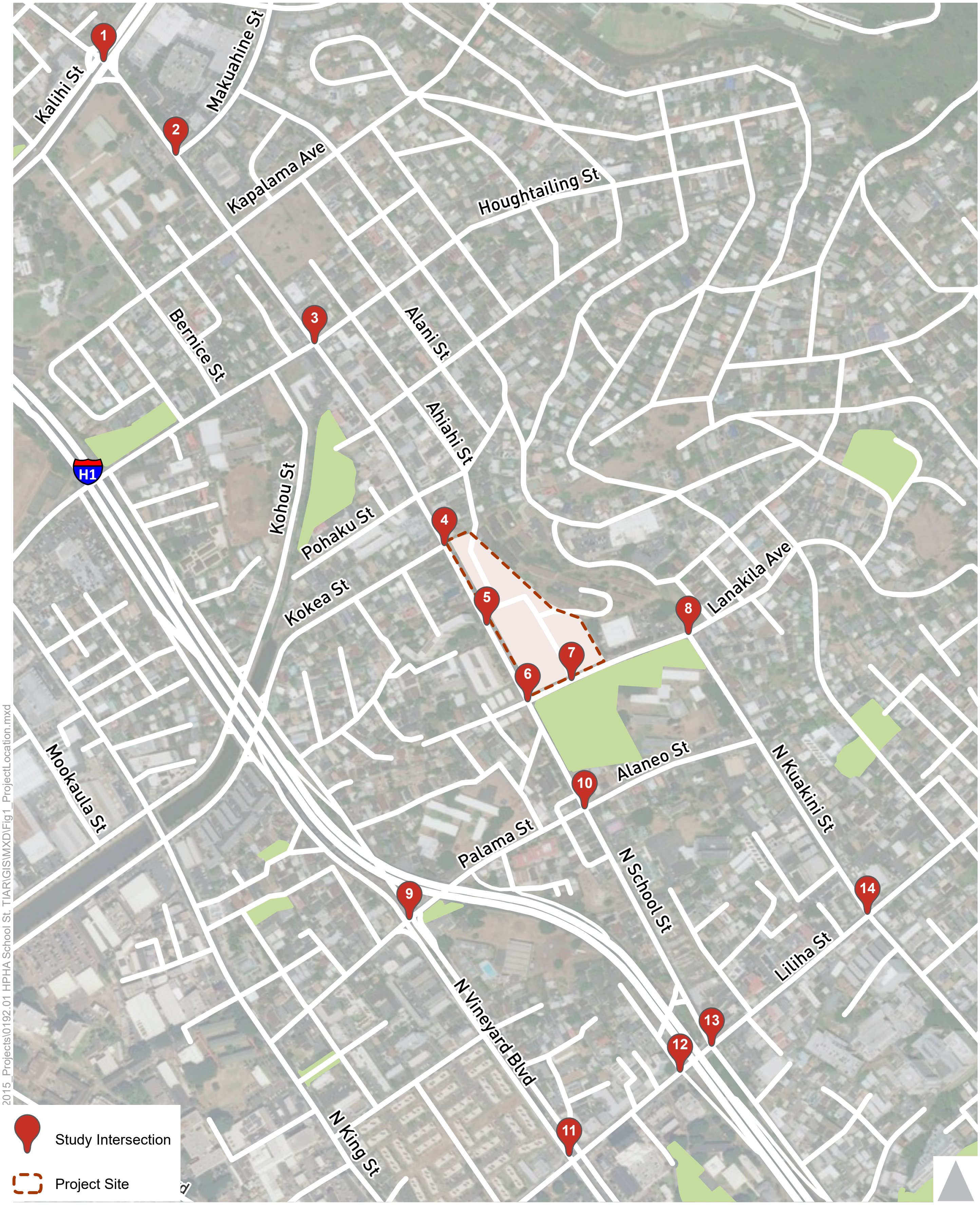


Figure 1

Project Location

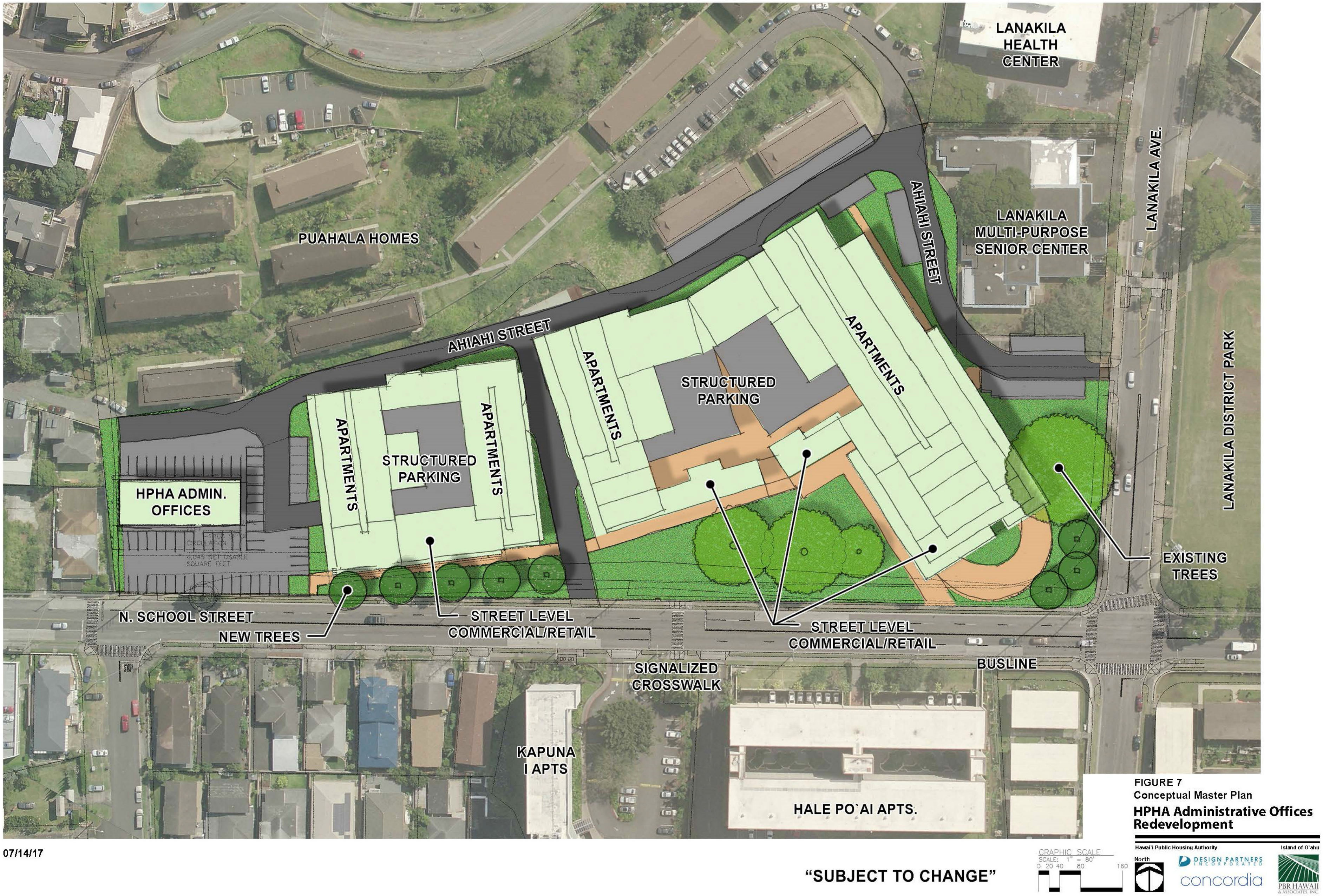


Figure 2

Site Plan

2.2 PROJECT STUDY AREA

The study analyzed the potential project-related traffic impacts during the typical weekday AM and PM peak hours under current conditions and two project scenarios. The transportation analysis evaluated the operations at 14 intersections in the vicinity of the proposed project. The analyzed intersections are listed below and are shown on **Figure 1**:

1. N School Street / Kalihi Street
2. N School Street / Makuahine Street
3. N School Street / Houghtailing Street
4. N School Street / Kokea Street
5. N School Street / HPHA Driveway
6. N School Street / Lanakila Street
7. Ahiahi Street – HPHA Driveway / Lanakila Street
8. Kuakini Street / Lanakila Street
9. N Vineyard Boulevard / Palama Street
10. N School Street / Palama Street – Alaneo Street
11. N Vineyard Boulevard / Liliha Street
12. Kiapu Place / Liliha Street
13. N School Street / Liliha Street
14. Kuakini Street/Liliha Street

The operations of the study intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for the following scenarios:

- **Existing (2016) Conditions** – The analysis of existing traffic conditions was based on 2016 counts collected for the analyzed peak hours. The existing conditions analysis also includes a description of key area roadways and an assessment of bicycle, pedestrian, and transit facilities and services near the site.
- **Future (2029) Baseline Conditions** – Future Year 2029 volumes in the anticipated completion year of the full project build-out were projected by increasing traffic volumes using an annual growth factor to account for ambient growth.
- **Future (2029) Plus Project Conditions** – This traffic scenario provides projected traffic volumes and an assessment of operating conditions with the proposed project after roughly 10+ years of background traffic growth.

2.3 TRAFFIC ANALYSIS METHODS

The analysis of roadway operations performed for this study is based on procedures presented in the *Highway Capacity Manual* (HCM), published by the Transportation Research Board in 2010. The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the least congested operating conditions, to LOS F, with the most congested operating conditions. LOS E represents “at-capacity” operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions. The methodologies for signalized and unsignalized intersections are described below.

2.3.1 SIGNALIZED INTERSECTIONS

The method described in Chapter 18 of the *Highway Capacity Manual 2010* was used to prepare the LOS calculations for the signalized study intersections. This LOS method analyzes a signalized intersection’s operation based on average control delay per vehicle. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using Synchro 9.0 analysis software and is correlated to a LOS designation as shown in **Table 1**.

TABLE 1: SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
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.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.

2.3.2 UNSIGNALIZED INTERSECTIONS

The operations of the unsignalized intersections were evaluated either using the method contained in Chapter 19: Two-Way Stop-Controlled Intersections or Chapter 20: All-Way Stop-Controlled Intersections of the *HCM 2010*. LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At all-way stop-controlled intersections the overall intersection delay and LOS is reported, and the LOS is characterized solely on control delay. At two-way or side-street-controlled (TWSC) intersections, the average control delay is calculated for each minor-street stopped movement and the major-street left turns, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For approaches with multiple lanes, the control delay is computed for each movement; the movement with the worst (i.e., longest) delay is presented for TWSC. As shown in the **Table 2**, LOS F is assigned to the movement if the volume-to-capacity (V/C) ratio for the movement exceed 1.0 regardless of control delay. The average control delay for unsignalized intersections is calculated using Synchro 9.0 analysis software and is correlated to a LOS designation as shown in **Table 2**.

TABLE 2: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	> 10.0 to 15.0
C	Average traffic delays.	> 15.0 to 25.0
D	Long traffic delays.	> 25.0 to 35.0
E	Very long traffic delays.	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.
Notes:
[1] For approach-based and intersection-wide assessments, such as that used for AWSC intersections, LOS is defined solely by control delay.

2.3.3 SIGNIFICANT IMPACT CRITERIA

The analysis of Future (2029) Conditions compares future baseline operations with conditions when the project is partially and fully built out, respectively, to determine whether or not project traffic is expected to result in a significant operational impact on the surrounding roadways. Based on previous studies conducted for the City & County of Honolulu Department of Planning and Permitting (DPP) Traffic Review Branch (TRB), the minimum desired operating standard for a signalized intersection is typically LOS D. Additionally, the Hawaii Department of Transportation (HDOT) strives to maintain LOS D intersection operations and has jurisdiction over two of the streets fronting the project site. Both agencies usually define a significant intersection impact when the operation of an intersection or turning movement changes from LOS D or better to LOS E or F. Impacts are also defined to occur when the addition of project traffic exacerbates locations already operating or projected to operate at LOS E or F. When evaluating intersection operations at any location, other factors are considered in the analysis, such as traffic volumes, volume-to-capacity (V/C) ratios (should ideally be less than 1.00), and secondary impacts to pedestrian, bicycle, and transit travel.

Each of the identified significant impacts is categorized as either a project-related or cumulative impact. If the addition of project traffic is expected to degrade LOS D or better operations to LOS E or F at a signalized intersection, then the project is considered to have a project-specific impact. An impact is considered a cumulative impact at a signalized intersection if the addition of project trips exacerbates LOS E or F operations.

For unsignalized intersections, the project is determined to have a significant project-specific impact if the addition of project traffic causes an unsignalized intersection to degrade from LOS D or better to LOS E or F and if the peak hour signal warrant is satisfied. An impact is considered a cumulative impact when it adds traffic to a study location that includes a controlled approach that operates at an undesired level (i.e., LOS E or F) and if the peak hour signal warrant is satisfied. The peak hour warrant is one of several key indications as to whether a traffic signal may be needed at a given location.

TRB and DOT do not publish impact criteria for pedestrian, bicycle, and transit impacts. However, these impacts are generally evaluated based on whether a proposed project would: 1) conflict with existing or planned pedestrian, bicycle, or transit facilities, or 2) create walking, bicycling, or transit use demand without providing adequate and appropriate facilities for non-motorized mobility. The existing amenities for pedestrians, bicycles, and transit users were inventoried to evaluate the quality of the facilities in place today. The assessments of planned facilities outlined in planning documents, such as the *O`ahu Bike Plan* and the *Honolulu High-Capacity Transit Corridor Project Final Environmental Impact Statement*, were used to evaluate future conditions for non-automobile modes. For these modes, if the proposed project is expected to conflict with existing or planned improvements to pedestrian and bicycle facilities, or if the project is expected to generate a substantial demand which could warrant additional transit service, then the project is expected to have a project-specific impact.

2.4 REPORT ORGANIZATION

This report is divided into eight chapters. The existing transportation system serving the project site and the current operating conditions of the key intersections are described in **Chapter 3** Existing Conditions. **Chapter 4** summarizes the methodologies used to forecast the future traffic volumes and presents the analysis for Future (2029) Baseline Conditions. **Chapter 5** describes the project trip generation, distribution, and assignment used in the transportation impact analysis. **Chapter 6** represents the analysis for the Future (2029) Plus Project Conditions. **Chapter 7** discusses mitigation measures to address any project impacts. **Chapter 8** contains an assessment of the site access and on-site circulation of the proposed project, while **Chapter 9** includes an assessment of the potential future effect of the project on existing and future transit, bicycle, and pedestrian facilities.

3.0 EXISTING CONDITIONS

This chapter describes the existing roadway network and includes a discussion of the bicycle, pedestrian, and transit facilities located in the project study area. This chapter also includes a discussion of the existing intersection LOS results.

3.1 EXISTING TRANSPORTATION FACILIITIES

A comprehensive data collection effort was undertaken to identify existing transportation conditions in the vicinity of the proposed project. The assessment of existing conditions relevant to this study includes an inventory of the street system, traffic volumes on these facilities, and operating conditions at key intersections. Existing public transit service and bicycle and pedestrian facilities are also described.

3.1.1 EXISTING ROADWAY SYSTEM

The key roadways providing access to or in the vicinity of the site are described below. **Figure 1** illustrates the proposed project location and the surrounding roadway system.

H-1 serves a major east-west connection between Kapolei and the Primary Urban Center (PUC) of Honolulu. The freeway is generally six lanes (three in each direction) within the study area. An existing full interchange is provided at Kalihi Street and partial interchanges within the project vicinity are provided at Palama Street, Vineyard Boulevard, Liliha Street, and Nuuanu Avenue.

North School Street is a four-lane major arterial on the makai side of the project site. Within the study area, N School Street is an undivided ewa-Diamond Head roadway that parallels the H-1 freeway and extends from Notley Street/Haumana Place on the ewa side to Nuuanu Avenue on the Diamond Head side, where it then transitions to South School Street. N School Street provides direct access to a variety of community-oriented facilities, such as small businesses, residences, churches, and shopping centers. Since N School Street is a parallel facility to H-1, it serves high traffic volume during the AM and PM commute periods when the freeway is congested.

Lanakila Avenue is a mauka-makai two-lane local street on the Diamond Head side of the project site. This roadway connects Emmeluth Lane in the makai side to Luna Street/Kunawai Lane on the mauka side, where it then transitions to Judd Lane. Immediately adjacent to the project site, Lanakila Avenue has a posted speed limit of 15 mph. Direct access to the project site is provided on Lanakila Avenue via an unsignalized intersection at Ahiahi Street. On-street parking is currently permitted between the existing raised crosswalk, adjacent to the Lanakila Multipurpose Senior Center, and Kuakini Street.

Palama Street is an undivided two-lane mauka-makai roadway that connects N King Street to N School Street. Mauka of N School Street, it transitions into Alaneo Street. Palama Street has a posted speed limit of 25 mph and on-street parking is permitted on both sides of the roadway. An H-1 ewa-bound off-ramp is provided on Palama Street near Likelike Elementary School. During the peak periods, moderate mauka and makai bound queues were observed on Palama Street and Alaneo Street due to the permitted signal phasing at the N School Street intersection.

Liliha Street is a major mauka-makai arterial that provides direct access to the project site at the Kukui Street signalized intersection. Within the project area, this roadway contains four travel lanes, two in each direction, with separate or shared left-turn lanes at signalized intersections. This roadway is under HDOT's jurisdiction and provides regional access via N. School Street and H-1 interchange; thus, Liliha Street serves high traffic volumes during the AM and PM peak periods, and long mauka-bound queues heading towards the H-1 interchange were observed during both peak hours.

Houghtailing Street is an undivided mauka-makai roadway that extends from N King Street on the mauka side to its terminus at Hillcrest Street on the mauka side. Between N King Street and N School Street, Houghtailing Street is a four-lane roadway and narrows to two-lanes, one lane in each direction, mauka of N School Street to Hillcrest Street. Houghtailing Street has a posted speed limit of 25 mph and is generally fronted by residential units, as well as the Governor Wallace Rider Farrington High School.

Kalihi Street is a major mauka-makai arterial that is under HDOT's jurisdiction and includes a full H-1 interchange. It is a six-lane divided roadway that connects Auiki Street in the makai side to Makuahine Street in the mauka side, where it then transitions into Likelike Highway. Within the study area, it has a posted speed limit of 25 mph. Given that Kalihi Street provides direct access to H-1, it serves substantially high traffic volumes during the AM and PM peak periods and long makai-bound queues traveling towards H-1 were observed during the AM peak period.

North Vineyard Boulevard is a major ewa-Diamond Head arterial that extends from Olomea Street/H-1 in the ewa direction to H-1 beyond Aala Street on the Diamond Head side. Vineyard Boulevard is an undivided roadway with six travel lanes (three in each direction) and has a posted speed limit of 30 mph. Similar to N. King Street, Vineyard Boulevard is a parallel facility to H-1, and therefore, serves significant traffic volumes during the AM and PM commute periods when the freeway is congested. North Vineyard is under HDOT's jurisdiction and provides access to H-1.

3.1.2 EXISTING TRANSIT SERVICES

"TheBus" is O`ahu's provider of public transit. Transit ridership among residents in the area is significantly high, and the study area is well served by frequent bus services on N School Street, Houghtailing Street, Kalihi Street, Liliha Street, Vineyard Boulevard, and N King Street. The project site is surrounded by several nearby bus stops on N School Street that provide ewa-Diamond Head bound services. Bus shelters are present at all bus stops near the project site, except for the Diamond Head bound bus stop adjacent to the baseball field. There are currently four bus stops immediately adjacent to the project site:

- Ewa-bound stop serving routes 1L, 2, 2L, and W3
- Diamond Head-bound stop serving routes 1L , 2, 2L, 13, and W3

The project site is also located approximately 1 mile from the planned Kapalama and Iwilei Stations that will provide access to the rail transit line that is currently under construction. The Kapalama Station will be located Dillingham Boulevard immediately Diamond Head of Kokea Street, and the Iwilei Station will be located at the makai-Diamond Head corner of the Dillingham Boulevard/Ka'aahi Street intersection. This system will provide more reliable and faster transit service from East Kapolei to Ala Moana Shopping Center, and will allow some residents and employees of the proposed project to travel to and from the area without the need for a private vehicle.

Figure 3 illustrates the existing and planned transit facilities and services within the greater study area.

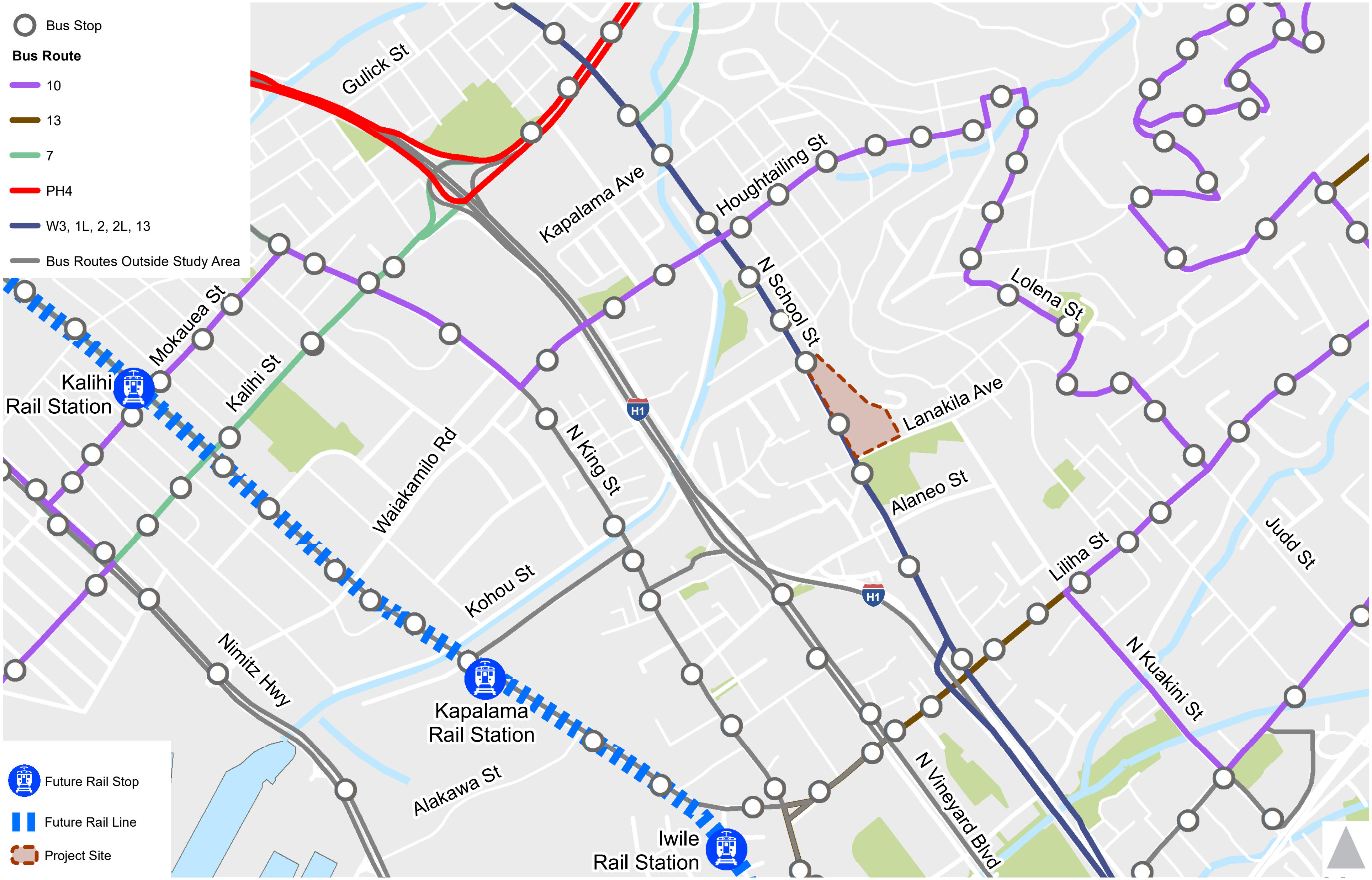


Figure 3

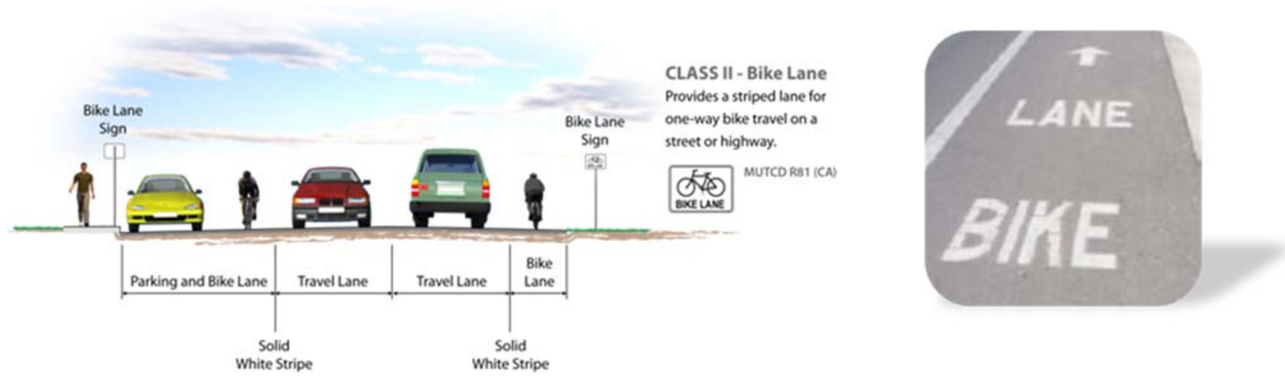
Existing and Planned Transit Facilities

3.1.3 EXISTING BICYCLE FACILITIES

Bicycle facilities generally consist of three types of facilities, which are outlined below:

- *Bike or Shared Use Paths* provide a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized. Generally, the recommended pavement width for a two-directional shared use path is ten (10) feet.

- *Bike Lanes* provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.



- *Bike Route or Signed Shared Roadways* provide for a right-of-way designated by signs or shared lane pavement markings, or "sharrows," for shared use with pedestrians or motor vehicles.

As depicted in **Figure 4**, no bicycle infrastructure is provided within the direct proximity of the project site, though existing bicycle facilities do serve adjacent community areas. Cyclists must share the travel lane with vehicles; however, given the heavy traffic volumes on the adjacent streets, the majority of cyclists ride on the sidewalks, which creates potential conflicts between bicycles and pedestrians along the narrowest sidewalk sections.

Bicycle infrastructure will be expanded and developed as planned land uses are built and occupied. The *Oahu Bike Plan* calls for new bicycle routes on N School Street and Makuahine Street, and planned bicycle lanes on N. King Street and Liliha Street. Implementation of separate bicycle lanes (Class II facilities) will require roadway restriping and/or the elimination of parking and vehicle travel lanes. The City & County of Honolulu is currently conducting complete streets planning efforts to identify specific multi-modal improvements in this area including at the intersection of N. King Street and Liliha Street-Dillingham Boulevard.

3.1.4 EXISTING PEDESTRIAN FACILITIES

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The project area has moderate pedestrian activity and is generally well-served by pedestrian infrastructure. All roadways in the immediate vicinity of the project site include sidewalks on both sides of the street. Portions of sidewalks on N School Street are relatively narrow (i.e. less than four feet wide), however, the sidewalks are still in fairly good condition and adequate to serve the pedestrian demand in the area. Sidewalks immediately adjacent to the project site are wide and in good condition, with some shade provided by trees. In addition, a raised crosswalk with a landscaped median is located immediately mauka of the main HPHA driveway on Lanakila Avenue.

All study intersections surrounding the project site includes marked crosswalks on at least three of the intersection approaches, with the exception of the N School Street/Kokea Street and N School Street/Makuahine Street, which only provide two marked crosswalks. Additionally, a mid-block pedestrian signal currently exists on N School Street, immediately adjacent to the project site, between Kokea Street and Lanakila Avenue. This signal is a two phased signal and serves pedestrians crossing N School Street and the ewa-Diamond Head vehicle traffic on N School Street. This signal is only activated when a pedestrian pushes the pedestrian push-button.

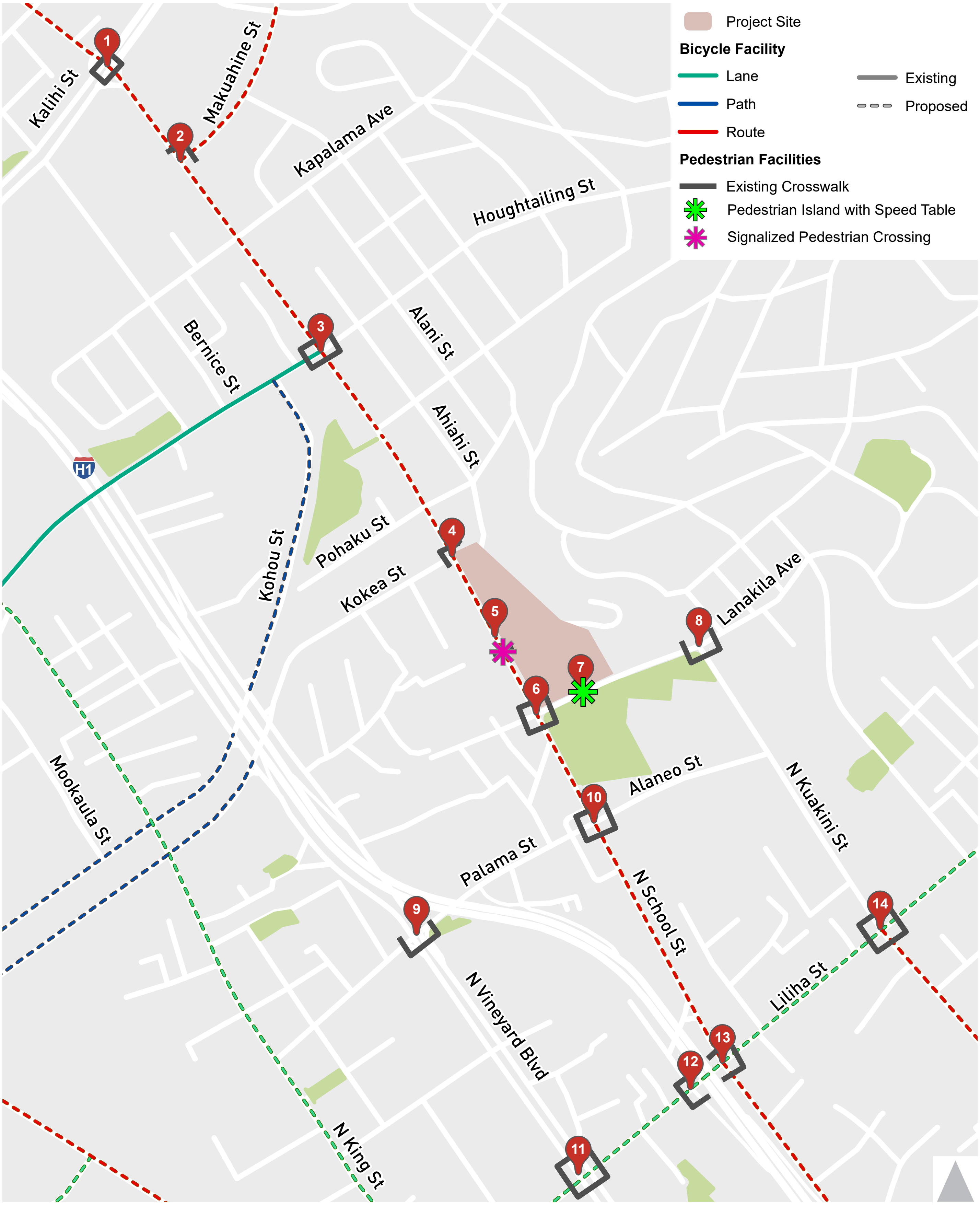


Figure 4

Existing and Proposed Bicycle and Pedestrian Facilities

3.2 EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The operations of the 14 existing study intersections were evaluated during weekday morning (6:00 to 8:00 AM) and evening (3:15 to 5:15 PM) peak-period conditions. Traffic counts were collected during the weekday AM and PM peak periods at the study intersections in August 2016, when local schools were in session. The weekday AM peak hour of traffic for the study area generally occurs between the hours of 7:00 AM and 8:00 AM. During the weekday afternoon/evening, the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM.

Existing lane configurations and signal controls were obtained through field observations. **Figure 5** presents the existing AM and PM peak-hour turning movement volumes, corresponding lane configurations, and traffic control devices. Raw traffic count data sheets are provided in **Appendix A**.

3.3 FIELD OBSERVATIONS

Field observations were conducted to identify existing traffic operational deficiencies and to confirm the accuracy of calculated levels of service. The purpose of this effort was to (1) to identify any existing traffic problems that may not be directly related to intersection level of service and (2) to identify any locations where the level of service calculation does not accurately reflect level of service in the field. Field observations were conducted on midweek day in August 2016 during the same time day traffic counts were conducted.

Vehicle queues, pedestrian/bicycle activity, and bus operations were observed on N School Street, Lanakila Avenue, Kuakini Street, Palama Street, Liliha Street, Houghtailing Street, Kalihi Street, and Vineyard Boulevard. During both AM and PM peak hours, the following traffic congestion was observed:

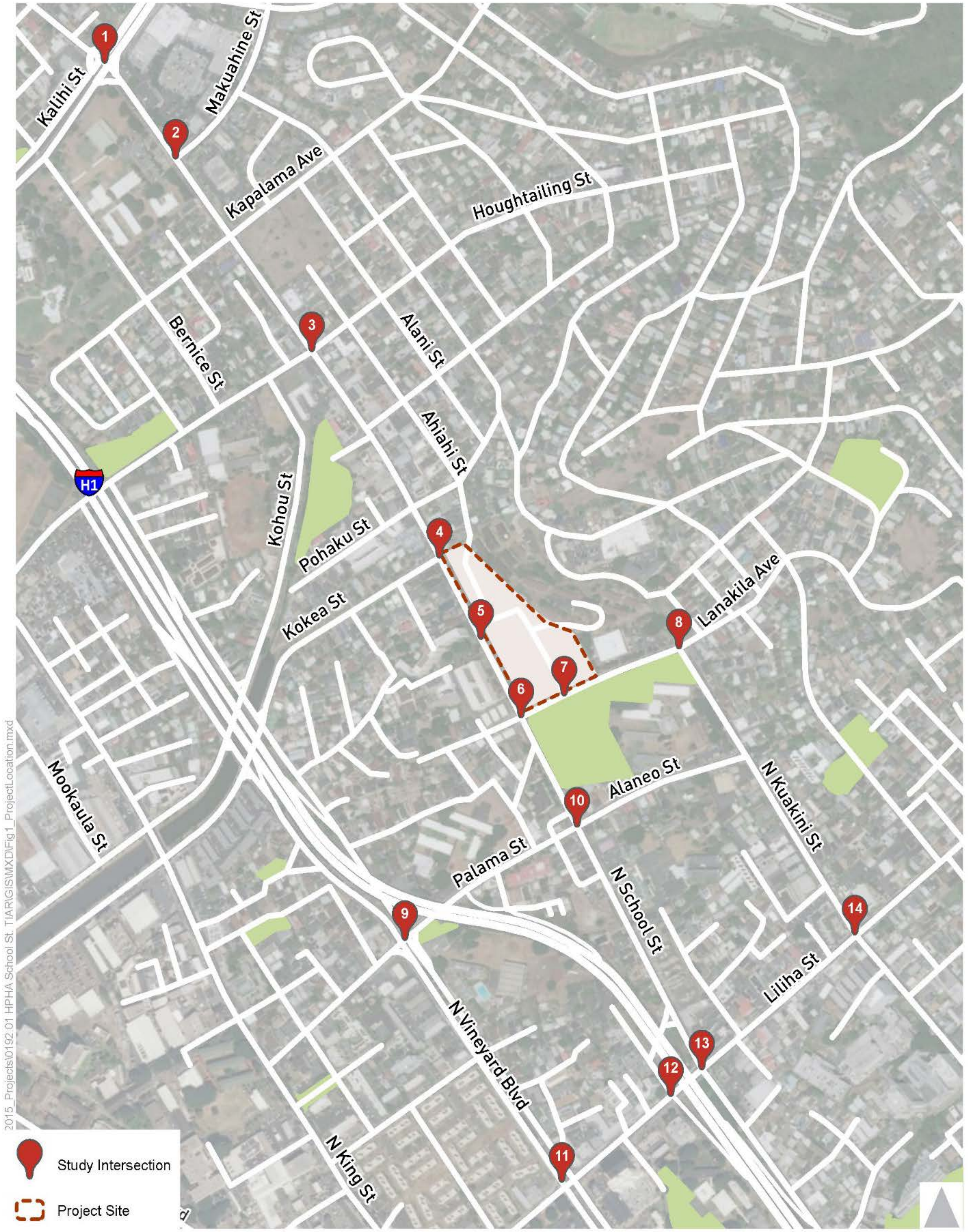
- N School Street serves substantial traffic volumes during the AM and PM commute peak periods on weekdays. During the AM peak hour, a lengthy Diamond Head-bound queue forms at the N School Street/Lanakila Avenue intersection. However, this queue does not adversely affect vehicle operations on N School Street as the intersection’s signal provides adequate green time to serve the vehicles in the queue under one signal cycle. N School Street
- Congestion and slow moving mauka-bound queues occur on Dillingham Boulevard-Liliha Street from Akepo Lane to the H-1 Freeway ramps. As mentioned in the *Roadways* section, Liliha Street provides regional access via the N King Street intersection and the H-1 Freeway, and therefore serves heavy vehicle volumes during the AM and PM peak periods. Furthermore, Liliha Street serves multiple bus routes with bus stops in between N King Street and Vineyard Boulevard, with no

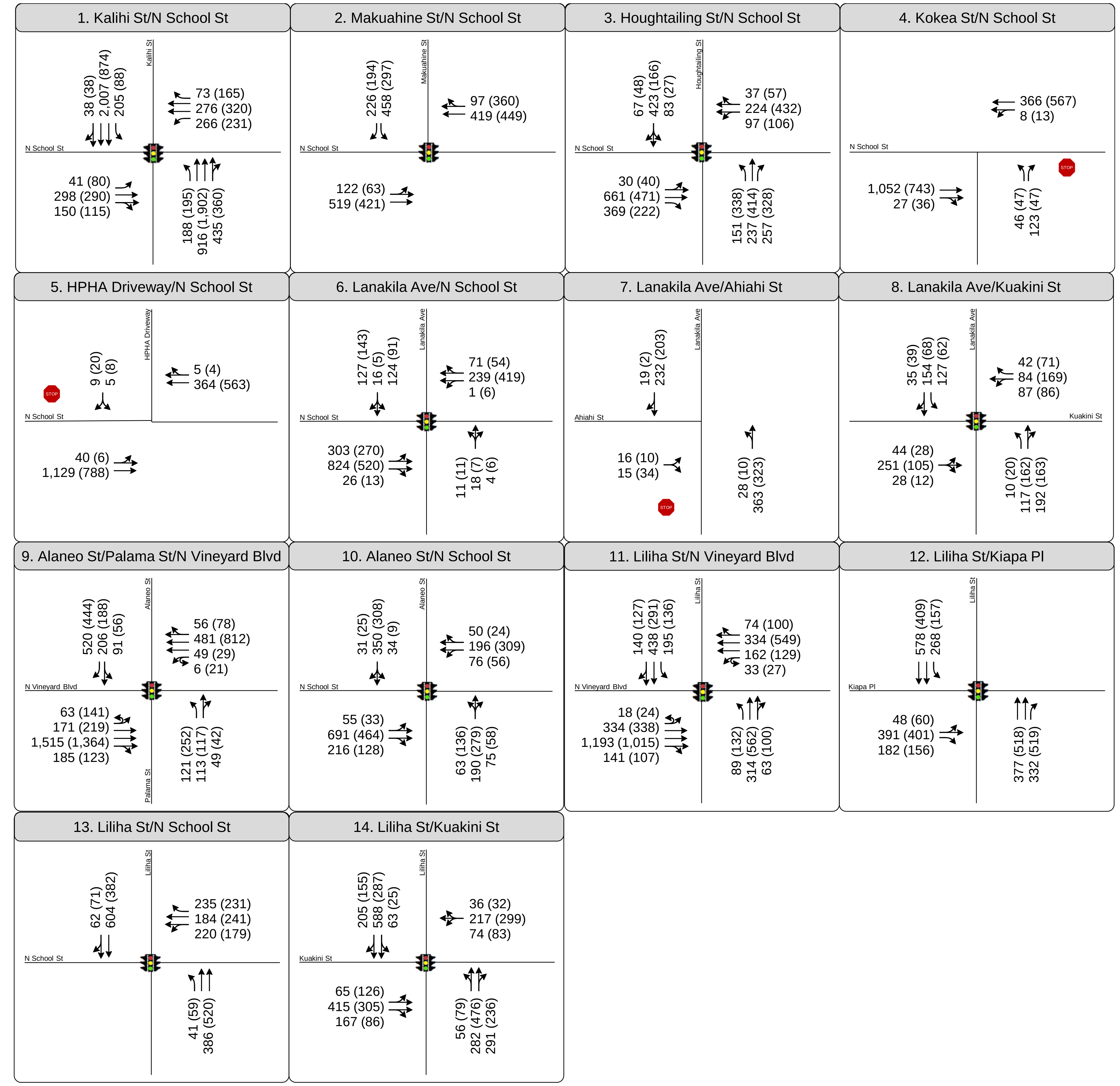
designated bus turnouts on Liliha Street. Consequently, when a bus is loading and unloading passengers at the stops, occasionally it blocks through traffic in the outside travel lane and impedes traffic flow on Liliha Street.

- Substantial queues were observed at the N School Street/Kalihi Street intersection during the AM and PM peak period. During the AM peak period, makai-bound queues on Kalihi Street were observed to extend from N School Street to Makuahine Street due to the high vehicle demand and limited vehicle capacity. This queue required at least two signal cycles to clear. Additionally, an ewa-bound left-turn queue on N School Street during both the AM and PM peak periods, which was caused by the long green signal times allocated on Kalihi Street. However, the ewa-bound queue was able to be served within one signal cycle.

Moderate pedestrian activity was observed on the major study corridors (i.e. N School Street, Houghtailing Street, Kalihi Street, and Liliha Street) during both peak hours. The study area is very dense with various land uses, such as schools, retail centers, residential units, industrial/office complexes, which is ideal from a walkability standpoint since a person can simply walk to their destination instead of drive because the distance is fairly close. Most pedestrians walking near the project site were observed to be coming from/to an adjacent transit stop.

Minimal bicycle activity on the study roadways was observed during the peak hours. Since no separate bicycle facilities are currently provided in the study area, the limited number of bicyclists traveling on the roadways was not unexpected. Most bicyclists were observed riding on the sidewalks on N School Street as they likely perceive that it provides a safer ride compared to riding on these roadways with high vehicle volumes.





AM (PM) Peak Hour Traffic Volume

Figure 5
Peak Hour Traffic Volumes and Lane Configurations
Existing Conditions

3.4 EXISTING INTERSECTION LEVELS OF SERVICE

Existing peak-hour volumes and lane configurations were used to calculate levels of service for each of the study intersections. The results of the existing LOS analysis are presented in **Table 3** and the corresponding LOS calculation sheets are included in **Appendix B**.

TABLE 3: EXISTING (2016) INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Delay (sec/veh)[2]	LOS[3,4]
1. N School St/Kalihi St	Signal	AM	**83.1**	**F**
		PM	49.5	D
2. N School St/Makuahine St	Signal	AM	29.1	C
		PM	14	B
3. N School St/Houghtailing St	Signal	AM	34	C
		PM	25.7	C
4. N School St/Kokea St	SSSC	AM	**74.4**	**F**
		PM	**40.7**	**E**
5. N School St/HPHA Dwy	SSSC	AM	16.9	C
		PM	14.1	B
6. N School St/Lanakila St	Signal	AM	15.8	B
		PM	10.9	B
7. Ahiahi St-HPHA Dwy/Lanakila Ave	SSSC	AM	14.8	B
		PM	11.2	B
8. Kuakini St/Lanakila St	Signal	AM	10	A
		PM	7.2	A
9. N Vineyard Blvd/Palama St	Signal	AM	38.4	D
		PM	42.3	D
10. N School St/Palama St-Alaneo St	Signal	AM	24.6	C
		PM	35.4	D
11. N Vineyard Blvd/Liliha St	Signal	AM	**79.4**	**E**
		PM	**69.5**	**E**

TABLE 3: EXISTING (2016) INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Delay (sec/veh)[2]	LOS[3,4]
12. Kiapu Pl/Liliha St	Signal	AM	26	C
		PM	29	C
13. N School St/Liliha St	Signal	AM	23.7	C
		PM	21.7	C
14. Kuakini St/Liliha St	Signal	AM	13.8	B
		PM	13.1	B

Source: Fehr & Peers, 2017.
Notes:
[1] SSSC = Side-street stop controlled
[2] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.
[3] LOS calculations performed using the *Highway Capacity Manual (HCM) 2010* method. LOS for side street stop-controlled (SSSC) intersections is worst-case movement. Other uncontrolled movements generally operate well with limited delay.
[4] Undesired LOS and corresponding seconds of delay per vehicle are highlighted in **bold.**

The results of the LOS calculations indicate that all study intersections operate at an overall desirable service level (LOS D or better), with the exception of the following three (3) intersections:

1. N School Street / Kalihi Street – LOS F (AM peak hour)
4. N School Street / Kokea Street – LOS F and LOS E (AM and PM peak hours, respectively)
11. N Vineyard Boulevard / Liliha Street – LOS E (AM and PM peak hours)

The poor operations at the N School Street/Kokea Street intersection is the stop-controlled mauka-bound left-turn movement on Kokea Street. N School Street serves high ewa and Diamond Head bound volumes during both peak hours, which makes it difficult for vehicles on the side-streets to find gaps in traffic flow to cross the intersection. However, drivers on N School Street are typically accommodating to those on the side-streets and will either slow down or stop to provide a gap in traffic to allow vehicles turning left from Kokea Street to pass. The majority of vehicles traveling through this intersection are those on N School Street and experience minimal delay.

The remaining 11 study intersections operate at a desirable LOS (D or better) at an overall intersection-level during both peak hours. However, it should be noted that some individual turning movements/approaches operate below LOS D even when the overall intersection is operating at a desirable LOS. Movements operating at LOS E or F during peak periods is not uncommon, especially on high volume, urban arterials and are only considered notable problems when they negatively impede other turning movement flows.

The majority of the poorly operating movements are left-turn movements. This is attributed to the existing signal timing allocating more green time to the through movements, which in most cases, will cause the left-turn movements to operate at LOS E or F in at least one of the peak hours. For left-turns operating poorly at unsignalized intersections, this is primarily due to the high traffic volume on the major streets (e.g. N School Street, Liliha Street, Kalihi Street, Vineyard Boulevard) and limited number of gaps for vehicles at the stop-controll9ed movement to make left-turns.

4.0 FUTURE (2029) BASELINE CONDITIONS

To evaluate the potential impacts of traffic generated by the proposed project on the surrounding street system, it was necessary to first develop estimates of future traffic conditions in the area without the project. Future traffic conditions without the project reflect traffic increases due to regional growth and development. These conditions are referred to as the baseline condition (i.e., "no project" condition). The forecasted future or cumulative baseline traffic volumes were then used to identify impacts on the roadway system. Development of these future traffic scenarios is described in this chapter.

4.1 FUTURE (2029) TRAFFIC ESTIMATES

The following section summarizes the growth assumptions used to estimate the amount of traffic that would be adding to existing intersection volumes to develop volume estimates for Future (2029) Baseline Conditions.

4.1.1 AREAWIDE OR AMBIENT TRAFFIC GROWTH

A growth factor was individually applied to the traffic of each intersection's approach to account for future regional growth. Since this scenario would include the future rail in operation, the *Honolulu High-Capacity Transit Corridor Project (HHCTP), Final Environmental Impact Statement* (June 2010) was reviewed to calculate the traffic forecasts. According to that study and other transportation studies in the study area, the traffic volumes on major roadways are anticipated to increase approximately 0.5 percent per year when the future rail is in full operation. This growth rate is considered reasonable given the urban and dense nature of the adjacent areas and surrounding neighborhoods. Additionally, while the future rail is expected to address future transportation demand and capacity needs, it is not expected to significantly reduce traffic volumes on major roadways near the rail line as the extra capacity on the roadway would be backfilled with the increase of traffic generated by planned developments around the region. Therefore, a 0.5 percent growth factor was applied to the existing traffic volumes collected in August 2016. The growth rate was compounded over a 13-year timeframe (2016 to 2029) during full buildout of the proposed project.

4.1.2 CUMULATIVE PROJECT TRAFFIC GENERATION AND ASSIGNMENT

Future base traffic forecasts also include the effects of individual planned/approved development projects, expected to be constructed with the project's 13-year development timeframe and expected to add traffic in the vicinity of the project site.

One cumulative project was identified in the greater study area and the traffic from that future development was subsequently added to the cumulative base traffic projections for 2029.

The Mayor Wright Redevelopment project will redevelop the existing 364 affordable housing units into a mixed-use development comprising residential and retail uses. The project will include up to 2,500 residential units and up to 80,000 square feet (s.f) of retail and commercial uses and is anticipated to by fully operational by Year 2028.

The trip generation for the Mayor Wright Redevelopment project is shown in **Table 4**.

TABLE 3 MAYOR WRIGHT ESTIMATED TRIP GENERATION

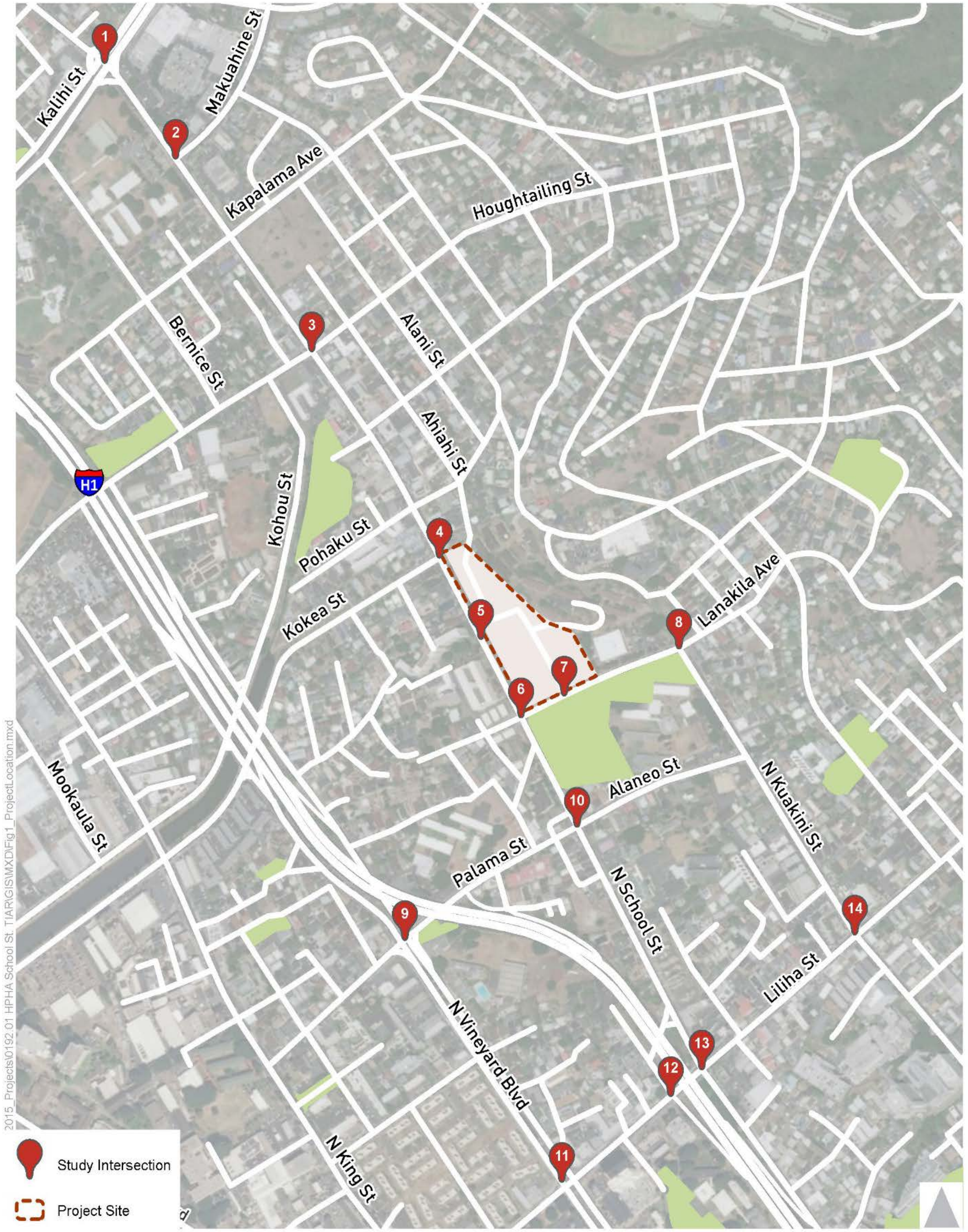
Mayor Wright Redevelopment Trip Generation	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
TOTAL	**111**	**467**	**578**	**590**	**369**	**959**

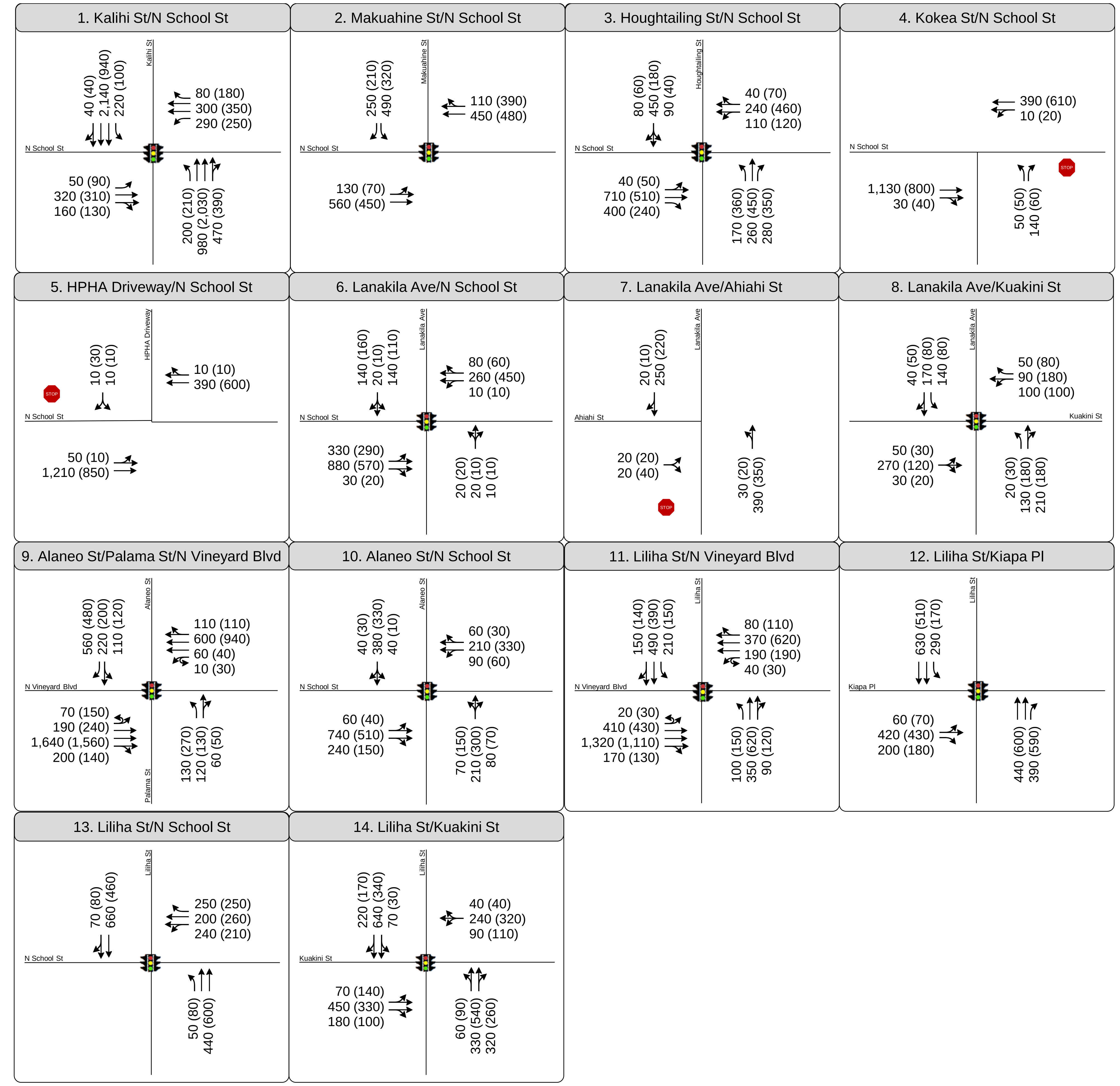
Source: Fehr & Peers, 2017

The proportion of related project traffic that will travel through the study area was added to the ambient background volume. The resulting traffic volumes, representing Future (2029) Baseline Conditions, are presented in **Figure 6.** These future projections take into account the estimated overall growth in the surrounding area without the addition of traffic generated by the Project. The use of the growth factor and the addition of future Mayor Wright traffic results in a conservative estimate of traffic under "No Project" conditions.

4.1.3 FUTURE (2029) BASELINE STREET SYSTEM IMPROVEMENTS

Based on a review of public documents, including O`ahu's *Transportation Improvement Program for Fiscal Years 2015-2018* and the *O`ahu Regional Transportation Plan 2040*, no substantive roadway improvements or transportation system changes are projected to occur through 2029 in the immediate vicinity of the project site and more specifically at the study intersections. Therefore, the Future (2029) Baseline traffic network is assumed to remain the same as Existing Conditions. **Figure 6** shows the traffic volumes and lane configurations under Future (2029) Baseline Conditions





AM (PM) Peak Hour Traffic Volume

Figure 6
Peak Hour Traffic Volumes and Lane Configurations
Future (2029) Baseline Conditions

4.2 FUTURE (2029) BASELINE LEVELS OF SERVICE

Levels of service calculations were conducted to evaluate the operating levels of the study intersections under Future (2029) Baseline Conditions based on the projected growth in traffic and the anticipated roadway improvements. The results of the LOS analysis for the study intersections under Future (2029) Baseline Conditions are presented in **Table 5.** The corresponding LOS Calculation sheets are included in **Appendix C**

TABLE 5: FUTURE (2029) BASELINEINTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Delay (sec/veh)[2]	LOS[3,4]
1. N School St/Kalihi St	Signal	AM	**106.2**	**F**
		PM	**56.4**	**E**
2. N School St/Makuahine St	Signal	AM	34.5	C
		PM	14.9	B
3. N School St/Houghtailing St	Signal	AM	40.2	D
		PM	31.2	C
4. N School St/Kokea St	SSSC	AM	**103.2**	**F**
		PM	**54.0**	**F**
5. N School St/HPHA Dwy	SSSC	AM	22.3	C
		PM	14.8	B
6. N School St/Lanakila St	Signal	AM	17.8	B
		PM	12.9	B
7. Ahiahi St-HPHA Dwy/Lanakila Ave	SSSC	AM	14.9	B
		PM	12.4	B
8. Kuakini St/Lanakila St	Signal	AM	10.2	B
		PM	7.8	A
9. N Vineyard Blvd/Palama St	Signal	AM	47.3	D
		PM	52.4	D
10. N School St/Palama St - Alaneo St	Signal	AM	**61.5**	**E**
		PM	**66.4**	**E**

TABLE 5: FUTURE (2029) BASELINEINTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Delay (sec/veh)[2]	LOS[3,4]
11. N Vineyard Blvd/Liliha St	Signal	AM	**104.7**	**F**
		PM	**100.3**	**F**
12. Kiapu Pl/Liliha St	Signal	AM	27.8	C
		PM	31.2	C
13. N School St/Liliha St	Signal	AM	24.5	C
		PM	22.6	C
14. Kuakini St/Liliha St	Signal	AM	18.3	B
		PM	18.9	B

Source: Fehr & Peers, 2017.
Notes:
[1] SSSC = Side-street stop controlled
[2] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.
[3] LOS calculations performed using the *Highway Capacity Manual (HCM) 2010* method. LOS for side street stop-controlled (SSSC) intersections is worst-case movement. Other uncontrolled movements generally operate well with limited delay.
[4] Undesired LOS and corresponding seconds of delay per vehicle are highlighted in **bold.**

The analysis results indicate that 10 study intersections are forecasted to operate at LOS D or better under Future (2029) Baseline Conditions. The following four (4) study intersections are expected to operate at undesirable LOS E or F for at least one peak hour and include:

1. N School Street / Kalihi Street – LOS F and LOS E (AM and PM peak hours, respectively)
4. N School Street / Kokea Street – LOS F (AM and PM peak hours)
10. N School Street / Palama Street – Alaneo Street – LOS E (AM and PM peak hours)
11. N Vineyard Boulevard / Liliha Street – LOS F (AM and PM peak hours)

As noted previously, some individual turning movements/approaches operate below LOS D even though the overall intersection is operating at a desirable LOS. The majority of the poorly operating movements are left-turn movements. This is attributed by the signal timing allocating more green time to the through movements, which in most cases, will cause the left-turn movements to operate at LOS E or F in at least one of the peak hours.

5.0 PROJECT TRAFFIC PROJECTIONS

This chapter describes the anticipated number of vehicle trips and directionality of those trips that would result from implementation of the proposed project. Future traffic added to the roadway system by the project is estimated using a three-step process: (1) project trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of project-generated traffic will be added to the roadway network. The second step estimates the direction of travel to and from the project site. The new trips are assigned to specific street segments and intersection turning movements during the third step. The proposed project includes up to 800 residential units, 10,000 square feet (s.f.) of retail or commercial uses, and a replacement of the existing HPHA Administrative office. The new HPHA Administrative office is anticipated to relocate the existing employees into a larger office space, but not increase employment. While only 800 all-Senior units is proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

This process is described in more detail in the following sections.

5.1 PROJECT TRIP GENERATION ESTIMATES

The project's trip estimates were based on four (4) sources of data:

- Trip Generation 9th Edition
- MainStreet (Fehr & Peers' MXD+ web app)
- Existing commute survey

The proposed new residential and retail uses would generate traffic that would increase the traffic currently generated by the existing HPHA employees. Vehicle trips are estimated based on standard rates published in the *Trip Generation* (9th Edition, 2012) by the Institute of Transportation Engineers (ITE), including adjustments to account for internal vehicle trips and non-motorized trips given the mix of land use proposed and the location of the project relative to other facilities.

The combined effects of the project's land use, location, and development scale would contribute to a reduction in off-site average weekday vehicle trips. This reduction is attributed primarily to the project's proximity to existing transit services or walking distances to complimentary land uses, as well as the interaction between the residential units and retail uses.

The anticipated internalization of trips generated by complementary uses within the project site was estimated using MainStreet, a web application developed by Fehr & Peers that uses the Mixed-Use (MXD+) Trip Generation Model. This MXD+ model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain to the project site, as well as external transit, walk and vehicle mode splits.

The provision of the bus transit system in close proximity to the project site (ewa and Diamond-head bus routes immediately adjacent to project frontage) would allow some residents of the proposed project to reduce the number of vehicle trips they make by providing a reliable alternative to auto travel. In some cases, residents may choose to not own a vehicle and rely exclusively on the bus. Furthermore, some patrons of the retail uses, as well as some employees, would use bus transit further reducing traffic to the site. The future rail system will include two stations within approximately a one (1) mile walk of the site. Generally, a ½-mile walking distance is considered close enough to have a substantial impact on transit ridership. While some employees and residents will use the rail transit system, we have not assumed a significant reduction per typical planning practice.

The last set of reductions applied to project trips was for pass-by retail trips. Pass-by trips are made by those vehicles already passing by the site on N School Street (where the existing driveway is), and those vehicles would simply turn into and out of the site during a trip that is already being made. In this case, pass-by trips are not new trips generated by the site or new to the roadway network, but still comprise a portion of site-generated traffic at its driveways. A 25 percent pass-by reduction was applied to the retail uses. This reduction was obtained from the *ITE Trip Generation Manual* and is a standard approach for retail uses.

Lastly, since the project site currently serves trips traveling to and from the existing HPHA Administrative offices, the existing trips were credited towards the project's net vehicle trip generation as those trips are already traveling on the network and are not considered new trips. We used the existing peak hour driveway counts to calculate the existing site's peak hour trip generation.

Table 6 displays the project's trip generation estimate for the two project alternatives. For the "1,000 Senior Units" alternative, the project is estimated to generate approximately 2,896 net new daily trips, 147 net new AM peak hour trips (47 inbound/100 outbound), and 227 net new PM peak hour trips (125 inbound/102 outbound). For the "600 Non-Age Restricted Mixed-Income Units and 400 Senior Units" alternative, the project is estimated to generate approximately 4,305 net new daily trips, 273 net new AM peak hour trips (54 inbound/218 outbound), and 372 net new PM peak hour trips (236 inbound/136 outbound). The MXD (i.e. internalization and walking/biking trips) and future transit reductions is approximately 45 percent, which accounts for the mixed-use nature of the land use where vehicle trips would be linked (e.g. residential-retail interplay), and/or replaced with walk, bike, and transit trips to nearby land uses.

TABLE 6: PROJECT TRIP GENERATION ESTIMATES

Land Use	Units	Daily	AM Peak Hour[2]			PM Peak Hour[2]		
			In	Out	Total	In	Out	Total
1,000 SENIOR UNITS (A)								
Office	196 employees	783	105	14	119	23	110	133
Senior Housing	1,000 du	3,001	68	132	200	130	111	242
Retail	10 ksf	3,743	24	15	38	61	67	128
	Gross Total	5,305	196	161	357	215	288	502
	Internalization[3]	*-265*	*-10*	*-8*	*-18*	*-11*	*-14*	*-25*
	Net External Vehicle Trips (Post Internalization)	5,040	186	153	339	204	274	477
	Non-Auto Trips[3]	*-1,076*	*-31*	*-35*	*-66*	*-44*	*-50*	*-94*
	Net External Vehicle Trips (Post Internalization & Non-Auto Reductions)	3,964	155	118	273	160	224	383
	Retail Pass-By (25%)[4]	*-284*	*-4*	*-3*	*-7*	*-12*	*-12*	*-24*
	Net New Vehicle Trips (A)	*3,680*	*151*	*115*	*266*	*148*	*212*	*359*
600 NON-AGE RESTRICTED MIXED-INCOME UNITS & 400 SENIOR UNITS (B)								
Office	196 employees	783	105	14	119	23	110	133
Apartment	600 du	3,760	60	238	298	226	122	348
Senior Housing	1,000 du	1,213	27	53	80	53	45	98
Retail	10 ksf	1,520	24	15	38	61	67	128
	Gross Total	7276	215	320	535	363	343	706
	Internalization[3]	*-364*	*-11*	*-16*	*-27*	*-18*	*-17*	*-35*
	Net External Vehicle Trips (Post Internalization)	6,912	204	304	508	345	326	671
	Non-Auto Trips[3]	*-1,544*	*-41*	*-68*	*-109*	*-74*	*-68*	*-142*

TABLE 6: PROJECT TRIP GENERATION ESTIMATES

Net External Vehicle Trips (Post Internalization & Non-Auto Reductions)	5,368	163	236	399	271	258	529
Retail Pass-By (25%)[4]	-280	-4	-3	-7	-12	-12	-24
Net New Vehicle Trips (B)	5,088	159	233	392	259	246	505
EXISTING USES (C)							
Office — *196 employees* — *(C)*	-783	-105	-14	-119	-23	-110	-133
PROPOSED PROJECT NET NEW VEHICLE TRIPS							
1,000 SENIOR UNITS NET NEW VEHICLE TRIPS (A-C)	**2,896**	**47**	**100**	**147**	**125**	**102**	**227**
600 NON-AGE RESTTRICTED & 400 SENIOR UNITS NET NEW VEHICLE TRIPS (B-C)	**4,305**	**54**	**218**	**272**	**236**	**136**	**372**

Source: Fehr & Peers, 2017
Notes:
1 DU = Dwelling Unit; ksf = 1,000 square feet
2 Senior Housing uses Senior Adult Housing- Attached Best Fit equation
Daily: T = 2.98(X) + 21.05; AM: T = 0.20(X) – 0.13; PM: T = 0.24(X)+1.64
Apartment uses Apartment Best Fit equation
Daily: T = 6.06(X) + 123.56; AM: T = 0.49(X) + 3.73; PM: T = 0.55(X) + 17.65
Retail uses Shopping Center Best Fit Equation
Daily: Ln(T) = 0.65Ln(X)+5.83; AM: Ln(T) = 0.61Ln(X) + 2.24
Office Uses General Office Building Best Fit Equation
Daily: Ln(T) = 0.84Ln(X) + 2.23; AM: Ln(T) = 0.86Ln(X) + 0.24; PM: T= 0.37(X)+60.08
3 The MXD model (MXD+) was used to obtain these non-auto (walking/bicycling/transit)-oriented and internalization trip reduction percentages. This percentage was further refined based on the existing walking/biking percentage from the Kalihi Community Survey.
4 Retail pass-by reduction from the *ITE Trip Generation Manual*.

5.2 PROJECT TRIP DISTRIBUTION

An initial trip distribution estimate was based on a “select zone” analysis using the OahuMPO Regional Travel Demand Forecasting Model (TDFM). This process identifies the number of trips on each roadway segment included in the model that is generated by the single traffic analysis zone (TAZ) representing the project area. The distribution was further refined and adjusted based on:

- Existing traffic volumes
- Level of accessibility of route to and from the project site
- Location of complementary land uses (retail centers and schools from which residents would be drawn)

- Locations of other similar land uses

Based on these factors, the vehicle trip distribution of the project-generated traffic under Future (2029) Conditions is estimated to be:

Residential Trip Distribution

- 22% to/from the West along H-1
- 3% to/from the West along N School Street
- 7% to/from the North along Kalihi Street/Likelike Highway
- 7% to/from the South along Kalihi Street
- 1% to/from the North along Makuahine Street
- 3% to/from the South along Houghtailing Street
- 2% to/from the North along Lanakila Avenue
- 2% to/from the South along Palama Street
- 2% to/from the North along Liliha Street
- 10% to/from the East along Kuakini Street
- 20% to/from the East along H-1
- 6% to/from the South along Liliha Street
- 15% to/from the East along Vineyard Boulevard

Retail Trip Distribution

- 13% to/from the West along H-1
- 7% to/from the West along N School Street
- 6% to/from the North along Kalihi Street/Likelike Highway
- 2% to/from the South along Kalihi Street
- 1% to/from the North along Makuahine Street
- 3% to/from the North along Houghtailing Street
- 1% to/from the South along Houghtailing Street

- 5% to/from the North along Lanakila Avenue
- 2% to/from the South along Palama Street
- 22% to/from the North along Liliha Street
- 10% to/from the East along Kuakini Street
- 9% to/from the East along H-1
- 10% to/from the South along Liliha Street
- 9% to/from the East along Vineyard Boulevard

Figure 7 illustrates the project trip distribution pattern described above.

5.3 PROPOSED PROJECT ROADWAY MODIFICATIONS

The proposed project plans to provide access via the following two site driveways:

- N School Street/HPHA Driveway – existing side-street-stop-controlled driveway
- Lanakila Street/Ahiahi Street-HPHA Driveway – existing side-street-stop-controlled driveway

Further explanation on the site driveways are described in Section 8 in this report.

5.4 PROJECT TRIP ASSIGNMENT

Using the estimated trip generation, the distribution patterns, and the proposed roadway modifications discussed previously, the traffic generated by the proposed project under Future Year (2029) Baseline Conditions was assigned to the study intersections based on the characteristics of the streets within the study area, anticipated congestion, and directness of route. **Figure 8 and 9** shows the assignment of trips generated by the project for "1,000 Senior Units" and "600 Non-Age Restricted Mixed-Income Units and 400 Senior Units", respectively.

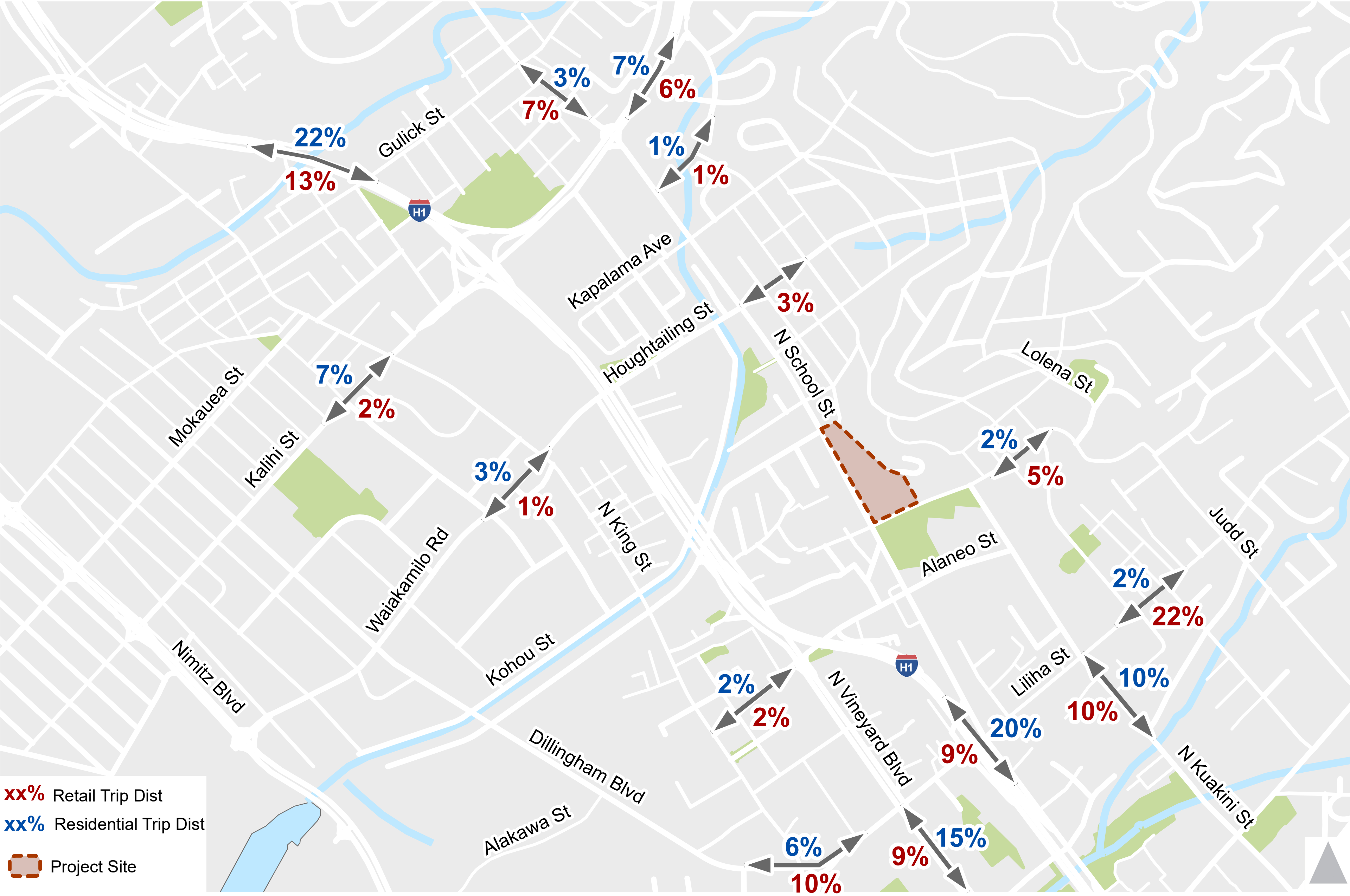
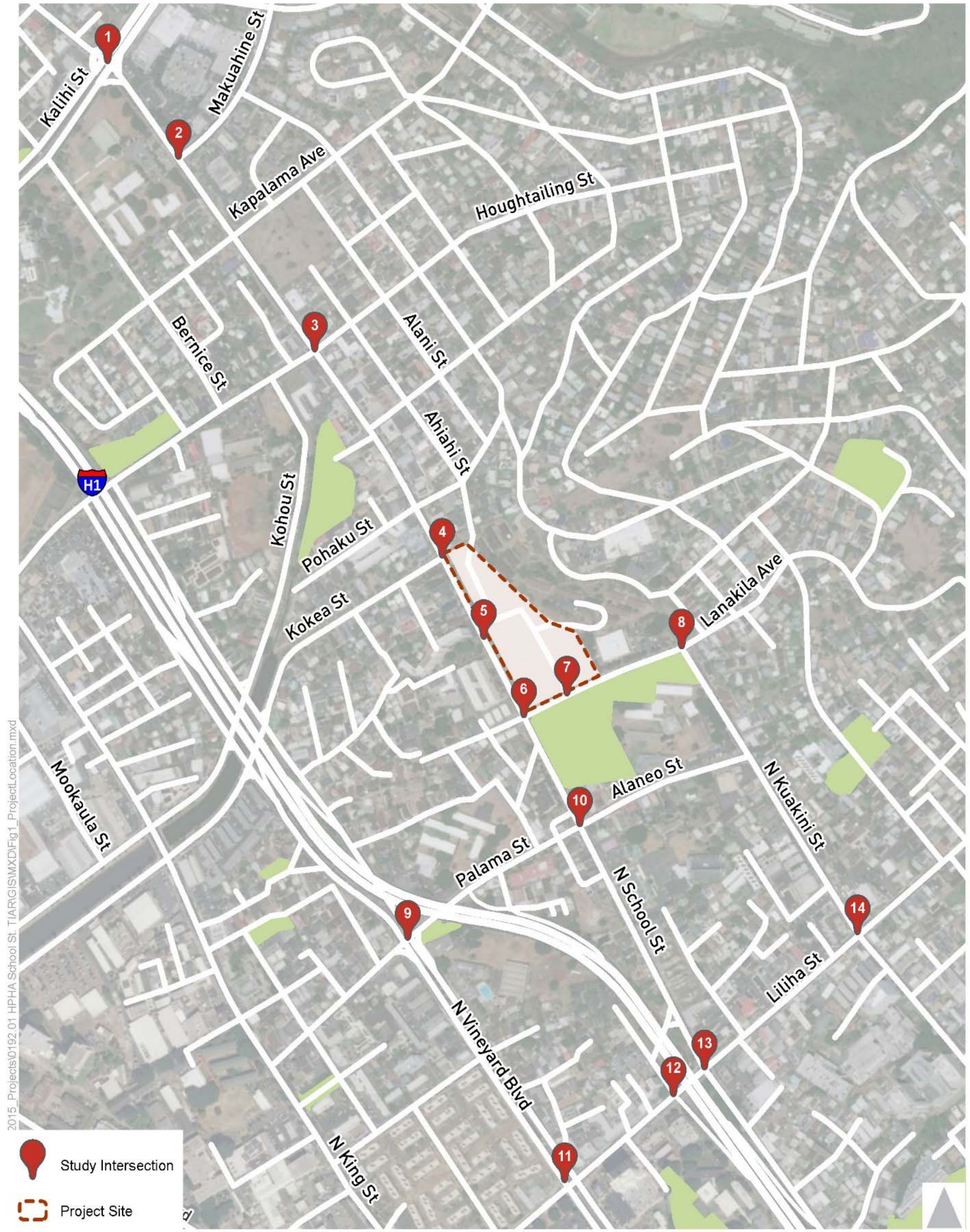


Figure 7

Trip Distribution



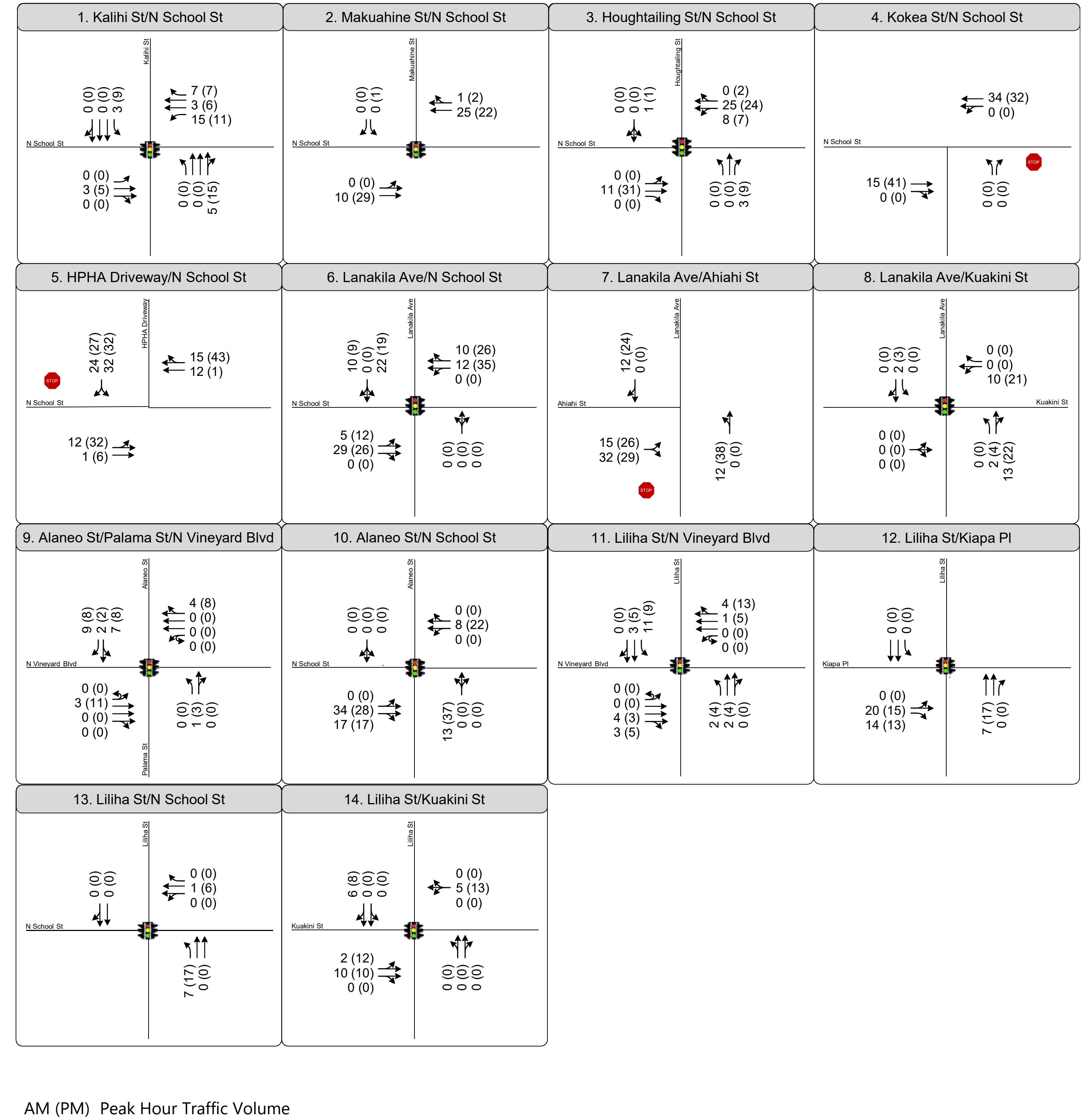
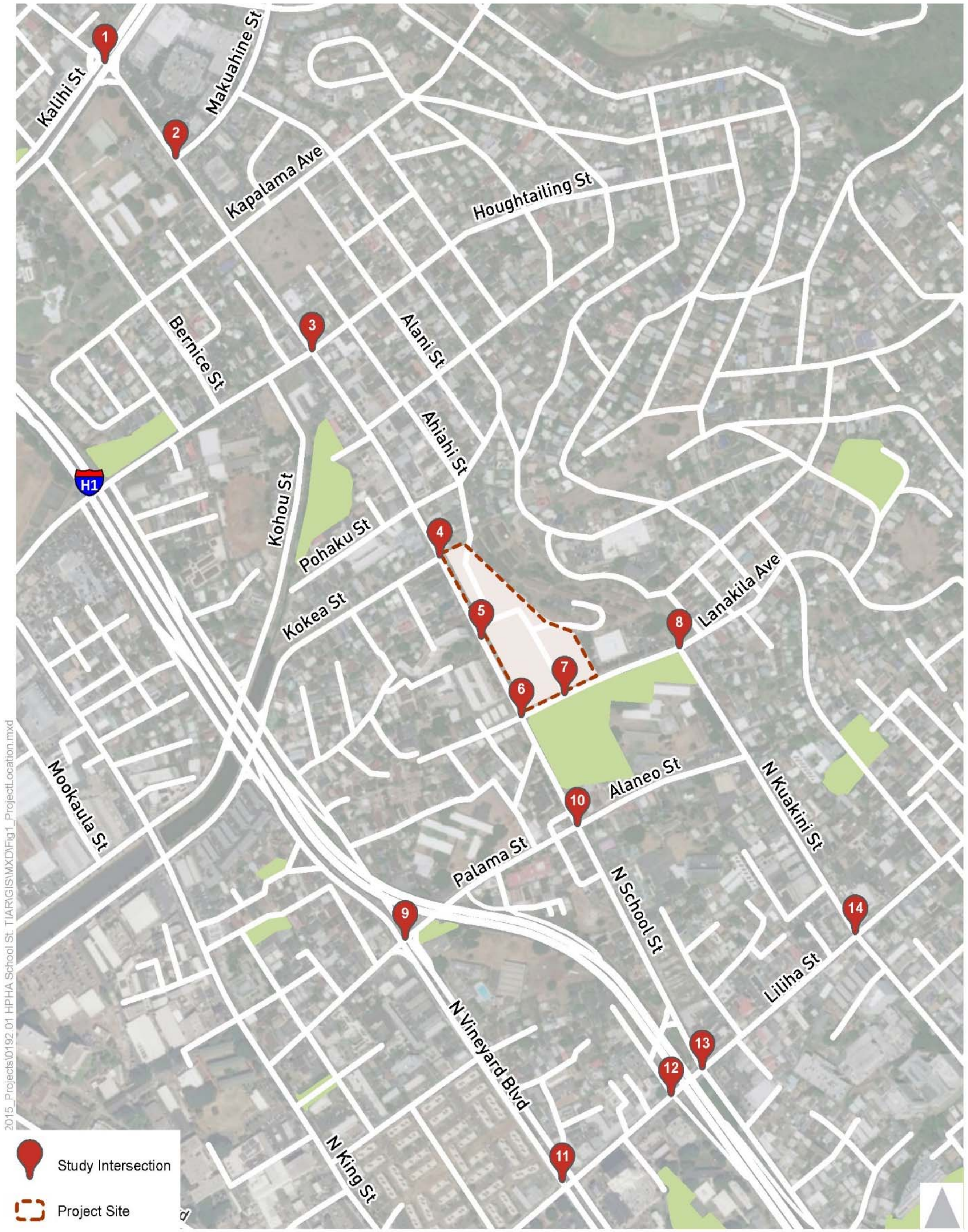
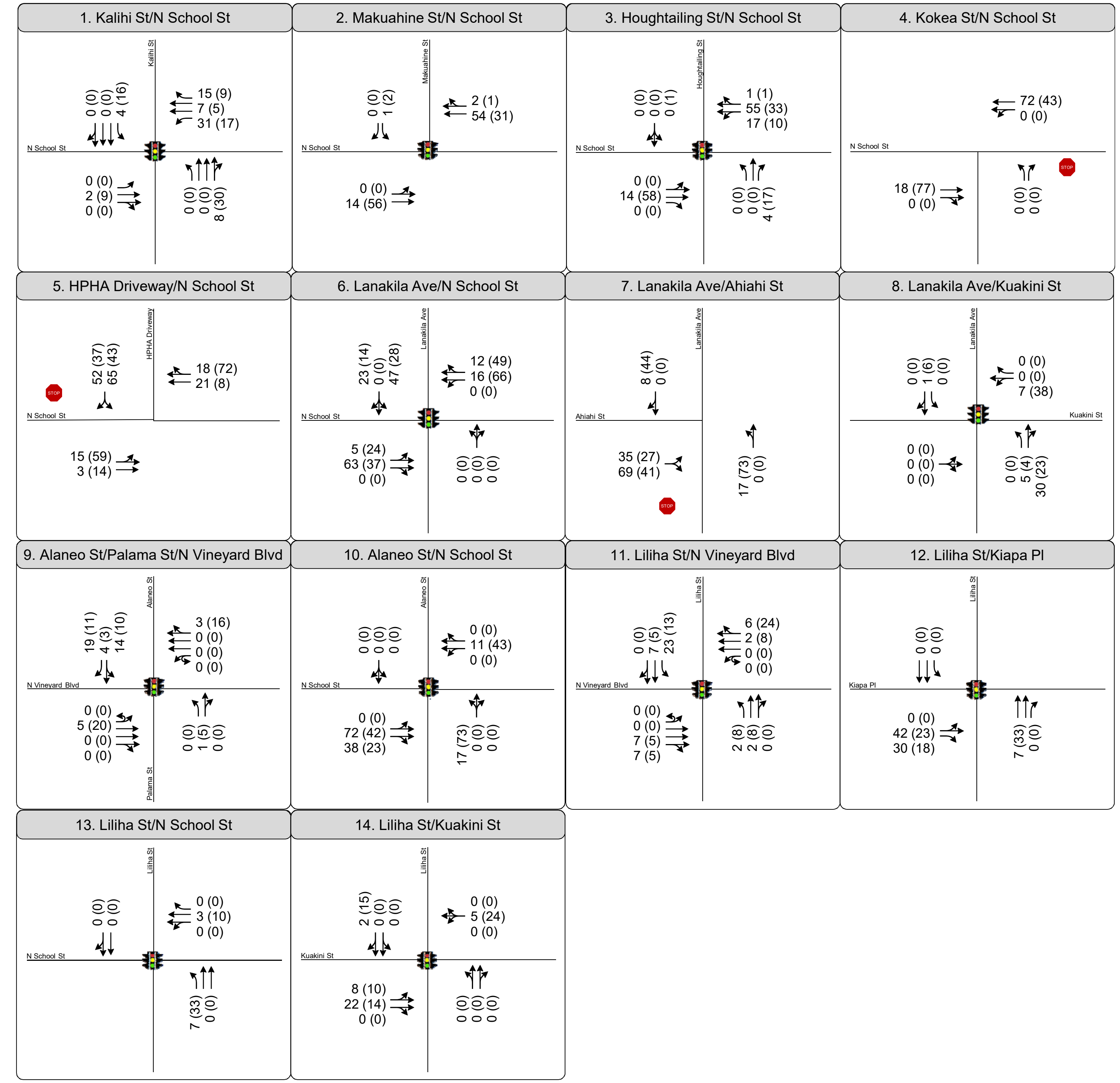


Figure 8
Peak Hour Traffic Volumes and Lane Configurations
1000 Senior Units Trip Assignment





AM (PM) Peak Hour Traffic Volume

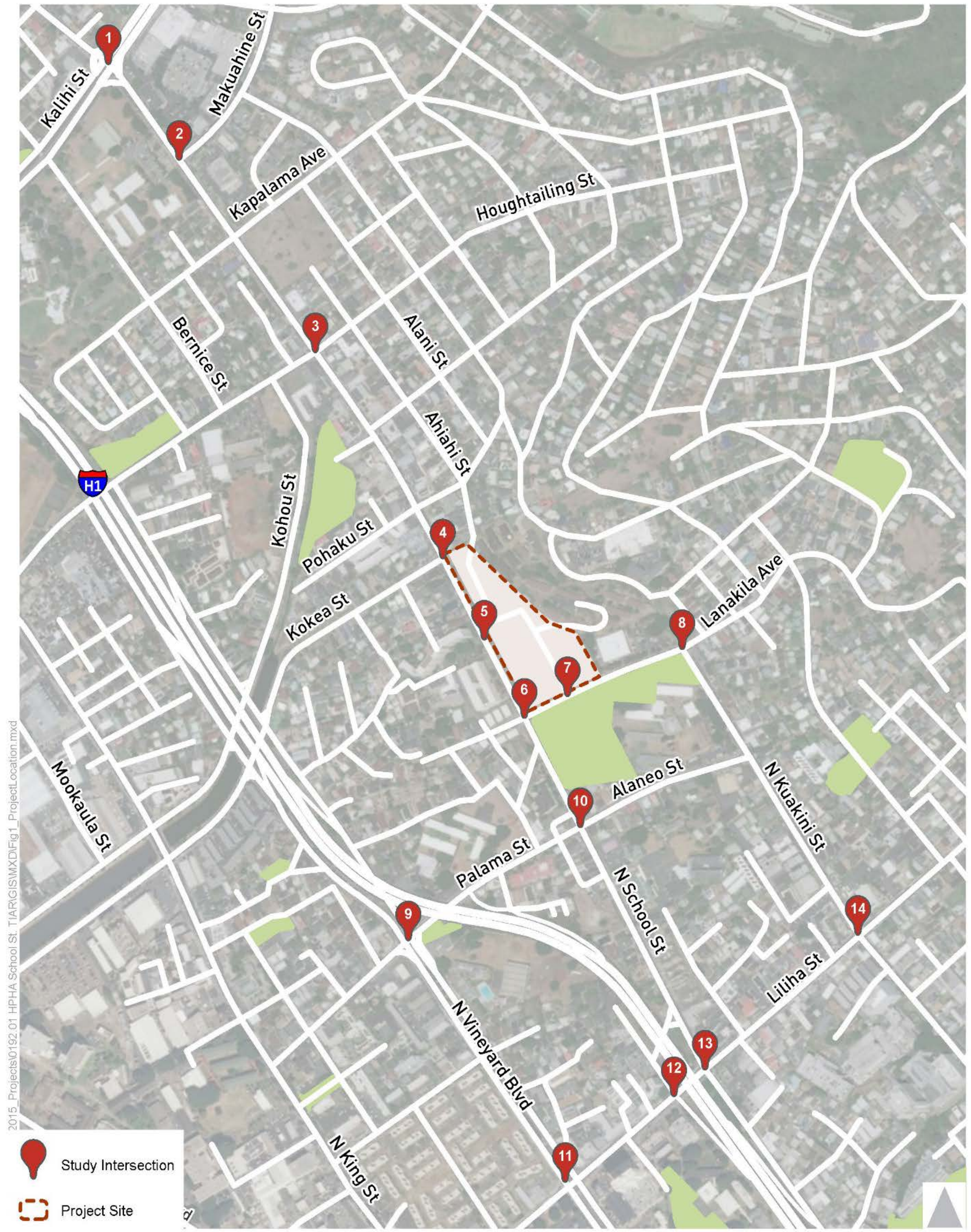
Figure 9
Peak Hour Traffic Volumes and Lane Configurations
600 Non-Aged Restricted & 400 Senior Units Trip Assignment

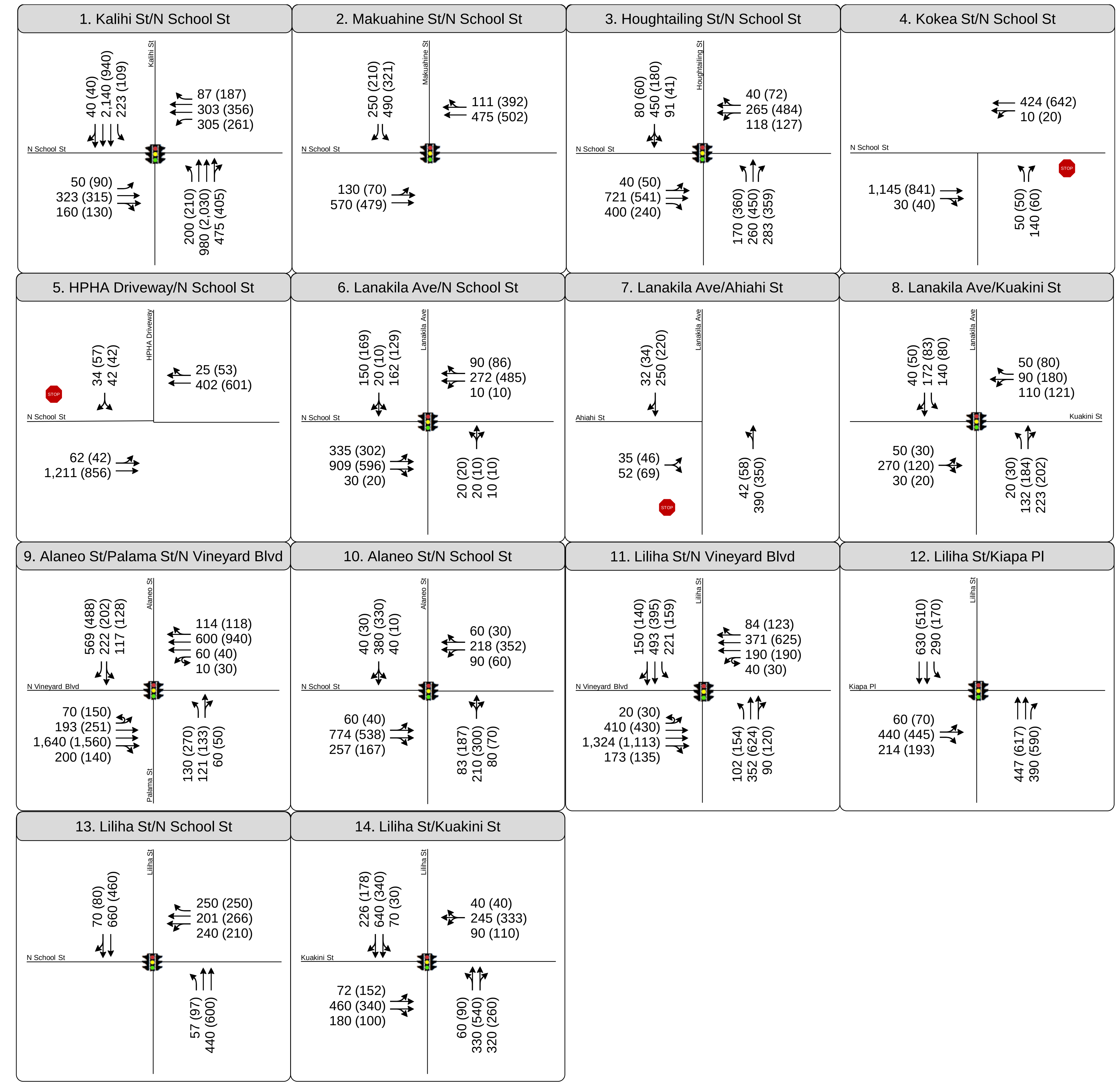
6.0 FUTURE (2029) PLUS PROJECT CONDITIONS

This chapter summarizes and presents an analysis of the potential impacts on the roadway system due to projected increases in traffic, including traffic generated by the project in 2029. The Future (2029) Plus Project Conditions roadway network is the same network assumed under the baseline scenario. The analysis compares the projected levels of service at each study intersection under future baseline (or "No Project") conditions against the "Plus Project" scenario to determine potential Future year impacts.

6.1 FUTURE (2029) PLUS PROJECT LEVEL OF SERVICE

This section presents an analysis of potential future traffic conditions projected for Future (2029) Plus Project Conditions. To forecast the peak hour operating conditions at each study intersection, the project trip assignments for the two project scenarios were superimposed on Future (2029) Baseline traffic volumes to yield Future (2029) Plus Project volumes. **Figure 10** and **Figure 11** presents the anticipated lane configurations and projected Future (2029) Plus Project (1,000 Senior Units) and Future (2029) Plus Project (600 Non-Age Restricted Mixed Income and 400 Senior) AM and PM peak hour volume, respectively.





AM (PM) Peak Hour Traffic Volume

Figure 10
Peak Hour Traffic Volumes and Lane Configurations
Future (2029) Baseline Plus 1,000 Senior Units Conditions

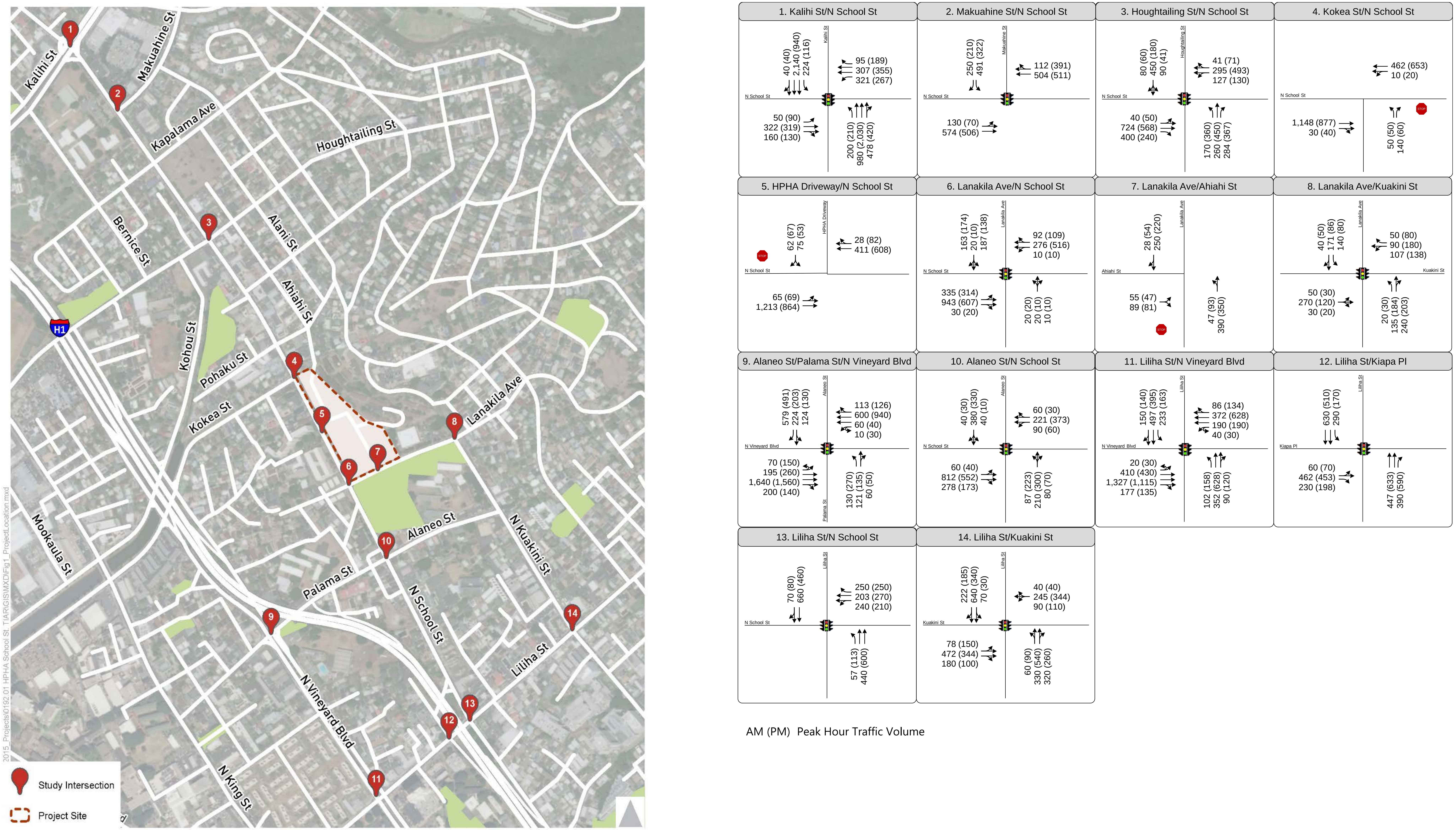


Figure 11
Peak Hour Traffic Volumes and Lane Configurations
Future (2029) Baseline Plus 600 Non-Age Restricted and 400 Senior Units Conditions

Table 7 presents the intersection operating conditions and traffic impacts under the two Future (2029) Plus Project Conditions scenarios, and compares the projected levels of service at each study intersection under Future (2029) Baseline Conditions. The corresponding LOS Calculation sheets are included in **Appendix C.**

According to the results in **Table 7**, the two Plus Project scenarios would result in the same number of intersection impacts. Under both Plus Project scenarios, the addition of projects trip would cause a total of five (5) study intersections to operate at undesirable service levels:

1. N School Street / Kalihi Street – LOS F and LOS E (AM and PM peak hours, respectively)
4. N School Street / Kokea Street – LOS F (AM and PM peak hours)
5. N School Street / HPHA Driveway – LOS E (AM Peak Hour) under 1,000 Senior Units scenario, and LOS F and LOS E (AM and PM peak hours, respectively) under 600 Non-Age Restricted Mixed Income Units and 400 Senior Units scenario
10. N School Street / Palama Street – Alaneo Street – LOS E and LOS F (AM and PM peak hours, respectively)
11. N Vineyard Boulevard / Liliha Street – LOS F (AM and PM peak hours)

In addition to evaluating overall intersection operations, DPP and HDOT typically requires that a review be conducted of the individual turning movements at each intersection to determine whether any movements are operating below LOS D. The majority of the poorly operating movements are left-turns. This is attributed to the signal timing allocating more green time to the through movements, which in most cases has caused the left-turn movements to operate at LOS E or F in at least one of the peak hours. For left-turns operating poorly at unsignalized intersections, this is primarily due to the high traffic volume on the major streets (e.g. N School Street) and limited number of gaps for vehicles at the stop-controlled movement to make left-turns.

SIGNAL WARRANTS

When operations at an unsignalized intersection are deemed unacceptable, several improvement options are available including, but not limited to, providing additional turn lanes, providing a merging lane, prohibiting one or more movements, or installing a traffic signal. Part of the process of evaluating the need for a traffic signal is the application of industry standard warrants. Traffic signal warrants correlate the need for a traffic signal at an intersection with pedestrian and vehicle volumes and other traffic data/ characteristics.

TABLE 7: FUTURE (2029) PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Future Baseline		Future Plus Project (1,000 Senior Units)			Future Plus Project (600 Non-Age Restricted & 400 Senior)		
			Delay (sec/veh)[2]	LOS[3,4]	Delay (sec/veh)[2]	LOS[3,4]	Delay Change[5] (sec/veh)	Delay (sec/veh)[2]	LOS[3,4]	Delay Change[5] (sec/veh)
1. N School St/Kalihi St	Signal	AM	**106.2**	**F**	**108**	**F**	**1.8**	**109.7**	**F**	**3.5**
		PM	**56.4**	**E**	**58.6**	**E**	**2.2**	**60.1**	**E**	**3.7**
2. N School St/Makuahine St	Signal	AM	34.5	C	34.1	C	-0.4	33.9	C	-0.6
		PM	14.9	B	14.7	B	-0.2	14.6	B	-0.3
3. N School St/Houghtailing St	Signal	AM	40.2	D	40.5	D	0.3	40	D	-0.2
		PM	31.2	C	31.7	C	0.5	31.7	C	0.5
4. N School St/Kokea St	SSSC	AM	**103.2**	**F**	**112.9**	**F**	**9.7**	**121.2**	**F**	**18.0**
		PM	**54.0**	**F**	**62.9**	**F**	**8.9**	**69.7**	**F**	**15.7**
5. N School St/HPHA Dwy	SSSC	AM	22.3	C	**37.5**	**E**	**15.2**	**78.5**	**F**	**56.2**
		PM	14.8	B	26.1	D	11.3	**39.4**	**E**	**24.6**
6. N School St/Lanakila St	Signal	AM	17.8	B	20.5	C	2.7	23.9	C	6.1
		PM	12.9	B	14.4	B	1.5	15.4	B	2.5
7. Ahiahi St-HPHA Dwy/Lanakila Ave	SSSC	AM	14.9	B	16.1	C	1.2	18.5	C	3.6
		PM	12.4	B	15.3	C	2.9	16.9	C	4.5
8. Kuakini St/Lanakila St	Signal	AM	10.2	B	10.4	B	0.2	10.5	B	0.3
		PM	7.8	A	8.2	A	0.4	8.4	A	0.6
	Signal	AM	47.3	D	50.1	D	2.8	52.7	D	5.4

TABLE 7: FUTURE (2029) PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control[1]	Peak Hour	Future Baseline		Future Plus Project (1,000 Senior Units)			Future Plus Project (600 Non-Age Restricted & 400 Senior)		
			Delay (sec/veh)[2]	LOS[3,4]	Delay (sec/veh)[2]	LOS[3,4]	Delay Change[5] (sec/veh)	Delay (sec/veh)[2]	LOS[3,4]	Delay Change[5] (sec/veh)
9. N Vineyard Blvd/Palama St		PM	52.4	D	53.8	D	1.4	54.5	D	2.1
10. N School St/Palama St - Alaneo St	Signal	AM	**61.5**	**E**	**69.8**	**E**	**8.3**	**72.2**	**E**	**10.7**
		PM	**66.4**	**E**	**91.8**	**F**	**25.4**	**118.6**	**F**	**52.2**
11. N Vineyard Blvd/Liliha St	Signal	AM	**104.7**	**F**	**106.8**	**F**	**2.1**	**109.4**	**F**	**4.7**
		PM	**100.3**	**F**	**100.8**	**F**	**0.5**	**101.1**	**F**	**0.8**
12. Kiapu Pl/Liliha St	Signal	AM	27.8	C	28.6	C	0.8	29.8	C	2
		PM	31.2	C	31.9	C	0.7	32.5	C	1.3
13. N School St/Liliha St	Signal	AM	24.5	C	24.5	C	0	24.5	C	0
		PM	22.6	C	22.9	C	0.3	23.1	C	0.5
14. Kuakini St/Liliha St	Signal	AM	18.3	B	19	B	0.7	19.7	B	1.4
		PM	18.9	B	21.6	C	2.7	23.2	C	4.3

Source: Fehr & Peers, 2017.
Notes:
[1] SSSC = Side-street stop controlled
[2] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop-controlled intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections.
[3] LOS calculations performed using the *Highway Capacity Manual (HCM) 2010* method. LOS for side street stop-controlled (SSSC) intersections is worst-case movement. Other uncontrolled movements generally operate well with limited delay.
[4] Undesired LOS and corresponding seconds of delay per vehicle are highlighted in **bold.** Project impacts highlighted **gray and bold**.
[5] Change in delay from Plus Project to Baseline conditions.

Table 8 below summarizes the evaluation of peak hour signal warrants identified in the 2014 edition of the *Manual of Uniform Traffic Control Devices* (MUTCD, Federal Highway Administration). Of the three (3) unsignalized study intersections, only the N School Street/HPHA School Driveway would meet the peak hour signal warrant, which indicates that intersection as significantly impacted by the project. While N School Street/Kokea Street operates at LOS F operations without and with the Project, the intersection does not meet the peak hour signal warrant, and therefore, is not considered a significant impact.

Appendix D illustrates the urban signal warrants for both the morning and evening peak hours at the three (3) unsignalized study intersections.

Unsignalized intersection warrant analysis is intended to examine the general correlation between Future Baseline and Future Plus Project conditions and the need to install new traffic signals. Future (2029) peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the Manual of Uniform Traffic Control Devices (MUTCD), Federal Highway Administration 2014. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible state or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

TABLE 8: FUTURE (2029) PLUS PROJECT UNSIGNALIZED INTERSECTION PEAK HOUR SIGNAL WARRANT EVALUATION

Intersection	Peak Hour	Future Baseline	Future Plus Project (1,000 Senior Units)		Future Plus Project (600 Non-Age Restricted & 400 Senior)	
		LOS[1,2]	LOS[1,2]	Signal Warrant Met?[3]	LOS[1,2]	Signal Warrant Met?[3]
4. N School St/Kokea St	AM	**F**	**F**	NO	**F**	NO
	PM	**F**	**F**	NO	**F**	NO
5. N School St/HPHA Dwy	AM	C	**E**	**YES**	**F**	**YES**
	PM	B	D	YES	**E**	**YES**
7. Ahiahi St-HPHA Dwy/Lanakila Ave	AM	B	C	NO	C	NO
	PM	B	C	NO	C	NO

Source: Fehr & Peers, 2017.
Notes:
[1] LOS calculations performed using the *Highway Capacity Manual (HCM) 2010* method. LOS for side street stop-controlled (SSSC) intersections is worst-case movement. Other uncontrolled movements generally operate well with limited delay.
[2] Undesired LOS are highlighted in **bold.**
[3] Peak hour signal warrant.
[4] Impacted intersections are highlighted in **grey.**

7.0 POTENTIAL TRAFFIC IMPROVEMENTS

Potential traffic improvements were identified to increase the capacity and/or efficiency of the roadway system at the locations where the addition of project-related traffic would cause or contribute to poor operating conditions. The emphasis was to identify physical and/or operational improvements that could be implemented within the existing or planned roadway rights-of-way and determine if improvements would be ultimately feasible.

The potential measures to address the identified traffic impacts are described in this chapter. Each of the initially identified impacts would be reduced such that future plus project operations would be better than baseline conditions. The full range of improvements that address both project-related and/or cumulative traffic impacts are discussed in detail below.

INTERSECTION 1: N SCHOOL STREET / KALHI STREET (CUMULATIVE IMPACT)

Significantly impacted with any redevelopment of HPHA (i.e. 1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units)

This intersection is projected to operate at LOS F and LOS E in the AM and PM peak hours, respectively, in the PM peak hours under Future (2029) conditions. The addition of project trips (1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units) would exacerbate LOS F and LOS E operations under all two project scenarios.

<u>Potential Improvements:</u>

- Optimize existing signal timings to reallocate signal splits (green time), but maintain existing cycle length
  <u>or</u>
- Change the existing “protected” signal phasing for the ewa-bound left-turn to “protected + permitted” phasing

Vehicle capacity enhancements at this intersection are considered limited due to the right-of-way constraints and high traffic volumes on all approaches. Substantially reducing delay at this intersection with the existing and projected high volumes on all approaches would essentially require widening one or more approaches to provide additional through lanes and separate turn lanes. However, widening these roadways is not considered feasible due to: the right-of-way constraints and secondary adverse impacts (i.e. to pedestrians/bicyclists).

Consequently, options to improve operations at this intersection include optimizing the signal timings to allocate more green time to the ewa-bound left-turn movement *or* changing the existing protected ewa-bound left-turn phasing to "protected + permitted". The ewa-bound left-turn movement on N School Street currently experiences moderate delays and queue build-up during the peak hours due to the long signal green time allocated to the Kalihi Street movements. However, given that the opposing Diamond Head through volume on N School Street is not that high, some of the green time for that movement can be allocated to the ewa-bound left-turn to serve the higher vehicle demand and improve overall intersection operations to better than Future (2029) Baseline Conditions.

"Protected + permitted" phasing could reduce the control delay of the intersection, resulting in a higher capacity for the ewa-bound left-turn movement. Implementing this type of phasing would require updating the signal head to provide a five head signal, which includes a red ball, yellow ball, green ball, yellow left-turn arrow, and green left-turn arrow. This intersection is controlled by the State, so ultimately, implementation of this improvement is dependent on DOT.

INTERSECTION 5: N SCHOOL STREET / HPHA DRIVEWAY (PROJECT-SPECIFIC IMPACT)

Significantly impacted with any redevelopment of HPHA (i.e. 1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units)

Based on the significance criteria described in Section 2.3.3 of this report, the proposed project is expected to result in a project-specific impact at the N School Street/HPHA Driveway intersection, where the intersection delay would be degraded with the addition of project traffic, and the peak hour signal warrants is met, under both project scenarios. .

Potential Improvement:

- Install a full traffic signal

Installing a signal at this intersection would improve operations to LOS B in the AM and PM peak hours under Future (2029) Plus Project conditions for both project scenarios. Given the close proximity of the N School Street/HPHA Driveway intersection to the Kapuna One Apartment Driveway and the existing pedestrian signal, it is recommended that HPHA driveway be realigned to align with the existing Kapuna One Apartment driveway to create one full access signalized driveway. Additionally, the pedestrian signal would be removed since a crosswalk and signalized pedestrian crossing phase would be provided at the new signalized intersection. Since this intersection would serve some senior project residents, a "Leading Pedestrian Interval" (LPI) should be implemented to allow pedestrians to start crossing the intersection prior to the green light turning on for vehicles. Creating one-full access driveway would reduce the vehicle and pedestrian conflict points on N School Street, and improve operations at the HPHA driveway intersection.

INTERSECTION 10: N SCHOOL STREET / PALAMA STREET – ALANEO STREET (CUMULATIVE IMPACT)

Significantly impacted with any redevelopment of HPHA (i.e. 1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units)

This intersection operates at LOS F and LOS E in the AM and PM peak hours, respectively, in the PM peak hours under Future (2029) conditions. The addition of project trips (1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units) would exacerbate LOS F and LOS E operations under all two project scenarios.

<u>Potential improvement:</u> Restripe mauka and makai-bound on Palama Street/Alaneo Street to provide a separate left-turn lane and a through/right-turn lane.

The existing roadway width is sufficient to add a separate left-turn lane and a through/right-turn lane for the mauka and makai-bound approaches on Palama Street/Alaneo Street. To provide the appropriate lane alignments and vehicle queue storage, this configuration would require removing approximately six (6) parking stalls: four on Alaneo Street and two on Palama Street. This modification would improve operations to LOS C in the AM and PM peak hours under Future (2029) Plus Project conditions.

INTERSECTION 11: N VINEYARD BOULEVARD / LILIHA STREET (CUMULATIVE IMPACT)

Significantly impacted with any redevelopment of HPHA (i.e. 1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units)

This intersection operates at F in the AM and PM peak hours under Future (2029) Baseline Conditions. The addition of project trips (1,000 Senior Units or 600 Non-Age Restricted Units & 400 Senior Units) would exacerbate LOS F operations under all two project scenarios.

<u>Potential improvement</u>: Construct a second Diamond Head-bound left-turn lane on N Vineyard Boulevard to accommodate the future vehicle demand. This would require taking four (4) feet of the existing median, reducing the Diamond Head-bound left-turn lanes to 10 feet each, the two through lanes to 11 feet, and the through/right-turn to 13 feet (to accommodate right-turning buses).

The addition of project traffic exacerbates the poor overall LOS F intersection operations. Installation of a second mauka-bound left turn on N Vineyard Boulevard is recommended to accommodate vehicle demand and ameliorate vehicle delay at this intersection to better than Baseline Conditions in the AM and PM peak hours. This improvement is considered feasible from a right-of way perspective and would still allow for an ADA-compliant pedestrian refuge area in the median island.

This improvement is also recommended as part of the Mayor Wright Redevelopment Project and improvement costs could be shared depending on the timing of each project.

7.1 POTENTIAL TRAVEL DEMAND MANAGEMENT STRATEGIES

Besides simply expanding roadways to accommodate additional vehicle demand, the proposed project could implement some transportation demand management (TDM) strategies to reduce overall site-generated traffic volumes. Application of TDM strategies that could lead to vehicle trip reduction, use of alternative modes, and better traffic management at the site could include, but are not limited to:

- Implementation of a detailed TDM program for residents, retail employees, and office employees, which would be managed by a TDM coordinator who would organized and coordinate monitoring efforts, parking and traffic management plans, and the implementation of TDM and recommendations and modifications.
- Provision of a transportation kiosk and on-line portal for information on ride-sharing, transit, bicycling, walking, and options for accessing the site without using a private automobile.
- Partial or fully subsidized transit passes for on-site employees and/or residents.
- Provision of bicycle racks adjacent to retail development, at communal open space, and residential buildings within the project site.
- Dedicating space on the property frontage to accommodate a future Biki bike share station
- Unbundling parking from apartment units to reduce rental costs for some units and to incentivize use of non-auto travel modes.

Prior to the implementation of any TDM measures, the project sponsor will need to coordinate with the City & County of Honolulu and/or transit service providers.

8.0 SITE ACCESS AND CIRCULATION

This chapter includes a review of the site access and on-site circulation for vehicles, bicyclists and pedestrians. An evaluation of off-site active and transit travel modes is presented in Chapter 11.

8.1 SITE ACCESS

As described in Chapter 5.3: *Proposed Project Roadway Modifications,* vehicle access to the site will be provided via two (2) driveways: full-access driveway at N School Street and a full-access driveway on Lanakila Avenue.

Based on the operations analysis, the N School Street Driveway will operate at undesirable operations under both project scenarios, but realigning the intersection and installing a signal would improve operations to desirable levels for both AM and PM peak hours. The Lanakila Driveway is anticipated to operate at desirable levels for both AM and PM peak hours under both project conditions. Therefore, with the implementation of the recommended improvements on N School Street, the two site driveways are adequate to serve the project demand. One potential site issue is site driveway blockages on Lanakila Avenue. Due to the signal at N School Street, makai-bound vehicle queues on Lanakila Avenue could potentially extend back and block the site driveway for vehicles entering or exiting the project site. A "Keep Clear" designation should be striped on Lanakila Avenue to require gaps in the queue and allow left-turn access into and out of the project site during peak periods, but primarily during the AM peak hour.

8.2 ON-SITE VEHICLE CIRCULATION

The site plan includes two-way drive aisles on Ahiahi Street and the mauka-makai internal roadway that connects to the N School Street Driveway. None of the aisles/internal roadways are excessively long to where vehicle speeds on-site are expected to be excessive.

The parking supply locations have not yet been finalized on site, but parking is expected to be provided in structures or underground facilities incorporated within several of the residential building areas, as well as a surface parking lot on the ewa side that serves primarily the HPHA offices. According to the site plan, access to the two parking structures is provided via the mauka-makai internal roadway. If these structures are gated and require an access card or key to enter, it is recommended that the gate be located at least 150 in from the parking structure driveway, such that there's ample space to serve vehicle queues waiting to drive in. If there is not enough storage provided on the internal roadway, a vehicle queue could potentially form from vehicles trying to enter the parking structure and could spill back into the adjacent external roadway and impede traffic on N School Street.

8.3 ON-SITE PEDESTRIAN AND BICYCLE CIRCULATION

The site plan shows a paved pedestrian pathway that borders the makai side of the project buildings and connects provides access to N School Street. Pedestrian and vehicle conflicts could potentially occur at project driveways, particularly at unsignalized driveways when a car is entering or exiting and pedestrians using the sidewalk that crosses the driveway. To enhance safety for pedestrians, it is recommended that signage be installed at all of the unsignalized driveways to alert motorists of potential pedestrian conflicts. Signs would typically include a "STOP" sign on each driveway approach, as well as a sign indicating the presence of pedestrians.

People on bicycles are also expected to access the project site. No separate paths need to be incorporated within the site, since bicyclists will be expected to share the internal roadways with vehicles. Volumes and speeds are expected to be relatively low creating a "bicycle boulevard" environment within the site. However, secure bike parking should be provided at various locations throughout the site for both residents and visitors. At a minimum, this would include bike racks at several key locations to encourage the use of non-automobile travel. The final locations for bike storage facilities will be determined by the project team in consultation with DPP staff.

9.0 MULTI-MODAL ASSESSMENT

Consistent with State of Hawaii and City & County of Honolulu policies on Complete Streets, this chapter addresses any potential project impacts on all non-automobile modes of transportation, including existing and planned pedestrian, bicycle, and transit facilities. Based on the review of the site plan illustrated on **Figure 2** and the project description, the project would not cause any significant impact to the overall existing and planned external multi-modal transportation system in the study area. The project design will adhere to the policies and principles outlined in the City & County of Honolulu's Ordinance relating to Complete Streets (2012) as it includes features to enhance mobility and access for all its residents and other users using all modes of transportation. The Nuuanu/Liliha Complete Streets Solutions Project plans to identify solutions to increase safety and accommodate all travel modes. The Liliha Complete Streets Project covers the segment of Liliha Street between Wyllie Street and N School Street. It is recommended that as the site plan is further refined, the Developer should consult with the State and City & County of Honolulu to design the internal roadway networks, cross sections, and access driveways in a manner that embraces the principles of Complete Streets and correlates with the adjacent Liliha Complete Streets project.

9.1.1 PEDESTRIAN AND BICYCLE NETWORK

The proposed project follows new urbanist design principles that include an emphasis on walkability and connectivity through the pedestrian networks within the project site and connecting to the rest of the Lanakila community. The site plan does not currently provide details on the external sidewalk widths, but it is assumed that the existing widths and quality will be maintained or enhanced and widened where feasible with the project.

The following enhancements are recommended to improve safety and serve existing and future pedestrian demand:

- *Relocate all pedestrian push buttons at adjacent signalized intersections so that they are within 10 feet from the curb ramp.* This intersection currently only provides one push button in each corner. To ensure that pedestrians can easily activate a pedestrian call for their crosswalk, a push-button should be provided within in close proximity to the curb ramp.

- *Install "Leading Pedestrian Intervals" (LPIs) at all crosswalks at adjacent signalized intersections.* LPIs give pedestrians a few seconds (typically 3 to 7 seconds) head start when entering an intersection with the corresponding green signal. According to the National Association of City Transportation Officials (NACTO), LPIs could reduce pedestrian-vehicle collision as much as 60 percent at treated intersections. This improvement would increase the visibility of pedestrians crossing as they would enter the intersection before the vehicle is given the green light to turn left or right. LPIs are a relatively low cost improvement as it would only require adjustments to the existing signals.

- *Sidewalks along the project frontage should be a minimum of six (6) feet wide.* The sidewalks should be clear of obstruction (e.g. no light poles, furniture, signal boxes, etc.).

9.1.2 BICYCLE NETWORK

The *O`ahu Bike Plan* (August 2012) plans for enhanced bicycle facilities to be implemented within the study area. The following are planned bicycle projects relevant to the project site and that would serve the study area:

- Bicycle route on N School Street from Middle Street to `Iolani Avenue
- Bicycle lane on Liliha Street from N King Street to Wyllie Street
- Bicycle lane on N King Street from Middle Street to River Street
- Bicycle Path on Kapalama Canal (Kohou Street Side – North Section) from Halona Street to Houghtailing Street
- Bicycle route on Dillingham Boulevard from Pu'uhale Road to N King Street
- Bicycle path at the future Iwilei Transit Station from Dillingham Boulevard to Nimitz Highway

No additional designated bicycle paths or lanes are necessary as part of project implementation. The type and feasibility of bicycle facilities on facilities directly adjacent to the project site is currently being evaluated as part of complete streets projects being managed by the City & county of Honolulu Department of Transportation Services (DTS).

9.1.3 TRANSIT NETWORK

It is anticipated that by 2025, the Honolulu Rail Transit system will start operating the initial section from Kapolei to Aloha Stadium. The Kapalama Station will be located on Dillingham Boulevard, Diamond Head of Kokea Street, and the Iwilei Station will be located at Kaaahi Street and will serve the Kalihi and other outlying residential areas. Both stations will be located approximately one-mile from the project site and will feature ADA pedestrian access, bicycle parking. Current plans are for trains to operate between 4:00 AM and midnight daily, with five-minute headways during peak travel times and 10 minute headways during off-peak hours.

The project would not significantly impact transit service within the study area. All bus stops in the study area provide covered shelters and benches for transit users. However, to enhance the transit and pedestrian facilities immediately adjacent to the site, it is recommended that the bus shelters along the project frontage be pushed back further from the curb of the sidewalk to remove obstructions from the pedestrian walkway and provide pedestrians a wider sidewalk. This would require that a small section (approximately 10 feet mauka of N School Street) of the project site is dedicated for the relocation of the bus shelters.

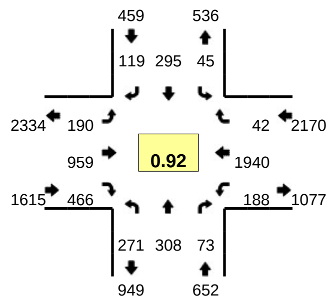
Generally, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes. The project is also expected to not conflict with any existing facilities and planned improvements. Thus, the project's impacts to pedestrian, bicycle, and transit facilities and services are therefore considered *less-than-significant*.

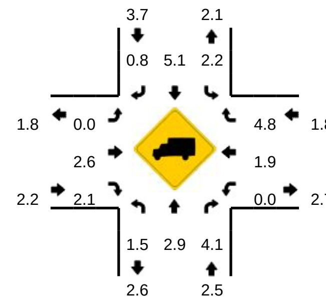
APPENDIX A: TRAFFIC COUNT DATA

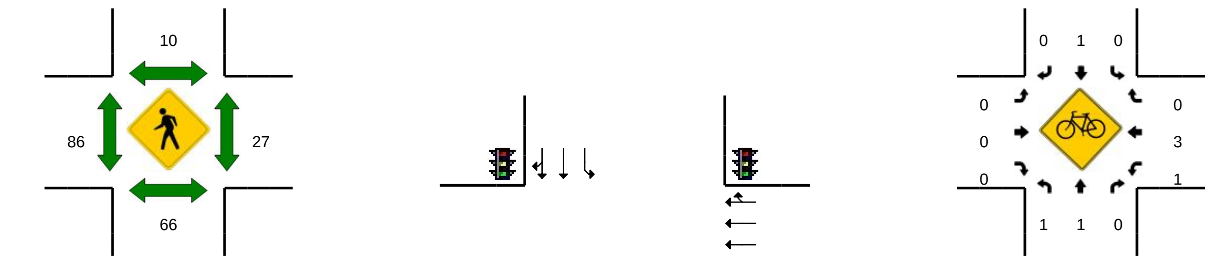
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

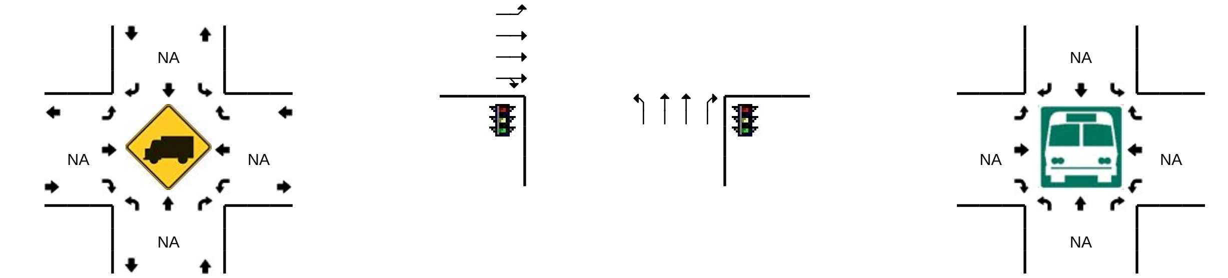
LOCATION: 1. N School St -- Kalihi St | **QC JOB #:** 14273201
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:00 AM -- 7:15 AM









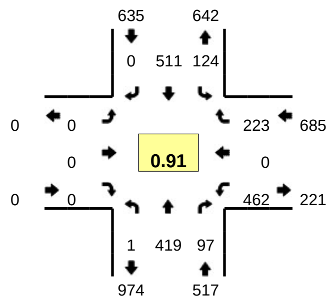
15-Min Count Period Beginning At	1. N School St (Northbound) Left	Thru	Right	U	1. N School St (Southbound) Left	Thru	Right	U	Kalihi St (Eastbound) Left	Thru	Right	U	Kalihi St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	54	21	16	0	5	29	56	0	22	162	68	1	25	494	12	0	965	
6:15 AM	80	47	20	0	4	46	67	0	29	180	77	0	33	460	10	0	1053	
6:30 AM	75	58	16	0	13	34	53	0	36	207	82	0	24	549	12	0	1159	
6:45 AM	81	61	20	0	10	69	69	0	48	173	88	0	45	471	6	0	1141	4318
7:00 AM	62	60	15	0	6	78	26	0	30	278	108	0	52	606	15	0	1336	4689
7:15 AM	82	86	19	0	22	76	35	0	49	194	115	1	61	456	7	0	1203	4839
7:30 AM	56	73	22	0	2	75	37	0	55	263	106	1	40	437	6	0	1173	4853
7:45 AM	71	89	17	0	15	66	21	0	52	224	137	2	35	441	14	0	1184	4896

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	248	240	60	0	24	312	104	0	120	1112	432	0	208	2424	60	0	5344
Heavy Trucks	8	12	4		0	12	0		0	24	4		0	52	4		120
Pedestrians		60				4				72				0			136
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

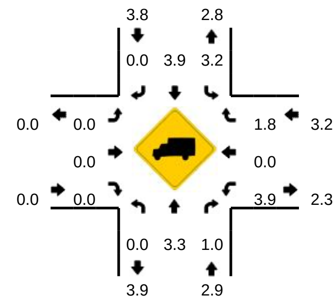
Comments:

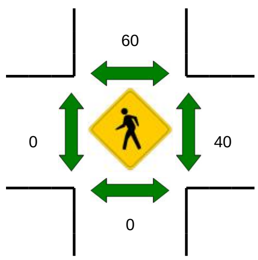
Type of peak hour being reported: Intersection Peak   Method for determining peak hour: Total Entering Volume

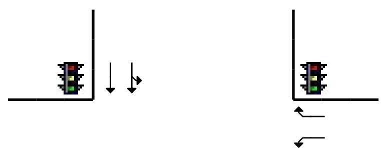
LOCATION: 2. N School St -- Makuahine St   **QC JOB #:** 14273203
CITY/STATE: Honolulu, HI   **DATE:** Tue, Apr 18 2017

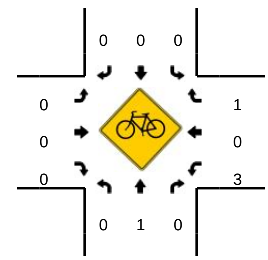


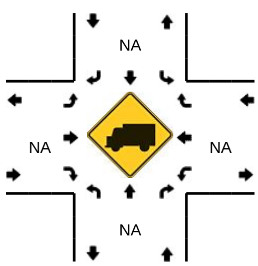
Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 7:00 AM -- 7:15 AM

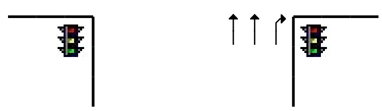


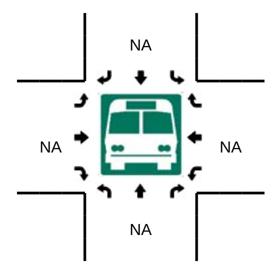












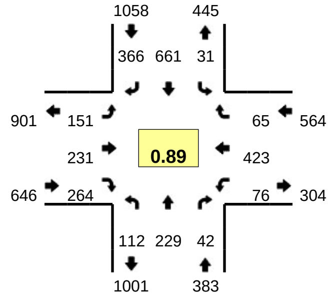
15-Min Count Period Beginning At	2. N School St (Northbound) Left	Thru	Right	U	2. N School St (Southbound) Left	Thru	Right	U	Makuahine St (Eastbound) Left	Thru	Right	U	Makuahine St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	0	73	19	0	11	71	0	0	0	0	0	0	71	0	28	0	273	
6:15 AM	0	104	22	0	25	85	0	0	0	0	0	0	73	0	57	0	366	
6:30 AM	0	101	30	0	25	82	0	0	0	0	0	0	103	0	43	0	384	
6:45 AM	0	99	30	1	41	114	0	0	0	0	0	0	112	0	47	0	444	1467
7:00 AM	0	107	37	0	41	126	0	0	0	0	0	0	130	0	63	0	504	1698
7:15 AM	0	96	18	0	33	141	0	0	0	0	0	0	115	0	55	0	458	1790
7:30 AM	0	117	12	0	9	130	0	0	0	0	0	0	105	0	58	0	431	1837
7:45 AM	0	99	27	0	18	116	0	0	0	0	0	0	80	0	59	0	399	1792

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	428	148	0	164	504	0	0	0	0	0	0	520	0	252	0	2016
Heavy Trucks	0	20	4		0	20	0		0	0	0		20	0	4		68
Pedestrians		0				68				0				24			92
Bicycles	0	0	0		0	0	0		0	0	0		1	0	0		1
Railroad																	
Stopped Buses																	

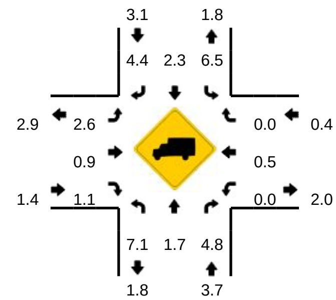
Comments:

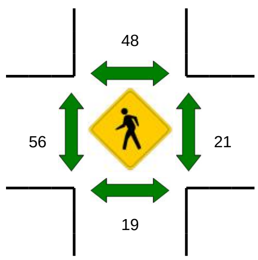
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

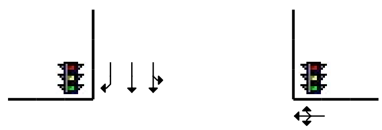
LOCATION: 3. N School St -- Houghtailing St | **QC JOB #:** 14273205
CITY/STATE: Honolulu, HI | **DATE:** Wed, Apr 19 2017

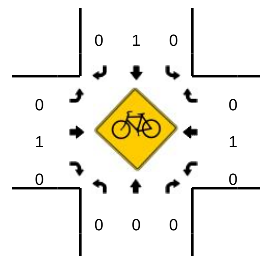


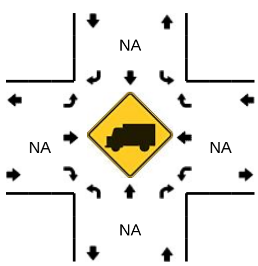
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

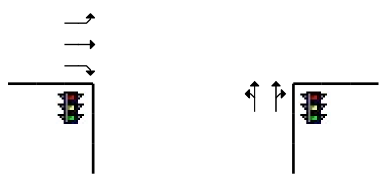


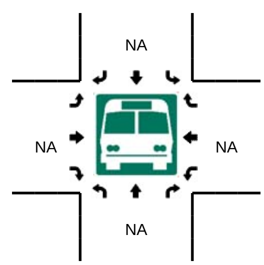












15-Min Count Period Beginning At	3. N School St (Northbound)				3. N School St (Southbound)				Houghtailing St (Eastbound)				Houghtailing St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	16	32	3	0	4	64	27	0	11	14	20	0	7	19	7	0	224	
6:15 AM	16	45	3	0	6	98	69	0	29	26	40	0	12	47	18	0	409	
6:30 AM	17	52	1	0	7	129	75	0	37	37	39	0	17	53	19	0	483	
6:45 AM	22	46	3	0	11	142	79	0	32	54	48	0	19	74	19	0	549	1665
7:00 AM	20	56	2	0	8	174	88	0	34	56	64	0	22	83	13	0	620	2061
7:15 AM	34	59	11	0	8	136	68	0	35	73	64	0	23	128	24	0	663	2315
7:30 AM	19	50	17	0	3	197	115	0	45	60	74	0	20	132	13	0	745	2577
7:45 AM	39	64	12	0	12	154	95	0	37	42	62	0	11	80	15	0	623	2651

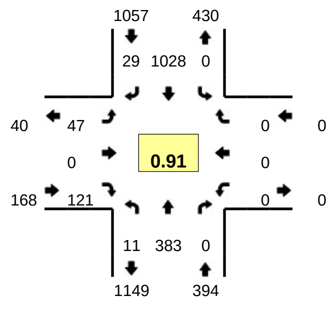
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	200	68	0	12	788	460	0	180	240	296	0	80	528	52	0	2980
Heavy Trucks	4	4	8		0	16	12		4	0	0		0	0	0		48
Pedestrians		8				12				36				4			60
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

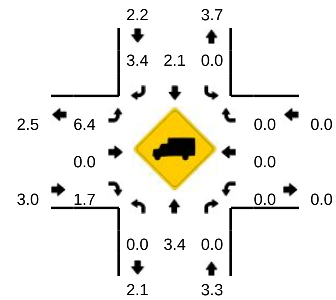
Comments:

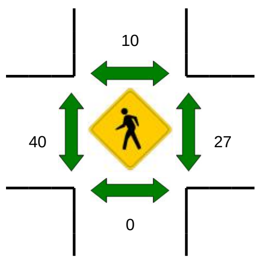
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

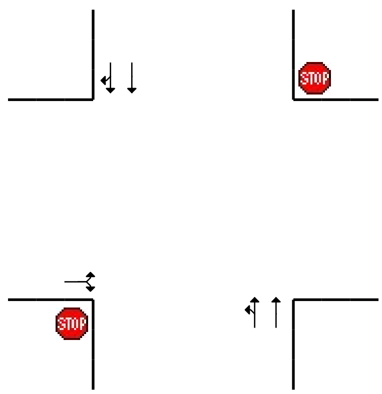
LOCATION: 4. N School St -- Kokea St | **QC JOB #:** 14273207
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

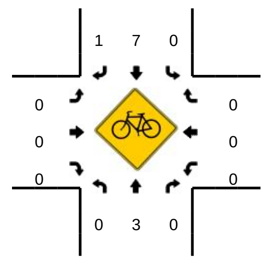
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

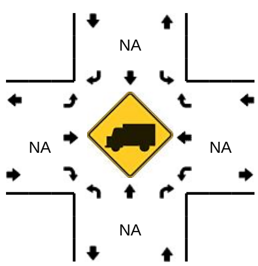


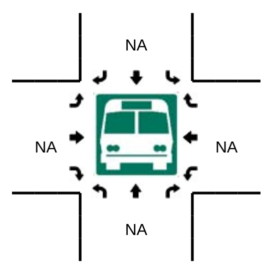












15-Min Count Period Beginning At	4. N School St (Northbound) Left	Thru	Right	U	4. N School St (Southbound) Left	Thru	Right	U	Kokea St (Eastbound) Left	Thru	Right	U	Kokea St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	0	42	0	0	0	137	2	0	7	0	9	0	0	0	0	0	197	
6:15 AM	2	43	0	0	0	156	1	0	4	0	20	0	0	0	0	0	226	
6:30 AM	0	57	0	0	0	183	5	0	5	0	18	0	0	0	0	0	268	
6:45 AM	2	61	0	0	0	214	5	0	5	0	23	0	0	0	0	0	310	1001
7:00 AM	2	85	0	0	0	261	6	0	12	0	27	0	0	0	0	0	393	1197
7:15 AM	2	87	0	0	0	284	6	0	12	0	27	0	0	0	0	0	418	1389
7:30 AM	3	108	0	0	0	267	8	0	14	0	44	0	0	0	0	0	444	1565
7:45 AM	4	103	0	0	0	216	9	0	9	0	23	0	0	0	0	0	364	1619

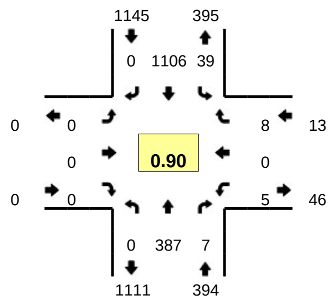
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	12	432	0	0	0	1068	32	0	56	0	176	0	0	0	0	0	1776
Heavy Trucks	0	24	0		0	28	0		0	0	0		0	0	0		52
Pedestrians		0				16				28				24			68
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

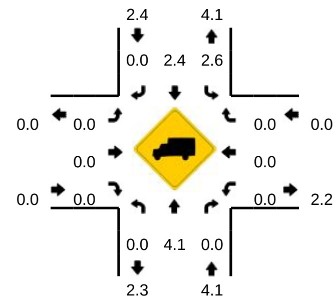
Comments:

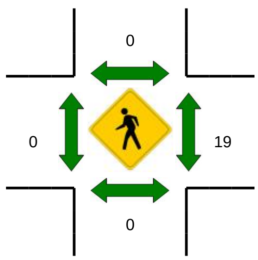
LOCATION: 5. N School St -- HPHA Dwy
CITY/STATE: Honolulu, HI

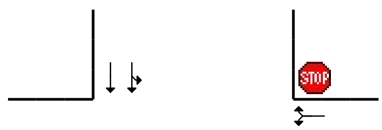
QC JOB #: 14273209
DATE: Tue, Apr 18 2017

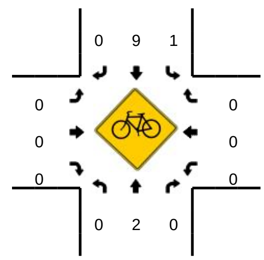
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

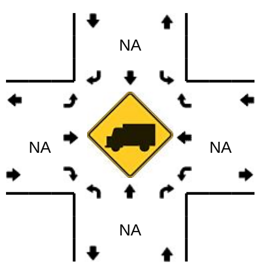


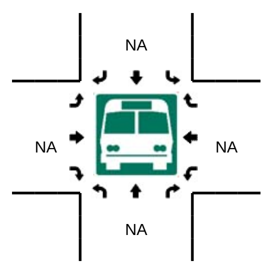












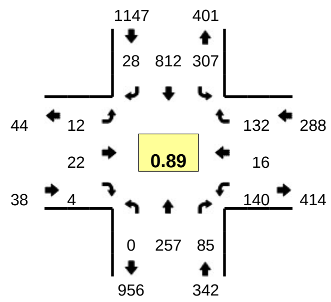
15-Min Count Period Beginning At	5. N School St (Northbound) Left	Thru	Right	U	5. N School St (Southbound) Left	Thru	Right	U	HPHA Dwy (Eastbound) Left	Thru	Right	U	HPHA Dwy (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	0	42	0	0	4	144	0	0	0	0	0	0	3	0	0	0	193	
6:15 AM	0	42	2	0	2	173	0	0	0	0	0	0	0	0	3	0	222	
6:30 AM	0	56	0	0	1	200	0	0	0	0	0	0	2	0	1	0	260	
6:45 AM	0	60	0	0	6	231	0	0	0	0	0	0	1	0	1	0	299	974
7:00 AM	0	86	1	0	7	279	0	0	0	0	0	0	0	0	3	0	376	1157
7:15 AM	0	91	1	0	11	292	0	0	0	0	0	0	2	0	2	0	399	1334
7:30 AM	0	104	3	0	14	305	0	0	0	0	0	0	2	0	3	0	431	1505
7:45 AM	0	106	2	0	7	230	0	0	0	0	0	0	1	0	0	0	346	1552

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	416	12	0	56	1220	0	0	0	0	0	0	8	0	12	0	1724
Heavy Trucks	0	24	0		0	32	0		0	0	0		0	0	0		56
Pedestrians		0				0				0				24			24
Bicycles	0	1	0		0	3	0		0	0	0		0	0	0		4
Railroad																	
Stopped Buses																	

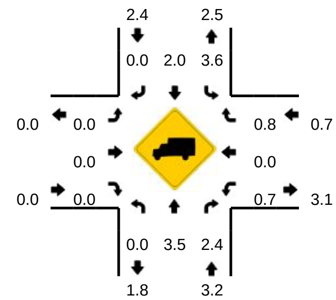
Comments:

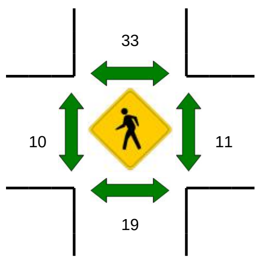
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

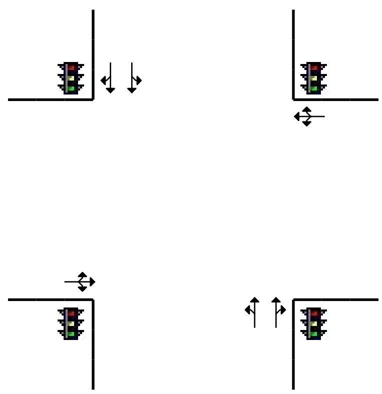
LOCATION: 6. N School St -- Lanakila St | **QC JOB #:** 14273211
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

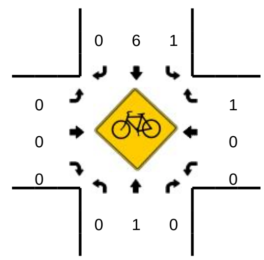


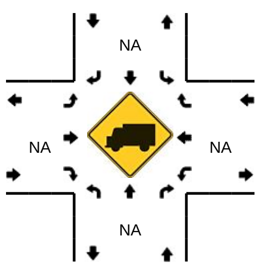
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

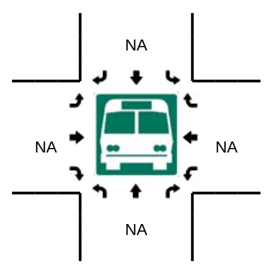












15-Min Count Period Beginning At	6. N School St (Northbound) Left	Thru	Right	U	6. N School St (Southbound) Left	Thru	Right	U	Lanakila St (Eastbound) Left	Thru	Right	U	Lanakila St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	1	29	6	0	36	109	0	0	1	2	1	0	8	0	16	0	209	
6:15 AM	0	18	3	0	48	128	1	0	0	3	1	0	9	0	24	0	235	
6:30 AM	2	33	7	0	43	160	1	0	1	2	3	0	15	0	22	0	289	
6:45 AM	1	38	13	1	60	165	0	0	2	1	0	0	20	2	20	0	323	1056
7:00 AM	0	58	16	0	62	211	7	0	5	8	2	0	28	3	29	0	429	1276
7:15 AM	0	60	17	0	81	226	4	0	2	5	1	0	26	3	33	0	458	1499
7:30 AM	0	71	27	0	85	214	13	0	3	3	0	0	53	8	31	0	508	1718
7:45 AM	0	68	25	0	79	161	4	0	2	6	1	0	33	2	39	0	420	1815

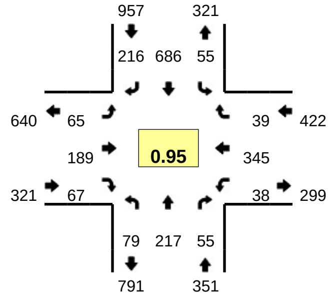
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	284	108	0	340	856	52	0	12	12	0	0	212	32	124	0	2032
Heavy Trucks	0	16	4		4	20	0		0	0	0		0	0	0		44
Pedestrians		16				24				8				16			64
Bicycles	0	1	0		0	2	0		0	0	0		0	0	0		3
Railroad																	
Stopped Buses																	

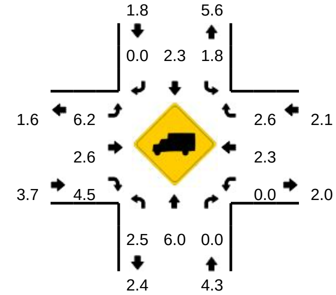
Comments:

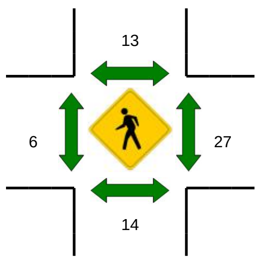
Type of peak hour being reported: Intersection Peak — Method for determining peak hour: Total Entering Volume

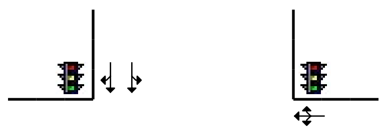
LOCATION: 7. N School St -- Palama St/Alaneo St — **QC JOB #:** 14273213
CITY/STATE: Honolulu, HI — **DATE:** Tue, Apr 18 2017

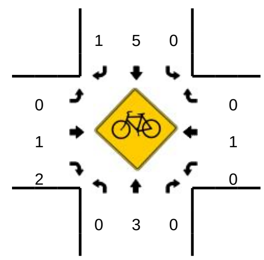
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

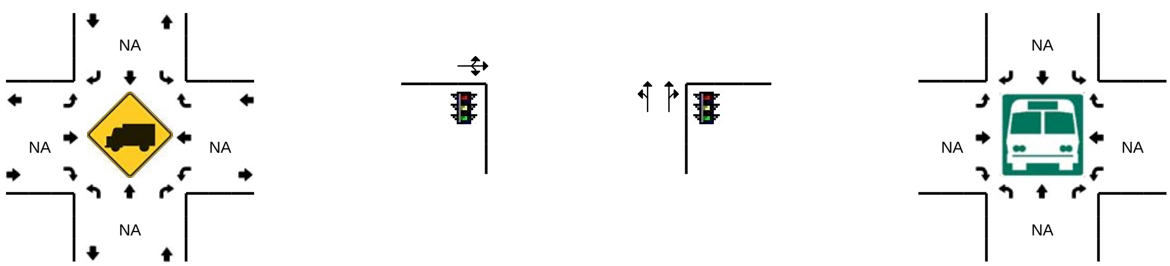












15-Min Count Period Beginning At	7. N School St (Northbound) Left	Thru	Right	U	7. N School St (Southbound) Left	Thru	Right	U	Palama St/Alaneo St (Eastbound) Left	Thru	Right	U	Palama St/Alaneo St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	11	20	5	0	8	91	18	0	6	47	15	0	1	56	5	0	283	
6:15 AM	15	16	2	0	8	115	28	0	1	50	7	0	3	56	1	0	302	
6:30 AM	17	34	2	0	5	156	25	0	4	51	15	0	3	67	3	0	382	
6:45 AM	19	31	7	0	13	155	32	0	12	47	19	0	4	73	4	0	416	1383
7:00 AM	18	50	12	0	9	196	34	0	11	42	13	0	2	107	7	0	501	1601
7:15 AM	21	50	12	0	18	172	61	0	22	52	23	0	8	99	4	0	542	1841
7:30 AM	15	69	18	0	15	159	81	0	17	45	21	0	11	71	8	0	530	1989
7:45 AM	25	48	13	0	13	159	40	0	15	50	10	0	17	68	20	0	478	2051

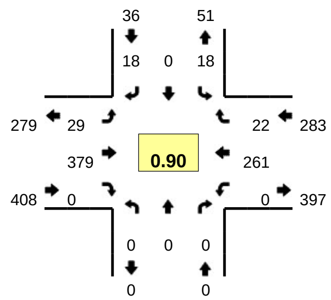
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	84	200	48	0	72	688	244	0	88	208	92	0	32	396	16	0	2168
Heavy Trucks	0	4	0		0	20	0		0	0	8		0	8	0		40
Pedestrians		12				4				12				0			28
Bicycles	0	1	0		0	4	0		0	1	0		0	1	0		7
Railroad																	
Stopped Buses																	

Comments:

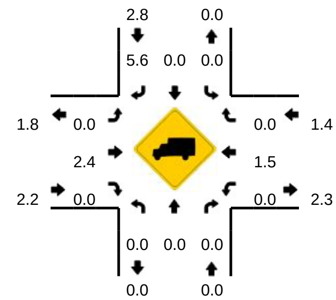
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

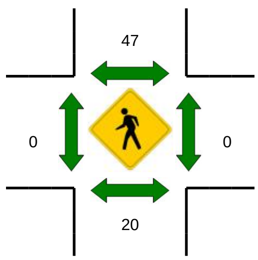
LOCATION: 8. Ahiahi St -- Lanakila Ave | **QC JOB #:** 14273215

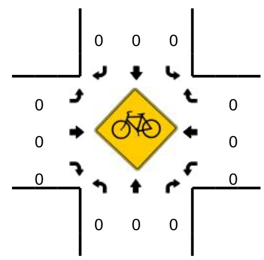
CITY/STATE: Honolulu, HI | **DATE:** Wed, Apr 19 2017

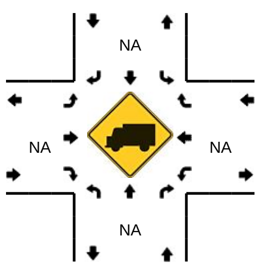


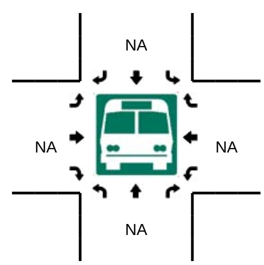
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:45 AM -- 8:00 AM









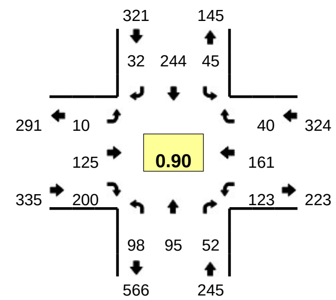


15-Min Count Period Beginning At	8. Ahiahi St (Northbound)				8. Ahiahi St (Southbound)				Lanakila Ave (Eastbound)				Lanakila Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	1	0	1	0	1	42	0	0	0	28	0	0	73	
6:15 AM	0	0	0	0	0	0	1	0	1	47	0	0	0	31	0	0	80	
6:30 AM	0	0	0	0	2	0	2	0	3	53	0	0	0	45	1	0	106	
6:45 AM	0	0	0	0	0	0	4	0	1	69	0	0	0	43	0	0	117	376
7:00 AM	0	0	0	0	4	0	2	0	4	80	0	0	0	48	5	0	143	446
7:15 AM	0	0	0	0	7	0	4	0	12	91	0	0	0	69	3	0	186	552
7:30 AM	0	0	0	0	4	0	5	0	9	109	0	0	0	63	5	0	195	641
7:45 AM	0	0	0	0	3	0	7	0	4	99	0	0	0	81	9	0	203	727

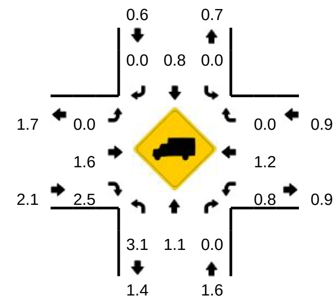
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	12	0	28	0	16	396	0	0	0	324	36	0	812
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	4	0		16
Pedestrians		8				48				0				0			56
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

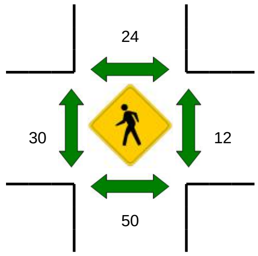
Comments:

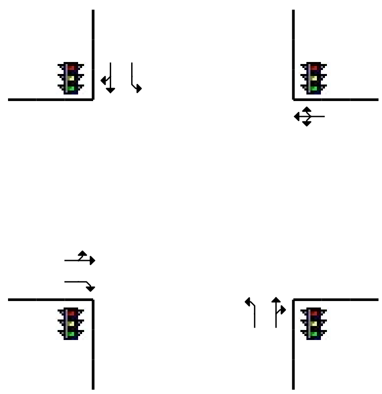
LOCATION: 9. Kuakini St -- Lanakila St
CITY/STATE: Honolulu, HI
QC JOB #: 14273217
DATE: Tue, Apr 18 2017

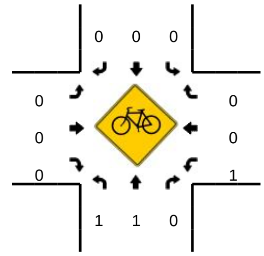


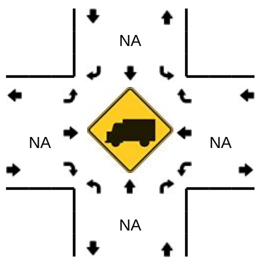
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

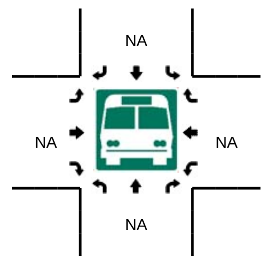












15-Min Count Period Beginning At	9. Kuakini St (Northbound) Left	Thru	Right	U	9. Kuakini St (Southbound) Left	Thru	Right	U	Lanakila St (Eastbound) Left	Thru	Right	U	Lanakila St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	11	11	8	0	3	21	2	0	2	8	30	0	20	13	4	0	133	
6:15 AM	13	8	4	0	4	32	2	0	1	20	20	0	24	15	3	0	146	
6:30 AM	16	14	3	0	7	36	4	0	2	15	27	0	33	15	3	0	175	
6:45 AM	7	13	9	0	8	60	7	0	3	21	38	0	25	29	5	0	225	679
7:00 AM	19	15	5	0	6	66	1	0	4	25	40	0	39	35	8	0	263	809
7:15 AM	26	25	16	0	15	67	12	0	0	34	59	0	24	37	6	0	321	984
7:30 AM	27	29	11	0	14	64	9	0	2	26	58	0	30	54	15	0	339	1148
7:45 AM	26	26	20	0	10	47	10	0	4	40	43	0	29	35	11	1	302	1225

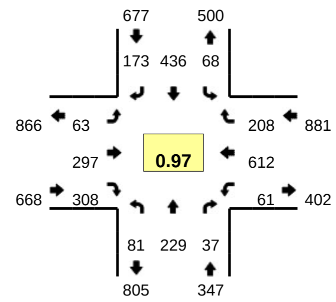
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	108	116	44	0	56	256	36	0	8	104	232	0	120	216	60	0	1356
Heavy Trucks	0	0	0		0	4	0		0	0	4		0	4	0		12
Pedestrians		48				28				40				16			132
Bicycles	0	0	0		0	0	0		0	0	0		1	0	0		1
Railroad																	
Stopped Buses																	

Comments:

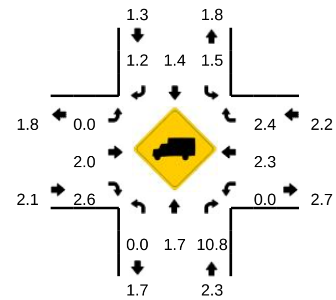
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

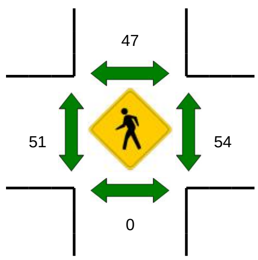
LOCATION: 10. Kuakini St -- Liliha St | **QC JOB #:** 14273219

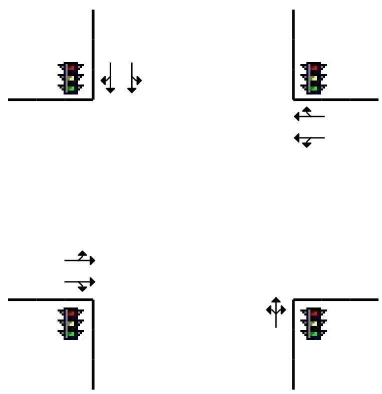
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

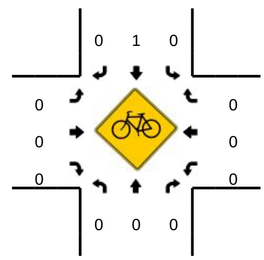


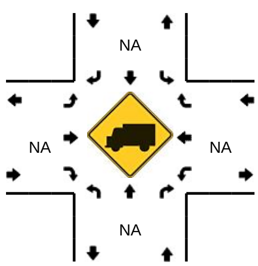
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

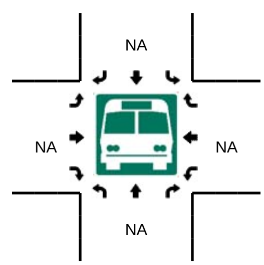












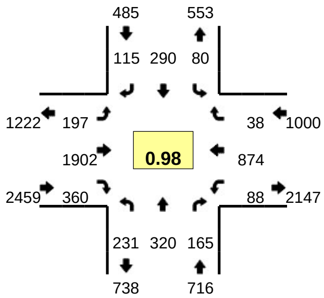
15-Min Count Period Beginning At	10. Kuakini St (Northbound) Left	Thru	Right	U	10. Kuakini St (Southbound) Left	Thru	Right	U	Liliha St (Eastbound) Left	Thru	Right	U	Liliha St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:00 AM	6	18	4	0	14	68	15	0	6	40	42	0	7	58	34	0	312	
6:15 AM	6	22	3	0	21	69	17	0	2	43	52	0	1	54	36	0	326	
6:30 AM	10	29	3	0	15	84	28	0	8	42	45	0	8	93	43	0	408	
6:45 AM	11	22	9	0	23	91	34	0	7	59	42	0	14	121	45	0	478	1524
7:00 AM	17	43	10	0	17	108	43	0	13	65	84	0	18	146	54	0	618	1830
7:15 AM	16	67	6	0	20	124	49	0	16	63	80	0	15	151	59	0	666	2170
7:30 AM	24	66	13	0	14	98	41	0	16	89	75	0	16	145	38	0	635	2397
7:45 AM	24	53	8	0	17	106	40	0	18	80	69	0	12	170	57	0	654	2573

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	64	268	24	0	80	496	196	0	64	252	320	0	60	604	236	0	2664
Heavy Trucks	0	8	0		0	4	4		0	0	12		0	12	12		52
Pedestrians		0				40				72				52			164
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

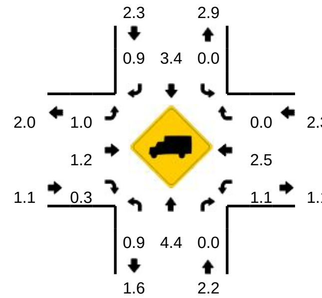
Comments:

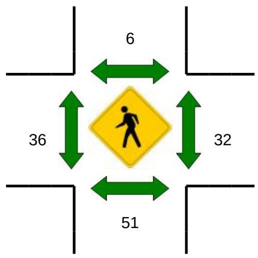
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

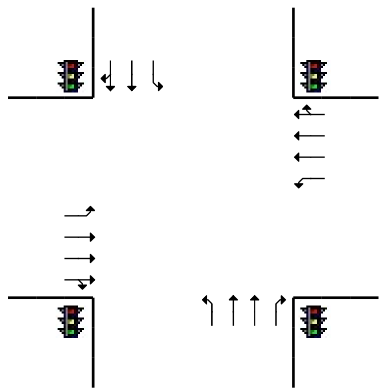
LOCATION: 1. N School St -- Kalihi St | **QC JOB #:** 14273202
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

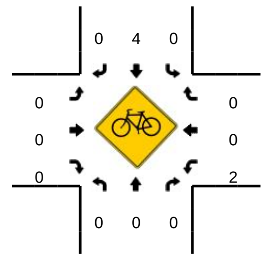


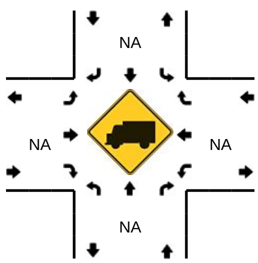
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

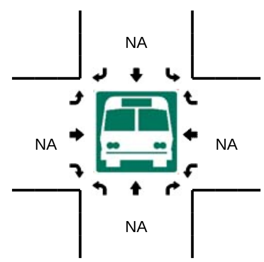












15-Min Count Period Beginning At	1. N School St (Northbound)				1. N School St (Southbound)				Kalihi St (Eastbound)				Kalihi St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	71	79	31	0	19	57	32	0	47	440	85	1	18	185	9	0	1074	
4:15 PM	60	92	48	0	23	82	37	0	68	457	91	1	22	202	7	0	1190	
4:30 PM	59	68	40	0	16	58	23	0	33	500	100	1	24	259	9	0	1190	
4:45 PM	53	85	40	0	22	89	32	0	55	450	80	0	26	210	10	0	1152	4606
5:00 PM	59	75	37	0	19	61	23	0	39	495	89	0	16	203	12	0	1128	4660
5:15 PM	61	103	37	0	16	82	31	0	54	443	77	1	22	182	14	0	1123	4593
5:30 PM	56	70	35	0	21	63	24	0	29	519	77	0	23	197	16	0	1130	4533
5:45 PM	51	100	51	0	10	63	39	0	60	420	64	0	13	175	7	0	1053	4434

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	240	368	192	0	92	328	148	0	272	1828	364	4	88	808	28	0	4760
Heavy Trucks	4	12	0		0	16	0		0	12	0		0	24	0		68
Pedestrians		80				4				72				28			184
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

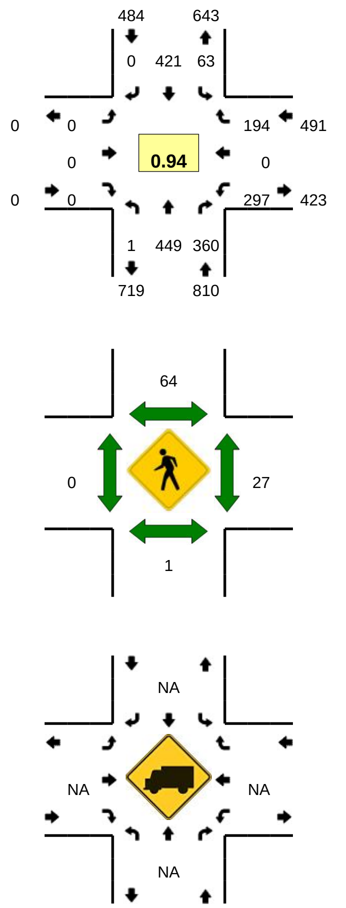
Comments:

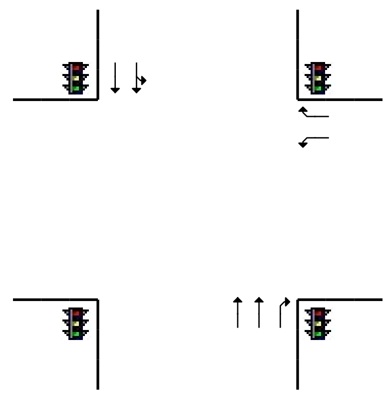
Report generated on 4/28/2017 3:43 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

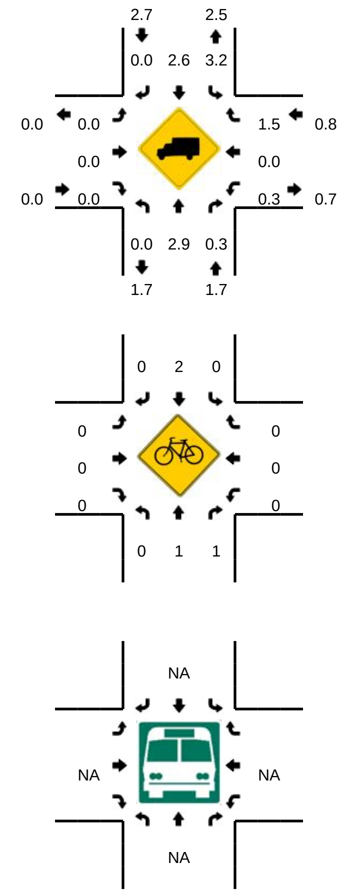
Type of peak hour being reported: System Peak — Method for determining peak hour: Total Entering Volume

LOCATION: 2. N School St -- Makuahine St — **QC JOB #:** 14273204
CITY/STATE: Honolulu, HI — **DATE:** Tue, Apr 18 2017

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM







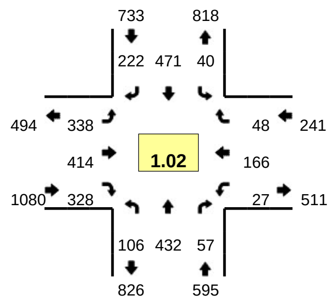
15-Min Count Period Beginning At	2. N School St (Northbound) Left	Thru	Right	U	2. N School St (Southbound) Left	Thru	Right	U	Makuahine St (Eastbound) Left	Thru	Right	U	Makuahine St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	109	76	1	19	91	0	0	0	0	0	0	72	0	39	0	407	
4:15 PM	0	122	94	0	15	108	0	0	0	0	0	0	81	0	56	0	476	
4:30 PM	0	109	94	0	12	106	0	0	0	0	0	0	83	0	46	0	450	
4:45 PM	0	111	97	0	18	108	0	0	0	0	0	0	68	0	43	0	445	1778
5:00 PM	0	107	75	1	18	99	0	0	0	0	0	0	65	0	49	0	414	1785
5:15 PM	0	121	86	0	14	105	0	0	0	0	0	0	69	0	57	0	452	1761
5:30 PM	0	103	75	0	23	92	0	0	0	0	0	0	68	0	42	0	403	1714
5:45 PM	0	119	77	0	15	78	0	0	0	0	0	0	68	0	61	0	418	1687

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	488	376	0	60	432	0	0	0	0	0	0	324	0	224	0	1904
Heavy Trucks	0	12	0		4	12	0		0	0	0		0	0	4		32
Pedestrians		0				48				0				24			72
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

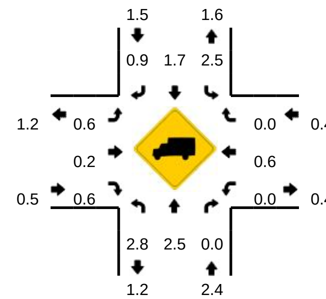
Comments:

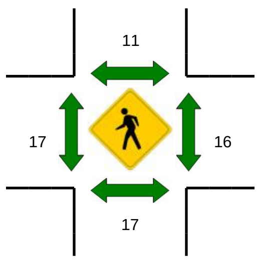
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

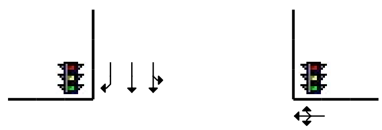
LOCATION: 3. N School St -- Houghtailing St | **QC JOB #:** 14273206
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

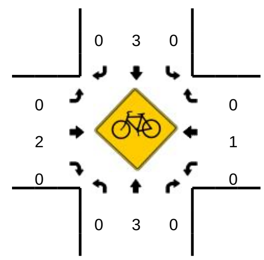


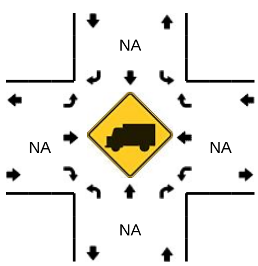
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

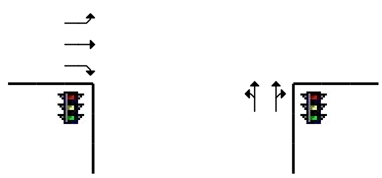


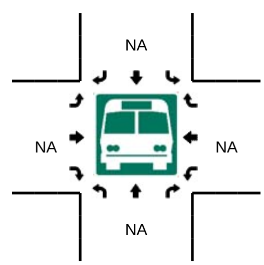












15-Min Count Period Beginning At	3. N School St (Northbound)				3. N School St (Southbound)				Houghtailing St (Eastbound)				Houghtailing St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	42	108	16	0	15	108	53	0	93	106	76	0	12	38	8	0	675	
4:15 PM	25	117	10	0	5	115	63	0	76	93	84	0	8	42	13	0	651	
4:30 PM	30	98	17	0	11	130	57	0	99	102	62	0	11	41	14	0	672	
4:45 PM	29	116	16	0	10	106	49	0	79	111	83	0	5	40	13	0	657	2655
5:00 PM	22	101	14	0	14	120	53	0	84	108	99	0	3	43	8	0	669	2649
5:15 PM	20	100	13	0	12	125	52	0	83	127	67	0	8	34	9	0	650	2648
5:30 PM	16	96	15	0	9	111	62	0	88	101	68	0	8	38	8	0	620	2596
5:45 PM	33	106	15	0	10	82	45	0	75	94	49	0	9	35	15	0	568	2507

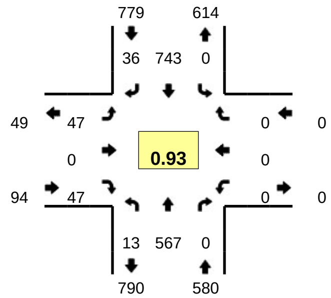
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	100	468	40	0	20	460	252	0	304	372	336	0	32	168	52	0	2604
Heavy Trucks	0	8	0		0	8	0		0	0	0		0	0	0		16
Pedestrians		12				16				16				12			56
Bicycles	0	1	0		0	1	0		0	1	0		0	0	0		3
Railroad																	
Stopped Buses																	

Comments:

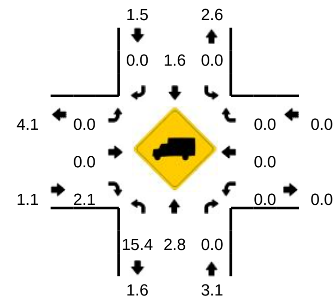
Report generated on 4/28/2017 3:43 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

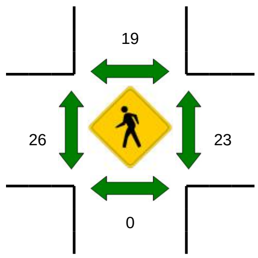
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

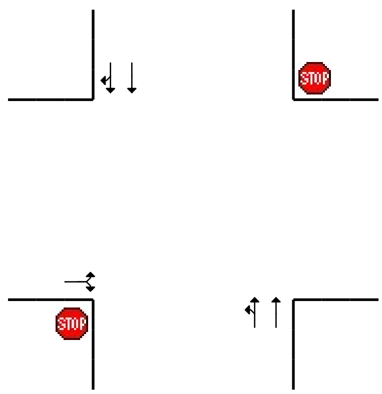
LOCATION: 4. N School St -- Kokea St | **QC JOB #:** 14273208
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

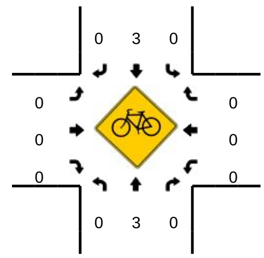


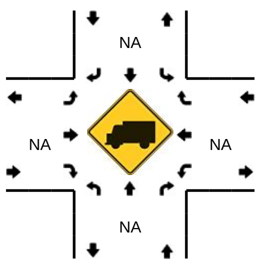
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

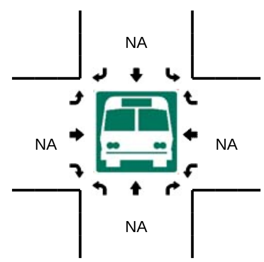












15-Min Count Period Beginning At	4. N School St (Northbound) Left	Thru	Right	U	4. N School St (Southbound) Left	Thru	Right	U	Kokea St (Eastbound) Left	Thru	Right	U	Kokea St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	1	157	0	0	0	178	13	0	16	0	12	0	0	0	0	0	377	
4:15 PM	2	154	0	0	0	196	12	0	15	0	11	0	0	0	0	0	390	
4:30 PM	3	129	0	0	0	182	9	0	10	0	15	0	0	0	0	0	348	
4:45 PM	6	147	0	0	0	176	7	0	15	0	8	0	0	0	0	0	359	1474
5:00 PM	2	137	0	0	0	189	8	0	7	0	13	0	0	0	0	0	356	1453
5:15 PM	9	143	0	0	0	183	10	0	16	0	18	0	0	0	0	0	379	1442
5:30 PM	4	128	0	0	0	161	12	0	20	0	9	0	0	0	0	0	334	1428
5:45 PM	0	126	0	0	0	126	11	0	21	0	14	0	0	0	0	0	298	1367

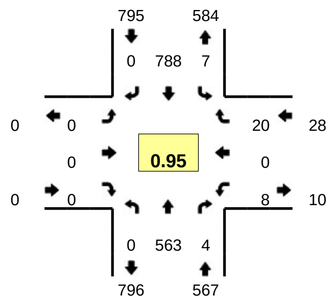
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	8	616	0	0	0	784	48	0	60	0	44	0	0	0	0	0	1560
Heavy Trucks	0	12	0		0	8	0		0	0	4		0	0	0		24
Pedestrians		0				16				12				20			48
Bicycles	0	1	0		0	1	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

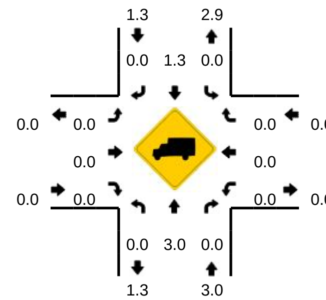
Comments:

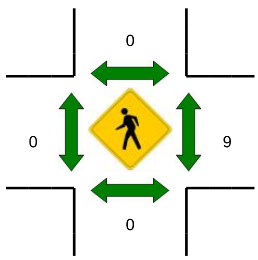
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

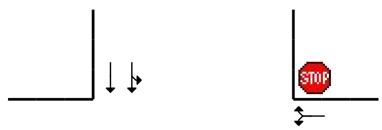
LOCATION: 5. N School St -- HPHA Dwy | **QC JOB #:** 14273210
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

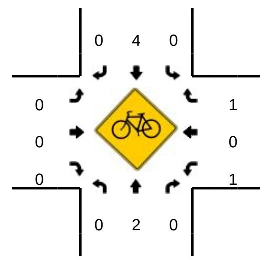
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

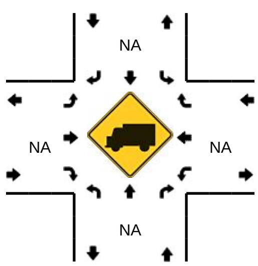


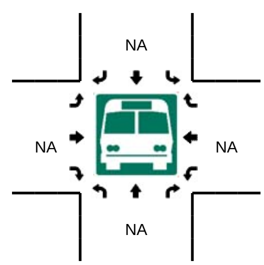












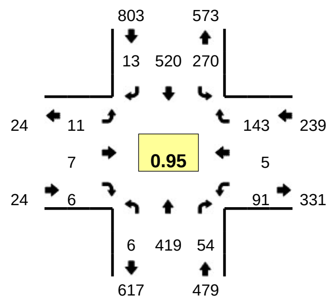
15-Min Count Period Beginning At	5. N School St (Northbound)				5. N School St (Southbound)				HPHA Dwy (Eastbound)				HPHA Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	151	1	0	4	183	0	0	0	0	0	0	5	0	6	0	350	
4:15 PM	0	151	2	0	2	202	0	0	0	0	0	0	4	0	6	0	367	
4:30 PM	0	126	1	0	2	196	0	0	0	0	0	0	1	0	7	0	333	
4:45 PM	0	152	1	0	1	188	0	0	0	0	0	0	0	0	3	0	345	1395
5:00 PM	0	134	0	0	1	202	0	1	0	0	0	0	3	0	4	0	345	1390
5:15 PM	0	149	1	0	2	198	0	0	0	0	0	0	1	0	3	0	354	1377
5:30 PM	0	129	2	0	1	166	0	1	0	0	0	0	1	0	4	0	304	1348
5:45 PM	0	121	0	0	2	136	0	0	0	0	0	0	0	0	4	0	263	1266

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	604	8	0	8	808	0	0	0	0	0	0	16	0	24	0	1468
Heavy Trucks	0	12	0		0	4	0		0	0	0		0	0	0		16
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	2	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

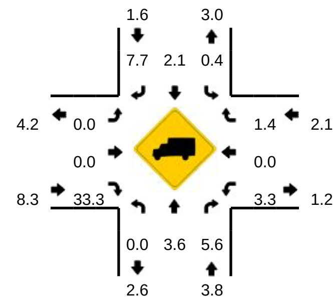
Type of peak hour being reported: System Peak Method for determining peak hour: Total Entering Volume

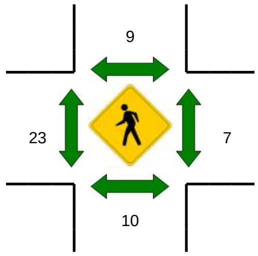
LOCATION: 6. N School St -- Lanakila St **QC JOB #:** 14273212
CITY/STATE: Honolulu, HI **DATE:** Tue, Apr 18 2017

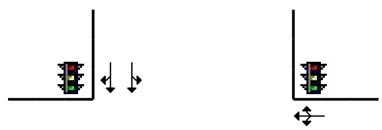


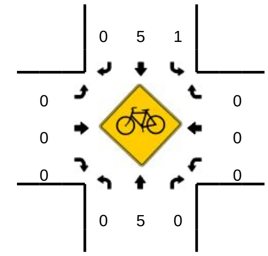
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

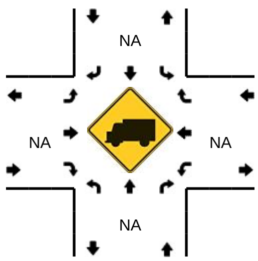
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

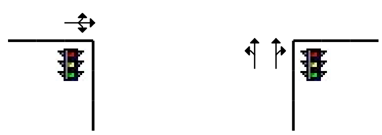


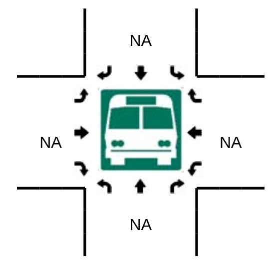












15-Min Count Period Beginning At	6. N School St (Northbound) Left	Thru	Right	U	6. N School St (Southbound) Left	Thru	Right	U	Lanakila St (Eastbound) Left	Thru	Right	U	Lanakila St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	121	17	0	61	130	4	0	5	2	1	0	21	0	29	0	391	
4:15 PM	1	124	10	0	73	137	4	0	3	2	1	0	24	0	29	0	408	
4:30 PM	2	86	14	0	54	130	2	0	4	4	3	0	37	0	32	0	368	
4:45 PM	1	108	14	0	68	109	7	0	1	0	1	0	21	1	45	0	376	1543
5:00 PM	2	101	16	0	75	144	0	0	3	1	1	0	9	4	37	0	393	1545
5:15 PM	2	112	5	0	65	122	5	0	2	3	1	0	15	4	34	0	370	1507
5:30 PM	3	106	16	0	57	119	7	0	2	0	1	0	11	4	23	0	349	1488
5:45 PM	1	85	15	0	26	106	3	0	3	2	2	0	13	3	34	0	293	1405

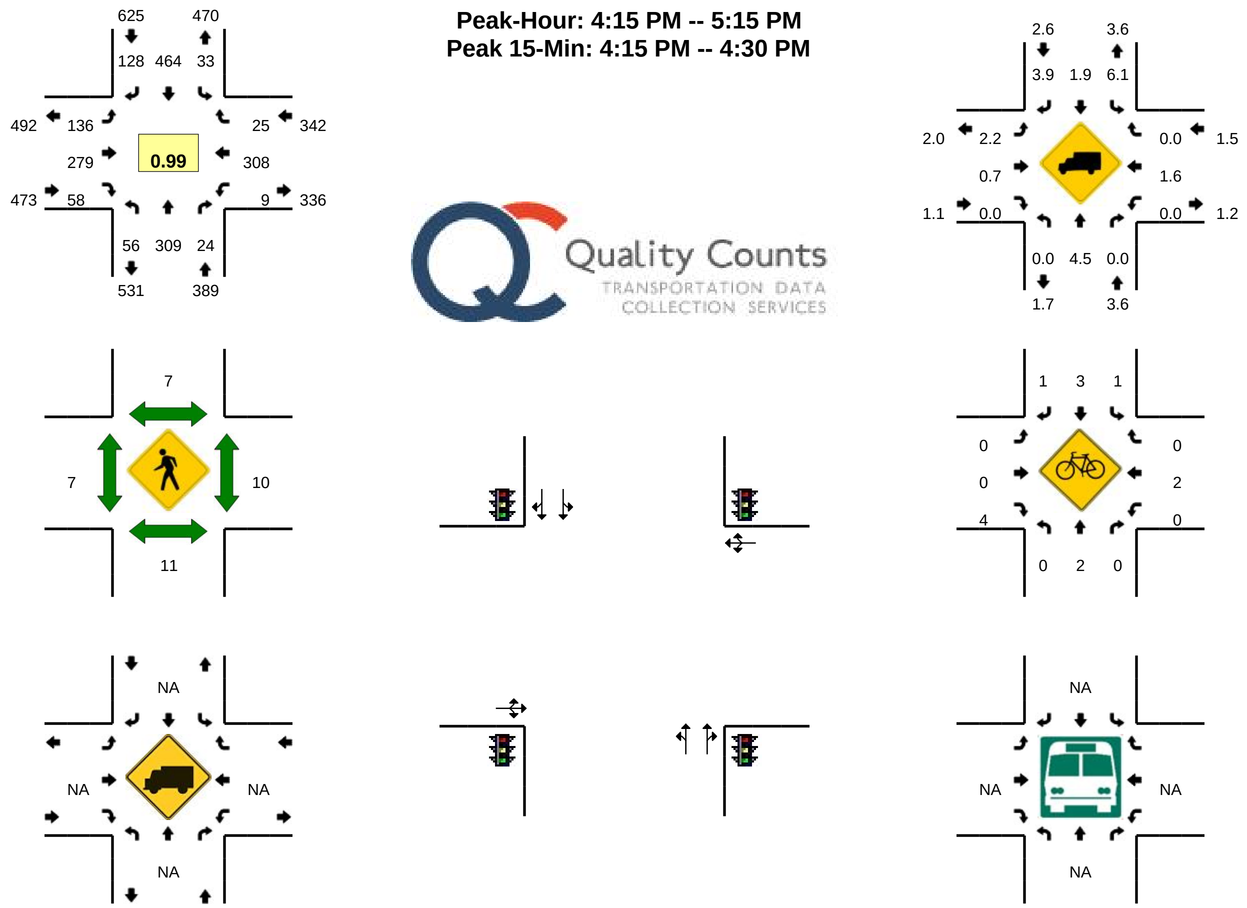
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	4	496	40	0	292	548	16	0	12	8	4	0	96	0	116	0	1632
Heavy Trucks	0	12	4		0	12	0		0	0	0		0	0	0		28
Pedestrians		20				12				16				8			56
Bicycles	0	2	0		0	3	0		0	0	0		0	0	0		5
Railroad																	
Stopped Buses																	

Comments:

Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

LOCATION: 7. N School St -- Palama St/Alaneo St | **QC JOB #:** 14273214
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM



15-Min Count Period Beginning At	7. N School St (Northbound)				7. N School St (Southbound)				Palama St/Alaneo St (Eastbound)				Palama St/Alaneo St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	23	87	8	0	6	131	33	0	36	54	19	0	1	78	8	0	484	
4:15 PM	15	71	5	0	5	129	33	0	48	77	10	0	2	60	6	0	461	
4:30 PM	9	69	5	0	10	120	39	0	33	73	16	0	3	92	5	0	474	
4:45 PM	16	91	5	0	4	99	29	0	24	70	20	0	2	82	6	0	448	1867
5:00 PM	16	78	9	0	14	116	27	0	31	59	12	0	2	74	8	0	446	1829
5:15 PM	19	77	5	0	10	121	23	0	26	72	20	0	4	74	8	0	459	1827
5:30 PM	22	84	5	0	7	104	21	0	28	61	13	0	1	71	1	0	418	1771
5:45 PM	25	71	7	0	6	101	26	0	28	54	11	0	5	61	5	0	400	1723

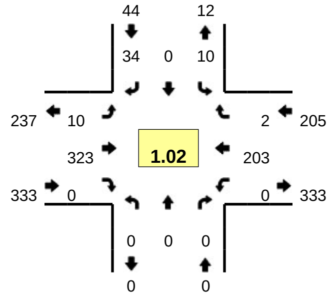
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	60	284	20	0	20	516	132	0	192	308	40	0	8	240	24	0	1844
Heavy Trucks	0	12	0		4	4	4		0	0	0		0	4	0		28
Pedestrians		12				8				12				16			48
Bicycles	0	0	0		1	1	0		0	0	1		0	0	0		3
Railroad																	
Stopped Buses																	

Comments:

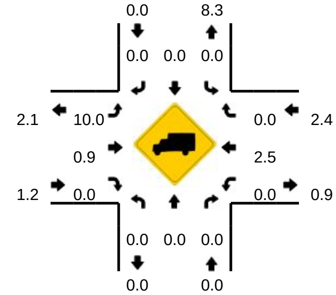
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

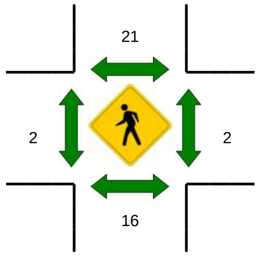
LOCATION: 8. Ahiahi St -- Lanakila Ave | **QC JOB #:** 14273216

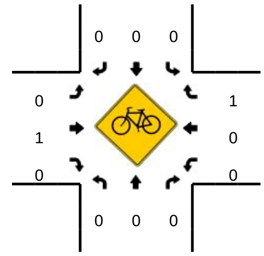
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

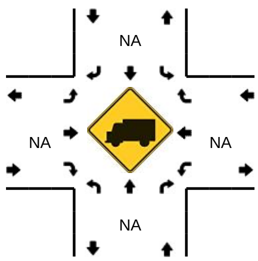


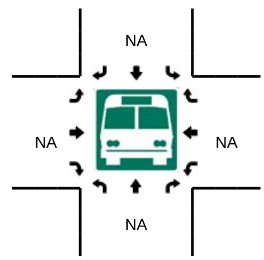
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM











15-Min Count Period Beginning At	8. Ahiahi St (Northbound)				8. Ahiahi St (Southbound)				Lanakila Ave (Eastbound)				Lanakila Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	4	0	11	0	4	74	0	0	0	35	0	0	128	
4:15 PM	0	0	0	0	1	0	9	0	1	85	0	0	0	47	0	0	143	
4:30 PM	0	0	0	0	7	0	15	0	5	68	0	0	0	54	2	0	151	
4:45 PM	0	0	0	0	2	0	6	0	2	80	0	0	0	56	0	0	146	568
5:00 PM	0	0	0	0	0	0	4	0	2	90	0	0	0	46	0	0	142	582
5:15 PM	0	0	0	0	3	0	6	0	1	70	0	0	0	48	2	0	130	569
5:30 PM	0	0	0	0	1	0	1	0	3	69	0	0	0	37	3	0	114	532
5:45 PM	0	0	0	0	2	0	4	0	3	42	0	0	0	43	2	0	96	482

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	36	0	4	340	0	0	0	188	0	0	572
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4
Pedestrians		16				20				0				4			40
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

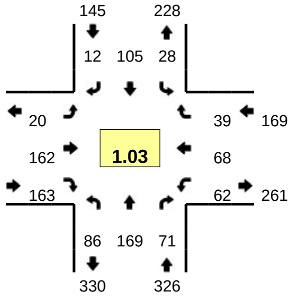
Comments:

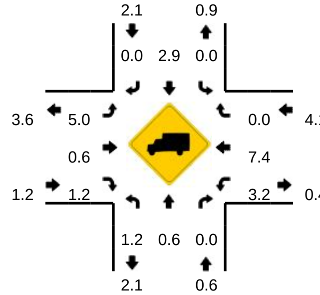
Report generated on 4/28/2017 3:43 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

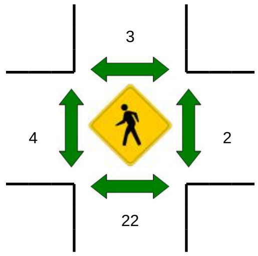
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

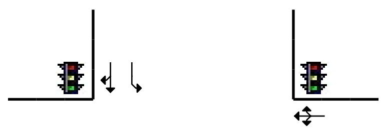
LOCATION: 9. Kuakini St -- Lanakila St | **QC JOB #:** 14273218
CITY/STATE: Honolulu, HI | **DATE:** Tue, Apr 18 2017

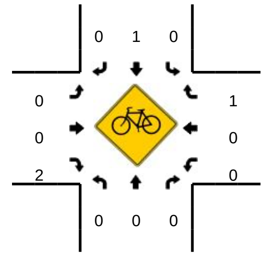
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

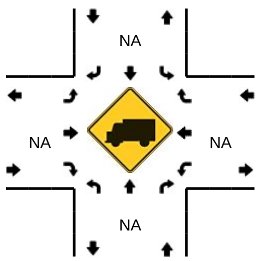


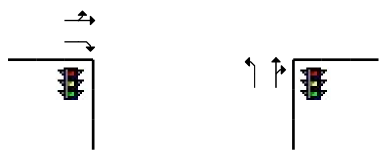


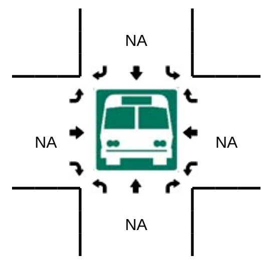












15-Min Count Period Beginning At	9. Kuakini St (Northbound) Left	Thru	Right	U	9. Kuakini St (Southbound) Left	Thru	Right	U	Lanakila St (Eastbound) Left	Thru	Right	U	Lanakila St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	15	36	11	0	5	28	6	0	2	32	44	0	17	14	8	0	218	
4:15 PM	18	37	19	0	8	30	4	0	4	43	42	0	16	12	7	0	240	
4:30 PM	14	40	14	0	8	21	2	0	4	33	50	0	17	20	12	0	235	
4:45 PM	26	37	22	0	5	26	3	0	5	39	40	0	16	19	9	0	247	940
5:00 PM	28	55	16	0	7	28	3	0	7	47	31	0	13	17	11	0	263	985
5:15 PM	22	32	21	0	5	41	3	0	2	35	33	0	15	19	6	0	234	979
5:30 PM	17	36	16	0	6	19	4	0	4	36	30	0	13	19	9	0	209	953
5:45 PM	18	23	17	0	7	26	1	0	3	17	19	0	14	23	3	0	171	877

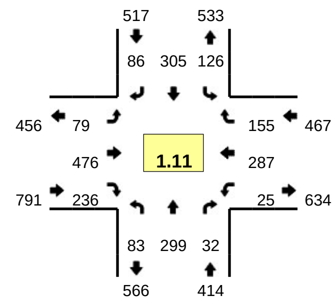
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	72	148	76	0	32	120	16	0	16	172	168	0	64	48	28	0	960
Heavy Trucks	0	4	0		0	8	0		0	0	4		0	0	0		16
Pedestrians		4				4				0				4			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	1		1
Railroad																	
Stopped Buses																	

Comments:

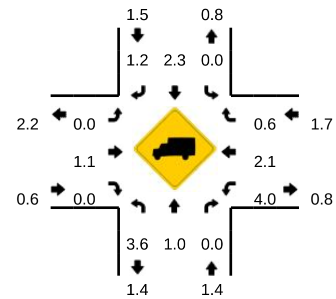
Type of peak hour being reported: System Peak | Method for determining peak hour: Total Entering Volume

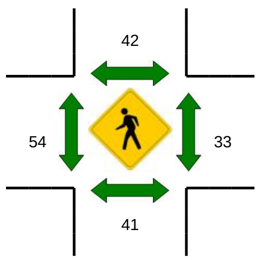
LOCATION: 10. Kuakini St -- Liliha St
CITY/STATE: Honolulu, HI

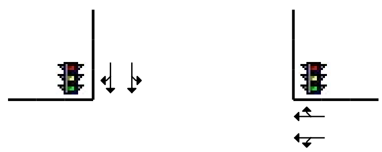
QC JOB #: 14273220
DATE: Tue, Apr 18 2017

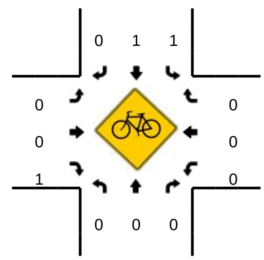


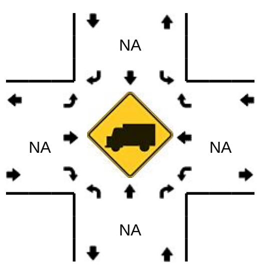
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

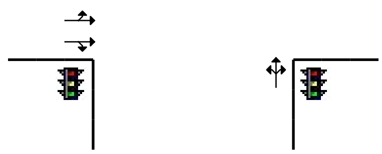


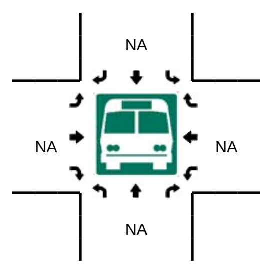












15-Min Count Period Beginning At	10. Kuakini St (Northbound) Left	Thru	Right	U	10. Kuakini St (Southbound) Left	Thru	Right	U	Liliha St (Eastbound) Left	Thru	Right	U	Liliha St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	22	77	6	0	31	77	28	0	13	83	60	0	6	54	38	0	495	
4:15 PM	22	55	5	0	20	77	28	0	18	114	53	0	4	67	31	0	494	
4:30 PM	18	74	9	0	32	81	25	0	20	131	67	0	10	76	32	0	575	
4:45 PM	29	82	9	0	43	74	14	0	22	107	56	0	6	67	50	0	559	2123
5:00 PM	14	88	9	0	31	73	19	0	19	124	60	0	5	77	42	0	561	2189
5:15 PM	17	61	7	0	34	80	14	0	17	113	61	0	3	71	44	0	522	2217
5:30 PM	18	54	14	0	31	62	11	0	14	87	60	0	8	74	55	0	488	2130
5:45 PM	28	47	7	0	20	60	19	0	19	108	54	0	2	44	29	0	437	2008

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	88	220	20	0	80	308	112	0	72	456	212	0	16	268	124	0	1976
Heavy Trucks	4	4	0		0	8	0		0	4	0		0	8	0		28
Pedestrians		8				40				48				36			132
Bicycles	0	0	0		1	0	0		0	0	1		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

APPENDIX B: EXISTING LOS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	298	150	266	276	73	188	916	435	205	2007	38
Future Volume (veh/h)	41	298	150	266	276	73	188	916	435	205	2007	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1900	1863	1845	1827	1863	1850	1900	1863	1862	1900
Adj Flow Rate, veh/h	45	324	108	289	300	6	204	996	0	223	2182	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	2	3	4	2	3	3	2	2	2
Cap, veh/h	58	536	173	273	1182	498	225	1923	0	240	1979	0
Arrive On Green	0.03	0.22	0.22	0.15	0.34	0.34	0.13	0.38	0.00	0.14	0.39	0.00
Sat Flow, veh/h	1723	2475	797	1774	3505	1478	1774	5218	0	1774	5252	0
Grp Volume(v), veh/h	45	224	208	289	300	6	204	996	0	223	2182	0
Grp Sat Flow(s),veh/h/ln	1723	1736	1536	1774	1752	1478	1774	1684	0	1774	1695	0
Q Serve(g_s), s	4.1	18.4	19.5	24.5	9.9	0.4	18.0	24.2	0.0	19.8	61.9	0.0
Cycle Q Clear(g_c), s	4.1	18.4	19.5	24.5	9.9	0.4	18.0	24.2	0.0	19.8	61.9	0.0
Prop In Lane	1.00		0.52	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	58	376	333	273	1182	498	225	1923	0	240	1979	0
V/C Ratio(X)	0.78	0.59	0.63	1.06	0.25	0.01	0.91	0.52	0.00	0.93	1.10	0.00
Avail Cap(c_a), veh/h	266	551	488	273	1182	498	240	1923	0	240	1979	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	76.2	56.0	56.4	67.2	38.2	35.0	68.5	38.0	0.0	68.0	48.5	0.0
Incr Delay (d2), s/veh	19.6	1.5	1.9	70.2	0.1	0.0	33.5	1.0	0.0	39.2	54.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.0	8.5	17.3	4.8	0.2	10.9	11.4	0.0	12.3	38.9	0.0
LnGrp Delay(d),s/veh	95.8	57.5	58.3	137.4	38.3	35.1	102.0	39.0	0.0	107.2	102.9	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	F	
Approach Vol, veh/h		477			595			1200			2405	
Approach Delay, s/veh		61.5			86.4			49.7			103.3	
Approach LOS		E			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	65.0	29.0	38.9	24.6	66.4	9.8	58.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	21.8	26.2	26.5	21.5	20.0	63.9	6.1	11.9
Green Ext Time (p_c), s	0.0	30.4	0.0	3.1	0.1	0.0	0.1	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	83.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	122	519	419	97	458	226
Future Volume (veh/h)	122	519	419	97	458	226
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1848	1900	1845	1863
Adj Flow Rate, veh/h	134	570	460	0	503	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	3	3	3	2
Cap, veh/h	356	1486	2165	0	498	449
Arrive On Green	0.62	0.62	0.62	0.00	0.28	0.00
Sat Flow, veh/h	486	2495	3696	0	1757	1583
Grp Volume(v), veh/h	328	376	460	0	503	0
Grp Sat Flow(s),veh/h/ln	1286	1610	1756	0	1757	1583
Q Serve(g_s), s	7.7	10.5	5.2	0.0	25.5	0.0
Cycle Q Clear(g_c), s	12.9	10.5	5.2	0.0	25.5	0.0
Prop In Lane	0.41			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	849	993	2165	0	498	449
V/C Ratio(X)	0.39	0.38	0.21	0.00	1.01	0.00
Avail Cap(c_a), veh/h	849	993	2165	0	498	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.1	8.6	7.6	0.0	32.2	0.0
Incr Delay (d2), s/veh	1.3	1.1	0.2	0.0	43.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	4.9	2.6	0.0	18.2	0.0
LnGrp Delay(d),s/veh	10.4	9.7	7.8	0.0	75.3	0.0
LnGrp LOS	B	A	A		F	
Approach Vol, veh/h		704	460		503	
Approach Delay, s/veh		10.0	7.8		75.3	
Approach LOS		B	A		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		30.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				14.9		27.5		7.2
Green Ext Time (p_c), s				10.2		0.0		10.5

Intersection Summary	
HCM 2010 Ctrl Delay	29.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	661	369	97	224	37	151	237	257	83	423	67
Future Volume (veh/h)	30	661	369	97	224	37	151	237	257	83	423	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.93	0.99		0.94	1.00		0.93	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1812	1845	1900	1822	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	34	751	255	110	255	22	172	269	193	94	481	67
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	5	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	82	1631	733	247	790	70	204	754	598	112	464	62
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	86	3230	1451	357	1565	139	847	1863	1477	174	1146	154
Grp Volume(v), veh/h	415	370	255	131	0	256	172	269	193	642	0	0
Grp Sat Flow(s),veh/h/ln	1749	1566	1451	438	0	1623	847	1863	1477	1474	0	0
Q Serve(g_s), s	0.0	15.3	10.6	16.3	0.0	9.3	0.0	10.0	8.9	30.5	0.0	0.0
Cycle Q Clear(g_c), s	14.7	15.3	10.6	31.6	0.0	9.3	40.5	10.0	8.9	40.5	0.0	0.0
Prop In Lane	0.08		1.00	0.84		0.09	1.00		1.00	0.15		0.10
Lane Grp Cap(c), veh/h	922	791	733	288	0	819	204	754	598	638	0	0
V/C Ratio(X)	0.45	0.47	0.35	0.45	0.00	0.31	0.85	0.36	0.32	1.01	0.00	0.00
Avail Cap(c_a), veh/h	922	791	733	288	0	819	204	754	598	638	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.9	16.0	14.9	25.0	0.0	14.5	34.5	20.7	20.4	31.7	0.0	0.0
Incr Delay (d2), s/veh	1.6	2.0	1.3	5.1	0.0	1.0	32.8	1.3	1.4	37.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.0	4.4	3.3	0.0	4.4	6.6	5.4	3.9	24.1	0.0	0.0
LnGrp Delay(d),s/veh	17.5	18.0	16.2	30.2	0.0	15.5	67.3	22.0	21.8	68.9	0.0	0.0
LnGrp LOS	B	B	B	C		B	E	C	C	F		
Approach Vol, veh/h		1040			387			634			642	
Approach Delay, s/veh		17.4			20.5			34.2			68.9	
Approach LOS		B			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		17.3		42.5		33.6
Green Ext Time (p_c), s		0.0		11.9		0.0		8.7

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1052	27	8	366	46	123
Future Vol, veh/h	1052	27	8	366	46	123
Conflicting Peds, #/hr	0	53	0	0	39	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	2	4	7	3
Mvmt Flow	1156	30	9	402	51	135

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1239	0	1482	646
Stage 1	-	-	-	-	1224	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	558	-	111	412
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	558	-	99	391
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	34.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	99	391	-	-	558	-
HCM Lane V/C Ratio	0.511	0.346	-	-	0.016	-
HCM Control Delay (s)	74.4	19	-	-	11.6	0.1
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	2.3	1.5	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	1129	364	5	5	9
Future Vol, veh/h	40	1129	364	5	5	9
Conflicting Peds, #/hr	0	0	0	18	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	3	4	2	2	2
Mvmt Flow	45	1269	409	6	6	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	433	0	-	0	1154	243
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	724	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1123	-	-	-	190	758
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	441	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	158	732
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	374	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1104	-	-	-	319
HCM Lane V/C Ratio	0.041	-	-	-	0.049
HCM Control Delay (s)	8.4	0.5	-	-	16.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	824	26	1	239	71	11	18	4	124	16	127
Future Volume (veh/h)	303	824	26	1	239	71	11	18	4	124	16	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.94	1.00		0.96	0.96		0.96	0.97		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1853	1900	1900	1835	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	337	916	23	1	266	19	12	20	1	138	18	92
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	546	1436	37	38	2167	153	147	218	10	216	32	113
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	725	2134	55	1	3222	227	410	929	42	674	138	479
Grp Volume(v), veh/h	577	0	699	151	0	135	33	0	0	248	0	0
Grp Sat Flow(s),veh/h/ln	1242	0	1672	1832	0	1618	1381	0	0	1291	0	0
Q Serve(g_s), s	27.8	0.0	22.9	0.0	0.0	2.9	0.0	0.0	0.0	16.1	0.0	0.0
Cycle Q Clear(g_c), s	30.7	0.0	22.9	2.9	0.0	2.9	1.5	0.0	0.0	17.6	0.0	0.0
Prop In Lane	0.58		0.03	0.01		0.14	0.36		0.03	0.56		0.37
Lane Grp Cap(c), veh/h	894	0	1125	1270	0	1089	375	0	0	361	0	0
V/C Ratio(X)	0.65	0.00	0.62	0.12	0.00	0.12	0.09	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	894	0	1125	1270	0	1089	413	0	0	395	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.2	0.0	9.0	5.7	0.0	5.7	29.1	0.0	0.0	35.1	0.0	0.0
Incr Delay (d2), s/veh	3.6	0.0	2.6	0.2	0.0	0.2	0.1	0.0	0.0	4.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	0.0	11.3	1.5	0.0	1.3	0.7	0.0	0.0	6.7	0.0	0.0
LnGrp Delay(d),s/veh	14.8	0.0	11.5	5.9	0.0	5.9	29.2	0.0	0.0	39.5	0.0	0.0
LnGrp LOS	B		B	A		A	C			D		
Approach Vol, veh/h		1276			286			33			248	
Approach Delay, s/veh		13.0			5.9			29.2			39.5	
Approach LOS		B			A			C			D	
Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.4		70.0		27.4		70.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5				
Max Q Clear Time (g_c+I1), s		3.5		32.7		19.6		4.9				
Green Ext Time (p_c), s		1.8		14.8		0.8		18.0				
Intersection Summary												
HCM 2010 Ctrl Delay			15.8									
HCM 2010 LOS			B									

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	15	28	363	232	19
Future Vol, veh/h	16	15	28	363	232	19
Conflicting Peds, #/hr	0	45	26	0	0	45
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	7	2	2	2	2
Mvmt Flow	19	17	33	422	270	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	813	371	337	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Critical Hdwy	6.42	6.27	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.363	2.218	-	-	-
Pot Cap-1 Maneuver	348	664	1222	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	307	608	1170	-	-	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1170	-	404	-	-
HCM Lane V/C Ratio	0.028	-	0.089	-	-
HCM Control Delay (s)	8.2	0	14.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	251	28	87	84	42	10	117	192	127	154	35
Future Volume (veh/h)	44	251	28	87	84	42	10	117	192	127	154	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.93	0.96		0.91	0.97		0.91	0.94		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1854	1863	1863	1856	1900	1863	1863	1900
Adj Flow Rate, veh/h	51	292	25	101	98	15	12	136	52	148	179	8
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	2	2
Cap, veh/h	144	545	43	349	300	528	585	535	205	566	760	34
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	140	1492	119	618	822	1445	1151	1244	476	1118	1765	79
Grp Volume(v), veh/h	368	0	0	199	0	15	12	0	188	148	0	187
Grp Sat Flow(s),veh/h/ln	1752	0	0	1439	0	1445	1151	0	1719	1118	0	1844
Q Serve(g_s), s	0.6	0.0	0.0	0.0	0.0	0.3	0.3	0.0	3.1	4.3	0.0	2.8
Cycle Q Clear(g_c), s	7.1	0.0	0.0	3.7	0.0	0.3	3.1	0.0	3.1	7.4	0.0	2.8
Prop In Lane	0.14		0.07	0.51		1.00	1.00		0.28	1.00		0.04
Lane Grp Cap(c), veh/h	733	0	0	649	0	528	585	0	740	566	0	794
V/C Ratio(X)	0.50	0.00	0.00	0.31	0.00	0.03	0.02	0.00	0.25	0.26	0.00	0.24
Avail Cap(c_a), veh/h	902	0	0	779	0	672	1147	0	1579	1112	0	1694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.1	0.0	0.0	10.0	0.0	9.0	9.0	0.0	8.0	10.4	0.0	8.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	1.8	0.0	0.1	0.1	0.0	1.5	1.4	0.0	1.4
LnGrp Delay(d),s/veh	11.6	0.0	0.0	10.3	0.0	9.0	9.0	0.0	8.2	10.6	0.0	8.1
LnGrp LOS	B			B		A	A		A	B		A
Approach Vol, veh/h		368			214			200			335	
Approach Delay, s/veh		11.6			10.2			8.3			9.2	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.5		20.6		23.5		20.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5				
Max Q Clear Time (g_c+I1), s		5.1		9.1		9.4		5.7				
Green Ext Time (p_c), s		3.3		2.9		3.3		3.4				
Intersection Summary												
HCM 2010 Ctrl Delay			10.0									
HCM 2010 LOS			B									

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	63	171	1515	185	6	49	481	56	121	113	49	91	206	520
Future Volume (veh/h)	63	171	1515	185	6	49	481	56	121	113	49	91	206	520
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.98		1.00		0.76	0.94		0.76	0.85		0.84
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1827	1827	1900		1827	1740	1900	1863	1828	1900	1900	1863	1827
Adj Flow Rate, veh/h		180	1595	175		52	506	44	127	119	38	96	217	225
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		4	4	4		4	10	10	2	3	3	2	2	4
Cap, veh/h		204	2729	299		67	2260	190	187	317	101	112	203	338
Arrive On Green		0.12	0.60	0.60		0.04	0.52	0.52	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1740	4555	499		1740	4346	366	1095	1222	390	318	781	1303
Grp Volume(v), veh/h		180	1164	606		52	364	186	127	0	157	313	0	225
Grp Sat Flow(s),veh/h/ln		1740	1663	1729		1740	1584	1544	1095	0	1612	1099	0	1303
Q Serve(g_s), s		16.3	34.5	34.7		4.7	10.0	10.5	0.0	0.0	12.8	28.7	0.0	24.7
Cycle Q Clear(g_c), s		16.3	34.5	34.7		4.7	10.0	10.5	35.8	0.0	12.8	41.5	0.0	24.7
Prop In Lane		1.00		0.29		1.00		0.24	1.00		0.24	0.31		1.00
Lane Grp Cap(c), veh/h		204	1992	1036		67	1648	803	187	0	418	314	0	338
V/C Ratio(X)		0.88	0.58	0.59		0.78	0.22	0.23	0.68	0.00	0.38	1.00	0.00	0.67
Avail Cap(c_a), veh/h		451	1992	1036		245	1648	803	187	0	418	314	0	338
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.94	0.94	0.94	1.00	0.00	1.00	0.38	0.00	0.38
Uniform Delay (d), s/veh		69.5	19.8	19.8		76.3	20.8	20.9	57.1	0.0	48.6	65.5	0.0	53.0
Incr Delay (d2), s/veh		11.7	1.3	2.4		16.6	0.3	0.6	18.1	0.0	2.6	30.3	0.0	3.9
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		8.5	16.2	17.2		2.6	4.4	4.6	6.3	0.0	6.0	16.5	0.0	9.3
LnGrp Delay(d),s/veh		81.2	21.0	22.2		92.8	21.1	21.6	75.2	0.0	51.2	95.8	0.0	57.0
LnGrp LOS		F	C	C		F	C	C	E		D	F		E
Approach Vol, veh/h			1950				602			284			538	
Approach Delay, s/veh			27.0				27.4			61.9			79.6	
Approach LOS			C				C			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	11.6	101.4		47.0	24.3	88.7
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		41.5	22.5	79.5		41.5	41.5	60.5
Max Q Clear Time (g_c+I1), s		37.8	6.7	36.7		43.5	18.3	12.5
Green Ext Time (p_c), s		1.7	0.1	27.0		0.0	0.5	28.9

Intersection Summary	
HCM 2010 Ctrl Delay	38.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	691	216	76	196	50	63	190	75	34	350	31
Future Volume (veh/h)	55	691	216	76	196	50	63	190	75	34	350	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	1.00		0.94	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1848	1900	1900	1809	1900	1900	1844	1900	1900	1846	1900
Adj Flow Rate, veh/h	60	751	150	83	213	7	68	207	67	37	380	30
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	5	5	5	2	2	2	3	3	3
Cap, veh/h	127	1509	296	273	985	34	96	260	77	63	452	34
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	155	2636	518	373	1721	60	161	758	224	77	1318	100
Grp Volume(v), veh/h	508	0	453	112	0	191	342	0	0	447	0	0
Grp Sat Flow(s),veh/h/ln	1747	0	1562	522	0	1631	1143	0	0	1495	0	0
Q Serve(g_s), s	3.4	0.0	18.4	9.6	0.0	6.0	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.5	0.0	18.4	28.1	0.0	6.0	31.1	0.0	0.0	29.8	0.0	0.0
Prop In Lane	0.12		0.33	0.74		0.04	0.20		0.20	0.08		0.07
Lane Grp Cap(c), veh/h	1038	0	894	358	0	934	432	0	0	549	0	0
V/C Ratio(X)	0.49	0.00	0.51	0.31	0.00	0.21	0.79	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	1038	0	894	358	0	934	487	0	0	612	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.4	0.0	13.6	19.6	0.0	11.0	31.6	0.0	0.0	32.1	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	2.0	2.3	0.0	0.5	7.8	0.0	0.0	7.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	0.0	8.4	2.5	0.0	2.8	10.4	0.0	0.0	13.3	0.0	0.0
LnGrp Delay(d),s/veh	15.0	0.0	15.7	21.9	0.0	11.5	39.4	0.0	0.0	39.6	0.0	0.0
LnGrp LOS	B		B	C		B	D			D		
Approach Vol, veh/h		961			303			342			447	
Approach Delay, s/veh		15.3			15.3			39.4			39.6	
Approach LOS		B			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.7		65.0		40.7		65.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		60.5		40.5		60.5
Max Q Clear Time (g_c+I1), s		33.1		20.4		31.8		30.1
Green Ext Time (p_c), s		3.2		11.8		3.5		10.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	18	334	1193	141	33	162	334	74	89	314	63	195	438	140
Future Volume (veh/h)	18	334	1193	141	33	162	334	74	89	314	63	195	438	140
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.94		1.00		0.88	1.00		0.92	1.00		0.88
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1812	1855	1900		1863	1750	1900	1696	1790	1900	1863	1814	1900
Adj Flow Rate, veh/h		355	1269	134		172	355	44	95	334	51	207	466	122
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.94	0.94	0.94		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		5	0	0		2	10	10	12	7	7	2	5	5
Cap, veh/h		232	1746	184		161	1374	163	114	887	133	161	806	208
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.07	0.30	0.30	0.09	0.32	0.32
Sat Flow, veh/h		1726	4618	488		1774	4110	488	1616	2926	440	1774	2494	644
Grp Volume(v), veh/h		355	928	475		172	272	127	95	192	193	207	320	268
Grp Sat Flow(s),veh/h/ln		1726	1688	1730		1774	1593	1412	1616	1700	1666	1774	1723	1415
Q Serve(g_s), s		21.5	23.8	23.8		14.5	9.9	10.6	9.3	14.2	14.6	14.5	24.7	25.3
Cycle Q Clear(g_c), s		21.5	23.8	23.8		14.5	9.9	10.6	9.3	14.2	14.6	14.5	24.7	25.3
Prop In Lane		1.00		0.28		1.00		0.35	1.00		0.26	1.00		0.45
Lane Grp Cap(c), veh/h		232	1277	654		161	1065	472	114	515	505	161	557	457
V/C Ratio(X)		1.53	0.73	0.73		1.07	0.25	0.27	0.83	0.37	0.38	1.29	0.57	0.59
Avail Cap(c_a), veh/h		232	1277	654		161	1065	472	237	515	505	161	557	457
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.74	0.74	0.74		1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96
Uniform Delay (d), s/veh		58.5	15.0	15.0		72.8	38.7	39.0	73.4	43.8	43.9	72.8	45.0	45.2
Incr Delay (d2), s/veh		254.4	2.7	5.2		90.8	0.6	1.4	14.4	2.1	2.2	166.8	4.1	5.2
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		26.6	11.3	12.0		11.2	4.5	4.3	4.6	7.0	7.0	14.6	12.4	10.6
LnGrp Delay(d),s/veh		312.9	17.7	20.2		163.5	39.3	40.4	87.8	45.9	46.1	239.6	49.1	50.4
LnGrp LOS		F	B	C		F	D	D	F	D	D	F	D	D
Approach Vol, veh/h			1758				571			480			795	
Approach Delay, s/veh			78.0				77.0			54.3			99.2	
Approach LOS			E				E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	16.8	57.2	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	16.6	16.5	25.8	11.3	27.3	23.5	12.6
Green Ext Time (p_c), s	0.0	7.6	0.0	17.3	0.2	5.1	0.0	18.6

Intersection Summary	
HCM 2010 Ctrl Delay	79.4
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	391	182	0	0	0	0	377	332	268	578	0
Future Volume (veh/h)	48	391	182	0	0	0	0	377	332	268	578	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.84	0.95		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	51	412	-44				0	397	175	282	608	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	68	547	515				0	1505	571	524	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.44	0.44	0.10	0.58	0.00
Sat Flow, veh/h	202	1634	1538				0	3529	1305	1774	3632	0
Grp Volume(v), veh/h	463	0	-44				0	397	175	282	608	0
Grp Sat Flow(s),veh/h/ln	1837	0	1538				0	1719	1305	1774	1770	0
Q Serve(g_s), s	29.2	0.0	0.0				0.0	9.5	11.3	11.0	11.3	0.0
Cycle Q Clear(g_c), s	29.2	0.0	0.0				0.0	9.5	11.3	11.0	11.3	0.0
Prop In Lane	0.11		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	615	0	515				0	1505	571	524	2055	0
V/C Ratio(X)	0.75	0.00	-0.09				0.00	0.26	0.31	0.54	0.30	0.00
Avail Cap(c_a), veh/h	615	0	515				0	1505	571	543	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.5	0.0	0.0				0.0	23.2	23.7	16.2	13.8	0.0
Incr Delay (d2), s/veh	8.3	0.0	0.0				0.0	0.4	1.4	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.2	0.0	0.0				0.0	4.6	4.3	5.5	5.6	0.0
LnGrp Delay(d),s/veh	46.8	0.0	0.0				0.0	23.7	25.1	17.2	14.2	0.0
LnGrp LOS	D							C	C	B	B	
Approach Vol, veh/h		419						572			890	
Approach Delay, s/veh		51.7						24.1			15.1	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.6	62.4		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	13.0	13.3		31.2		13.3		
Green Ext Time (p_c), s	0.1	10.3		2.5		10.7		

Intersection Summary		
HCM 2010 Ctrl Delay		26.0
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	220	184	235	41	386	0	1	604	62
Future Volume (veh/h)	0	0	0	220	184	235	41	386	0	1	604	62
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00	1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1597	1863	0	1900	1863	1900
Adj Flow Rate, veh/h				244	204	261	46	429	0	1	671	61
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				2	2	2	19	2	0	2	2	2
Cap, veh/h				750	748	622	260	1689	0	33	1256	114
Arrive On Green				0.42	0.42	0.42	0.03	0.48	0.00	0.39	0.39	0.39
Sat Flow, veh/h				1774	1770	1471	1521	3632	0	1	3195	290
Grp Volume(v), veh/h				244	204	261	46	429	0	391	0	342
Grp Sat Flow(s),veh/h/ln				1774	1770	1471	1521	1770	0	1862	0	1623
Q Serve(g_s), s				10.1	8.3	13.7	1.9	7.9	0.0	0.0	0.0	17.8
Cycle Q Clear(g_c), s				10.1	8.3	13.7	1.9	7.9	0.0	17.8	0.0	17.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.18
Lane Grp Cap(c), veh/h				750	748	622	260	1689	0	765	0	638
V/C Ratio(X)				0.33	0.27	0.42	0.18	0.25	0.00	0.51	0.00	0.54
Avail Cap(c_a), veh/h				750	748	622	395	1689	0	765	0	638
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh				21.3	20.7	22.3	19.4	17.1	0.0	25.7	0.0	25.7
Incr Delay (d2), s/veh				1.2	0.9	2.1	0.3	0.4	0.0	2.4	0.0	3.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.2	4.2	5.9	0.8	4.0	0.0	9.6	0.0	8.5
LnGrp Delay(d),s/veh				22.4	21.6	24.4	19.7	17.5	0.0	28.1	0.0	28.9
LnGrp LOS				C	C	C	B	B		C		C
Approach Vol, veh/h					709			475			733	
Approach Delay, s/veh					22.9			17.7			28.5	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			9.3	48.7		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		9.9			3.9	19.8		15.7
Green Ext Time (p_c), s		10.3			0.0	6.5		4.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	415	167	74	217	36	56	282	291	63	588	205
Future Volume (veh/h)	65	415	167	74	217	36	56	282	291	63	588	205
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.92	0.97		0.95	0.97		0.96	0.98		0.88
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1847	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	71	456	107	81	238	30	62	310	200	69	646	141
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	935	212	146	372	42	142	664	460	143	1111	236
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	231	2290	519	183	911	103	160	1484	1027	170	2482	528
Grp Volume(v), veh/h	349	0	285	349	0	0	287	0	285	451	0	405
Grp Sat Flow(s),veh/h/ln	1657	0	1383	1197	0	0	1208	0	1462	1663	0	1517
Q Serve(g_s), s	0.0	0.0	9.6	6.4	0.0	0.0	1.5	0.0	8.3	3.5	0.0	12.5
Cycle Q Clear(g_c), s	8.9	0.0	9.6	15.9	0.0	0.0	14.0	0.0	8.3	11.8	0.0	12.5
Prop In Lane	0.20		0.38	0.23		0.09	0.22		0.70	0.15		0.35
Lane Grp Cap(c), veh/h	746	0	564	560	0	0	611	0	654	811	0	679
V/C Ratio(X)	0.47	0.00	0.50	0.62	0.00	0.00	0.47	0.00	0.44	0.56	0.00	0.60
Avail Cap(c_a), veh/h	878	0	677	663	0	0	883	0	951	1132	0	986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	13.7	15.1	0.0	0.0	11.6	0.0	11.8	12.6	0.0	13.0
Incr Delay (d2), s/veh	0.5	0.0	0.7	1.4	0.0	0.0	0.6	0.0	0.5	0.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	3.8	5.3	0.0	0.0	3.3	0.0	3.4	5.8	0.0	5.3
LnGrp Delay(d),s/veh	13.9	0.0	14.4	16.5	0.0	0.0	12.1	0.0	12.3	13.2	0.0	13.8
LnGrp LOS	B		B	B			B		B	B		B
Approach Vol, veh/h		634			349			572			856	
Approach Delay, s/veh		14.2			16.5			12.2			13.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.4		29.9		32.4		29.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		16.0		11.6		14.5		17.9
Green Ext Time (p_c), s		11.9		6.9		12.2		5.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	290	115	231	320	165	195	1902	360	88	874	38
Future Volume (veh/h)	80	290	115	231	320	165	195	1902	360	88	874	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1850	1900	1863	1827	1863	1863	1863	1900	1863	1845	1900
Adj Flow Rate, veh/h	85	309	86	246	340	37	207	2023	0	94	930	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	3	3
Cap, veh/h	106	563	153	267	1044	437	228	2326	0	115	1983	0
Arrive On Green	0.06	0.21	0.21	0.15	0.30	0.30	0.13	0.46	0.00	0.07	0.39	0.00
Sat Flow, veh/h	1774	2682	728	1774	3471	1452	1774	5253	0	1774	5204	0
Grp Volume(v), veh/h	85	200	195	246	340	37	207	2023	0	94	930	0
Grp Sat Flow(s),veh/h/ln	1774	1757	1652	1774	1736	1452	1774	1695	0	1774	1679	0
Q Serve(g_s), s	7.3	15.6	16.3	21.0	11.7	2.8	17.7	55.1	0.0	8.0	21.1	0.0
Cycle Q Clear(g_c), s	7.3	15.6	16.3	21.0	11.7	2.8	17.7	55.1	0.0	8.0	21.1	0.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	106	369	347	267	1044	437	228	2326	0	115	1983	0
V/C Ratio(X)	0.80	0.54	0.56	0.92	0.33	0.08	0.91	0.87	0.00	0.81	0.47	0.00
Avail Cap(c_a), veh/h	283	577	543	283	1141	477	248	2326	0	248	1983	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	71.4	54.1	54.4	64.4	41.7	38.6	66.0	37.6	0.0	70.9	34.6	0.0
Incr Delay (d2), s/veh	13.0	1.2	1.4	32.7	0.2	0.1	32.0	4.8	0.0	12.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	7.7	7.6	12.7	5.6	1.1	10.7	26.7	0.0	4.4	10.0	0.0
LnGrp Delay(d),s/veh	84.4	55.4	55.8	97.1	41.8	38.6	98.0	42.4	0.0	83.8	35.4	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	D	
Approach Vol, veh/h		480			623			2230			1024	
Approach Delay, s/veh		60.7			63.5			47.5			39.9	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	74.8	27.6	36.8	24.3	65.0	13.7	50.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	10.0	57.1	23.0	18.3	19.7	23.1	9.3	13.7
Green Ext Time (p_c), s	0.1	3.3	0.1	5.4	0.1	31.7	0.2	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	421	449	360	297	194
Future Volume (veh/h)	63	421	449	360	297	194
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1853	1900	1863	1863
Adj Flow Rate, veh/h	69	463	493	0	326	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	3	3	2	2
Cap, veh/h	288	1875	2391	0	374	333
Arrive On Green	0.68	0.68	0.68	0.00	0.21	0.00
Sat Flow, veh/h	342	2846	3705	0	1774	1583
Grp Volume(v), veh/h	263	269	493	0	326	0
Grp Sat Flow(s),veh/h/ln	1493	1610	1760	0	1774	1583
Q Serve(g_s), s	0.0	5.3	4.3	0.0	14.5	0.0
Cycle Q Clear(g_c), s	4.3	5.3	4.3	0.0	14.5	0.0
Prop In Lane	0.26			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	1069	1094	2391	0	374	333
V/C Ratio(X)	0.25	0.25	0.21	0.00	0.87	0.00
Avail Cap(c_a), veh/h	1069	1094	2391	0	554	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	4.9	5.0	4.9	0.0	31.2	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.2	0.0	10.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.5	2.1	0.0	8.1	0.0
LnGrp Delay(d),s/veh	5.4	5.6	5.1	0.0	41.2	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		532	493		326	
Approach Delay, s/veh		5.5	5.1		41.2	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		21.7		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				7.3		16.5		6.3
Green Ext Time (p_c), s				8.6		0.7		8.6

Intersection Summary		
HCM 2010 Ctrl Delay		14.0
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	471	222	106	432	57	338	414	328	27	166	48
Future Volume (veh/h)	40	471	222	106	432	57	338	414	328	27	166	48
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.95	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1861	1845	1900	1841	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	42	496	45	112	455	43	356	436	93	28	175	35
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	135	1518	768	256	1070	106	405	754	617	82	475	89
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	185	3007	1522	406	2119	209	1151	1863	1524	104	1172	220
Grp Volume(v), veh/h	270	268	45	277	0	333	356	436	93	238	0	0
Grp Sat Flow(s),veh/h/ln	1582	1609	1522	1111	0	1624	1151	1863	1524	1496	0	0
Q Serve(g_s), s	0.4	9.9	1.5	11.3	0.0	12.8	21.6	18.2	3.9	0.8	0.0	0.0
Cycle Q Clear(g_c), s	13.2	9.9	1.5	21.2	0.0	12.8	40.5	18.2	3.9	18.9	0.0	0.0
Prop In Lane	0.16		1.00	0.40		0.13	1.00		1.00	0.12		0.15
Lane Grp Cap(c), veh/h	841	813	768	611	0	820	405	754	617	646	0	0
V/C Ratio(X)	0.32	0.33	0.06	0.45	0.00	0.41	0.88	0.58	0.15	0.37	0.00	0.00
Avail Cap(c_a), veh/h	841	813	768	611	0	820	405	754	617	646	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.4	14.7	12.6	18.2	0.0	15.4	35.1	23.1	18.9	20.5	0.0	0.0
Incr Delay (d2), s/veh	1.0	1.1	0.1	2.4	0.0	1.5	22.8	3.2	0.5	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	4.6	0.7	5.8	0.0	6.1	12.4	10.0	1.7	4.8	0.0	0.0
LnGrp Delay(d),s/veh	15.4	15.8	12.8	20.7	0.0	16.9	57.9	26.3	19.4	22.1	0.0	0.0
LnGrp LOS	B	B	B	C		B	E	C	B	C		
Approach Vol, veh/h		583			610			885			238	
Approach Delay, s/veh		15.4			18.6			38.3			22.1	
Approach LOS		B			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		15.2		20.9		23.2
Green Ext Time (p_c), s		0.0		9.7		6.5		9.0

Intersection Summary		
HCM 2010 Ctrl Delay		25.7
HCM 2010 LOS		C

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	743	36	13	567	47	47
Future Vol, veh/h	743	36	13	567	47	47
Conflicting Peds, #/hr	0	45	0	0	26	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	7	3
Mvmt Flow	799	39	14	610	51	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	883	0	1222	464
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	762	-	165	542
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	663	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	762	-	150	519
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	628	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	26.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	150	519	-	-	762	-
HCM Lane V/C Ratio	0.337	0.097	-	-	0.018	-
HCM Control Delay (s)	40.7	12.7	-	-	9.8	0.1
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	1.4	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	788	563	4	8	20
Future Vol, veh/h	6	788	563	4	8	20
Conflicting Peds, #/hr	0	0	0	9	0	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	6	829	593	4	8	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	606	0	-	0	1031	316
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	968	-	-	-	229	680
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	960	-	-	-	222	668
Mov Cap-2 Maneuver	-	-	-	-	222	-
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	960	-	-	-	424
HCM Lane V/C Ratio	0.007	-	-	-	0.07
HCM Control Delay (s)	8.8	0.1	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	520	13	6	419	54	11	7	6	91	5	143
Future Volume (veh/h)	270	520	13	6	419	54	11	7	6	91	5	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.97	0.99		1.00	0.95		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1861	1900	1900	1823	1900	1900	1736	1900	1900	1856	1900
Adj Flow Rate, veh/h	284	547	11	6	441	26	12	7	0	96	5	75
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	627	1244	25	49	2261	132	201	100	0	189	22	113
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.20	0.20	0.00	0.20	0.20	0.20
Sat Flow, veh/h	792	1774	36	14	3224	188	682	494	0	638	111	556
Grp Volume(v), veh/h	329	0	513	249	0	224	19	0	0	176	0	0
Grp Sat Flow(s),veh/h/ln	917	0	1685	1807	0	1618	1177	0	0	1305	0	0
Q Serve(g_s), s	16.2	0.0	12.2	0.0	0.0	4.5	0.0	0.0	0.0	9.8	0.0	0.0
Cycle Q Clear(g_c), s	20.7	0.0	12.2	4.4	0.0	4.5	0.8	0.0	0.0	11.5	0.0	0.0
Prop In Lane	0.86		0.02	0.02		0.12	0.63		0.00	0.55		0.43
Lane Grp Cap(c), veh/h	715	0	1182	1307	0	1135	301	0	0	324	0	0
V/C Ratio(X)	0.46	0.00	0.43	0.19	0.00	0.20	0.06	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	715	0	1182	1307	0	1135	387	0	0	414	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.4	0.0	6.0	4.8	0.0	4.8	30.0	0.0	0.0	34.2	0.0	0.0
Incr Delay (d2), s/veh	2.1	0.0	1.2	0.3	0.0	0.4	0.1	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	5.9	2.3	0.0	2.1	0.4	0.0	0.0	4.3	0.0	0.0
LnGrp Delay(d),s/veh	10.6	0.0	7.2	5.2	0.0	5.2	30.1	0.0	0.0	35.6	0.0	0.0
LnGrp LOS	B		A	A		A	C			D		
Approach Vol, veh/h		842			473			19			176	
Approach Delay, s/veh		8.5			5.2			30.1			35.6	
Approach LOS		A			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.4		70.0		23.4		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		2.8		22.7		13.5		6.5
Green Ext Time (p_c), s		1.2		12.5		0.9		13.2

Intersection Summary		
HCM 2010 Ctrl Delay		10.9
HCM 2010 LOS		B

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	34	10	323	203	2
Future Vol, veh/h	10	34	10	323	203	2
Conflicting Peds, #/hr	0	23	18	0	0	23
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	2	2	2	2
Mvmt Flow	11	37	11	347	218	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	611	265	243	0	-	0
Stage 1	242	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.5	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	444	774	1323	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	682	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	420	740	1294	-	-	-
Mov Cap-2 Maneuver	420	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	660	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1294	-	631	-	-
HCM Lane V/C Ratio	0.008	-	0.075	-	-
HCM Control Delay (s)	7.8	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	105	12	86	169	71	20	162	163	62	68	39
Future Volume (veh/h)	28	105	12	86	169	71	20	162	163	62	68	39
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.96	0.98		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1850	1900	1900	1863	1863	1810	1863	1900	1845	1806	1900
Adj Flow Rate, veh/h	30	112	6	91	180	16	21	172	42	66	72	19
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	2	2	2	5	2	2	3	7	7
Cap, veh/h	214	441	21	298	380	453	685	526	128	583	504	133
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	177	1479	70	397	1275	1520	1256	1435	350	1125	1376	363
Grp Volume(v), veh/h	148	0	0	271	0	16	21	0	214	66	0	91
Grp Sat Flow(s),veh/h/ln	1726	0	0	1672	0	1520	1256	0	1786	1125	0	1739
Q Serve(g_s), s	0.0	0.0	0.0	1.3	0.0	0.2	0.3	0.0	2.3	1.2	0.0	0.9
Cycle Q Clear(g_c), s	1.7	0.0	0.0	3.4	0.0	0.2	1.2	0.0	2.3	3.5	0.0	0.9
Prop In Lane	0.20		0.04	0.34		1.00	1.00		0.20	1.00		0.21
Lane Grp Cap(c), veh/h	676	0	0	678	0	453	685	0	654	583	0	637
V/C Ratio(X)	0.22	0.00	0.00	0.40	0.00	0.04	0.03	0.00	0.33	0.11	0.00	0.14
Avail Cap(c_a), veh/h	1436	0	0	1424	0	1161	2119	0	2695	1868	0	2625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.2	0.0	0.0	7.8	0.0	6.7	6.1	0.0	6.1	7.4	0.0	5.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.7	0.0	0.1	0.1	0.0	1.2	0.4	0.0	0.4
LnGrp Delay(d),s/veh	7.4	0.0	0.0	8.1	0.0	6.7	6.1	0.0	6.4	7.5	0.0	5.8
LnGrp LOS	A			A		A	A		A	A		A
Approach Vol, veh/h		148			287			235			157	
Approach Delay, s/veh		7.4			8.1			6.4			6.5	
Approach LOS		A			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		12.5		14.3		12.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5				
Max Q Clear Time (g_c+I1), s		4.3		3.7		5.5		5.4				
Green Ext Time (p_c), s		2.4		2.5		2.4		2.4				
Intersection Summary												
HCM 2010 Ctrl Delay			7.2									
HCM 2010 LOS			A									

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	141	219	1364	123	21	29	812	78	252	117	42	56	188	444
Future Volume (veh/h)	141	219	1364	123	21	29	812	78	252	117	42	56	188	444
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.83	0.96		0.89	0.93		0.92
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1863	1863	1900		1863	1768	1900	1863	1863	1900	1900	1841	1863
Adj Flow Rate, veh/h		226	1406	114		30	837	69	260	121	32	58	194	242
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.97	0.97	0.97		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %		2	2	2		2	8	8	2	2	2	3	3	2
Cap, veh/h		251	2914	236		41	2187	179	231	367	97	100	304	387
Arrive On Green		0.14	0.61	0.61		0.02	0.49	0.49	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h		1774	4791	388		1774	4465	365	1135	1380	365	271	1145	1456
Grp Volume(v), veh/h		226	995	525		30	601	305	260	0	153	252	0	242
Grp Sat Flow(s),veh/h/ln		1774	1695	1789		1774	1609	1613	1135	0	1745	1416	0	1456
Q Serve(g_s), s		20.1	26.0	26.0		2.7	18.8	19.0	14.7	0.0	11.3	16.5	0.0	23.4
Cycle Q Clear(g_c), s		20.1	26.0	26.0		2.7	18.8	19.0	42.5	0.0	11.3	27.8	0.0	23.4
Prop In Lane		1.00		0.22		1.00		0.23	1.00		0.21	0.23		1.00
Lane Grp Cap(c), veh/h		251	2062	1088		41	1576	790	231	0	464	404	0	387
V/C Ratio(X)		0.90	0.48	0.48		0.73	0.38	0.39	1.12	0.00	0.33	0.62	0.00	0.63
Avail Cap(c_a), veh/h		449	2062	1088		238	1576	790	231	0	464	404	0	387
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.86	0.86	0.86	1.00	0.00	1.00	0.84	0.00	0.84
Uniform Delay (d), s/veh		67.6	17.4	17.4		77.7	25.6	25.7	66.5	0.0	47.3	54.3	0.0	51.7
Incr Delay (d2), s/veh		11.4	0.8	1.5		19.6	0.6	1.2	96.3	0.0	1.9	6.0	0.0	6.3
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		10.7	12.4	13.3		1.5	8.5	8.7	16.4	0.0	5.7	10.8	0.0	10.1
LnGrp Delay(d),s/veh		79.0	18.2	18.9		97.3	26.2	26.9	162.8	0.0	49.2	60.3	0.0	58.0
LnGrp LOS		E	B	B		F	C	C	F		D	E		E
Approach Vol, veh/h			1746				936			413			494	
Approach Delay, s/veh			26.3				28.7			120.7			59.2	
Approach LOS			C				C			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		48.0	9.2	102.8		48.0	28.1	83.9
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		42.5	21.5	79.5		42.5	40.5	60.5
Max Q Clear Time (g_c+I1), s		44.5	4.7	28.0		29.8	22.1	21.0
Green Ext Time (p_c), s		0.0	0.0	31.0		3.9	0.6	26.3

Intersection Summary	
HCM 2010 Ctrl Delay	42.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	464	128	56	309	24	136	279	58	9	308	25
Future Volume (veh/h)	33	464	128	56	309	24	136	279	58	9	308	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.96	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1854	1900	1900	1820	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	34	478	72	58	319	13	140	288	54	9	318	22
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	5	5	5	2	2	2	2	2	2
Cap, veh/h	114	1531	227	233	1326	57	156	270	48	39	560	38
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	141	2784	413	345	2410	103	309	733	131	15	1520	103
Grp Volume(v), veh/h	305	0	279	184	0	206	482	0	0	349	0	0
Grp Sat Flow(s),veh/h/ln	1742	0	1596	1225	0	1633	1173	0	0	1638	0	0
Q Serve(g_s), s	0.0	0.0	10.5	2.7	0.0	7.2	21.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.8	0.0	10.5	13.2	0.0	7.2	40.5	0.0	0.0	18.6	0.0	0.0
Prop In Lane	0.11		0.26	0.32		0.06	0.29		0.11	0.03		0.06
Lane Grp Cap(c), veh/h	994	0	878	717	0	898	474	0	0	637	0	0
V/C Ratio(X)	0.31	0.00	0.32	0.26	0.00	0.23	1.02	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	994	0	878	717	0	898	474	0	0	637	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.3	0.0	13.5	13.3	0.0	12.7	37.6	0.0	0.0	27.8	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	1.0	0.9	0.0	0.6	45.6	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	4.8	3.3	0.0	3.4	20.4	0.0	0.0	8.6	0.0	0.0
LnGrp Delay(d),s/veh	14.1	0.0	14.4	14.2	0.0	13.3	83.2	0.0	0.0	28.8	0.0	0.0
LnGrp LOS	B		B	B		B	F			C		
Approach Vol, veh/h		584			390			482			349	
Approach Delay, s/veh		14.3			13.7			83.2			28.8	
Approach LOS		B			B			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		65.0		45.0		65.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		60.5		40.5		60.5
Max Q Clear Time (g_c+I1), s		42.5		12.5		20.6		15.2
Green Ext Time (p_c), s		0.0		7.7		6.0		7.7

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	24	338	1015	107	27	129	549	100	132	562	100	136	291	127
Future Volume (veh/h)	24	338	1015	107	27	129	549	100	132	562	100	136	291	127
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.87	1.00		0.95	1.00		0.86
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1863	1849	1900		1863	1863	1900	1397	1832	1900	1863	1813	1900
Adj Flow Rate, veh/h		356	1068	97		136	578	62	139	592	80	143	306	120
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	36	4	4	2	6	6
Cap, veh/h		238	1791	162		156	1484	155	155	928	125	161	615	230
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.12	0.30	0.30	0.09	0.28	0.28
Sat Flow, veh/h		1774	4706	427		1774	4439	465	1331	3061	412	1774	2217	829
Grp Volume(v), veh/h		356	763	402		136	438	202	139	336	336	143	234	192
Grp Sat Flow(s),veh/h/ln		1774	1682	1768		1774	1695	1514	1331	1741	1733	1774	1723	1323
Q Serve(g_s), s		21.5	15.9	15.9		12.1	15.8	16.4	16.5	26.7	26.8	12.8	18.2	19.6
Cycle Q Clear(g_c), s		21.5	15.9	15.9		12.1	15.8	16.4	16.5	26.7	26.8	12.8	18.2	19.6
Prop In Lane		1.00		0.24		1.00		0.31	1.00		0.24	1.00		0.63
Lane Grp Cap(c), veh/h		238	1281	673		156	1134	506	155	528	525	161	478	367
V/C Ratio(X)		1.49	0.60	0.60		0.87	0.39	0.40	0.90	0.64	0.64	0.89	0.49	0.52
Avail Cap(c_a), veh/h		238	1281	673		161	1134	506	195	528	525	161	478	367
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.84	0.84	0.84		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh		58.5	13.7	13.7		72.1	40.7	40.9	69.8	48.1	48.2	72.0	48.3	48.8
Incr Delay (d2), s/veh		239.8	1.7	3.3		36.2	1.0	2.3	32.8	5.8	5.9	40.3	3.5	5.1
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		26.3	7.5	8.2		7.5	7.6	7.2	7.5	13.6	13.7	8.1	9.1	7.7
LnGrp Delay(d),s/veh		298.3	15.4	17.0		108.2	41.7	43.2	102.5	53.9	54.1	112.3	51.9	54.0
LnGrp LOS		F	B	B		F	D	D	F	D	D	F	D	D
Approach Vol, veh/h			1521				776			811			569	
Approach Delay, s/veh			82.0				53.8			62.3			67.8	
Approach LOS			F				D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	19.6	66.4	24.1	49.9	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	14.8	28.8	14.1	17.9	18.5	21.6	23.5	18.4
Green Ext Time (p_c), s	0.0	7.4	0.0	18.4	0.2	7.1	0.0	17.0

Intersection Summary	
HCM 2010 Ctrl Delay	69.5
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	401	156	0	0	0	0	518	519	157	409	0
Future Volume (veh/h)	60	401	156	0	0	0	0	518	519	157	409	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.85	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	65	431	-73				0	557	381	169	440	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	80	534	515				0	1631	628	386	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.47	0.47	0.06	0.58	0.00
Sat Flow, veh/h	240	1595	1538				0	3529	1324	1774	3632	0
Grp Volume(v), veh/h	496	0	-73				0	557	381	169	440	0
Grp Sat Flow(s),veh/h/ln	1835	0	1538				0	1719	1324	1774	1770	0
Q Serve(g_s), s	32.0	0.0	0.0				0.0	13.2	27.6	6.1	7.7	0.0
Cycle Q Clear(g_c), s	32.0	0.0	0.0				0.0	13.2	27.6	6.1	7.7	0.0
Prop In Lane	0.13		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1631	628	386	2055	0
V/C Ratio(X)	0.81	0.00	-0.14				0.00	0.34	0.61	0.44	0.21	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1631	628	470	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.4	0.0	0.0				0.0	21.4	25.2	15.6	13.0	0.0
Incr Delay (d2), s/veh	10.9	0.0	0.0				0.0	0.6	4.3	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	0.0	0.0				0.0	6.4	10.8	3.0	3.9	0.0
LnGrp Delay(d),s/veh	50.4	0.0	0.0				0.0	22.0	29.5	16.3	13.3	0.0
LnGrp LOS	D							C	C	B	B	
Approach Vol, veh/h		423						938			609	
Approach Delay, s/veh		59.1						25.0			14.1	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.8	67.2		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	8.1	29.6		34.0		9.7		
Green Ext Time (p_c), s	0.2	10.2		2.3		12.6		

Intersection Summary	
HCM 2010 Ctrl Delay	29.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	179	241	231	59	520	0	0	382	71
Future Volume (veh/h)	0	0	0	179	241	231	59	520	0	0	382	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1624	1863	0	0	1847	1900
Adj Flow Rate, veh/h				186	251	241	61	542	0	0	398	67
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	2	2	17	2	0	0	3	3
Cap, veh/h				611	894	652	362	1689	0	0	1168	195
Arrive On Green				0.42	0.42	0.42	0.04	0.48	0.00	0.00	0.39	0.39
Sat Flow, veh/h				1445	2115	1542	1547	3632	0	0	3097	502
Grp Volume(v), veh/h				230	207	241	61	542	0	0	231	234
Grp Sat Flow(s),veh/h/ln				1790	1770	1542	1547	1770	0	0	1755	1751
Q Serve(g_s), s				9.4	8.4	11.8	2.5	10.4	0.0	0.0	10.2	10.4
Cycle Q Clear(g_c), s				9.4	8.4	11.8	2.5	10.4	0.0	0.0	10.2	10.4
Prop In Lane				0.81		1.00	1.00		0.00	0.00		0.29
Lane Grp Cap(c), veh/h				757	748	652	362	1689	0	0	682	681
V/C Ratio(X)				0.30	0.28	0.37	0.17	0.32	0.00	0.00	0.34	0.34
Avail Cap(c_a), veh/h				757	748	652	492	1689	0	0	682	681
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.0	20.8	21.7	18.4	17.7	0.0	0.0	23.7	23.7
Incr Delay (d2), s/veh				1.0	0.9	1.6	0.2	0.5	0.0	0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.8	4.3	5.3	1.1	5.2	0.0	0.0	5.2	5.3
LnGrp Delay(d),s/veh				22.1	21.7	23.3	18.6	18.2	0.0	0.0	25.0	25.1
LnGrp LOS				C	C	C	B	B			C	C
Approach Vol, veh/h					678			603			465	
Approach Delay, s/veh					22.4			18.3			25.0	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			9.7	48.3		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		12.4			4.5	12.4		13.8
Green Ext Time (p_c), s		8.5			0.1	7.1		4.0

Intersection Summary		
HCM 2010 Ctrl Delay		21.7
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	305	86	83	299	32	79	476	236	25	287	155
Future Volume (veh/h)	126	305	86	83	299	32	79	476	236	25	287	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.92	0.97		0.95	0.95		0.93	0.98		0.91
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1855	1900	1900	1863	1900	1900	1861	1900
Adj Flow Rate, veh/h	134	324	56	88	318	28	84	506	124	27	305	64
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	326	735	129	157	473	38	185	984	234	116	1092	221
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	542	1717	301	195	1105	90	262	2346	558	113	2603	526
Grp Volume(v), veh/h	246	0	268	434	0	0	370	0	344	209	0	187
Grp Sat Flow(s),veh/h/ln	1119	0	1442	1390	0	0	1616	0	1549	1702	0	1540
Q Serve(g_s), s	0.0	0.0	7.7	7.6	0.0	0.0	3.0	0.0	9.8	0.0	0.0	4.7
Cycle Q Clear(g_c), s	10.1	0.0	7.7	15.3	0.0	0.0	9.1	0.0	9.8	4.3	0.0	4.7
Prop In Lane	0.54		0.21	0.20		0.06	0.23		0.36	0.13		0.34
Lane Grp Cap(c), veh/h	573	0	617	668	0	0	753	0	650	783	0	646
V/C Ratio(X)	0.43	0.00	0.43	0.65	0.00	0.00	0.49	0.00	0.53	0.27	0.00	0.29
Avail Cap(c_a), veh/h	686	0	746	792	0	0	1163	0	1063	1204	0	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.1	0.0	11.9	13.8	0.0	0.0	12.4	0.0	12.8	11.2	0.0	11.3
Incr Delay (d2), s/veh	0.5	0.0	0.5	1.4	0.0	0.0	0.5	0.0	0.7	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	3.1	6.1	0.0	0.0	4.5	0.0	4.2	2.2	0.0	2.0
LnGrp Delay(d),s/veh	12.6	0.0	12.3	15.2	0.0	0.0	12.9	0.0	13.4	11.4	0.0	11.6
LnGrp LOS	B		B	B			B		B	B		B
Approach Vol, veh/h		514			434			714			396	
Approach Delay, s/veh		12.5			15.2			13.2			11.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		29.3		29.7		29.3		29.7
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		11.8		12.1		6.7		17.3
Green Ext Time (p_c), s		9.1		6.6		9.5		5.6

Intersection Summary		
HCM 2010 Ctrl Delay		13.1
HCM 2010 LOS		B

APPENDIX C: FUTURE LOS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	320	160	290	300	80	200	980	470	220	2140	40
Future Volume (veh/h)	50	320	160	290	300	80	200	980	470	220	2140	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1900	1863	1845	1827	1863	1850	1900	1863	1862	1900
Adj Flow Rate, veh/h	54	348	119	315	326	14	217	1065	0	239	2326	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	2	3	4	2	3	3	2	2	2
Cap, veh/h	69	539	179	272	1167	492	237	1916	0	239	1935	0
Arrive On Green	0.04	0.22	0.22	0.15	0.33	0.33	0.13	0.38	0.00	0.13	0.38	0.00
Sat Flow, veh/h	1723	2454	813	1774	3505	1477	1774	5218	0	1774	5252	0
Grp Volume(v), veh/h	54	243	224	315	326	14	217	1065	0	239	2326	0
Grp Sat Flow(s),veh/h/ln	1723	1736	1532	1774	1752	1477	1774	1684	0	1774	1695	0
Q Serve(g_s), s	5.0	20.3	21.3	24.5	10.9	1.0	19.3	26.4	0.0	21.5	60.7	0.0
Cycle Q Clear(g_c), s	5.0	20.3	21.3	24.5	10.9	1.0	19.3	26.4	0.0	21.5	60.7	0.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	69	381	336	272	1167	492	237	1916	0	239	1935	0
V/C Ratio(X)	0.78	0.64	0.67	1.16	0.28	0.03	0.92	0.56	0.00	1.00	1.20	0.00
Avail Cap(c_a), veh/h	265	549	485	272	1167	492	239	1916	0	239	1935	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	75.9	56.5	56.9	67.5	39.1	35.8	68.2	38.9	0.0	69.0	49.4	0.0
Incr Delay (d2), s/veh	17.1	1.8	2.3	103.4	0.1	0.0	36.4	1.2	0.0	58.1	96.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.9	9.2	19.8	5.3	0.4	11.9	12.5	0.0	14.3	45.5	0.0
LnGrp Delay(d),s/veh	93.0	58.3	59.2	171.0	39.3	35.8	104.6	40.1	0.0	127.1	145.4	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	F	
Approach Vol, veh/h		521			655			1282			2565	
Approach Delay, s/veh		62.3			102.5			51.0			143.7	
Approach LOS		E			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	65.0	29.0	39.5	25.8	65.2	10.9	57.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	23.5	28.4	26.5	23.3	21.3	62.7	7.0	12.9
Green Ext Time (p_c), s	0.0	29.5	0.0	3.8	0.0	0.0	0.1	6.0

Intersection Summary	
HCM 2010 Ctrl Delay	106.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	560	450	110	490	250
Future Volume (veh/h)	130	560	450	110	490	250
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1848	1900	1845	1863
Adj Flow Rate, veh/h	141	609	489	0	533	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	3	2
Cap, veh/h	349	1478	2165	0	498	449
Arrive On Green	0.62	0.62	0.62	0.00	0.28	0.00
Sat Flow, veh/h	474	2481	3696	0	1757	1583
Grp Volume(v), veh/h	346	404	489	0	533	0
Grp Sat Flow(s),veh/h/ln	1261	1610	1756	0	1757	1583
Q Serve(g_s), s	8.9	11.6	5.6	0.0	25.5	0.0
Cycle Q Clear(g_c), s	14.5	11.6	5.6	0.0	25.5	0.0
Prop In Lane	0.41			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	834	993	2165	0	498	449
V/C Ratio(X)	0.41	0.41	0.23	0.00	1.07	0.00
Avail Cap(c_a), veh/h	834	993	2165	0	498	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	8.8	7.7	0.0	32.2	0.0
Incr Delay (d2), s/veh	1.5	1.2	0.2	0.0	60.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.4	2.7	0.0	20.7	0.0
LnGrp Delay(d),s/veh	10.9	10.1	7.9	0.0	92.9	0.0
LnGrp LOS	B	B	A		F	
Approach Vol, veh/h		750	489		533	
Approach Delay, s/veh		10.5	7.9		92.9	
Approach LOS		B	A		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		30.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				16.5		27.5		7.6
Green Ext Time (p_c), s				11.1		0.0		11.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	710	400	110	240	40	170	260	280	90	450	80
Future Volume (veh/h)	40	710	400	110	240	40	170	260	280	90	450	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.93	0.99		0.94	1.00		0.93	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1812	1845	1900	1821	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	43	772	278	120	261	23	185	283	209	98	489	78
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	97	1606	733	243	768	69	204	754	598	110	439	68
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	114	3181	1451	345	1521	136	833	1863	1477	170	1085	167
Grp Volume(v), veh/h	429	386	278	130	0	274	185	283	209	665	0	0
Grp Sat Flow(s),veh/h/ln	1728	1567	1451	379	0	1623	833	1863	1477	1421	0	0
Q Serve(g_s), s	0.0	16.2	11.7	19.6	0.0	10.1	0.0	10.7	9.8	29.8	0.0	0.0
Cycle Q Clear(g_c), s	15.3	16.2	11.7	35.8	0.0	10.1	40.5	10.7	9.8	40.5	0.0	0.0
Prop In Lane	0.10		1.00	0.92		0.08	1.00		1.00	0.15		0.12
Lane Grp Cap(c), veh/h	912	791	733	261	0	819	204	754	598	617	0	0
V/C Ratio(X)	0.47	0.49	0.38	0.50	0.00	0.33	0.91	0.38	0.35	1.08	0.00	0.00
Avail Cap(c_a), veh/h	912	791	733	261	0	819	204	754	598	617	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.0	16.3	15.2	27.4	0.0	14.7	35.5	20.9	20.6	32.1	0.0	0.0
Incr Delay (d2), s/veh	1.7	2.2	1.5	6.7	0.0	1.1	42.5	1.4	1.6	59.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	7.5	4.9	3.5	0.0	4.7	7.5	5.7	4.3	27.1	0.0	0.0
LnGrp Delay(d),s/veh	17.8	18.4	16.6	34.1	0.0	15.8	78.1	22.3	22.2	91.1	0.0	0.0
LnGrp LOS	B	B	B	C		B	E	C	C	F		
Approach Vol, veh/h		1093			404			677			665	
Approach Delay, s/veh		17.7			21.7			37.5			91.1	
Approach LOS		B			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		18.2		42.5		37.8
Green Ext Time (p_c), s		0.0		12.7		0.0		7.6

Intersection Summary			
HCM 2010 Ctrl Delay			40.2
HCM 2010 LOS			D

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1130	30	10	390	50	140
Future Vol, veh/h	1130	30	10	390	50	140
Conflicting Peds, #/hr	0	53	0	0	39	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	2	4	7	3
Mvmt Flow	1228	33	11	424	54	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1314	0	1571	683
Stage 1	-	-	-	-	1298	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	522	-	96	389
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	734	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	522	-	85	369
Mov Cap-2 Maneuver	-	-	-	-	85	-
Stage 1	-	-	-	-	200	-
Stage 2	-	-	-	-	687	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	42.9
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	85	369	-	-	522	-
HCM Lane V/C Ratio	0.639	0.412	-	-	0.021	-
HCM Control Delay (s)	103.2	21.4	-	-	12	0.2
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	3	2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	1210	390	10	10	10
Future Vol, veh/h	50	1210	390	10	10	10
Conflicting Peds, #/hr	0	0	0	18	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	4	2	2	2
Mvmt Flow	54	1315	424	11	11	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	453	0	-	0	1213	253
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	766	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1104	-	-	-	174	746
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	419	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1085	-	-	-	137	721
Mov Cap-2 Maneuver	-	-	-	-	137	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	336	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	22.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1085	-	-	-	230
HCM Lane V/C Ratio	0.05	-	-	-	0.095
HCM Control Delay (s)	8.5	0.7	-	-	22.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	880	30	10	260	80	20	20	10	140	20	140
Future Volume (veh/h)	330	880	30	10	260	80	20	20	10	140	20	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.94	1.00		0.96	0.97		0.97	0.97		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1853	1900	1900	1836	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	359	957	28	11	283	28	22	22	8	152	22	104
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	535	1401	42	82	1955	193	165	151	48	221	32	117
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	713	2098	63	64	2928	289	468	626	199	682	134	488
Grp Volume(v), veh/h	606	0	738	166	0	156	52	0	0	278	0	0
Grp Sat Flow(s),veh/h/ln	1204	0	1670	1675	0	1605	1293	0	0	1304	0	0
Q Serve(g_s), s	32.9	0.0	25.8	0.1	0.0	3.5	0.0	0.0	0.0	17.6	0.0	0.0
Cycle Q Clear(g_c), s	36.4	0.0	25.8	25.9	0.0	3.5	2.5	0.0	0.0	20.1	0.0	0.0
Prop In Lane	0.59		0.04	0.07		0.18	0.42		0.15	0.55		0.37
Lane Grp Cap(c), veh/h	863	0	1115	1158	0	1072	363	0	0	371	0	0
V/C Ratio(X)	0.70	0.00	0.66	0.14	0.00	0.15	0.14	0.00	0.00	0.75	0.00	0.00
Avail Cap(c_a), veh/h	863	0	1115	1158	0	1072	389	0	0	395	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.7	0.0	9.7	6.0	0.0	6.0	29.2	0.0	0.0	35.7	0.0	0.0
Incr Delay (d2), s/veh	4.8	0.0	3.1	0.3	0.0	0.3	0.2	0.0	0.0	7.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.6	0.0	12.6	1.7	0.0	1.6	1.1	0.0	0.0	8.0	0.0	0.0
LnGrp Delay(d),s/veh	17.5	0.0	12.8	6.2	0.0	6.3	29.4	0.0	0.0	43.0	0.0	0.0
LnGrp LOS	B		B	A		A	C			D		
Approach Vol, veh/h		1344			322			52			278	
Approach Delay, s/veh		14.9			6.3			29.4			43.0	
Approach LOS		B			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		28.1		70.0		28.1		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.5		38.4		22.1		27.9
Green Ext Time (p_c), s		2.2		14.8		0.7		17.5

Intersection Summary		
HCM 2010 Ctrl Delay		17.8
HCM 2010 LOS		B

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	20	30	390	250	20
Future Vol, veh/h	20	20	30	390	250	20
Conflicting Peds, #/hr	0	45	26	0	0	45
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	2	2	2	2
Mvmt Flow	22	22	33	424	272	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	817	373	338	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.42	6.27	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.363	2.218	-	-	-
Pot Cap-1 Maneuver	346	662	1221	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	305	606	1169	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	14.9		0.6		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1169	-	406	-	-
HCM Lane V/C Ratio	0.028	-	0.107	-	-
HCM Control Delay (s)	8.2	0	14.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	270	30	100	90	50	20	130	210	140	170	40
Future Volume (veh/h)	50	270	30	100	90	50	20	130	210	140	170	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.93	0.97		0.91	0.97		0.92	0.94		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1853	1863	1863	1856	1900	1863	1863	1900
Adj Flow Rate, veh/h	54	293	25	109	98	22	22	141	68	152	185	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	2	2
Cap, veh/h	146	537	43	352	281	525	580	500	241	553	748	53
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	150	1478	117	632	772	1444	1141	1146	552	1101	1714	120
Grp Volume(v), veh/h	372	0	0	207	0	22	22	0	209	152	0	198
Grp Sat Flow(s),veh/h/ln	1746	0	0	1404	0	1444	1141	0	1698	1101	0	1835
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.4	0.6	0.0	3.6	4.6	0.0	3.1
Cycle Q Clear(g_c), s	7.4	0.0	0.0	4.2	0.0	0.4	3.6	0.0	3.6	8.2	0.0	3.1
Prop In Lane	0.15		0.07	0.53		1.00	1.00		0.33	1.00		0.07
Lane Grp Cap(c), veh/h	726	0	0	633	0	525	580	0	741	553	0	800
V/C Ratio(X)	0.51	0.00	0.00	0.33	0.00	0.04	0.04	0.00	0.28	0.27	0.00	0.25
Avail Cap(c_a), veh/h	883	0	0	752	0	658	1110	0	1530	1065	0	1653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.4	0.0	0.0	10.3	0.0	9.2	9.2	0.0	8.1	10.8	0.0	8.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	1.9	0.0	0.2	0.2	0.0	1.7	1.4	0.0	1.6
LnGrp Delay(d),s/veh	12.0	0.0	0.0	10.6	0.0	9.3	9.2	0.0	8.4	11.0	0.0	8.2
LnGrp LOS	B			B		A	A		A	B		A
Approach Vol, veh/h		372			229			231			350	
Approach Delay, s/veh		12.0			10.5			8.4			9.4	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		24.1		20.8		24.1		20.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		5.6		9.4		10.2		6.2
Green Ext Time (p_c), s		3.7		3.0		3.6		3.4

Intersection Summary			
HCM 2010 Ctrl Delay			10.2
HCM 2010 LOS			B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	70	190	1640	200	10	60	600	110	130	120	60	110	220	560
Future Volume (veh/h)	70	190	1640	200	10	60	600	110	130	120	60	110	220	560
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.98		1.00		0.76	0.95		0.76	0.86		0.84
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1827	1827	1900		1827	1747	1900	1863	1827	1900	1900	1863	1827
Adj Flow Rate, veh/h		200	1726	191		63	632	101	137	126	49	116	232	267
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		4	4	4		4	10	10	2	3	3	2	2	4
Cap, veh/h		224	2692	297		80	2024	311	199	295	115	112	168	338
Arrive On Green		0.13	0.59	0.59		0.05	0.51	0.51	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1740	4552	502		1740	3979	612	1081	1138	443	315	648	1303
Grp Volume(v), veh/h		200	1259	658		63	500	233	137	0	175	348	0	267
Grp Sat Flow(s),veh/h/ln		1740	1663	1728		1740	1590	1412	1081	0	1581	963	0	1303
Q Serve(g_s), s		18.1	39.8	40.2		5.7	14.7	15.5	0.0	0.0	14.7	26.8	0.0	30.5
Cycle Q Clear(g_c), s		18.1	39.8	40.2		5.7	14.7	15.5	35.6	0.0	14.7	41.5	0.0	30.5
Prop In Lane		1.00		0.29		1.00		0.43	1.00		0.28	0.33		1.00
Lane Grp Cap(c), veh/h		224	1967	1022		80	1617	718	199	0	410	280	0	338
V/C Ratio(X)		0.89	0.64	0.64		0.79	0.31	0.32	0.69	0.00	0.43	1.24	0.00	0.79
Avail Cap(c_a), veh/h		451	1967	1022		245	1617	718	199	0	410	280	0	338
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.93	0.93	0.93	1.00	0.00	1.00	0.09	0.00	0.09
Uniform Delay (d), s/veh		68.6	21.5	21.6		75.5	22.9	23.1	57.1	0.0	49.3	67.6	0.0	55.2
Incr Delay (d2), s/veh		11.5	1.6	3.1		14.6	0.5	1.1	17.8	0.0	3.2	112.6	0.0	1.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		9.4	18.6	19.9		3.1	6.6	6.3	6.8	0.0	6.8	21.1	0.0	11.2
LnGrp Delay(d),s/veh		80.1	23.1	24.7		90.1	23.4	24.3	74.9	0.0	52.6	180.2	0.0	57.0
LnGrp LOS		F	C	C		F	C	C	E		D	F		E
Approach Vol, veh/h			2117				796			312			615	
Approach Delay, s/veh			29.0				28.9			62.4			126.7	
Approach LOS			C				C			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	12.9	100.1		47.0	26.1	86.9
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		41.5	22.5	79.5		41.5	41.5	60.5
Max Q Clear Time (g_c+I1), s		37.6	7.7	42.2		43.5	20.1	17.5
Green Ext Time (p_c), s		1.9	0.1	28.4		0.0	0.5	31.5

Intersection Summary	
HCM 2010 Ctrl Delay	47.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	740	240	90	210	60	70	210	80	40	380	40
Future Volume (veh/h)	60	740	240	90	210	60	70	210	80	40	380	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	1.00		0.94	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1848	1900	1900	1809	1900	1900	1844	1900	1900	1846	1900
Adj Flow Rate, veh/h	65	804	176	98	228	18	76	228	72	43	413	39
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	5	5	5	2	2	2	3	3	3
Cap, veh/h	139	1653	356	307	1011	83	80	182	53	58	343	31
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	159	2579	556	386	1578	129	147	656	190	83	1236	113
Grp Volume(v), veh/h	553	0	492	119	0	225	376	0	0	495	0	0
Grp Sat Flow(s),veh/h/ln	1739	0	1555	478	0	1615	993	0	0	1432	0	0
Q Serve(g_s), s	2.5	0.0	18.3	11.9	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.1	0.0	18.3	30.2	0.0	6.4	30.5	0.0	0.0	30.5	0.0	0.0
Prop In Lane	0.12		0.36	0.83		0.08	0.20		0.19	0.09		0.08
Lane Grp Cap(c), veh/h	1151	0	997	366	0	1035	315	0	0	433	0	0
V/C Ratio(X)	0.48	0.00	0.49	0.32	0.00	0.22	1.19	0.00	0.00	1.14	0.00	0.00
Avail Cap(c_a), veh/h	1151	0	997	366	0	1035	315	0	0	433	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.1	0.0	10.4	16.9	0.0	8.2	40.3	0.0	0.0	40.4	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	1.7	2.3	0.0	0.5	114.5	0.0	0.0	89.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	0.0	8.3	2.5	0.0	3.0	19.5	0.0	0.0	23.8	0.0	0.0
LnGrp Delay(d),s/veh	11.6	0.0	12.1	19.2	0.0	8.7	154.8	0.0	0.0	129.5	0.0	0.0
LnGrp LOS	B		B	B		A	F			F		
Approach Vol, veh/h		1045			344			376			495	
Approach Delay, s/veh		11.8			12.4			154.8			129.5	
Approach LOS		B			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		75.0		35.0		75.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		70.5		30.5		70.5
Max Q Clear Time (g_c+I1), s		32.5		20.3		32.5		32.2
Green Ext Time (p_c), s		0.0		14.7		0.0		13.7

Intersection Summary		
HCM 2010 Ctrl Delay		61.5
HCM 2010 LOS		E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	20	410	1320	170	40	190	370	80	100	350	90	210	490	150
Future Volume (veh/h)	20	410	1320	170	40	190	370	80	100	350	90	210	490	150
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.94		1.00		0.88	1.00		0.92	1.00		0.88
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1812	1851	1900		1863	1750	1900	1696	1793	1900	1863	1814	1900
Adj Flow Rate, veh/h		436	1404	165		202	394	50	106	372	80	223	521	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.94	0.94	0.94		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		5	0	0		2	10	10	12	7	7	2	5	5
Cap, veh/h		232	1720	202		161	1369	167	125	834	176	161	792	200
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.08	0.30	0.30	0.09	0.32	0.32
Sat Flow, veh/h		1726	4549	534		1774	4094	499	1616	2751	582	1774	2505	633
Grp Volume(v), veh/h		436	1040	529		202	303	141	106	228	224	223	357	297
Grp Sat Flow(s),veh/h/ln		1726	1685	1714		1774	1592	1408	1616	1703	1630	1774	1723	1416
Q Serve(g_s), s		21.5	31.4	31.5		14.5	11.2	11.9	10.4	17.2	17.8	14.5	28.6	29.1
Cycle Q Clear(g_c), s		21.5	31.4	31.5		14.5	11.2	11.9	10.4	17.2	17.8	14.5	28.6	29.1
Prop In Lane		1.00		0.31		1.00		0.35	1.00		0.36	1.00		0.45
Lane Grp Cap(c), veh/h		232	1274	648		161	1065	471	125	516	494	161	545	447
V/C Ratio(X)		1.88	0.82	0.82		1.26	0.28	0.30	0.84	0.44	0.45	1.39	0.65	0.66
Avail Cap(c_a), veh/h		232	1274	648		161	1065	471	237	516	494	161	545	447
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.64	0.64	0.64		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh		58.5	16.0	16.0		72.8	39.2	39.4	72.8	44.9	45.0	72.8	47.2	47.4
Incr Delay (d2), s/veh		406.5	3.8	7.3		156.0	0.7	1.6	14.0	2.7	3.0	206.4	5.8	7.2
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		36.4	14.8	15.7		14.1	5.0	4.8	5.1	8.5	8.4	16.3	14.4	12.3
LnGrp Delay(d),s/veh		465.0	19.8	23.2		228.7	39.8	41.0	86.9	47.6	48.0	279.2	53.0	54.6
LnGrp LOS		F	B	C		F	D	D	F	D	D	F	D	D
Approach Vol, veh/h			2005				646			558			877	
Approach Delay, s/veh			117.5				99.2			55.2			111.0	
Approach LOS			F				F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	17.9	56.1	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	19.8	16.5	33.5	12.4	31.1	23.5	13.9
Green Ext Time (p_c), s	0.0	8.7	0.0	17.1	0.2	4.5	0.0	21.5

Intersection Summary	
HCM 2010 Ctrl Delay	104.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	420	200	0	0	0	0	440	390	290	630	0
Future Volume (veh/h)	60	420	200	0	0	0	0	440	390	290	630	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.84	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	63	442	-25				0	463	237	305	663	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	77	538	515				0	1479	559	492	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.43	0.43	0.11	0.58	0.00
Sat Flow, veh/h	229	1606	1538				0	3529	1300	1774	3632	0
Grp Volume(v), veh/h	505	0	-25				0	463	237	305	663	0
Grp Sat Flow(s),veh/h/ln	1835	0	1538				0	1719	1300	1774	1770	0
Q Serve(g_s), s	32.8	0.0	0.0				0.0	11.5	16.5	12.0	12.6	0.0
Cycle Q Clear(g_c), s	32.8	0.0	0.0				0.0	11.5	16.5	12.0	12.6	0.0
Prop In Lane	0.12		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1479	559	492	2055	0
V/C Ratio(X)	0.82	0.00	-0.05				0.00	0.31	0.42	0.62	0.32	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1479	559	497	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.7	0.0	0.0				0.0	24.4	25.8	16.9	14.1	0.0
Incr Delay (d2), s/veh	11.8	0.0	0.0				0.0	0.6	2.3	2.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	0.0	0.0				0.0	5.6	6.3	6.1	6.2	0.0
LnGrp Delay(d),s/veh	51.5	0.0	0.0				0.0	25.0	28.2	19.2	14.5	0.0
LnGrp LOS	D							C	C	B	B	
Approach Vol, veh/h		480						700			968	
Approach Delay, s/veh		54.2						26.0			16.0	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.6	61.4		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	14.0	18.5		34.8		14.6		
Green Ext Time (p_c), s	0.1	12.0		2.2		13.2		

Intersection Summary		
HCM 2010 Ctrl Delay		27.8
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	200	250	50	440	0	10	660	70
Future Volume (veh/h)	0	0	0	240	200	250	50	440	0	10	660	70
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00	1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1597	1863	0	1900	1863	1900
Adj Flow Rate, veh/h				261	217	272	54	478	0	11	717	68
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	19	2	0	2	2	2
Cap, veh/h				750	748	622	244	1689	0	41	1231	116
Arrive On Green				0.42	0.42	0.42	0.04	0.48	0.00	0.39	0.39	0.39
Sat Flow, veh/h				1774	1770	1471	1521	3632	0	18	3152	296
Grp Volume(v), veh/h				261	217	272	54	478	0	424	0	372
Grp Sat Flow(s),veh/h/ln				1774	1770	1471	1521	1770	0	1844	0	1621
Q Serve(g_s), s				11.0	8.9	14.4	2.2	9.0	0.0	0.0	0.0	20.0
Cycle Q Clear(g_c), s				11.0	8.9	14.4	2.2	9.0	0.0	19.7	0.0	20.0
Prop In Lane				1.00		1.00	1.00		0.00	0.03		0.18
Lane Grp Cap(c), veh/h				750	748	622	244	1689	0	754	0	633
V/C Ratio(X)				0.35	0.29	0.44	0.22	0.28	0.00	0.56	0.00	0.59
Avail Cap(c_a), veh/h				750	748	622	375	1689	0	754	0	633
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh				21.5	20.9	22.5	20.0	17.4	0.0	26.4	0.0	26.5
Incr Delay (d2), s/veh				1.3	1.0	2.2	0.5	0.4	0.0	3.0	0.0	4.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.5	6.2	1.0	4.5	0.0	10.8	0.0	9.6
LnGrp Delay(d),s/veh				22.8	21.9	24.7	20.4	17.8	0.0	29.5	0.0	30.5
LnGrp LOS				C	C	C	C	B		C		C
Approach Vol, veh/h					750			532			796	
Approach Delay, s/veh					23.2			18.1			29.9	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			9.5	48.5		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		11.0			4.2	22.0		16.4
Green Ext Time (p_c), s		11.7			0.1	6.4		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	450	180	90	240	40	60	330	320	70	640	220
Future Volume (veh/h)	70	450	180	90	240	40	60	330	320	70	640	220
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	0.98		0.95	0.98		0.96	0.99		0.88
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1847	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	76	489	120	98	261	33	65	359	230	76	696	156
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	149	877	209	134	312	35	122	652	472	131	1055	244
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	214	2100	501	172	748	85	136	1422	1029	161	2299	532
Grp Volume(v), veh/h	352	0	333	392	0	0	327	0	327	482	0	446
Grp Sat Flow(s),veh/h/ln	1425	0	1390	1005	0	0	1125	0	1463	1473	0	1519
Q Serve(g_s), s	0.0	0.0	13.3	14.6	0.0	0.0	3.5	0.0	11.3	8.8	0.0	16.3
Cycle Q Clear(g_c), s	11.8	0.0	13.3	27.9	0.0	0.0	19.8	0.0	11.3	20.2	0.0	16.3
Prop In Lane	0.22		0.36	0.25		0.08	0.20		0.70	0.16		0.35
Lane Grp Cap(c), veh/h	655	0	580	481	0	0	575	0	671	733	0	697
V/C Ratio(X)	0.54	0.00	0.57	0.81	0.00	0.00	0.57	0.00	0.49	0.66	0.00	0.64
Avail Cap(c_a), veh/h	659	0	583	484	0	0	708	0	815	886	0	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	0.0	16.2	20.9	0.0	0.0	13.9	0.0	13.7	15.7	0.0	15.1
Incr Delay (d2), s/veh	0.9	0.0	1.4	10.3	0.0	0.0	0.9	0.0	0.5	1.3	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	5.3	8.9	0.0	0.0	5.4	0.0	4.6	8.2	0.0	7.0
LnGrp Delay(d),s/veh	16.2	0.0	17.6	31.2	0.0	0.0	14.8	0.0	14.3	17.1	0.0	16.2
LnGrp LOS	B		B	C			B		B	B		B
Approach Vol, veh/h		685			392			654			928	
Approach Delay, s/veh		16.9			31.2			14.5			16.7	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		37.8		34.8		37.8		34.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		21.8		15.3		22.2		29.9
Green Ext Time (p_c), s		11.3		6.8		11.2		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	310	130	250	350	180	210	2030	390	100	940	40
Future Volume (veh/h)	90	310	130	250	350	180	210	2030	390	100	940	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1850	1900	1863	1827	1863	1863	1863	1900	1863	1845	1900
Adj Flow Rate, veh/h	96	330	102	266	372	52	223	2160	0	106	1000	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	3	3
Cap, veh/h	117	553	167	275	1045	437	241	2273	0	128	1929	0
Arrive On Green	0.07	0.21	0.21	0.16	0.30	0.30	0.14	0.45	0.00	0.07	0.38	0.00
Sat Flow, veh/h	1774	2608	787	1774	3471	1452	1774	5253	0	1774	5204	0
Grp Volume(v), veh/h	96	220	212	266	372	52	223	2160	0	106	1000	0
Grp Sat Flow(s),veh/h/ln	1774	1757	1637	1774	1736	1452	1774	1695	0	1774	1679	0
Q Serve(g_s), s	8.4	17.8	18.5	23.6	13.3	4.1	19.6	64.5	0.0	9.3	24.2	0.0
Cycle Q Clear(g_c), s	8.4	17.8	18.5	23.6	13.3	4.1	19.6	64.5	0.0	9.3	24.2	0.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	117	373	347	275	1045	437	241	2273	0	128	1929	0
V/C Ratio(X)	0.82	0.59	0.61	0.97	0.36	0.12	0.92	0.95	0.00	0.83	0.52	0.00
Avail Cap(c_a), veh/h	275	562	523	275	1109	464	241	2273	0	241	1929	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	72.8	56.0	56.3	66.4	43.2	40.0	67.5	42.0	0.0	72.4	37.6	0.0
Incr Delay (d2), s/veh	12.9	1.5	1.7	45.1	0.2	0.1	37.9	10.4	0.0	12.8	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	8.8	8.5	15.0	6.4	1.7	12.2	32.4	0.0	5.0	11.4	0.0
LnGrp Delay(d),s/veh	85.7	57.5	58.1	111.5	43.4	40.2	105.3	52.4	0.0	85.2	38.6	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	D	
Approach Vol, veh/h		528			690			2383			1106	
Approach Delay, s/veh		62.9			69.4			57.3			43.0	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	75.1	29.0	38.0	26.0	65.0	15.0	52.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	11.3	66.5	25.6	20.5	21.6	26.2	10.4	15.3
Green Ext Time (p_c), s	0.2	0.0	0.0	6.0	0.0	30.7	0.2	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	56.4
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	450	480	390	320	210
Future Volume (veh/h)	70	450	480	390	320	210
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1853	1900	1863	1863
Adj Flow Rate, veh/h	76	489	522	0	348	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	2	2
Cap, veh/h	292	1819	2356	0	394	352
Arrive On Green	0.67	0.67	0.67	0.00	0.22	0.00
Sat Flow, veh/h	353	2802	3705	0	1774	1583
Grp Volume(v), veh/h	276	289	522	0	348	0
Grp Sat Flow(s),veh/h/ln	1461	1610	1760	0	1774	1583
Q Serve(g_s), s	0.0	6.0	4.8	0.0	15.7	0.0
Cycle Q Clear(g_c), s	4.8	6.0	4.8	0.0	15.7	0.0
Prop In Lane	0.28			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	1033	1078	2356	0	394	352
V/C Ratio(X)	0.27	0.27	0.22	0.00	0.88	0.00
Avail Cap(c_a), veh/h	1033	1078	2356	0	545	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	5.3	5.5	5.3	0.0	31.2	0.0
Incr Delay (d2), s/veh	0.6	0.6	0.2	0.0	12.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	2.4	0.0	9.0	0.0
LnGrp Delay(d),s/veh	6.0	6.1	5.5	0.0	43.3	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		565	522		348	
Approach Delay, s/veh		6.1	5.5		43.3	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		22.9		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				8.0		17.7		6.8
Green Ext Time (p_c), s				9.3		0.7		9.4

Intersection Summary		
HCM 2010 Ctrl Delay		14.9
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	510	240	120	460	70	360	450	350	40	180	60
Future Volume (veh/h)	50	510	240	120	460	70	360	450	350	40	180	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.95	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1861	1845	1900	1841	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	53	537	64	126	484	57	379	474	116	42	189	47
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	147	1406	768	247	1001	125	372	754	617	88	370	85
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	205	2784	1522	386	1982	247	1127	1863	1524	114	913	209
Grp Volume(v), veh/h	276	314	64	294	0	373	379	474	116	278	0	0
Grp Sat Flow(s),veh/h/ln	1381	1609	1522	1001	0	1615	1127	1863	1524	1237	0	0
Q Serve(g_s), s	1.7	12.0	2.2	14.8	0.0	14.8	18.0	20.3	4.9	2.2	0.0	0.0
Cycle Q Clear(g_c), s	16.6	12.0	2.2	26.8	0.0	14.8	40.5	20.3	4.9	22.5	0.0	0.0
Prop In Lane	0.19		1.00	0.43		0.15	1.00		1.00	0.15		0.17
Lane Grp Cap(c), veh/h	740	813	768	557	0	816	372	754	617	542	0	0
V/C Ratio(X)	0.37	0.39	0.08	0.53	0.00	0.46	1.02	0.63	0.19	0.51	0.00	0.00
Avail Cap(c_a), veh/h	740	813	768	557	0	816	372	754	617	542	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.8	15.2	12.8	20.4	0.0	15.9	37.4	23.7	19.2	21.5	0.0	0.0
Incr Delay (d2), s/veh	1.4	1.4	0.2	3.6	0.0	1.8	51.2	3.9	0.7	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	5.6	1.0	6.7	0.0	7.0	15.5	11.2	2.2	5.9	0.0	0.0
LnGrp Delay(d),s/veh	16.2	16.6	13.0	24.0	0.0	17.8	88.7	27.7	19.8	25.0	0.0	0.0
LnGrp LOS	B	B	B	C		B	F	C	B	C		
Approach Vol, veh/h		654			667			969			278	
Approach Delay, s/veh		16.1			20.5			50.6			25.0	
Approach LOS		B			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		18.6		24.5		28.8
Green Ext Time (p_c), s		0.0		10.9		6.8		9.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	800	40	20	610	50	60
Future Vol, veh/h	800	40	20	610	50	60
Conflicting Peds, #/hr	0	45	0	0	26	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	7	3
Mvmt Flow	860	43	22	656	54	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	948	0	1324	497
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	720	-	141	516
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	125	494
Mov Cap-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	589	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	125	494	-	-	720	-
HCM Lane V/C Ratio	0.43	0.131	-	-	0.03	-
HCM Control Delay (s)	54	13.4	-	-	10.2	0.2
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	1.9	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	850	600	10	10	30
Future Vol, veh/h	10	850	600	10	10	30
Conflicting Peds, #/hr	0	0	0	9	0	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	11	895	632	11	11	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	651	0	-	0	1114	339
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	931	-	-	-	202	657
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	923	-	-	-	194	646
Mov Cap-2 Maneuver	-	-	-	-	194	-
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	578	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	923	-	-	-	408
HCM Lane V/C Ratio	0.011	-	-	-	0.103
HCM Control Delay (s)	8.9	0.1	-	-	14.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	290	570	20	10	450	60	20	10	10	110	10	160
Future Volume (veh/h)	290	570	20	10	450	60	20	10	10	110	10	160
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	0.99		0.95	0.96		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1860	1900	1900	1824	1900	1900	1728	1900	1900	1856	1900
Adj Flow Rate, veh/h	305	600	18	11	474	32	21	11	5	116	11	92
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	590	1201	37	62	2167	144	187	88	34	195	28	120
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	755	1747	53	33	3151	210	585	402	154	632	130	552
Grp Volume(v), veh/h	353	0	570	271	0	246	37	0	0	219	0	0
Grp Sat Flow(s),veh/h/ln	875	0	1680	1780	0	1613	1142	0	0	1314	0	0
Q Serve(g_s), s	20.7	0.0	15.3	0.0	0.0	5.3	0.0	0.0	0.0	12.7	0.0	0.0
Cycle Q Clear(g_c), s	26.1	0.0	15.3	5.2	0.0	5.3	2.0	0.0	0.0	14.8	0.0	0.0
Prop In Lane	0.86		0.03	0.04		0.13	0.57		0.14	0.53		0.42
Lane Grp Cap(c), veh/h	672	0	1155	1263	0	1109	308	0	0	344	0	0
V/C Ratio(X)	0.53	0.00	0.49	0.21	0.00	0.22	0.12	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	672	0	1155	1263	0	1109	368	0	0	408	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.3	0.0	7.0	5.5	0.0	5.5	29.9	0.0	0.0	34.7	0.0	0.0
Incr Delay (d2), s/veh	2.9	0.0	1.5	0.4	0.0	0.5	0.2	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	7.4	2.7	0.0	2.5	0.8	0.0	0.0	5.6	0.0	0.0
LnGrp Delay(d),s/veh	13.2	0.0	8.5	5.9	0.0	5.9	30.0	0.0	0.0	37.2	0.0	0.0
LnGrp LOS	B		A	A		A	C			D		
Approach Vol, veh/h		923			517			37			219	
Approach Delay, s/veh		10.3			5.9			30.0			37.2	
Approach LOS		B			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.3		70.0		25.3		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.0		28.1		16.8		7.3
Green Ext Time (p_c), s		1.6		14.0		1.0		15.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	40	20	350	220	10
Future Vol, veh/h	20	40	20	350	220	10
Conflicting Peds, #/hr	0	23	18	0	0	23
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	2	2	2	2
Mvmt Flow	22	43	22	376	237	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	684	288	270	0	-	0
Stage 1	265	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.5	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	402	751	1293	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	718	1265	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	619	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1265	-	551	-	-
HCM Lane V/C Ratio	0.017	-	0.117	-	-
HCM Control Delay (s)	7.9	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	120	20	100	180	80	30	180	180	80	80	50
Future Volume (veh/h)	30	120	20	100	180	80	30	180	180	80	80	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.97	0.98		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1850	1900	1900	1863	1863	1810	1863	1900	1845	1808	1900
Adj Flow Rate, veh/h	32	128	14	106	191	25	32	191	60	85	85	31
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	2	2	2	5	2	2	3	7	7
Cap, veh/h	190	447	43	296	380	478	661	525	165	552	492	179
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	157	1424	138	431	1211	1523	1228	1348	423	1090	1263	461
Grp Volume(v), veh/h	174	0	0	297	0	25	32	0	251	85	0	116
Grp Sat Flow(s),veh/h/ln	1719	0	0	1642	0	1523	1228	0	1771	1090	0	1723
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	0.3	0.5	0.0	3.1	1.8	0.0	1.3
Cycle Q Clear(g_c), s	2.2	0.0	0.0	4.3	0.0	0.3	1.9	0.0	3.1	4.9	0.0	1.3
Prop In Lane	0.18		0.08	0.36		1.00	1.00		0.24	1.00		0.27
Lane Grp Cap(c), veh/h	681	0	0	677	0	478	661	0	690	552	0	671
V/C Ratio(X)	0.26	0.00	0.00	0.44	0.00	0.05	0.05	0.00	0.36	0.15	0.00	0.17
Avail Cap(c_a), veh/h	1269	0	0	1245	0	1028	1822	0	2363	1582	0	2299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.9	0.0	0.0	8.6	0.0	7.3	6.7	0.0	6.6	8.3	0.0	6.1
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	2.1	0.0	0.2	0.2	0.0	1.5	0.6	0.0	0.6
LnGrp Delay(d),s/veh	8.1	0.0	0.0	9.0	0.0	7.3	6.7	0.0	6.9	8.5	0.0	6.2
LnGrp LOS	A			A		A	A		A	A		A
Approach Vol, veh/h		174			322			283			201	
Approach Delay, s/veh		8.1			8.9			6.9			7.1	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		16.3		14.0		16.3		14.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		5.1		4.2		6.9		6.3
Green Ext Time (p_c), s		3.1		2.8		3.1		2.7

Intersection Summary	
HCM 2010 Ctrl Delay	7.8
HCM 2010 LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	150	240	1560	140	30	40	940	110	270	130	50	120	200	480
Future Volume (veh/h)	150	240	1560	140	30	40	940	110	270	130	50	120	200	480
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.82	0.97		0.89	0.93		0.92
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1863	1863	1900		1863	1770	1900	1863	1863	1900	1900	1838	1863
Adj Flow Rate, veh/h		247	1608	131		41	969	102	278	134	41	124	206	279
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.97	0.97	0.97		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %		2	2	2		2	8	8	2	2	2	3	3	2
Cap, veh/h		272	2879	234		53	2074	217	226	352	108	132	170	387
Arrive On Green		0.15	0.60	0.60		0.03	0.48	0.48	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h		1774	4789	390		1774	4340	454	1136	1327	406	381	639	1456
Grp Volume(v), veh/h		247	1138	601		41	718	353	278	0	175	330	0	279
Grp Sat Flow(s),veh/h/ln		1774	1695	1789		1774	1610	1573	1136	0	1732	1020	0	1456
Q Serve(g_s), s		21.9	32.2	32.3		3.7	24.0	24.2	0.0	0.0	13.2	29.3	0.0	27.8
Cycle Q Clear(g_c), s		21.9	32.2	32.3		3.7	24.0	24.2	42.5	0.0	13.2	42.5	0.0	27.8
Prop In Lane		1.00		0.22		1.00		0.29	1.00		0.23	0.38		1.00
Lane Grp Cap(c), veh/h		272	2038	1075		53	1539	752	226	0	460	302	0	387
V/C Ratio(X)		0.91	0.56	0.56		0.77	0.47	0.47	1.23	0.00	0.38	1.09	0.00	0.72
Avail Cap(c_a), veh/h		449	2038	1075		238	1539	752	226	0	460	302	0	387
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.82	0.82	0.82	1.00	0.00	1.00	0.75	0.00	0.75
Uniform Delay (d), s/veh		66.6	19.1	19.2		77.1	28.1	28.1	63.0	0.0	48.0	66.7	0.0	53.4
Incr Delay (d2), s/veh		14.3	1.1	2.1		17.3	0.8	1.7	135.9	0.0	2.4	72.1	0.0	8.4
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		11.8	15.3	16.5		2.1	10.8	10.9	18.5	0.0	6.6	19.4	0.0	12.1
LnGrp Delay(d),s/veh		80.9	20.3	21.3		94.3	28.9	29.9	198.9	0.0	50.4	138.9	0.0	61.8
LnGrp LOS		F	C	C		F	C	C	F		D	F		E
Approach Vol, veh/h			1986				1112			453			609	
Approach Delay, s/veh			28.1				31.6			141.5			103.6	
Approach LOS			C				C			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		48.0	10.3	101.7		48.0	30.0	82.0
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		42.5	21.5	79.5		42.5	40.5	60.5
Max Q Clear Time (g_c+I1), s		44.5	5.7	34.3		44.5	23.9	26.2
Green Ext Time (p_c), s		0.0	0.1	34.0		0.0	0.6	27.4

Intersection Summary	
HCM 2010 Ctrl Delay	52.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	510	150	60	330	30	150	300	70	10	330	30
Future Volume (veh/h)	40	510	150	60	330	30	150	300	70	10	330	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.96	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1854	1900	1900	1821	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	41	526	95	62	340	19	155	309	66	10	340	27
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	5	5	5	2	2	2	2	2	2
Cap, veh/h	126	1545	274	236	1343	79	140	216	44	41	508	40
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	152	2681	476	331	2331	137	283	638	131	16	1503	117
Grp Volume(v), veh/h	346	0	316	195	0	226	530	0	0	377	0	0
Grp Sat Flow(s),veh/h/ln	1726	0	1582	1173	0	1626	1052	0	0	1637	0	0
Q Serve(g_s), s	0.0	0.0	11.1	2.8	0.0	7.2	14.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	11.1	13.9	0.0	7.2	35.5	0.0	0.0	20.6	0.0	0.0
Prop In Lane	0.12		0.30	0.32		0.08	0.29		0.12	0.03		0.07
Lane Grp Cap(c), veh/h	1033	0	911	721	0	937	400	0	0	589	0	0
V/C Ratio(X)	0.34	0.00	0.35	0.27	0.00	0.24	1.33	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	1033	0	911	721	0	937	400	0	0	589	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.6	0.0	11.8	11.5	0.0	10.9	38.0	0.0	0.0	29.8	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	1.0	0.9	0.0	0.6	163.0	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	5.1	3.3	0.0	3.4	29.7	0.0	0.0	9.7	0.0	0.0
LnGrp Delay(d),s/veh	12.5	0.0	12.8	12.4	0.0	11.6	201.0	0.0	0.0	32.1	0.0	0.0
LnGrp LOS	B		B	B		B	F			C		
Approach Vol, veh/h		662			421			530			377	
Approach Delay, s/veh		12.6			12.0			201.0			32.1	
Approach LOS		B			B			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		65.0		40.0		65.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		35.5		60.5		35.5		60.5
Max Q Clear Time (g_c+I1), s		37.5		13.1		22.6		15.9
Green Ext Time (p_c), s		0.0		9.0		5.4		9.0

Intersection Summary	
HCM 2010 Ctrl Delay	66.4
HCM 2010 LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	30	430	1110	130	30	190	620	110	150	620	120	150	390	140
Future Volume (veh/h)	30	430	1110	130	30	190	620	110	150	620	120	150	390	140
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.87	1.00		0.95	1.00		0.85
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1863	1848	1900		1863	1863	1900	1397	1833	1900	1863	1810	1900
Adj Flow Rate, veh/h		453	1168	121		200	653	73	158	653	101	158	411	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	36	4	4	2	6	6
Cap, veh/h		238	1754	182		161	1476	162	173	909	140	161	614	194
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.13	0.30	0.30	0.09	0.26	0.26
Sat Flow, veh/h		1774	4639	480		1774	4414	484	1331	2999	463	1774	2331	736
Grp Volume(v), veh/h		453	847	442		200	499	227	158	379	375	158	301	243
Grp Sat Flow(s),veh/h/ln		1774	1681	1756		1774	1695	1507	1331	1741	1721	1774	1720	1347
Q Serve(g_s), s		21.5	19.8	19.8		14.5	18.4	18.9	18.8	31.0	31.1	14.2	24.9	26.0
Cycle Q Clear(g_c), s		21.5	19.8	19.8		14.5	18.4	18.9	18.8	31.0	31.1	14.2	24.9	26.0
Prop In Lane		1.00		0.27		1.00		0.32	1.00		0.27	1.00		0.55
Lane Grp Cap(c), veh/h		238	1271	664		161	1134	504	173	528	522	161	453	355
V/C Ratio(X)		1.90	0.67	0.67		1.24	0.44	0.45	0.91	0.72	0.72	0.98	0.66	0.69
Avail Cap(c_a), veh/h		238	1271	664		161	1134	504	195	528	522	161	453	355
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.74	0.74	0.74		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh		58.5	14.5	14.5		72.8	41.6	41.7	68.7	49.6	49.7	72.6	52.6	53.0
Incr Delay (d2), s/veh		416.6	2.1	3.9		151.2	1.2	2.9	38.2	8.1	8.3	64.5	7.2	10.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		38.0	9.3	10.1		13.9	8.8	8.3	8.7	16.1	16.0	9.9	12.8	10.7
LnGrp Delay(d),s/veh		475.1	16.6	18.4		224.0	42.8	44.6	106.9	57.8	58.0	137.2	59.8	63.0
LnGrp LOS		F	B	B		F	D	D	F	E	E	F	E	E
Approach Vol, veh/h			1742				926			912			702	
Approach Delay, s/veh			136.3				82.4			66.4			78.3	
Approach LOS			F				F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	26.3	47.7	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.2	33.1	16.5	21.8	20.8	28.0	23.5	20.9
Green Ext Time (p_c), s	0.0	7.8	0.0	20.6	0.1	6.4	0.0	18.8

Intersection Summary	
HCM 2010 Ctrl Delay	100.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	430	180	0	0	0	0	600	590	170	510	0
Future Volume (veh/h)	70	430	180	0	0	0	0	600	590	170	510	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.85	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	75	462	-47				0	645	457	183	548	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	86	528	515				0	1616	621	351	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.47	0.47	0.07	0.58	0.00
Sat Flow, veh/h	256	1578	1538				0	3529	1322	1774	3632	0
Grp Volume(v), veh/h	537	0	-47				0	645	457	183	548	0
Grp Sat Flow(s),veh/h/ln	1834	0	1538				0	1719	1322	1774	1770	0
Q Serve(g_s), s	35.8	0.0	0.0				0.0	15.9	36.4	6.7	10.0	0.0
Cycle Q Clear(g_c), s	35.8	0.0	0.0				0.0	15.9	36.4	6.7	10.0	0.0
Prop In Lane	0.14		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1616	621	351	2055	0
V/C Ratio(X)	0.87	0.00	-0.09				0.00	0.40	0.74	0.52	0.27	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1616	621	428	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.7	0.0	0.0				0.0	22.5	27.9	16.4	13.5	0.0
Incr Delay (d2), s/veh	16.0	0.0	0.0				0.0	0.7	7.6	1.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.8	0.0	0.0				0.0	7.7	14.5	3.3	5.0	0.0
LnGrp Delay(d),s/veh	56.7	0.0	0.0				0.0	23.2	35.5	17.6	13.8	0.0
LnGrp LOS	E							C	D	B	B	
Approach Vol, veh/h		490						1102			731	
Approach Delay, s/veh		62.1						28.3			14.8	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.4	66.6		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	8.7	38.4		37.8		12.0		
Green Ext Time (p_c), s	0.2	10.0		1.8		17.0		

Intersection Summary		
HCM 2010 Ctrl Delay		31.2
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	210	260	250	80	600	0	0	460	80
Future Volume (veh/h)	0	0	0	210	260	250	80	600	0	0	460	80
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1624	1863	0	0	1847	1900
Adj Flow Rate, veh/h				219	271	260	83	625	0	0	479	76
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	2	2	17	2	0	0	3	3
Cap, veh/h				641	862	652	333	1689	0	0	1154	182
Arrive On Green				0.42	0.42	0.42	0.05	0.48	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1517	2040	1542	1547	3632	0	0	3124	478
Grp Volume(v), veh/h				258	232	260	83	625	0	0	276	279
Grp Sat Flow(s),veh/h/ln				1787	1770	1542	1547	1770	0	0	1755	1755
Q Serve(g_s), s				10.7	9.6	12.9	3.5	12.3	0.0	0.0	12.7	12.9
Cycle Q Clear(g_c), s				10.7	9.6	12.9	3.5	12.3	0.0	0.0	12.7	12.9
Prop In Lane				0.85		1.00	1.00		0.00	0.00		0.27
Lane Grp Cap(c), veh/h				755	748	652	333	1689	0	0	668	668
V/C Ratio(X)				0.34	0.31	0.40	0.25	0.37	0.00	0.00	0.41	0.42
Avail Cap(c_a), veh/h				755	748	652	451	1689	0	0	668	668
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.4	21.1	22.0	19.0	18.3	0.0	0.0	25.0	25.1
Incr Delay (d2), s/veh				1.2	1.1	1.8	0.4	0.6	0.0	0.0	1.9	1.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.9	5.8	1.5	6.1	0.0	0.0	6.5	6.6
LnGrp Delay(d),s/veh				22.7	22.2	23.9	19.4	18.9	0.0	0.0	26.9	27.0
LnGrp LOS				C	C	C	B	B			C	C
Approach Vol, veh/h					750			708			555	
Approach Delay, s/veh					22.9			18.9			27.0	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			10.6	47.4		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		14.3			5.5	14.9		14.9
Green Ext Time (p_c), s		10.4			0.1	8.0		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	330	100	110	320	40	90	540	260	30	340	170
Future Volume (veh/h)	140	330	100	110	320	40	90	540	260	30	340	170
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	0.98		0.95	0.96		0.93	0.98		0.91
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1854	1900	1900	1863	1900	1900	1861	1900
Adj Flow Rate, veh/h	149	351	71	117	340	37	96	574	150	32	362	80
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	288	645	133	154	379	38	173	904	238	102	1004	222
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	438	1423	293	194	836	83	259	2188	576	100	2431	538
Grp Volume(v), veh/h	221	0	350	494	0	0	418	0	402	246	0	228
Grp Sat Flow(s),veh/h/ln	708	0	1446	1114	0	0	1479	0	1543	1534	0	1535
Q Serve(g_s), s	0.0	0.0	11.8	17.9	0.0	0.0	8.9	0.0	13.9	0.5	0.0	6.9
Cycle Q Clear(g_c), s	16.0	0.0	11.8	29.6	0.0	0.0	15.8	0.0	13.9	14.4	0.0	6.9
Prop In Lane	0.67		0.20	0.24		0.07	0.23		0.37	0.13		0.35
Lane Grp Cap(c), veh/h	411	0	655	571	0	0	677	0	637	694	0	634
V/C Ratio(X)	0.54	0.00	0.53	0.87	0.00	0.00	0.62	0.00	0.63	0.35	0.00	0.36
Avail Cap(c_a), veh/h	411	0	655	571	0	0	960	0	929	985	0	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	13.3	19.1	0.0	0.0	16.0	0.0	15.7	13.4	0.0	13.6
Incr Delay (d2), s/veh	1.4	0.0	0.8	13.1	0.0	0.0	0.9	0.0	1.0	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	4.8	11.0	0.0	0.0	6.4	0.0	6.1	3.1	0.0	3.0
LnGrp Delay(d),s/veh	15.2	0.0	14.1	32.3	0.0	0.0	16.9	0.0	16.7	13.7	0.0	14.0
LnGrp LOS	B		B	C			B		B	B		B
Approach Vol, veh/h		571			494			820			474	
Approach Delay, s/veh		14.6			32.3			16.8			13.8	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.3		35.0		32.3		35.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		17.8		18.0		16.4		31.6
Green Ext Time (p_c), s		10.0		6.1		10.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		18.9
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	323	160	305	303	87	200	980	475	223	2140	40
Future Volume (veh/h)	50	323	160	305	303	87	200	980	475	223	2140	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1900	1863	1845	1827	1863	1851	1900	1863	1862	1900
Adj Flow Rate, veh/h	54	351	119	332	329	22	217	1065	0	242	2326	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	2	3	4	2	3	3	2	2	2
Cap, veh/h	69	540	177	272	1167	492	237	1916	0	239	1936	0
Arrive On Green	0.04	0.22	0.22	0.15	0.33	0.33	0.13	0.38	0.00	0.13	0.38	0.00
Sat Flow, veh/h	1723	2460	809	1774	3505	1477	1774	5218	0	1774	5252	0
Grp Volume(v), veh/h	54	244	226	332	329	22	217	1065	0	242	2326	0
Grp Sat Flow(s),veh/h/ln	1723	1735	1533	1774	1752	1477	1774	1684	0	1774	1695	0
Q Serve(g_s), s	5.0	20.4	21.5	24.5	11.0	1.6	19.3	26.4	0.0	21.5	60.7	0.0
Cycle Q Clear(g_c), s	5.0	20.4	21.5	24.5	11.0	1.6	19.3	26.4	0.0	21.5	60.7	0.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	69	381	336	272	1167	492	237	1916	0	239	1936	0
V/C Ratio(X)	0.78	0.64	0.67	1.22	0.28	0.04	0.92	0.56	0.00	1.01	1.20	0.00
Avail Cap(c_a), veh/h	265	549	485	272	1167	492	239	1916	0	239	1936	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	75.9	56.6	57.0	67.5	39.2	36.0	68.2	38.9	0.0	69.0	49.4	0.0
Incr Delay (d2), s/veh	17.1	1.8	2.3	126.8	0.1	0.0	36.4	1.2	0.0	61.3	96.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	10.0	9.3	21.6	5.4	0.7	11.9	12.5	0.0	14.6	45.5	0.0
LnGrp Delay(d),s/veh	93.0	58.4	59.3	194.3	39.3	36.1	104.6	40.1	0.0	130.4	145.4	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	F	
Approach Vol, veh/h		524			683			1282			2568	
Approach Delay, s/veh		62.3			114.5			51.0			144.0	
Approach LOS		E			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	65.0	29.0	39.5	25.8	65.2	10.9	57.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	23.5	28.4	26.5	23.5	21.3	62.7	7.0	13.0
Green Ext Time (p_c), s	0.0	29.5	0.0	3.9	0.0	0.0	0.1	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	108.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	570	475	111	490	250
Future Volume (veh/h)	130	570	475	111	490	250
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1848	1900	1845	1863
Adj Flow Rate, veh/h	141	620	516	0	533	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	3	2
Cap, veh/h	341	1473	2165	0	498	449
Arrive On Green	0.62	0.62	0.62	0.00	0.28	0.00
Sat Flow, veh/h	462	2474	3696	0	1757	1583
Grp Volume(v), veh/h	349	412	516	0	533	0
Grp Sat Flow(s),veh/h/ln	1240	1610	1756	0	1757	1583
Q Serve(g_s), s	9.3	11.9	5.9	0.0	25.5	0.0
Cycle Q Clear(g_c), s	15.2	11.9	5.9	0.0	25.5	0.0
Prop In Lane	0.40			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	821	993	2165	0	498	449
V/C Ratio(X)	0.42	0.42	0.24	0.00	1.07	0.00
Avail Cap(c_a), veh/h	821	993	2165	0	498	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.6	8.9	7.8	0.0	32.2	0.0
Incr Delay (d2), s/veh	1.6	1.3	0.3	0.0	60.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.6	2.9	0.0	20.7	0.0
LnGrp Delay(d),s/veh	11.2	10.2	8.0	0.0	92.9	0.0
LnGrp LOS	B	B	A		F	
Approach Vol, veh/h		761	516		533	
Approach Delay, s/veh		10.6	8.0		92.9	
Approach LOS		B	A		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		30.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				17.2		27.5		7.9
Green Ext Time (p_c), s				11.5		0.0		12.1

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	721	400	118	265	40	170	260	283	91	450	80
Future Volume (veh/h)	40	721	400	118	265	40	170	260	283	91	450	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.93	0.99		0.94	1.00		0.93	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1812	1845	1900	1822	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	43	784	278	128	288	23	185	283	213	99	489	78
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	96	1606	733	240	775	63	205	754	598	110	437	67
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	112	3180	1451	338	1535	124	833	1863	1477	171	1079	166
Grp Volume(v), veh/h	434	393	278	138	0	301	185	283	213	666	0	0
Grp Sat Flow(s),veh/h/ln	1725	1567	1451	371	0	1626	833	1863	1477	1415	0	0
Q Serve(g_s), s	0.0	16.5	11.7	21.8	0.0	11.2	0.0	10.7	10.0	29.8	0.0	0.0
Cycle Q Clear(g_c), s	15.6	16.5	11.7	38.4	0.0	11.2	40.5	10.7	10.0	40.5	0.0	0.0
Prop In Lane	0.10		1.00	0.93		0.08	1.00		1.00	0.15		0.12
Lane Grp Cap(c), veh/h	911	791	733	257	0	821	205	754	598	614	0	0
V/C Ratio(X)	0.48	0.50	0.38	0.54	0.00	0.37	0.90	0.38	0.36	1.08	0.00	0.00
Avail Cap(c_a), veh/h	911	791	733	257	0	821	205	754	598	614	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	16.3	15.2	28.4	0.0	15.0	35.5	20.9	20.7	32.1	0.0	0.0
Incr Delay (d2), s/veh	1.8	2.2	1.5	7.9	0.0	1.3	41.9	1.4	1.7	61.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	7.6	4.9	3.9	0.0	5.3	7.5	5.7	4.4	27.3	0.0	0.0
LnGrp Delay(d),s/veh	17.9	18.6	16.6	36.3	0.0	16.3	77.3	22.3	22.3	93.2	0.0	0.0
LnGrp LOS	B	B	B	D		B	E	C	C	F		
Approach Vol, veh/h		1105			439			681			666	
Approach Delay, s/veh		17.8			22.6			37.3			93.2	
Approach LOS		B			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		18.5		42.5		40.4
Green Ext Time (p_c), s		0.0		13.3		0.0		6.6

Intersection Summary	
HCM 2010 Ctrl Delay	40.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1145	30	10	424	50	140
Future Vol, veh/h	1145	30	10	424	50	140
Conflicting Peds, #/hr	0	53	0	0	39	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	2	4	7	3
Mvmt Flow	1245	33	11	461	54	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1330	0	1605	692
Stage 1	-	-	-	-	1314	-
Stage 2	-	-	-	-	291	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	515	-	91	384
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	718	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	515	-	81	365
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	45.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	81	365	-	-	515	-
HCM Lane V/C Ratio	0.671	0.417	-	-	0.021	-
HCM Control Delay (s)	112.9	21.7	-	-	12.1	0.2
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	3.1	2	-	-	0.1	-

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	62	1211	402	25	42	34
Future Vol, veh/h	62	1211	402	25	42	34
Conflicting Peds, #/hr	0	0	0	18	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	4	2	2	2
Mvmt Flow	67	1316	437	27	46	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	482	0	-	0	1262	268
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	793	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1077	-	-	-	162	730
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	406	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1059	-	-	-	120	705
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	305	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	37.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1059	-	-	-	191
HCM Lane V/C Ratio	0.064	-	-	-	0.433
HCM Control Delay (s)	8.6	0.9	-	-	37.5
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	909	30	10	272	90	20	20	10	162	20	150
Future Volume (veh/h)	335	909	30	10	272	90	20	20	10	162	20	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.94	1.00		0.96	0.99		0.97	0.97		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1853	1900	1900	1836	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	364	988	28	11	296	39	22	22	8	176	22	115
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	510	1373	40	74	1840	242	174	160	51	239	27	122
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	691	2097	62	55	2809	370	480	626	201	716	108	479
Grp Volume(v), veh/h	621	0	759	179	0	167	52	0	0	313	0	0
Grp Sat Flow(s),veh/h/ln	1179	0	1671	1648	0	1587	1307	0	0	1303	0	0
Q Serve(g_s), s	37.6	0.0	28.7	0.3	0.0	4.1	0.0	0.0	0.0	21.0	0.0	0.0
Cycle Q Clear(g_c), s	41.7	0.0	28.7	29.0	0.0	4.1	2.5	0.0	0.0	23.5	0.0	0.0
Prop In Lane	0.59		0.04	0.06		0.23	0.42		0.15	0.56		0.37
Lane Grp Cap(c), veh/h	829	0	1094	1118	0	1039	385	0	0	388	0	0
V/C Ratio(X)	0.75	0.00	0.69	0.16	0.00	0.16	0.14	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	829	0	1094	1118	0	1039	385	0	0	388	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.7	0.0	10.9	6.6	0.0	6.7	28.7	0.0	0.0	36.2	0.0	0.0
Incr Delay (d2), s/veh	6.1	0.0	3.6	0.3	0.0	0.3	0.2	0.0	0.0	11.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	0.0	14.2	2.0	0.0	1.9	1.1	0.0	0.0	9.7	0.0	0.0
LnGrp Delay(d),s/veh	20.8	0.0	14.5	6.9	0.0	7.0	28.8	0.0	0.0	48.0	0.0	0.0
LnGrp LOS	C		B	A		A	C			D		
Approach Vol, veh/h		1380			346			52			313	
Approach Delay, s/veh		17.4			7.0			28.8			48.0	
Approach LOS		B			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		70.0		30.0		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.5		43.7		25.5		31.0
Green Ext Time (p_c), s		2.4		13.5		0.0		17.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Intersection						
Int Delay, s/veh	2.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	52	42	390	250	32
Future Vol, veh/h	35	52	42	390	250	32
Conflicting Peds, #/hr	0	45	26	0	0	45
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	2	2	2	2
Mvmt Flow	38	57	46	424	272	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	849	379	352	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.27	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.363	2.218	-	-	-
Pot Cap-1 Maneuver	331	657	1207	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	287	602	1155	-	-	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	544	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.1	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1155	-	418	-	-
HCM Lane V/C Ratio	0.04	-	0.226	-	-
HCM Control Delay (s)	8.2	0	16.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	270	30	110	90	50	20	132	223	140	172	40
Future Volume (veh/h)	50	270	30	110	90	50	20	132	223	140	172	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.93	0.97		0.91	0.97		0.92	0.94		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1853	1863	1863	1856	1900	1863	1863	1900
Adj Flow Rate, veh/h	54	293	25	120	98	22	22	143	82	152	187	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	2	2
Cap, veh/h	145	535	42	360	260	523	582	470	270	543	755	52
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	151	1478	117	654	718	1443	1139	1069	613	1087	1716	119
Grp Volume(v), veh/h	372	0	0	218	0	22	22	0	225	152	0	200
Grp Sat Flow(s),veh/h/ln	1746	0	0	1371	0	1443	1139	0	1682	1087	0	1835
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.4	0.6	0.0	3.9	4.8	0.0	3.1
Cycle Q Clear(g_c), s	7.5	0.0	0.0	4.8	0.0	0.4	3.7	0.0	3.9	8.7	0.0	3.1
Prop In Lane	0.15		0.07	0.55		1.00	1.00		0.36	1.00		0.06
Lane Grp Cap(c), veh/h	723	0	0	619	0	523	582	0	740	543	0	807
V/C Ratio(X)	0.51	0.00	0.00	0.35	0.00	0.04	0.04	0.00	0.30	0.28	0.00	0.25
Avail Cap(c_a), veh/h	874	0	0	733	0	651	1096	0	1499	1034	0	1636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	0.0	10.6	0.0	9.4	9.2	0.0	8.2	11.0	0.0	8.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.0	2.1	0.0	0.2	0.2	0.0	1.9	1.5	0.0	1.6
LnGrp Delay(d),s/veh	12.2	0.0	0.0	11.0	0.0	9.4	9.2	0.0	8.5	11.3	0.0	8.2
LnGrp LOS	B			B		A	A		A	B		A
Approach Vol, veh/h		372			240			247			352	
Approach Delay, s/veh		12.2			10.8			8.5			9.5	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		24.5		20.9		24.5		20.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		5.9		9.5		10.7		6.8
Green Ext Time (p_c), s		3.9		3.1		3.8		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	70	193	1640	200	10	60	600	114	130	121	60	117	222	569
Future Volume (veh/h)	70	193	1640	200	10	60	600	114	130	121	60	117	222	569
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.98		1.00		0.76	0.95		0.76	0.86		0.84
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1827	1827	1900		1827	1748	1900	1863	1827	1900	1900	1863	1827
Adj Flow Rate, veh/h		203	1726	191		63	632	105	137	127	49	123	234	277
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		4	4	4		4	10	10	2	3	3	2	2	4
Cap, veh/h		227	2692	297		80	2002	320	204	296	114	114	160	338
Arrive On Green		0.13	0.59	0.59		0.05	0.51	0.51	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1740	4552	502		1740	3951	631	1080	1142	441	323	618	1303
Grp Volume(v), veh/h		203	1259	658		63	504	233	137	0	176	357	0	277
Grp Sat Flow(s),veh/h/ln		1740	1663	1728		1740	1590	1401	1080	0	1582	941	0	1303
Q Serve(g_s), s		18.4	39.8	40.2		5.7	14.9	15.8	0.0	0.0	14.8	26.7	0.0	32.0
Cycle Q Clear(g_c), s		18.4	39.8	40.2		5.7	14.9	15.8	34.2	0.0	14.8	41.5	0.0	32.0
Prop In Lane		1.00		0.29		1.00		0.45	1.00		0.28	0.34		1.00
Lane Grp Cap(c), veh/h		227	1967	1022		80	1612	710	204	0	410	274	0	338
V/C Ratio(X)		0.89	0.64	0.64		0.79	0.31	0.33	0.67	0.00	0.43	1.30	0.00	0.82
Avail Cap(c_a), veh/h		451	1967	1022		245	1612	710	204	0	410	274	0	338
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.93	0.93	0.93	1.00	0.00	1.00	0.09	0.00	0.09
Uniform Delay (d), s/veh		68.4	21.5	21.6		75.5	23.1	23.3	56.5	0.0	49.4	68.0	0.0	55.7
Incr Delay (d2), s/veh		11.5	1.6	3.1		14.5	0.5	1.1	16.4	0.0	3.3	138.2	0.0	2.1
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		9.6	18.6	19.9		3.1	6.6	6.3	6.7	0.0	6.9	22.6	0.0	11.7
LnGrp Delay(d),s/veh		79.9	23.1	24.7		90.1	23.6	24.5	72.9	0.0	52.6	206.2	0.0	57.8
LnGrp LOS		E	C	C		F	C	C	E		D	F		E
Approach Vol, veh/h			2120				800			313			634	
Approach Delay, s/veh			29.0				29.1			61.5			141.4	
Approach LOS			C				C			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	12.9	100.1		47.0	26.4	86.6
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		41.5	22.5	79.5		41.5	41.5	60.5
Max Q Clear Time (g_c+I1), s		36.2	7.7	42.2		43.5	20.4	17.8
Green Ext Time (p_c), s		2.6	0.1	28.4		0.0	0.5	31.4

Intersection Summary	
HCM 2010 Ctrl Delay	50.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	774	257	90	218	60	83	210	80	40	380	40
Future Volume (veh/h)	60	774	257	90	218	60	83	210	80	40	380	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	1.00		0.94	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1848	1900	1900	1809	1900	1900	1843	1900	1900	1846	1900
Adj Flow Rate, veh/h	65	841	194	98	237	18	90	228	72	43	413	39
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	5	5	5	2	2	2	3	3	3
Cap, veh/h	133	1640	373	290	1009	79	85	160	46	59	346	32
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	151	2559	582	358	1574	124	161	579	167	84	1249	114
Grp Volume(v), veh/h	583	0	517	118	0	235	390	0	0	495	0	0
Grp Sat Flow(s),veh/h/ln	1743	0	1550	440	0	1616	907	0	0	1448	0	0
Q Serve(g_s), s	4.0	0.0	19.8	13.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	19.8	32.8	0.0	6.7	30.5	0.0	0.0	30.5	0.0	0.0
Prop In Lane	0.11		0.38	0.83		0.08	0.23		0.18	0.09		0.08
Lane Grp Cap(c), veh/h	1154	0	993	342	0	1036	292	0	0	437	0	0
V/C Ratio(X)	0.51	0.00	0.52	0.34	0.00	0.23	1.34	0.00	0.00	1.13	0.00	0.00
Avail Cap(c_a), veh/h	1154	0	993	342	0	1036	292	0	0	437	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	0.0	10.6	18.0	0.0	8.3	40.5	0.0	0.0	40.5	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	1.9	2.7	0.0	0.5	172.9	0.0	0.0	84.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	8.9	2.6	0.0	3.2	22.8	0.0	0.0	23.5	0.0	0.0
LnGrp Delay(d),s/veh	12.0	0.0	12.6	20.7	0.0	8.8	213.4	0.0	0.0	125.1	0.0	0.0
LnGrp LOS	B		B	C		A	F			F		
Approach Vol, veh/h		1100			353			390			495	
Approach Delay, s/veh		12.3			12.8			213.4			125.1	
Approach LOS		B			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		75.0		35.0		75.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		70.5		30.5		70.5
Max Q Clear Time (g_c+I1), s		32.5		21.8		32.5		34.8
Green Ext Time (p_c), s		0.0		15.8		0.0		14.4

Intersection Summary		
HCM 2010 Ctrl Delay		69.8
HCM 2010 LOS		E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	20	410	1324	173	40	190	371	84	102	352	90	221	493	150
Future Volume (veh/h)	20	410	1324	173	40	190	371	84	102	352	90	221	493	150
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.94		1.00		0.88	1.00		0.92	1.00		0.88
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1812	1851	1900		1863	1751	1900	1696	1793	1900	1863	1814	1900
Adj Flow Rate, veh/h		436	1409	168		202	395	54	109	374	80	235	524	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.94	0.94	0.94		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		5	0	0		2	10	10	12	7	7	2	5	5
Cap, veh/h		232	1717	205		161	1355	177	129	835	176	161	788	198
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.08	0.30	0.30	0.09	0.31	0.31
Sat Flow, veh/h		1726	4540	541		1774	4054	531	1616	2754	580	1774	2508	631
Grp Volume(v), veh/h		436	1045	532		202	307	142	109	229	225	235	358	299
Grp Sat Flow(s),veh/h/ln		1726	1684	1712		1774	1593	1398	1616	1703	1630	1774	1723	1416
Q Serve(g_s), s		21.5	31.9	31.9		14.5	11.3	12.1	10.7	17.3	17.9	14.5	28.8	29.3
Cycle Q Clear(g_c), s		21.5	31.9	31.9		14.5	11.3	12.1	10.7	17.3	17.9	14.5	28.8	29.3
Prop In Lane		1.00		0.32		1.00		0.38	1.00		0.36	1.00		0.45
Lane Grp Cap(c), veh/h		232	1274	647		161	1065	467	129	516	494	161	541	445
V/C Ratio(X)		1.88	0.82	0.82		1.26	0.29	0.30	0.85	0.44	0.46	1.46	0.66	0.67
Avail Cap(c_a), veh/h		232	1274	647		161	1065	467	237	516	494	161	541	445
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.64	0.64	0.64		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh		58.5	16.0	16.0		72.8	39.2	39.5	72.7	44.9	45.1	72.8	47.5	47.7
Incr Delay (d2), s/veh		406.5	4.0	7.5		156.0	0.7	1.7	14.0	2.7	3.0	237.3	6.0	7.5
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		36.4	14.9	15.8		14.1	5.1	4.9	5.3	8.5	8.5	17.7	14.6	12.4
LnGrp Delay(d),s/veh		465.0	20.0	23.5		228.7	39.9	41.1	86.7	47.6	48.1	310.0	53.5	55.2
LnGrp LOS		F	B	C		F	D	D	F	D	D	F	D	E
Approach Vol, veh/h			2013				651			563			892	
Approach Delay, s/veh			117.3				98.8			55.4			121.6	
Approach LOS			F				F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	18.2	55.8	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	19.9	16.5	33.9	12.7	31.3	23.5	14.1
Green Ext Time (p_c), s	0.0	8.7	0.0	17.1	0.2	4.4	0.0	21.6

Intersection Summary	
HCM 2010 Ctrl Delay	106.8
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	440	214	0	0	0	0	447	390	290	630	0
Future Volume (veh/h)	60	440	214	0	0	0	0	447	390	290	630	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.84	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	63	463	-11				0	471	237	305	663	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	74	541	515				0	1479	559	489	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.43	0.43	0.11	0.58	0.00
Sat Flow, veh/h	220	1616	1538				0	3529	1300	1774	3632	0
Grp Volume(v), veh/h	526	0	-11				0	471	237	305	663	0
Grp Sat Flow(s),veh/h/ln	1836	0	1538				0	1719	1300	1774	1770	0
Q Serve(g_s), s	34.7	0.0	0.0				0.0	11.8	16.5	12.0	12.6	0.0
Cycle Q Clear(g_c), s	34.7	0.0	0.0				0.0	11.8	16.5	12.0	12.6	0.0
Prop In Lane	0.12		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1479	559	489	2055	0
V/C Ratio(X)	0.86	0.00	-0.02				0.00	0.32	0.42	0.62	0.32	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1479	559	494	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.3	0.0	0.0				0.0	24.5	25.8	16.9	14.1	0.0
Incr Delay (d2), s/veh	14.3	0.0	0.0				0.0	0.6	2.3	2.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	0.0	0.0				0.0	5.7	6.3	6.1	6.2	0.0
LnGrp Delay(d),s/veh	54.6	0.0	0.0				0.0	25.0	28.2	19.3	14.5	0.0
LnGrp LOS	D							C	C	B	B	
Approach Vol, veh/h		515						708			968	
Approach Delay, s/veh		55.8						26.1			16.0	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.6	61.4		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	14.0	18.5		36.7		14.6		
Green Ext Time (p_c), s	0.1	12.1		2.0		13.3		

Intersection Summary		
HCM 2010 Ctrl Delay		28.6
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	201	250	57	440	0	10	660	70
Future Volume (veh/h)	0	0	0	240	201	250	57	440	0	10	660	70
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00	1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1597	1863	0	1900	1863	1900
Adj Flow Rate, veh/h				261	218	272	62	478	0	11	717	68
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	19	2	0	2	2	2
Cap, veh/h				750	748	622	246	1689	0	41	1225	115
Arrive On Green				0.42	0.42	0.42	0.04	0.48	0.00	0.39	0.39	0.39
Sat Flow, veh/h				1774	1770	1471	1521	3632	0	18	3152	296
Grp Volume(v), veh/h				261	218	272	62	478	0	424	0	372
Grp Sat Flow(s),veh/h/ln				1774	1770	1471	1521	1770	0	1844	0	1621
Q Serve(g_s), s				11.0	8.9	14.4	2.6	9.0	0.0	0.0	0.0	20.1
Cycle Q Clear(g_c), s				11.0	8.9	14.4	2.6	9.0	0.0	19.8	0.0	20.1
Prop In Lane				1.00		1.00	1.00		0.00	0.03		0.18
Lane Grp Cap(c), veh/h				750	748	622	246	1689	0	750	0	630
V/C Ratio(X)				0.35	0.29	0.44	0.25	0.28	0.00	0.56	0.00	0.59
Avail Cap(c_a), veh/h				750	748	622	374	1689	0	750	0	630
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh				21.5	20.9	22.5	20.1	17.4	0.0	26.6	0.0	26.7
Incr Delay (d2), s/veh				1.3	1.0	2.2	0.5	0.4	0.0	3.1	0.0	4.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.6	6.2	1.1	4.5	0.0	10.8	0.0	9.7
LnGrp Delay(d),s/veh				22.8	21.9	24.7	20.6	17.8	0.0	29.7	0.0	30.7
LnGrp LOS				C	C	C	C	B		C		C
Approach Vol, veh/h					751			540			796	
Approach Delay, s/veh					23.2			18.1			30.2	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			9.7	48.3		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		11.0			4.6	22.1		16.4
Green Ext Time (p_c), s		11.7			0.1	6.4		4.5

Intersection Summary		
HCM 2010 Ctrl Delay		24.5
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	460	180	90	245	40	60	330	320	70	640	226
Future Volume (veh/h)	72	460	180	90	245	40	60	330	320	70	640	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	0.98		0.95	0.98		0.96	0.99		0.88
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1847	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	78	500	120	98	266	33	65	359	230	76	696	163
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	149	868	203	130	308	34	121	650	473	130	1046	253
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	212	2081	486	164	739	82	135	1414	1028	160	2276	551
Grp Volume(v), veh/h	354	0	344	397	0	0	327	0	327	487	0	448
Grp Sat Flow(s),veh/h/ln	1386	0	1394	985	0	0	1113	0	1464	1474	0	1513
Q Serve(g_s), s	0.0	0.0	14.0	15.3	0.0	0.0	3.6	0.0	11.4	9.1	0.0	16.6
Cycle Q Clear(g_c), s	12.2	0.0	14.0	29.3	0.0	0.0	20.3	0.0	11.4	20.5	0.0	16.6
Prop In Lane	0.22		0.35	0.25		0.08	0.20		0.70	0.16		0.36
Lane Grp Cap(c), veh/h	638	0	581	472	0	0	571	0	673	734	0	695
V/C Ratio(X)	0.55	0.00	0.59	0.84	0.00	0.00	0.57	0.00	0.49	0.66	0.00	0.64
Avail Cap(c_a), veh/h	638	0	581	472	0	0	697	0	811	881	0	838
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	16.5	21.5	0.0	0.0	14.0	0.0	13.7	15.9	0.0	15.2
Incr Delay (d2), s/veh	1.1	0.0	1.6	12.8	0.0	0.0	0.9	0.0	0.5	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	5.6	9.5	0.0	0.0	5.5	0.0	4.7	8.3	0.0	7.1
LnGrp Delay(d),s/veh	16.6	0.0	18.1	34.3	0.0	0.0	14.9	0.0	14.3	17.3	0.0	16.4
LnGrp LOS	B		B	C			B		B	B		B
Approach Vol, veh/h		698			397			654			935	
Approach Delay, s/veh		17.3			34.3			14.6			16.9	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.1		35.0		38.1		35.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		22.3		16.0		22.5		31.3
Green Ext Time (p_c), s		11.2		6.8		11.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	315	130	261	356	187	210	2030	405	109	940	40
Future Volume (veh/h)	90	315	130	261	356	187	210	2030	405	109	940	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1850	1900	1863	1827	1863	1863	1863	1900	1863	1845	1900
Adj Flow Rate, veh/h	96	335	102	278	379	60	223	2160	0	116	1000	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	3	3
Cap, veh/h	117	557	166	275	1047	438	241	2241	0	138	1927	0
Arrive On Green	0.07	0.21	0.21	0.15	0.30	0.30	0.14	0.44	0.00	0.08	0.38	0.00
Sat Flow, veh/h	1774	2618	779	1774	3471	1453	1774	5253	0	1774	5204	0
Grp Volume(v), veh/h	96	222	215	278	379	60	223	2160	0	116	1000	0
Grp Sat Flow(s),veh/h/ln	1774	1757	1640	1774	1736	1453	1774	1695	0	1774	1679	0
Q Serve(g_s), s	8.5	18.0	18.8	24.5	13.5	4.8	19.7	65.3	0.0	10.2	24.2	0.0
Cycle Q Clear(g_c), s	8.5	18.0	18.8	24.5	13.5	4.8	19.7	65.3	0.0	10.2	24.2	0.0
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	117	374	349	275	1047	438	241	2241	0	138	1927	0
V/C Ratio(X)	0.82	0.59	0.62	1.01	0.36	0.14	0.92	0.96	0.00	0.84	0.52	0.00
Avail Cap(c_a), veh/h	275	561	523	275	1108	464	241	2241	0	241	1927	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	72.9	56.1	56.4	66.8	43.3	40.2	67.5	43.0	0.0	72.0	37.6	0.0
Incr Delay (d2), s/veh	12.9	1.5	1.8	57.3	0.2	0.1	38.1	12.2	0.0	12.7	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	8.9	8.7	16.4	6.5	1.9	12.2	33.1	0.0	5.5	11.4	0.0
LnGrp Delay(d),s/veh	85.8	57.6	58.1	124.2	43.5	40.4	105.6	55.2	0.0	84.7	38.6	0.0
LnGrp LOS	F	E	E	F	D	D	F	E		F	D	
Approach Vol, veh/h		533			717			2383			1116	
Approach Delay, s/veh		62.9			74.5			60.0			43.4	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	74.2	29.0	38.2	26.0	65.0	15.0	52.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	12.2	67.3	26.5	20.8	21.7	26.2	10.5	15.5
Green Ext Time (p_c), s	0.2	0.0	0.0	6.2	0.0	30.6	0.2	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	58.6
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	479	502	392	321	210
Future Volume (veh/h)	70	479	502	392	321	210
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1853	1900	1863	1863
Adj Flow Rate, veh/h	76	521	546	0	349	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	2	2
Cap, veh/h	277	1836	2354	0	395	353
Arrive On Green	0.67	0.67	0.67	0.00	0.22	0.00
Sat Flow, veh/h	333	2830	3705	0	1774	1583
Grp Volume(v), veh/h	291	306	546	0	349	0
Grp Sat Flow(s),veh/h/ln	1468	1610	1760	0	1774	1583
Q Serve(g_s), s	0.0	6.4	5.0	0.0	15.8	0.0
Cycle Q Clear(g_c), s	5.1	6.4	5.0	0.0	15.8	0.0
Prop In Lane	0.26			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	1036	1077	2354	0	395	353
V/C Ratio(X)	0.28	0.28	0.23	0.00	0.88	0.00
Avail Cap(c_a), veh/h	1036	1077	2354	0	545	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	5.4	5.6	5.4	0.0	31.2	0.0
Incr Delay (d2), s/veh	0.7	0.7	0.2	0.0	12.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.0	2.5	0.0	9.1	0.0
LnGrp Delay(d),s/veh	6.1	6.3	5.6	0.0	43.4	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		597	546		349	
Approach Delay, s/veh		6.2	5.6		43.4	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		23.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				8.4		17.8		7.0
Green Ext Time (p_c), s				10.0		0.7		10.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	541	240	127	484	72	360	450	359	41	180	60
Future Volume (veh/h)	50	541	240	127	484	72	360	450	359	41	180	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.95	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1861	1845	1900	1841	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	53	569	64	134	509	59	379	474	126	43	189	47
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	138	1403	768	242	984	121	369	754	617	88	365	83
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	190	2778	1522	376	1949	240	1127	1863	1524	116	901	206
Grp Volume(v), veh/h	288	334	64	305	0	397	379	474	126	279	0	0
Grp Sat Flow(s),veh/h/ln	1358	1609	1522	949	0	1617	1127	1863	1524	1223	0	0
Q Serve(g_s), s	2.0	12.9	2.2	17.0	0.0	16.1	17.6	20.3	5.4	2.6	0.0	0.0
Cycle Q Clear(g_c), s	18.1	12.9	2.2	29.9	0.0	16.1	40.5	20.3	5.4	22.9	0.0	0.0
Prop In Lane	0.18		1.00	0.44		0.15	1.00		1.00	0.15		0.17
Lane Grp Cap(c), veh/h	729	813	768	531	0	816	369	754	617	537	0	0
V/C Ratio(X)	0.40	0.41	0.08	0.57	0.00	0.49	1.03	0.63	0.20	0.52	0.00	0.00
Avail Cap(c_a), veh/h	729	813	768	531	0	816	369	754	617	537	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.9	15.5	12.8	21.7	0.0	16.2	37.5	23.7	19.3	21.7	0.0	0.0
Incr Delay (d2), s/veh	1.6	1.5	0.2	4.5	0.0	2.1	53.6	3.9	0.7	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	6.1	1.0	7.3	0.0	7.6	15.7	11.2	2.4	6.9	0.0	0.0
LnGrp Delay(d),s/veh	16.6	17.0	13.0	26.2	0.0	18.3	91.1	27.7	20.0	25.3	0.0	0.0
LnGrp LOS	B	B	B	C		B	F	C	C	C		
Approach Vol, veh/h		686			702			979			279	
Approach Delay, s/veh		16.4			21.7			51.3			25.3	
Approach LOS		B			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		20.1		24.9		31.9
Green Ext Time (p_c), s		0.0		11.5		6.7		9.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	841	40	20	642	50	60
Future Vol, veh/h	841	40	20	642	50	60
Conflicting Peds, #/hr	0	45	0	0	26	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	7	3
Mvmt Flow	904	43	22	690	54	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	992	0	1385	519
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	414	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	693	-	128	499
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	693	-	113	478
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	575	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	36.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	478	-	-	693	-
HCM Lane V/C Ratio	0.476	0.135	-	-	0.031	-
HCM Control Delay (s)	62.9	13.7	-	-	10.4	0.2
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	2.1	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	856	601	53	42	57
Future Vol, veh/h	42	856	601	53	42	57
Conflicting Peds, #/hr	0	0	0	9	0	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	44	901	633	56	44	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	697	0	-	0	1209	362
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	895	-	-	-	175	635
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	887	-	-	-	155	624
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	490	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	26.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	887	-	-	-	273
HCM Lane V/C Ratio	0.05	-	-	-	0.382
HCM Control Delay (s)	9.3	0.4	-	-	26.1
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	302	596	20	10	485	86	20	10	10	129	10	169
Future Volume (veh/h)	302	596	20	10	485	86	20	10	10	129	10	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	0.99		0.96	0.96		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1860	1900	1900	1822	1900	1900	1728	1900	1900	1855	1900
Adj Flow Rate, veh/h	318	627	18	11	511	60	21	11	5	136	11	102
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	555	1161	34	57	2031	235	191	90	35	211	23	123
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	714	1712	50	26	2995	347	581	395	153	672	103	537
Grp Volume(v), veh/h	354	0	609	308	0	274	37	0	0	249	0	0
Grp Sat Flow(s),veh/h/ln	795	0	1681	1786	0	1582	1129	0	0	1311	0	0
Q Serve(g_s), s	25.1	0.0	17.7	0.0	0.0	6.5	0.0	0.0	0.0	15.3	0.0	0.0
Cycle Q Clear(g_c), s	31.6	0.0	17.7	6.3	0.0	6.5	2.0	0.0	0.0	17.4	0.0	0.0
Prop In Lane	0.90		0.03	0.04		0.22	0.57		0.14	0.55		0.41
Lane Grp Cap(c), veh/h	610	0	1140	1250	0	1073	316	0	0	357	0	0
V/C Ratio(X)	0.58	0.00	0.53	0.25	0.00	0.26	0.12	0.00	0.00	0.70	0.00	0.00
Avail Cap(c_a), veh/h	610	0	1140	1250	0	1073	359	0	0	403	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.2	0.0	7.8	6.0	0.0	6.0	29.5	0.0	0.0	35.3	0.0	0.0
Incr Delay (d2), s/veh	4.0	0.0	1.8	0.5	0.0	0.6	0.2	0.0	0.0	4.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	8.7	3.3	0.0	3.0	0.8	0.0	0.0	6.7	0.0	0.0
LnGrp Delay(d),s/veh	16.2	0.0	9.6	6.5	0.0	6.6	29.6	0.0	0.0	39.7	0.0	0.0
LnGrp LOS	B		A	A		A	C			D		
Approach Vol, veh/h		963			582			37			249	
Approach Delay, s/veh		12.0			6.5			29.6			39.7	
Approach LOS		B			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.6		70.0		26.6		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.0		33.6		19.4		8.5
Green Ext Time (p_c), s		1.8		14.7		0.9		17.9

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	69	58	350	220	34
Future Vol, veh/h	46	69	58	350	220	34
Conflicting Peds, #/hr	0	23	18	0	0	23
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	2	2	2	2
Mvmt Flow	49	74	62	376	237	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	779	301	296	0	-	0
Stage 1	278	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Critical Hdwy	6.5	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	353	739	1265	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	707	1237	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	543	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.3	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1237	-	473	-	-
HCM Lane V/C Ratio	0.05	-	0.261	-	-
HCM Control Delay (s)	8.1	0	15.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	120	20	121	180	80	30	184	202	80	83	50
Future Volume (veh/h)	30	120	20	121	180	80	30	184	202	80	83	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	0.99		0.97	0.98		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1850	1900	1900	1863	1863	1810	1863	1900	1845	1807	1900
Adj Flow Rate, veh/h	32	128	14	129	191	25	32	196	84	85	88	31
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	2	2	2	5	2	2	3	7	7
Cap, veh/h	181	462	45	322	357	493	656	489	210	524	509	179
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	155	1428	138	515	1105	1525	1225	1225	525	1064	1276	449
Grp Volume(v), veh/h	174	0	0	320	0	25	32	0	280	85	0	119
Grp Sat Flow(s),veh/h/ln	1721	0	0	1621	0	1525	1225	0	1749	1064	0	1725
Q Serve(g_s), s	0.0	0.0	0.0	2.5	0.0	0.4	0.6	0.0	3.7	2.0	0.0	1.4
Cycle Q Clear(g_c), s	2.3	0.0	0.0	5.1	0.0	0.4	2.0	0.0	3.7	5.8	0.0	1.4
Prop In Lane	0.18		0.08	0.40		1.00	1.00		0.30	1.00		0.26
Lane Grp Cap(c), veh/h	688	0	0	680	0	493	656	0	698	524	0	689
V/C Ratio(X)	0.25	0.00	0.00	0.47	0.00	0.05	0.05	0.00	0.40	0.16	0.00	0.17
Avail Cap(c_a), veh/h	1191	0	0	1156	0	963	1696	0	2183	1426	0	2153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.2	0.0	0.0	9.0	0.0	7.6	6.9	0.0	7.0	9.0	0.0	6.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	2.4	0.0	0.2	0.2	0.0	1.9	0.6	0.0	0.7
LnGrp Delay(d),s/veh	8.4	0.0	0.0	9.6	0.0	7.6	7.0	0.0	7.3	9.2	0.0	6.4
LnGrp LOS	A			A		A	A		A	A		A
Approach Vol, veh/h		174			345			312			204	
Approach Delay, s/veh		8.4			9.4			7.3			7.6	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		17.5		15.0		17.5		15.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		5.7		4.3		7.8		7.1
Green Ext Time (p_c), s		3.4		3.0		3.3		2.7

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	150	251	1560	140	30	40	940	118	270	133	50	128	202	488
Future Volume (veh/h)	150	251	1560	140	30	40	940	118	270	133	50	128	202	488
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.82	0.97		0.89	0.93		0.92
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1863	1863	1900		1863	1770	1900	1863	1863	1900	1900	1838	1863
Adj Flow Rate, veh/h		259	1608	131		41	969	111	278	137	41	132	208	287
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.97	0.97	0.97		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %		2	2	2		2	8	8	2	2	2	3	3	2
Cap, veh/h		284	2879	234		53	2021	230	232	355	106	134	162	387
Arrive On Green		0.16	0.60	0.60		0.03	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h		1774	4789	390		1774	4291	488	1134	1335	400	388	611	1456
Grp Volume(v), veh/h		259	1138	601		41	726	354	278	0	178	340	0	287
Grp Sat Flow(s),veh/h/ln		1774	1695	1789		1774	1611	1557	1134	0	1734	999	0	1456
Q Serve(g_s), s		23.0	32.2	32.3		3.7	24.6	24.9	0.0	0.0	13.4	29.1	0.0	28.8
Cycle Q Clear(g_c), s		23.0	32.2	32.3		3.7	24.6	24.9	42.5	0.0	13.4	42.5	0.0	28.8
Prop In Lane		1.00		0.22		1.00		0.31	1.00		0.23	0.39		1.00
Lane Grp Cap(c), veh/h		284	2038	1075		53	1518	734	232	0	461	297	0	387
V/C Ratio(X)		0.91	0.56	0.56		0.77	0.48	0.48	1.20	0.00	0.39	1.15	0.00	0.74
Avail Cap(c_a), veh/h		449	2038	1075		238	1518	734	232	0	461	297	0	387
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.81	0.81	0.81	1.00	0.00	1.00	0.75	0.00	0.75
Uniform Delay (d), s/veh		66.1	19.1	19.2		77.1	28.9	29.0	62.9	0.0	48.1	67.0	0.0	53.7
Incr Delay (d2), s/veh		15.7	1.1	2.1		17.0	0.9	1.8	123.4	0.0	2.4	91.3	0.0	9.3
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		12.5	15.3	16.5		2.1	11.2	11.1	18.2	0.0	6.7	20.6	0.0	12.6
LnGrp Delay(d),s/veh		81.8	20.3	21.3		94.1	29.8	30.8	186.3	0.0	50.5	158.3	0.0	63.0
LnGrp LOS		F	C	C		F	C	C	F		D	F		E
Approach Vol, veh/h			1998				1121			456			627	
Approach Delay, s/veh			28.5				32.4			133.3			114.7	
Approach LOS			C				C			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		48.0	10.3	101.7		48.0	31.1	80.9
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		42.5	21.5	79.5		42.5	40.5	60.5
Max Q Clear Time (g_c+I1), s		44.5	5.7	34.3		44.5	25.0	26.9
Green Ext Time (p_c), s		0.0	0.1	34.1		0.0	0.7	27.0

Intersection Summary		
HCM 2010 Ctrl Delay		53.8
HCM 2010 LOS		D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	538	167	60	352	30	187	300	70	10	330	30
Future Volume (veh/h)	40	538	167	60	352	30	187	300	70	10	330	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.96	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1854	1900	1900	1820	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	41	555	112	62	363	19	193	309	66	10	340	27
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	5	5	5	2	2	2	2	2	2
Cap, veh/h	118	1522	302	222	1350	74	152	181	38	41	509	40
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	138	2642	524	307	2343	129	314	534	112	16	1505	117
Grp Volume(v), veh/h	372	0	336	205	0	239	568	0	0	377	0	0
Grp Sat Flow(s),veh/h/ln	1732	0	1571	1152	0	1627	960	0	0	1639	0	0
Q Serve(g_s), s	0.0	0.0	12.1	3.0	0.0	7.7	14.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.2	0.0	12.1	15.1	0.0	7.7	35.5	0.0	0.0	20.6	0.0	0.0
Prop In Lane	0.11		0.33	0.30		0.08	0.34		0.12	0.03		0.07
Lane Grp Cap(c), veh/h	1036	0	905	709	0	938	370	0	0	589	0	0
V/C Ratio(X)	0.36	0.00	0.37	0.29	0.00	0.26	1.53	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	1036	0	905	709	0	938	370	0	0	589	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.8	0.0	12.0	11.7	0.0	11.1	38.9	0.0	0.0	29.8	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	1.2	1.0	0.0	0.7	253.2	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	5.5	3.6	0.0	3.6	36.8	0.0	0.0	9.7	0.0	0.0
LnGrp Delay(d),s/veh	12.8	0.0	13.2	12.7	0.0	11.7	292.1	0.0	0.0	32.1	0.0	0.0
LnGrp LOS	B		B	B		B	F			C		
Approach Vol, veh/h		708			444			568			377	
Approach Delay, s/veh		13.0			12.2			292.1			32.1	
Approach LOS		B			B			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		65.0		40.0		65.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		35.5		60.5		35.5		60.5
Max Q Clear Time (g_c+I1), s		37.5		14.1		22.6		17.1
Green Ext Time (p_c), s		0.0		9.9		5.7		9.8

Intersection Summary	
HCM 2010 Ctrl Delay	91.8
HCM 2010 LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	30	430	1113	135	30	190	625	123	154	624	120	159	395	140
Future Volume (veh/h)	30	430	1113	135	30	190	625	123	154	624	120	159	395	140
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.87	1.00		0.95	1.00		0.85
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1863	1847	1900		1863	1863	1900	1397	1833	1900	1863	1810	1900
Adj Flow Rate, veh/h		453	1172	126		200	658	86	162	657	101	167	416	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	36	4	4	2	6	6
Cap, veh/h		238	1746	188		161	1445	185	177	910	140	161	609	190
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.13	0.30	0.30	0.09	0.26	0.26
Sat Flow, veh/h		1774	4618	496		1774	4321	552	1331	3002	461	1774	2337	729
Grp Volume(v), veh/h		453	853	445		200	513	231	162	381	377	167	303	246
Grp Sat Flow(s),veh/h/ln		1774	1681	1753		1774	1695	1483	1331	1741	1721	1774	1720	1347
Q Serve(g_s), s		21.5	20.1	20.1		14.5	19.0	19.6	19.2	31.2	31.3	14.5	25.3	26.4
Cycle Q Clear(g_c), s		21.5	20.1	20.1		14.5	19.0	19.6	19.2	31.2	31.3	14.5	25.3	26.4
Prop In Lane		1.00		0.28		1.00		0.37	1.00		0.27	1.00		0.54
Lane Grp Cap(c), veh/h		238	1271	663		161	1134	496	177	528	522	161	448	351
V/C Ratio(X)		1.90	0.67	0.67		1.24	0.45	0.47	0.91	0.72	0.72	1.04	0.68	0.70
Avail Cap(c_a), veh/h		238	1271	663		161	1134	496	195	528	522	161	448	351
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.74	0.74	0.74		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh		58.5	14.6	14.6		72.8	41.8	42.0	68.4	49.7	49.8	72.8	53.1	53.5
Incr Delay (d2), s/veh		416.6	2.1	4.0		151.2	1.3	3.1	39.3	8.3	8.4	80.4	7.7	10.7
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(50%),veh/ln		38.0	9.4	10.1		13.9	9.1	8.4	9.0	16.2	16.1	10.7	13.0	10.9
LnGrp Delay(d),s/veh		475.1	16.7	18.6		224.0	43.1	45.1	107.7	58.0	58.2	153.3	60.8	64.2
LnGrp LOS		F	B	B		F	D	D	F	E	E	F	E	E
Approach Vol, veh/h			1751				944			920			716	
Approach Delay, s/veh			135.8				81.9			66.8			83.6	
Approach LOS			F				F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	26.8	47.2	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	33.3	16.5	22.1	21.2	28.4	23.5	21.6
Green Ext Time (p_c), s	0.0	7.8	0.0	20.9	0.1	6.3	0.0	18.9

Intersection Summary	
HCM 2010 Ctrl Delay	100.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	445	193	0	0	0	0	617	590	170	510	0
Future Volume (veh/h)	70	445	193	0	0	0	0	617	590	170	510	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.85	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	75	478	-33				0	663	457	183	548	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	83	531	515				0	1616	621	346	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.47	0.47	0.07	0.58	0.00
Sat Flow, veh/h	249	1586	1538				0	3529	1322	1774	3632	0
Grp Volume(v), veh/h	553	0	-33				0	663	457	183	548	0
Grp Sat Flow(s),veh/h/ln	1835	0	1538				0	1719	1322	1774	1770	0
Q Serve(g_s), s	37.3	0.0	0.0				0.0	16.5	36.4	6.7	10.0	0.0
Cycle Q Clear(g_c), s	37.3	0.0	0.0				0.0	16.5	36.4	6.7	10.0	0.0
Prop In Lane	0.14		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1616	621	346	2055	0
V/C Ratio(X)	0.90	0.00	-0.06				0.00	0.41	0.74	0.53	0.27	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1616	621	423	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.2	0.0	0.0				0.0	22.6	27.9	16.5	13.5	0.0
Incr Delay (d2), s/veh	18.7	0.0	0.0				0.0	0.8	7.6	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.1	0.0	0.0				0.0	8.0	14.5	3.3	5.0	0.0
LnGrp Delay(d),s/veh	59.9	0.0	0.0				0.0	23.4	35.5	17.8	13.8	0.0
LnGrp LOS	E							C	D	B	B	
Approach Vol, veh/h		520						1120			731	
Approach Delay, s/veh		63.7						28.3			14.8	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.4	66.6		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	8.7	38.4		39.3		12.0		
Green Ext Time (p_c), s	0.2	10.1		1.4		17.3		

Intersection Summary		
HCM 2010 Ctrl Delay		31.9
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	210	266	250	97	600	0	0	460	80
Future Volume (veh/h)	0	0	0	210	266	250	97	600	0	0	460	80
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1624	1863	0	0	1847	1900
Adj Flow Rate, veh/h				219	277	260	101	625	0	0	479	76
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	2	2	17	2	0	0	3	3
Cap, veh/h				634	870	652	339	1689	0	0	1127	178
Arrive On Green				0.42	0.42	0.42	0.06	0.48	0.00	0.00	0.37	0.37
Sat Flow, veh/h				1499	2058	1542	1547	3632	0	0	3124	478
Grp Volume(v), veh/h				261	235	260	101	625	0	0	276	279
Grp Sat Flow(s),veh/h/ln				1788	1770	1542	1547	1770	0	0	1755	1755
Q Serve(g_s), s				10.9	9.7	12.9	4.3	12.3	0.0	0.0	12.9	13.1
Cycle Q Clear(g_c), s				10.9	9.7	12.9	4.3	12.3	0.0	0.0	12.9	13.1
Prop In Lane				0.84		1.00	1.00		0.00	0.00		0.27
Lane Grp Cap(c), veh/h				756	748	652	339	1689	0	0	653	653
V/C Ratio(X)				0.35	0.31	0.40	0.30	0.37	0.00	0.00	0.42	0.43
Avail Cap(c_a), veh/h				756	748	652	443	1689	0	0	653	653
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.5	21.1	22.0	19.3	18.3	0.0	0.0	25.8	25.8
Incr Delay (d2), s/veh				1.3	1.1	1.8	0.5	0.6	0.0	0.0	2.0	2.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	5.0	5.8	1.8	6.1	0.0	0.0	6.6	6.6
LnGrp Delay(d),s/veh				22.7	22.2	23.9	19.8	18.9	0.0	0.0	27.8	27.8
LnGrp LOS				C	C	C	B	B			C	C
Approach Vol, veh/h					756			726			555	
Approach Delay, s/veh					23.0			19.0			27.8	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			11.6	46.4		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		14.3			6.3	15.1		14.9
Green Ext Time (p_c), s		10.4			0.1	7.9		4.5

Intersection Summary			
HCM 2010 Ctrl Delay			22.9
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	340	100	110	333	40	90	540	260	30	340	178
Future Volume (veh/h)	152	340	100	110	333	40	90	540	260	30	340	178
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	0.98		0.95	0.96		0.93	0.98		0.91
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1854	1900	1900	1863	1900	1900	1861	1900
Adj Flow Rate, veh/h	162	362	71	117	354	37	96	574	150	32	362	88
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	289	619	124	146	365	35	172	905	239	101	993	241
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	434	1371	273	177	807	77	257	2182	575	99	2394	581
Grp Volume(v), veh/h	218	0	377	508	0	0	417	0	403	251	0	231
Grp Sat Flow(s),veh/h/ln	627	0	1451	1061	0	0	1470	0	1544	1551	0	1523
Q Serve(g_s), s	0.0	0.0	13.0	17.5	0.0	0.0	8.9	0.0	13.9	0.4	0.0	7.1
Cycle Q Clear(g_c), s	18.9	0.0	13.0	30.5	0.0	0.0	15.9	0.0	13.9	14.4	0.0	7.1
Prop In Lane	0.74		0.19	0.23		0.07	0.23		0.37	0.13		0.38
Lane Grp Cap(c), veh/h	376	0	656	545	0	0	676	0	640	704	0	632
V/C Ratio(X)	0.58	0.00	0.57	0.93	0.00	0.00	0.62	0.00	0.63	0.36	0.00	0.37
Avail Cap(c_a), veh/h	376	0	656	545	0	0	952	0	926	990	0	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	13.7	20.5	0.0	0.0	16.0	0.0	15.6	13.4	0.0	13.6
Incr Delay (d2), s/veh	2.2	0.0	1.2	23.0	0.0	0.0	0.9	0.0	1.0	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	5.4	12.8	0.0	0.0	6.4	0.0	6.1	3.2	0.0	3.0
LnGrp Delay(d),s/veh	17.0	0.0	14.9	43.6	0.0	0.0	16.9	0.0	16.7	13.7	0.0	14.0
LnGrp LOS	B		B	D			B		B	B		B
Approach Vol, veh/h		595			508			820			482	
Approach Delay, s/veh		15.7			43.6			16.8			13.8	
Approach LOS		B			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.5		35.0		32.5		35.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		17.9		20.9		16.4		32.5
Green Ext Time (p_c), s		10.1		5.3		10.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		21.6
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	322	160	321	307	95	200	980	478	224	2140	40
Future Volume (veh/h)	50	322	160	321	307	95	200	980	478	224	2140	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1900	1863	1845	1827	1863	1851	1900	1863	1862	1900
Adj Flow Rate, veh/h	54	350	119	349	334	30	217	1065	0	243	2326	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	2	3	4	2	3	3	2	2	2
Cap, veh/h	69	539	178	273	1166	492	237	1917	0	239	1936	0
Arrive On Green	0.04	0.22	0.22	0.15	0.33	0.33	0.13	0.38	0.00	0.13	0.38	0.00
Sat Flow, veh/h	1723	2458	810	1774	3505	1477	1774	5219	0	1774	5252	0
Grp Volume(v), veh/h	54	244	225	349	334	30	217	1065	0	243	2326	0
Grp Sat Flow(s),veh/h/ln	1723	1736	1533	1774	1752	1477	1774	1684	0	1774	1695	0
Q Serve(g_s), s	5.0	20.4	21.4	24.5	11.2	2.2	19.3	26.4	0.0	21.5	60.7	0.0
Cycle Q Clear(g_c), s	5.0	20.4	21.4	24.5	11.2	2.2	19.3	26.4	0.0	21.5	60.7	0.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	69	380	336	273	1166	492	237	1917	0	239	1936	0
V/C Ratio(X)	0.78	0.64	0.67	1.28	0.29	0.06	0.92	0.56	0.00	1.02	1.20	0.00
Avail Cap(c_a), veh/h	265	550	485	273	1166	492	239	1917	0	239	1936	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	75.8	56.5	57.0	67.5	39.2	36.2	68.2	38.9	0.0	69.0	49.4	0.0
Incr Delay (d2), s/veh	17.1	1.8	2.3	151.3	0.1	0.1	36.4	1.2	0.0	62.3	95.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.9	9.3	23.4	5.4	0.9	11.9	12.5	0.0	14.6	45.5	0.0
LnGrp Delay(d),s/veh	93.0	58.4	59.3	218.8	39.4	36.3	104.6	40.1	0.0	131.4	145.2	0.0
LnGrp LOS	F	E	E	F	D	D	F	D		F	F	
Approach Vol, veh/h		523			713			1282			2569	
Approach Delay, s/veh		62.3			127.1			51.0			143.9	
Approach LOS		E			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	65.0	29.0	39.5	25.8	65.2	10.9	57.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	23.5	28.4	26.5	23.4	21.3	62.7	7.0	13.2
Green Ext Time (p_c), s	0.0	29.5	0.0	3.9	0.0	0.0	0.1	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	109.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	574	504	112	491	250
Future Volume (veh/h)	130	574	504	112	491	250
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1848	1900	1845	1863
Adj Flow Rate, veh/h	141	624	548	0	534	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	3	2
Cap, veh/h	334	1460	2165	0	498	449
Arrive On Green	0.62	0.62	0.62	0.00	0.28	0.00
Sat Flow, veh/h	451	2453	3696	0	1757	1583
Grp Volume(v), veh/h	347	418	548	0	534	0
Grp Sat Flow(s),veh/h/ln	1209	1610	1756	0	1757	1583
Q Serve(g_s), s	9.6	12.1	6.4	0.0	25.5	0.0
Cycle Q Clear(g_c), s	16.0	12.1	6.4	0.0	25.5	0.0
Prop In Lane	0.41			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	802	993	2165	0	498	449
V/C Ratio(X)	0.43	0.42	0.25	0.00	1.07	0.00
Avail Cap(c_a), veh/h	802	993	2165	0	498	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	8.9	7.8	0.0	32.2	0.0
Incr Delay (d2), s/veh	1.7	1.3	0.3	0.0	61.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.7	3.1	0.0	20.8	0.0
LnGrp Delay(d),s/veh	11.5	10.2	8.1	0.0	93.5	0.0
LnGrp LOS	B	B	A		F	
Approach Vol, veh/h		765	548		534	
Approach Delay, s/veh		10.8	8.1		93.5	
Approach LOS		B	A		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		30.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				18.0		27.5		8.4
Green Ext Time (p_c), s				12.0		0.0		12.6

Intersection Summary		
HCM 2010 Ctrl Delay		33.9
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	724	400	127	295	41	170	260	284	90	450	80
Future Volume (veh/h)	40	724	400	127	295	41	170	260	284	90	450	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.93	0.99		0.94	1.00		0.93	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1812	1845	1900	1822	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	43	787	278	138	321	25	185	283	214	98	489	78
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	96	1603	733	238	779	62	204	754	598	110	439	67
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	111	3175	1451	335	1542	122	833	1863	1477	169	1084	167
Grp Volume(v), veh/h	435	395	278	150	0	334	185	283	214	665	0	0
Grp Sat Flow(s),veh/h/ln	1720	1567	1451	372	0	1627	833	1863	1477	1420	0	0
Q Serve(g_s), s	0.0	16.7	11.7	24.4	0.0	12.8	0.0	10.7	10.1	29.8	0.0	0.0
Cycle Q Clear(g_c), s	15.7	16.7	11.7	41.0	0.0	12.8	40.5	10.7	10.1	40.5	0.0	0.0
Prop In Lane	0.10		1.00	0.92		0.07	1.00		1.00	0.15		0.12
Lane Grp Cap(c), veh/h	908	791	733	257	0	822	204	754	598	616	0	0
V/C Ratio(X)	0.48	0.50	0.38	0.59	0.00	0.41	0.91	0.38	0.36	1.08	0.00	0.00
Avail Cap(c_a), veh/h	908	791	733	257	0	822	204	754	598	616	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	16.4	15.2	29.3	0.0	15.4	35.5	20.9	20.7	32.1	0.0	0.0
Incr Delay (d2), s/veh	1.8	2.2	1.5	9.4	0.0	1.5	42.5	1.4	1.7	59.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	7.6	4.9	4.4	0.0	6.1	7.5	5.7	4.4	27.1	0.0	0.0
LnGrp Delay(d),s/veh	17.9	18.6	16.6	38.8	0.0	16.9	78.1	22.3	22.4	91.5	0.0	0.0
LnGrp LOS	B	B	B	D		B	E	C	C	F		
Approach Vol, veh/h		1108			484			682			665	
Approach Delay, s/veh		17.9			23.7			37.5			91.5	
Approach LOS		B			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		18.7		42.5		43.0
Green Ext Time (p_c), s		0.0		13.9		0.0		5.3

Intersection Summary	
HCM 2010 Ctrl Delay	40.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	5.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1148	30	10	462	50	140
Future Vol, veh/h	1148	30	10	462	50	140
Conflicting Peds, #/hr	0	53	0	0	39	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	4	2	4	7	3
Mvmt Flow	1248	33	11	502	54	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1333	0	1629	693
Stage 1	-	-	-	-	1317	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	513	-	88	384
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	513	-	78	365
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	47.9
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	78	365	-	-	513	-
HCM Lane V/C Ratio	0.697	0.417	-	-	0.021	-
HCM Control Delay (s)	121.2	21.7	-	-	12.2	0.2
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	3.3	2	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	1213	411	28	75	62
Future Vol, veh/h	65	1213	411	28	75	62
Conflicting Peds, #/hr	0	0	0	18	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	3	4	2	2	2
Mvmt Flow	71	1318	447	30	82	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	495	0	-	0	1281	275
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	801	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1065	-	-	-	157	722
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	402	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1047	-	-	-	113	697
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	295	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	78.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1047	-	-	-	182
HCM Lane V/C Ratio	0.067	-	-	-	0.818
HCM Control Delay (s)	8.7	1	-	-	78.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	943	30	10	276	92	20	20	10	187	20	163
Future Volume (veh/h)	335	943	30	10	276	92	20	20	10	187	20	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.94	1.00		0.96	1.00		0.97	0.97		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1853	1900	1900	1836	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	364	1025	28	11	300	41	22	22	8	203	22	129
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	497	1391	40	73	1818	249	174	161	52	247	21	121
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	672	2124	60	53	2776	381	483	630	202	746	81	474
Grp Volume(v), veh/h	642	0	775	181	0	171	52	0	0	354	0	0
Grp Sat Flow(s),veh/h/ln	1185	0	1671	1625	0	1585	1315	0	0	1301	0	0
Q Serve(g_s), s	39.8	0.0	29.9	0.4	0.0	4.2	0.0	0.0	0.0	23.0	0.0	0.0
Cycle Q Clear(g_c), s	43.9	0.0	29.9	30.2	0.0	4.2	2.5	0.0	0.0	25.5	0.0	0.0
Prop In Lane	0.57		0.04	0.06		0.24	0.42		0.15	0.57		0.36
Lane Grp Cap(c), veh/h	833	0	1095	1103	0	1038	387	0	0	388	0	0
V/C Ratio(X)	0.77	0.00	0.71	0.16	0.00	0.16	0.13	0.00	0.00	0.91	0.00	0.00
Avail Cap(c_a), veh/h	833	0	1095	1103	0	1038	387	0	0	388	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.2	0.0	11.1	6.6	0.0	6.7	28.7	0.0	0.0	37.8	0.0	0.0
Incr Delay (d2), s/veh	6.8	0.0	3.9	0.3	0.0	0.3	0.2	0.0	0.0	25.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	0.0	14.7	2.0	0.0	1.9	1.1	0.0	0.0	12.5	0.0	0.0
LnGrp Delay(d),s/veh	22.0	0.0	15.0	7.0	0.0	7.0	28.8	0.0	0.0	63.0	0.0	0.0
LnGrp LOS	C		B	A		A	C			E		
Approach Vol, veh/h		1417			352			52			354	
Approach Delay, s/veh		18.1			7.0			28.8			63.0	
Approach LOS		B			A			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		70.0		30.0		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.5		45.9		27.5		32.2
Green Ext Time (p_c), s		2.8		12.9		0.0		18.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.9
HCM 2010 LOS	C

Intersection						
Int Delay, s/veh	3.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	89	47	390	250	28
Future Vol, veh/h	55	89	47	390	250	28
Conflicting Peds, #/hr	0	45	26	0	0	45
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	2	2	2	2
Mvmt Flow	60	97	51	424	272	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	858	377	347	0	-	0
Stage 1	332	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Critical Hdwy	6.42	6.27	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.363	2.218	-	-	-
Pot Cap-1 Maneuver	327	659	1212	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	282	604	1160	-	-	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	535	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.5	0.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1160	-	421	-	-
HCM Lane V/C Ratio	0.044	-	0.372	-	-
HCM Control Delay (s)	8.2	0	18.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	270	30	107	90	50	20	135	240	140	171	40
Future Volume (veh/h)	50	270	30	107	90	50	20	135	240	140	171	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.94		0.93	0.96		0.91	0.97		0.92	0.95		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1853	1863	1863	1856	1900	1863	1863	1900
Adj Flow Rate, veh/h	54	293	25	116	98	22	22	147	101	152	186	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	3	3	2	2	2
Cap, veh/h	144	530	42	351	263	518	587	439	302	528	763	53
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	151	1477	117	643	732	1442	1141	986	678	1068	1715	120
Grp Volume(v), veh/h	372	0	0	214	0	22	22	0	248	152	0	199
Grp Sat Flow(s),veh/h/ln	1745	0	0	1375	0	1442	1141	0	1664	1068	0	1835
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.5	0.6	0.0	4.5	5.0	0.0	3.1
Cycle Q Clear(g_c), s	7.6	0.0	0.0	4.7	0.0	0.5	3.7	0.0	4.5	9.4	0.0	3.1
Prop In Lane	0.15		0.07	0.54		1.00	1.00		0.41	1.00		0.07
Lane Grp Cap(c), veh/h	716	0	0	614	0	518	587	0	741	528	0	817
V/C Ratio(X)	0.52	0.00	0.00	0.35	0.00	0.04	0.04	0.00	0.33	0.29	0.00	0.24
Avail Cap(c_a), veh/h	863	0	0	725	0	643	1084	0	1465	993	0	1615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	0.0	10.8	0.0	9.6	9.1	0.0	8.3	11.4	0.0	7.9
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.0	2.1	0.0	0.2	0.2	0.0	2.1	1.5	0.0	1.6
LnGrp Delay(d),s/veh	12.4	0.0	0.0	11.2	0.0	9.6	9.1	0.0	8.6	11.7	0.0	8.1
LnGrp LOS	B			B		A	A		A	B		A
Approach Vol, veh/h		372			236			270			351	
Approach Delay, s/veh		12.4			11.0			8.6			9.7	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		21.0		25.0		21.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		6.5		9.6		11.4		6.7
Green Ext Time (p_c), s		4.1		3.0		4.0		3.4

Intersection Summary		
HCM 2010 Ctrl Delay		10.5
HCM 2010 LOS		B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	70	195	1640	200	10	60	600	113	130	121	60	124	224	579
Future Volume (veh/h)	70	195	1640	200	10	60	600	113	130	121	60	124	224	579
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.98		1.00		0.76	0.95		0.76	0.86		0.84
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1827	1827	1900		1827	1747	1900	1863	1827	1900	1900	1863	1827
Adj Flow Rate, veh/h		205	1726	191		63	632	104	137	127	49	131	236	287
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		4	4	4		4	10	10	2	3	3	2	2	4
Cap, veh/h		229	2692	297		80	2001	316	209	296	114	117	155	338
Arrive On Green		0.13	0.59	0.59		0.05	0.51	0.51	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1740	4552	502		1740	3957	626	1078	1142	441	332	597	1303
Grp Volume(v), veh/h		205	1259	658		63	503	233	137	0	176	367	0	287
Grp Sat Flow(s),veh/h/ln		1740	1663	1728		1740	1590	1403	1078	0	1582	929	0	1303
Q Serve(g_s), s		18.6	39.8	40.2		5.7	14.9	15.8	0.0	0.0	14.8	26.7	0.0	33.5
Cycle Q Clear(g_c), s		18.6	39.8	40.2		5.7	14.9	15.8	32.7	0.0	14.8	41.5	0.0	33.5
Prop In Lane		1.00		0.29		1.00		0.45	1.00		0.28	0.36		1.00
Lane Grp Cap(c), veh/h		229	1967	1022		80	1608	709	209	0	410	271	0	338
V/C Ratio(X)		0.89	0.64	0.64		0.79	0.31	0.33	0.66	0.00	0.43	1.35	0.00	0.85
Avail Cap(c_a), veh/h		451	1967	1022		245	1608	709	209	0	410	271	0	338
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.93	0.93	0.93	1.00	0.00	1.00	0.09	0.00	0.09
Uniform Delay (d), s/veh		68.3	21.5	21.6		75.5	23.2	23.4	56.0	0.0	49.4	68.2	0.0	56.3
Incr Delay (d2), s/veh		11.5	1.6	3.1		14.5	0.5	1.1	14.9	0.0	3.3	160.6	0.0	2.6
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		9.7	18.6	19.9		3.1	6.6	6.3	6.6	0.0	6.9	24.1	0.0	12.3
LnGrp Delay(d),s/veh		79.8	23.1	24.7		90.1	23.7	24.6	70.9	0.0	52.6	228.8	0.0	58.9
LnGrp LOS		E	C	C		F	C	C	E		D	F		E
Approach Vol, veh/h			2122				799			313			654	
Approach Delay, s/veh			29.1				29.2			60.6			154.2	
Approach LOS			C				C			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	12.9	100.1		47.0	26.6	86.4
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		41.5	22.5	79.5		41.5	41.5	60.5
Max Q Clear Time (g_c+I1), s		34.7	7.7	42.2		43.5	20.6	17.8
Green Ext Time (p_c), s		3.1	0.1	28.4		0.0	0.5	31.4

Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	812	278	90	221	60	87	210	80	40	380	40
Future Volume (veh/h)	60	812	278	90	221	60	87	210	80	40	380	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	1.00		0.94	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1848	1900	1900	1809	1900	1900	1843	1900	1900	1846	1900
Adj Flow Rate, veh/h	65	883	217	98	240	18	95	228	72	43	413	39
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	5	5	5	2	2	2	3	3	3
Cap, veh/h	128	1624	393	273	997	77	86	154	44	59	348	32
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	143	2534	614	330	1555	120	165	554	160	85	1254	114
Grp Volume(v), veh/h	620	0	545	113	0	243	395	0	0	495	0	0
Grp Sat Flow(s),veh/h/ln	1748	0	1542	388	0	1617	880	0	0	1453	0	0
Q Serve(g_s), s	5.9	0.0	21.6	14.6	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.5	0.0	21.6	36.2	0.0	7.0	30.5	0.0	0.0	30.5	0.0	0.0
Prop In Lane	0.10		0.40	0.87		0.07	0.24		0.18	0.09		0.08
Lane Grp Cap(c), veh/h	1157	0	989	310	0	1036	285	0	0	438	0	0
V/C Ratio(X)	0.54	0.00	0.55	0.36	0.00	0.23	1.39	0.00	0.00	1.13	0.00	0.00
Avail Cap(c_a), veh/h	1157	0	989	310	0	1036	285	0	0	438	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.7	0.0	11.0	19.7	0.0	8.3	40.6	0.0	0.0	40.5	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.0	2.2	3.3	0.0	0.5	195.0	0.0	0.0	83.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	0.0	9.7	2.6	0.0	3.3	24.0	0.0	0.0	23.4	0.0	0.0
LnGrp Delay(d),s/veh	12.5	0.0	13.2	23.0	0.0	8.9	235.7	0.0	0.0	123.7	0.0	0.0
LnGrp LOS	B		B	C		A	F			F		
Approach Vol, veh/h		1165			356			395			495	
Approach Delay, s/veh		12.8			13.4			235.7			123.7	
Approach LOS		B			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		75.0		35.0		75.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		70.5		30.5		70.5
Max Q Clear Time (g_c+I1), s		32.5		23.6		32.5		38.2
Green Ext Time (p_c), s		0.0		17.1		0.0		14.8

Intersection Summary	
HCM 2010 Ctrl Delay	72.2
HCM 2010 LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	20	410	1327	177	40	190	372	86	102	352	90	233	497	150
Future Volume (veh/h)	20	410	1327	177	40	190	372	86	102	352	90	233	497	150
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.94		1.00		0.88	1.00		0.92	1.00		0.88
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1812	1850	1900		1863	1751	1900	1696	1793	1900	1863	1814	1900
Adj Flow Rate, veh/h		436	1412	172		202	396	56	109	374	80	248	529	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.94	0.94	0.94		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		5	0	0		2	10	10	12	7	7	2	5	5
Cap, veh/h		232	1711	208		161	1349	182	129	835	176	161	790	197
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.08	0.30	0.30	0.09	0.31	0.31
Sat Flow, veh/h		1726	4525	551		1774	4035	546	1616	2754	580	1774	2514	626
Grp Volume(v), veh/h		436	1051	533		202	309	143	109	229	225	248	361	301
Grp Sat Flow(s),veh/h/ln		1726	1684	1709		1774	1593	1393	1616	1703	1630	1774	1723	1417
Q Serve(g_s), s		21.5	32.4	32.4		14.5	11.4	12.2	10.7	17.3	17.9	14.5	29.1	29.6
Cycle Q Clear(g_c), s		21.5	32.4	32.4		14.5	11.4	12.2	10.7	17.3	17.9	14.5	29.1	29.6
Prop In Lane		1.00		0.32		1.00		0.39	1.00		0.36	1.00		0.44
Lane Grp Cap(c), veh/h		232	1273	646		161	1066	466	129	516	494	161	541	445
V/C Ratio(X)		1.88	0.83	0.83		1.26	0.29	0.31	0.85	0.44	0.46	1.54	0.67	0.68
Avail Cap(c_a), veh/h		232	1273	646		161	1066	466	237	516	494	161	541	445
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.64	0.64	0.64		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh		58.5	16.1	16.1		72.8	39.3	39.5	72.7	44.9	45.1	72.8	47.6	47.8
Incr Delay (d2), s/veh		406.5	4.1	7.7		156.0	0.7	1.7	14.0	2.7	3.0	271.3	6.1	7.6
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		36.4	15.3	16.2		14.1	5.1	4.9	5.3	8.5	8.5	19.2	14.8	12.6
LnGrp Delay(d),s/veh		465.0	20.1	23.8		228.7	39.9	41.2	86.7	47.6	48.1	344.1	53.7	55.4
LnGrp LOS		F	C	C		F	D	D	F	D	D	F	D	E
Approach Vol, veh/h			2020				654			563			910	
Approach Delay, s/veh			117.1				98.5			55.4			133.4	
Approach LOS			F				F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	18.2	55.8	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	19.9	16.5	34.4	12.7	31.6	23.5	14.2
Green Ext Time (p_c), s	0.0	8.8	0.0	17.0	0.2	4.3	0.0	21.7

Intersection Summary	
HCM 2010 Ctrl Delay	109.4
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	462	230	0	0	0	0	447	390	290	630	0
Future Volume (veh/h)	60	462	230	0	0	0	0	447	390	290	630	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92				1.00		0.84	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	63	486	6				0	471	237	305	663	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	71	544	474				0	1479	559	489	2055	0
Arrive On Green	0.33	0.33	0.33				0.00	0.43	0.43	0.11	0.58	0.00
Sat Flow, veh/h	211	1625	1415				0	3529	1300	1774	3632	0
Grp Volume(v), veh/h	549	0	6				0	471	237	305	663	0
Grp Sat Flow(s),veh/h/ln	1836	0	1415				0	1719	1300	1774	1770	0
Q Serve(g_s), s	36.9	0.0	0.4				0.0	11.8	16.5	12.0	12.6	0.0
Cycle Q Clear(g_c), s	36.9	0.0	0.4				0.0	11.8	16.5	12.0	12.6	0.0
Prop In Lane	0.11		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	474				0	1479	559	489	2055	0
V/C Ratio(X)	0.89	0.00	0.01				0.00	0.32	0.42	0.62	0.32	0.00
Avail Cap(c_a), veh/h	614	0	474				0	1479	559	494	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.1	0.0	28.9				0.0	24.5	25.8	16.9	14.1	0.0
Incr Delay (d2), s/veh	17.9	0.0	0.0				0.0	0.6	2.3	2.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.7	0.0	0.1				0.0	5.7	6.3	6.1	6.2	0.0
LnGrp Delay(d),s/veh	59.0	0.0	28.9				0.0	25.0	28.2	19.3	14.5	0.0
LnGrp LOS	E		C					C	C	B	B	
Approach Vol, veh/h		555						708			968	
Approach Delay, s/veh		58.6						26.1			16.0	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.6	61.4		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	14.0	18.5		38.9		14.6		
Green Ext Time (p_c), s	0.1	12.1		1.5		13.3		

Intersection Summary			
HCM 2010 Ctrl Delay			29.8
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	240	203	250	57	440	0	10	660	70
Future Volume (veh/h)	0	0	0	240	203	250	57	440	0	10	660	70
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00	1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1597	1863	0	1900	1863	1900
Adj Flow Rate, veh/h				261	221	272	62	478	0	11	717	68
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	19	2	0	2	2	2
Cap, veh/h				750	748	622	246	1689	0	41	1225	115
Arrive On Green				0.42	0.42	0.42	0.04	0.48	0.00	0.39	0.39	0.39
Sat Flow, veh/h				1774	1770	1471	1521	3632	0	18	3152	296
Grp Volume(v), veh/h				261	221	272	62	478	0	424	0	372
Grp Sat Flow(s),veh/h/ln				1774	1770	1471	1521	1770	0	1844	0	1621
Q Serve(g_s), s				11.0	9.1	14.4	2.6	9.0	0.0	0.0	0.0	20.1
Cycle Q Clear(g_c), s				11.0	9.1	14.4	2.6	9.0	0.0	19.8	0.0	20.1
Prop In Lane				1.00		1.00	1.00		0.00	0.03		0.18
Lane Grp Cap(c), veh/h				750	748	622	246	1689	0	750	0	630
V/C Ratio(X)				0.35	0.30	0.44	0.25	0.28	0.00	0.56	0.00	0.59
Avail Cap(c_a), veh/h				750	748	622	374	1689	0	750	0	630
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh				21.5	20.9	22.5	20.1	17.4	0.0	26.6	0.0	26.7
Incr Delay (d2), s/veh				1.3	1.0	2.2	0.5	0.4	0.0	3.1	0.0	4.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.6	6.2	1.1	4.5	0.0	10.8	0.0	9.7
LnGrp Delay(d),s/veh				22.8	21.9	24.7	20.6	17.8	0.0	29.7	0.0	30.7
LnGrp LOS				C	C	C	C	B		C		C
Approach Vol, veh/h					754			540			796	
Approach Delay, s/veh					23.2			18.1			30.2	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			9.7	48.3		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		11.0			4.6	22.1		16.4
Green Ext Time (p_c), s		11.7			0.1	6.4		4.5

Intersection Summary			
HCM 2010 Ctrl Delay			24.5
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	472	180	90	245	40	60	330	320	70	640	222
Future Volume (veh/h)	78	472	180	90	245	40	60	330	320	70	640	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	0.98		0.95	0.98		0.96	0.99		0.88
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1847	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	85	513	120	98	266	33	65	359	230	76	696	158
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	848	193	126	298	33	121	651	472	131	1051	246
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	224	2029	462	154	713	79	136	1419	1029	161	2291	537
Grp Volume(v), veh/h	355	0	363	397	0	0	327	0	327	484	0	446
Grp Sat Flow(s),veh/h/ln	1315	0	1400	945	0	0	1120	0	1463	1471	0	1517
Q Serve(g_s), s	0.0	0.0	14.9	15.6	0.0	0.0	3.6	0.0	11.4	9.0	0.0	16.5
Cycle Q Clear(g_c), s	13.1	0.0	14.9	30.5	0.0	0.0	20.1	0.0	11.4	20.4	0.0	16.5
Prop In Lane	0.24		0.33	0.25		0.08	0.20		0.70	0.16		0.35
Lane Grp Cap(c), veh/h	611	0	585	456	0	0	573	0	671	732	0	696
V/C Ratio(X)	0.58	0.00	0.62	0.87	0.00	0.00	0.57	0.00	0.49	0.66	0.00	0.64
Avail Cap(c_a), veh/h	611	0	585	456	0	0	702	0	812	881	0	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	16.7	22.1	0.0	0.0	14.0	0.0	13.8	15.8	0.0	15.1
Incr Delay (d2), s/veh	1.4	0.0	2.0	16.4	0.0	0.0	0.9	0.0	0.5	1.4	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	6.1	10.0	0.0	0.0	5.5	0.0	4.6	8.2	0.0	7.1
LnGrp Delay(d),s/veh	17.0	0.0	18.7	38.4	0.0	0.0	14.9	0.0	14.3	17.2	0.0	16.4
LnGrp LOS	B		B	D			B		B	B		B
Approach Vol, veh/h		718			397			654			930	
Approach Delay, s/veh		17.9			38.4			14.6			16.8	
Approach LOS		B			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.0		35.0		38.0		35.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		22.1		16.9		22.4		32.5
Green Ext Time (p_c), s		11.2		6.7		11.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	319	130	267	355	189	210	2030	420	116	940	40
Future Volume (veh/h)	90	319	130	267	355	189	210	2030	420	116	940	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1850	1900	1863	1827	1863	1863	1863	1900	1863	1845	1900
Adj Flow Rate, veh/h	96	339	102	284	378	62	223	2160	0	123	1000	0
Adj No. of Lanes	1	2	0	1	2	1	1	3	0	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	3	3
Cap, veh/h	117	560	165	275	1048	439	241	2219	0	145	1926	0
Arrive On Green	0.07	0.21	0.21	0.15	0.30	0.30	0.14	0.44	0.00	0.08	0.38	0.00
Sat Flow, veh/h	1774	2626	772	1774	3471	1453	1774	5253	0	1774	5204	0
Grp Volume(v), veh/h	96	224	217	284	378	62	223	2160	0	123	1000	0
Grp Sat Flow(s),veh/h/ln	1774	1757	1641	1774	1736	1453	1774	1695	0	1774	1679	0
Q Serve(g_s), s	8.5	18.2	18.9	24.5	13.5	4.9	19.7	65.9	0.0	10.8	24.2	0.0
Cycle Q Clear(g_c), s	8.5	18.2	18.9	24.5	13.5	4.9	19.7	65.9	0.0	10.8	24.2	0.0
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	117	375	350	275	1048	439	241	2219	0	145	1926	0
V/C Ratio(X)	0.82	0.60	0.62	1.03	0.36	0.14	0.93	0.97	0.00	0.85	0.52	0.00
Avail Cap(c_a), veh/h	275	561	524	275	1108	464	241	2219	0	241	1926	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	73.0	56.1	56.4	66.9	43.3	40.3	67.6	43.7	0.0	71.7	37.7	0.0
Incr Delay (d2), s/veh	12.9	1.5	1.8	63.4	0.2	0.1	38.2	13.8	0.0	13.4	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	9.0	8.8	16.8	6.5	2.0	12.2	33.6	0.0	5.9	11.4	0.0
LnGrp Delay(d),s/veh	85.8	57.7	58.2	130.3	43.5	40.4	105.8	57.5	0.0	85.1	38.7	0.0
LnGrp LOS	F	E	E	F	D	D	F	E		F	D	
Approach Vol, veh/h		537			724			2383			1123	
Approach Delay, s/veh		62.9			77.3			62.0			43.8	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	73.6	29.0	38.3	26.0	65.0	15.0	52.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	60.5	24.5	50.5	21.5	60.5	24.5	50.5
Max Q Clear Time (g_c+I1), s	12.8	67.9	26.5	20.9	21.7	26.2	10.5	15.5
Green Ext Time (p_c), s	0.2	0.0	0.0	6.2	0.0	30.6	0.2	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	60.1
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	506	511	391	322	210
Future Volume (veh/h)	70	506	511	391	322	210
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1852	1900	1863	1863
Adj Flow Rate, veh/h	76	550	555	0	350	0
Adj No. of Lanes	0	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	3	3	2	2
Cap, veh/h	266	1854	2352	0	396	354
Arrive On Green	0.67	0.67	0.67	0.00	0.22	0.00
Sat Flow, veh/h	317	2859	3705	0	1774	1583
Grp Volume(v), veh/h	306	320	555	0	350	0
Grp Sat Flow(s),veh/h/ln	1481	1610	1760	0	1774	1583
Q Serve(g_s), s	0.0	6.8	5.2	0.0	15.9	0.0
Cycle Q Clear(g_c), s	5.4	6.8	5.2	0.0	15.9	0.0
Prop In Lane	0.25			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	1044	1076	2352	0	396	354
V/C Ratio(X)	0.29	0.30	0.24	0.00	0.88	0.00
Avail Cap(c_a), veh/h	1044	1076	2352	0	545	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	5.5	5.7	5.4	0.0	31.2	0.0
Incr Delay (d2), s/veh	0.7	0.7	0.2	0.0	12.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	2.5	0.0	9.1	0.0
LnGrp Delay(d),s/veh	6.2	6.4	5.7	0.0	43.5	0.0
LnGrp LOS	A	A	A		D	
Approach Vol, veh/h		626	555		350	
Approach Delay, s/veh		6.3	5.7		43.5	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				60.0		23.0		60.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				55.5		25.5		55.5
Max Q Clear Time (g_c+I1), s				8.8		17.9		7.2
Green Ext Time (p_c), s				10.5		0.7		10.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	568	240	130	493	71	360	450	367	41	180	60
Future Volume (veh/h)	50	568	240	130	493	71	360	450	367	41	180	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.95	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1861	1845	1900	1841	1900	1845	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	53	598	64	137	519	58	379	474	134	43	189	47
Adj No. of Lanes	0	2	1	0	2	0	1	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	3	3	3	3	3	2	2	2	2	2
Cap, veh/h	133	1412	768	237	975	116	369	754	617	88	364	83
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	179	2796	1522	366	1931	230	1127	1863	1524	116	900	206
Grp Volume(v), veh/h	302	349	64	306	0	408	379	474	134	279	0	0
Grp Sat Flow(s),veh/h/ln	1366	1609	1522	908	0	1619	1127	1863	1524	1221	0	0
Q Serve(g_s), s	2.2	13.7	2.2	18.1	0.0	16.7	17.6	20.3	5.7	2.6	0.0	0.0
Cycle Q Clear(g_c), s	18.8	13.7	2.2	31.8	0.0	16.7	40.5	20.3	5.7	22.9	0.0	0.0
Prop In Lane	0.18		1.00	0.45		0.14	1.00		1.00	0.15		0.17
Lane Grp Cap(c), veh/h	732	813	768	511	0	818	369	754	617	536	0	0
V/C Ratio(X)	0.41	0.43	0.08	0.60	0.00	0.50	1.03	0.63	0.22	0.52	0.00	0.00
Avail Cap(c_a), veh/h	732	813	768	511	0	818	369	754	617	536	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	15.6	12.8	22.5	0.0	16.4	37.5	23.7	19.4	21.7	0.0	0.0
Incr Delay (d2), s/veh	1.7	1.7	0.2	5.1	0.0	2.2	53.7	3.9	0.8	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.4	1.0	7.5	0.0	7.9	15.7	11.2	2.6	6.9	0.0	0.0
LnGrp Delay(d),s/veh	16.8	17.3	13.0	27.6	0.0	18.6	91.2	27.7	20.2	25.3	0.0	0.0
LnGrp LOS	B	B	B	C		B	F	C	C	C		
Approach Vol, veh/h		715			714			987			279	
Approach Delay, s/veh		16.7			22.4			51.0			25.3	
Approach LOS		B			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.0		55.0		45.0		55.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		50.5		40.5		50.5
Max Q Clear Time (g_c+I1), s		42.5		20.8		24.9		33.8
Green Ext Time (p_c), s		0.0		11.9		6.8		8.9

Intersection Summary		
HCM 2010 Ctrl Delay		31.7
HCM 2010 LOS		C

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	877	40	20	653	50	60
Future Vol, veh/h	877	40	20	653	50	60
Conflicting Peds, #/hr	0	45	0	0	26	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	7	3
Mvmt Flow	943	43	22	702	54	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1031	0	1430	538
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	420	-
Critical Hdwy	-	-	4.14	-	6.94	6.96
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.22	-	3.57	3.33
Pot Cap-1 Maneuver	-	-	670	-	120	485
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	670	-	106	464
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	569	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	39.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	106	464	-	-	670	-
HCM Lane V/C Ratio	0.507	0.139	-	-	0.032	-
HCM Control Delay (s)	69.7	14	-	-	10.6	0.3
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	2.3	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	69	864	608	82	53	67
Future Vol, veh/h	69	864	608	82	53	67
Conflicting Peds, #/hr	0	0	0	9	0	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	73	909	640	86	56	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	735	0	-	0	1292	381
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	866	-	-	-	155	617
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	511	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	859	-	-	-	126	606
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	419	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	39.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	859	-	-	-	226
HCM Lane V/C Ratio	0.085	-	-	-	0.559
HCM Control Delay (s)	9.6	0.7	-	-	39.4
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.3	-	-	-	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	607	20	10	516	109	20	10	10	138	10	174
Future Volume (veh/h)	314	607	20	10	516	109	20	10	10	138	10	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	0.99		0.96	0.96		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1860	1900	1900	1821	1900	1900	1728	1900	1900	1855	1900
Adj Flow Rate, veh/h	331	639	18	11	543	84	21	11	5	145	11	107
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	534	1126	32	53	1947	297	193	91	35	217	21	124
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	686	1671	47	22	2888	440	580	392	152	686	92	533
Grp Volume(v), veh/h	349	0	639	340	0	298	37	0	0	263	0	0
Grp Sat Flow(s),veh/h/ln	722	0	1682	1790	0	1561	1124	0	0	1310	0	0
Q Serve(g_s), s	29.2	0.0	19.4	0.0	0.0	7.5	0.0	0.0	0.0	16.6	0.0	0.0
Cycle Q Clear(g_c), s	36.7	0.0	19.4	7.3	0.0	7.5	2.0	0.0	0.0	18.6	0.0	0.0
Prop In Lane	0.95		0.03	0.03		0.28	0.57		0.14	0.55		0.41
Lane Grp Cap(c), veh/h	559	0	1134	1245	0	1052	320	0	0	363	0	0
V/C Ratio(X)	0.62	0.00	0.56	0.27	0.00	0.28	0.12	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	559	0	1134	1245	0	1052	355	0	0	401	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.8	0.0	8.3	6.3	0.0	6.4	29.3	0.0	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	5.2	0.0	2.0	0.5	0.0	0.7	0.2	0.0	0.0	5.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	9.5	3.8	0.0	3.3	0.8	0.0	0.0	7.3	0.0	0.0
LnGrp Delay(d),s/veh	19.0	0.0	10.4	6.9	0.0	7.1	29.4	0.0	0.0	41.2	0.0	0.0
LnGrp LOS	B		B	A		A	C			D		
Approach Vol, veh/h		988			638			37			263	
Approach Delay, s/veh		13.4			7.0			29.4			41.2	
Approach LOS		B			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.2		70.0		27.2		70.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		65.5		25.5		65.5
Max Q Clear Time (g_c+I1), s		4.0		38.7		20.6		9.5
Green Ext Time (p_c), s		1.9		14.5		0.8		19.9

Intersection Summary			
HCM 2010 Ctrl Delay			15.4
HCM 2010 LOS			B

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	47	81	93	350	220	54
Future Vol, veh/h	47	81	93	350	220	54
Conflicting Peds, #/hr	0	23	18	0	0	23
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	2	2	2	2
Mvmt Flow	51	87	100	376	237	58

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	865	312	318	0	-	0
Stage 1	289	-	-	-	-	-
Stage 2	576	-	-	-	-	-
Critical Hdwy	6.5	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	314	728	1242	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	269	696	1215	-	-	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	479	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1215	-	440	-	-
HCM Lane V/C Ratio	0.082	-	0.313	-	-
HCM Control Delay (s)	8.2	0	16.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.3	-	1.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	120	20	138	180	80	30	184	203	80	86	50
Future Volume (veh/h)	30	120	20	138	180	80	30	184	203	80	86	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.96	1.00		0.97	0.98		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1850	1900	1900	1863	1863	1810	1863	1900	1845	1807	1900
Adj Flow Rate, veh/h	32	128	14	147	191	25	32	196	85	85	91	31
Adj No. of Lanes	0	1	0	0	1	1	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	2	2	2	5	2	2	3	7	7
Cap, veh/h	179	476	46	346	342	507	645	484	210	515	511	174
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	153	1431	139	572	1028	1526	1222	1219	529	1063	1288	439
Grp Volume(v), veh/h	174	0	0	338	0	25	32	0	281	85	0	122
Grp Sat Flow(s),veh/h/ln	1722	0	0	1600	0	1526	1222	0	1748	1063	0	1726
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.0	0.4	0.6	0.0	3.8	2.1	0.0	1.5
Cycle Q Clear(g_c), s	2.4	0.0	0.0	5.6	0.0	0.4	2.1	0.0	3.8	5.9	0.0	1.5
Prop In Lane	0.18		0.08	0.43		1.00	1.00		0.30	1.00		0.25
Lane Grp Cap(c), veh/h	701	0	0	687	0	507	645	0	694	515	0	685
V/C Ratio(X)	0.25	0.00	0.00	0.49	0.00	0.05	0.05	0.00	0.40	0.17	0.00	0.18
Avail Cap(c_a), veh/h	1163	0	0	1119	0	940	1647	0	2128	1386	0	2101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.2	0.0	0.0	9.2	0.0	7.5	7.2	0.0	7.2	9.3	0.0	6.5
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	2.6	0.0	0.2	0.2	0.0	1.9	0.6	0.0	0.7
LnGrp Delay(d),s/veh	8.4	0.0	0.0	9.7	0.0	7.6	7.2	0.0	7.6	9.5	0.0	6.6
LnGrp LOS	A			A		A	A		A	A		A
Approach Vol, veh/h		174			363			313			207	
Approach Delay, s/veh		8.4			9.6			7.5			7.8	
Approach LOS		A			A			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		17.7		15.6		17.7		15.6
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		20.5		40.5		20.5
Max Q Clear Time (g_c+I1), s		5.8		4.4		7.9		7.6
Green Ext Time (p_c), s		3.4		3.1		3.4		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	150	260	1560	140	30	40	940	126	270	135	50	130	203	491
Future Volume (veh/h)	150	260	1560	140	30	40	940	126	270	135	50	130	203	491
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.82	0.97		0.89	0.93		0.92
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1863	1863	1900		1863	1771	1900	1863	1863	1900	1900	1838	1863
Adj Flow Rate, veh/h		268	1608	131		41	969	119	278	139	41	134	209	290
Adj No. of Lanes		1	3	0		1	3	0	1	1	0	0	1	1
Peak Hour Factor		0.97	0.97	0.97		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %		2	2	2		2	8	8	2	2	2	3	3	2
Cap, veh/h		293	2879	234		53	1980	242	233	356	105	134	161	387
Arrive On Green		0.17	0.60	0.60		0.03	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h		1774	4789	390		1774	4248	518	1133	1340	395	388	604	1456
Grp Volume(v), veh/h		268	1138	601		41	734	354	278	0	180	343	0	290
Grp Sat Flow(s),veh/h/ln		1774	1695	1789		1774	1612	1543	1133	0	1736	992	0	1456
Q Serve(g_s), s		23.8	32.2	32.3		3.7	25.2	25.5	0.0	0.0	13.6	28.9	0.0	29.2
Cycle Q Clear(g_c), s		23.8	32.2	32.3		3.7	25.2	25.5	42.5	0.0	13.6	42.5	0.0	29.2
Prop In Lane		1.00		0.22		1.00		0.34	1.00		0.23	0.39		1.00
Lane Grp Cap(c), veh/h		293	2038	1075		53	1502	719	233	0	461	295	0	387
V/C Ratio(X)		0.91	0.56	0.56		0.77	0.49	0.49	1.19	0.00	0.39	1.16	0.00	0.75
Avail Cap(c_a), veh/h		449	2038	1075		238	1502	719	233	0	461	295	0	387
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		0.80	0.80	0.80	1.00	0.00	1.00	0.75	0.00	0.75
Uniform Delay (d), s/veh		65.7	19.1	19.2		77.1	29.5	29.6	62.9	0.0	48.1	67.1	0.0	53.9
Incr Delay (d2), s/veh		16.8	1.1	2.1		16.9	0.9	1.9	121.1	0.0	2.5	98.0	0.0	9.6
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		13.1	15.3	16.5		2.0	11.4	11.2	18.1	0.0	6.8	21.0	0.0	12.8
LnGrp Delay(d),s/veh		82.4	20.3	21.3		93.9	30.4	31.5	183.9	0.0	50.6	165.1	0.0	63.5
LnGrp LOS		F	C	C		F	C	C	F		D	F		E
Approach Vol, veh/h			2007				1129			458			633	
Approach Delay, s/veh			28.9				33.1			131.5			118.5	
Approach LOS			C				C			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		48.0	10.3	101.7		48.0	31.9	80.1
Change Period (Y+Rc), s		5.5	5.5	5.5		5.5	5.5	5.5
Max Green Setting (Gmax), s		42.5	21.5	79.5		42.5	40.5	60.5
Max Q Clear Time (g_c+I1), s		44.5	5.7	34.3		44.5	25.8	27.5
Green Ext Time (p_c), s		0.0	0.1	34.2		0.0	0.7	26.7

Intersection Summary	
HCM 2010 Ctrl Delay	54.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	552	173	60	373	30	223	300	70	10	330	30
Future Volume (veh/h)	40	552	173	60	373	30	223	300	70	10	330	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.96	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln	1900	1854	1900	1900	1820	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	41	569	118	62	385	19	230	309	66	10	340	27
Adj No. of Lanes	0	2	0	0	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	5	5	5	2	2	2	2	2	2
Cap, veh/h	114	1516	309	212	1366	71	162	154	33	41	510	40
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	133	2632	536	292	2371	123	338	457	97	17	1507	118
Grp Volume(v), veh/h	383	0	345	215	0	251	605	0	0	377	0	0
Grp Sat Flow(s),veh/h/ln	1732	0	1568	1157	0	1628	892	0	0	1641	0	0
Q Serve(g_s), s	0.0	0.0	12.6	3.1	0.0	8.1	14.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.6	0.0	12.6	15.7	0.0	8.1	35.5	0.0	0.0	20.6	0.0	0.0
Prop In Lane	0.11		0.34	0.29		0.08	0.38		0.11	0.03		0.07
Lane Grp Cap(c), veh/h	1036	0	904	711	0	938	349	0	0	590	0	0
V/C Ratio(X)	0.37	0.00	0.38	0.30	0.00	0.27	1.73	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	1036	0	904	711	0	938	349	0	0	590	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.9	0.0	12.1	11.7	0.0	11.2	39.7	0.0	0.0	29.8	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	1.2	1.1	0.0	0.7	341.7	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	5.7	3.7	0.0	3.8	43.2	0.0	0.0	9.7	0.0	0.0
LnGrp Delay(d),s/veh	12.9	0.0	13.3	12.8	0.0	11.9	381.5	0.0	0.0	32.1	0.0	0.0
LnGrp LOS	B		B	B		B	F			C		
Approach Vol, veh/h		728			466			605			377	
Approach Delay, s/veh		13.1			12.3			381.5			32.1	
Approach LOS		B			B			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		65.0		40.0		65.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		35.5		60.5		35.5		60.5
Max Q Clear Time (g_c+I1), s		37.5		14.6		22.6		17.7
Green Ext Time (p_c), s		0.0		10.4		6.0		10.3

Intersection Summary	
HCM 2010 Ctrl Delay	118.6
HCM 2010 LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	30	430	1115	135	30	190	628	134	158	628	120	163	395	140
Future Volume (veh/h)	30	430	1115	135	30	190	628	134	158	628	120	163	395	140
Number		7	4	14		3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		0.99		1.00		0.87	1.00		0.95	1.00		0.85
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow, veh/h/ln		1863	1847	1900		1863	1863	1900	1397	1833	1900	1863	1810	1900
Adj Flow Rate, veh/h		453	1174	126		200	661	98	166	661	101	172	416	133
Adj No. of Lanes		1	3	0		1	3	0	1	2	0	1	2	0
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	36	4	4	2	6	6
Cap, veh/h		238	1747	187		161	1417	205	181	911	139	161	602	188
Arrive On Green		0.27	0.76	0.76		0.09	0.33	0.33	0.14	0.30	0.30	0.09	0.26	0.26
Sat Flow, veh/h		1774	4619	496		1774	4239	614	1331	3004	458	1774	2336	729
Grp Volume(v), veh/h		453	854	446		200	526	233	166	383	379	172	304	245
Grp Sat Flow(s),veh/h/ln		1774	1681	1753		1774	1695	1462	1331	1741	1722	1774	1720	1345
Q Serve(g_s), s		21.5	20.2	20.2		14.5	19.5	20.2	19.7	31.4	31.5	14.5	25.5	26.5
Cycle Q Clear(g_c), s		21.5	20.2	20.2		14.5	19.5	20.2	19.7	31.4	31.5	14.5	25.5	26.5
Prop In Lane		1.00		0.28		1.00		0.42	1.00		0.27	1.00		0.54
Lane Grp Cap(c), veh/h		238	1271	663		161	1134	489	181	528	522	161	443	347
V/C Ratio(X)		1.90	0.67	0.67		1.24	0.46	0.48	0.92	0.72	0.73	1.07	0.68	0.71
Avail Cap(c_a), veh/h		238	1271	663		161	1134	489	195	528	522	161	443	347
HCM Platoon Ratio		2.00	2.00	2.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.74	0.74	0.74		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh		58.5	14.6	14.6		72.8	41.9	42.2	68.2	49.8	49.8	72.8	53.5	53.9
Incr Delay (d2), s/veh		416.6	2.1	4.0		151.2	1.4	3.3	40.3	8.4	8.6	89.5	8.1	11.2
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		38.0	9.4	10.1		13.9	9.3	8.6	9.3	16.3	16.2	11.1	13.1	11.0
LnGrp Delay(d),s/veh		475.1	16.7	18.6		224.0	43.3	45.5	108.5	58.2	58.4	162.3	61.6	65.1
LnGrp LOS		F	B	B		F	D	D	F	E	E	F	E	E
Approach Vol, veh/h			1753				959			928			721	
Approach Delay, s/veh			135.6				81.5			67.3			86.8	
Approach LOS			F				F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.0	20.0	66.0	27.3	46.7	27.0	59.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	14.5	48.5	14.5	60.5	23.5	39.5	21.5	53.5
Max Q Clear Time (g_c+I1), s	16.5	33.5	16.5	22.2	21.7	28.5	23.5	22.2
Green Ext Time (p_c), s	0.0	7.7	0.0	21.2	0.1	6.3	0.0	18.8

Intersection Summary	
HCM 2010 Ctrl Delay	101.1
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	453	198	0	0	0	0	633	590	170	510	0
Future Volume (veh/h)	70	453	198	0	0	0	0	633	590	170	510	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.85	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1847	1810				0	1810	1827	1863	1863	0
Adj Flow Rate, veh/h	75	487	-28				0	681	457	183	548	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	3	5				0	5	4	2	2	0
Cap, veh/h	82	532	515				0	1616	621	341	2055	0
Arrive On Green	0.33	0.33	0.00				0.00	0.47	0.47	0.07	0.58	0.00
Sat Flow, veh/h	245	1590	1538				0	3529	1322	1774	3632	0
Grp Volume(v), veh/h	562	0	-28				0	681	457	183	548	0
Grp Sat Flow(s),veh/h/ln	1835	0	1538				0	1719	1322	1774	1770	0
Q Serve(g_s), s	38.2	0.0	0.0				0.0	17.0	36.4	6.7	10.0	0.0
Cycle Q Clear(g_c), s	38.2	0.0	0.0				0.0	17.0	36.4	6.7	10.0	0.0
Prop In Lane	0.13		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	614	0	515				0	1616	621	341	2055	0
V/C Ratio(X)	0.92	0.00	-0.05				0.00	0.42	0.74	0.54	0.27	0.00
Avail Cap(c_a), veh/h	614	0	515				0	1616	621	418	2055	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.5	0.0	0.0				0.0	22.8	27.9	16.7	13.5	0.0
Incr Delay (d2), s/veh	20.6	0.0	0.0				0.0	0.8	7.6	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.9	0.0	0.0				0.0	8.2	14.5	3.3	5.0	0.0
LnGrp Delay(d),s/veh	62.1	0.0	0.0				0.0	23.6	35.5	18.0	13.8	0.0
LnGrp LOS	E							C	D	B	B	
Approach Vol, veh/h		534						1138			731	
Approach Delay, s/veh		65.3						28.4			14.9	
Approach LOS		E						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.4	66.6		49.0		81.0		
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	14.5	55.5		43.5		75.5		
Max Q Clear Time (g_c+I1), s	8.7	38.4		40.2		12.0		
Green Ext Time (p_c), s	0.2	10.2		1.2		17.7		

Intersection Summary	
HCM 2010 Ctrl Delay	32.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	210	270	250	113	600	0	0	460	80
Future Volume (veh/h)	0	0	0	210	270	250	113	600	0	0	460	80
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1863	1863	1624	1863	0	0	1847	1900
Adj Flow Rate, veh/h				219	281	260	118	625	0	0	479	76
Adj No. of Lanes				0	2	1	1	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	2	2	17	2	0	0	3	3
Cap, veh/h				629	875	652	344	1689	0	0	1103	174
Arrive On Green				0.42	0.42	0.42	0.06	0.48	0.00	0.00	0.36	0.36
Sat Flow, veh/h				1487	2071	1542	1547	3632	0	0	3123	478
Grp Volume(v), veh/h				263	237	260	118	625	0	0	276	279
Grp Sat Flow(s),veh/h/ln				1788	1770	1542	1547	1770	0	0	1755	1754
Q Serve(g_s), s				11.0	9.8	12.9	5.0	12.3	0.0	0.0	13.1	13.2
Cycle Q Clear(g_c), s				11.0	9.8	12.9	5.0	12.3	0.0	0.0	13.1	13.2
Prop In Lane				0.83		1.00	1.00		0.00	0.00		0.27
Lane Grp Cap(c), veh/h				756	748	652	344	1689	0	0	638	638
V/C Ratio(X)				0.35	0.32	0.40	0.34	0.37	0.00	0.00	0.43	0.44
Avail Cap(c_a), veh/h				756	748	652	436	1689	0	0	638	638
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.5	21.2	22.0	19.6	18.3	0.0	0.0	26.4	26.5
Incr Delay (d2), s/veh				1.3	1.1	1.8	0.6	0.6	0.0	0.0	2.1	2.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.7	5.0	5.8	2.2	6.1	0.0	0.0	6.7	6.8
LnGrp Delay(d),s/veh				22.8	22.3	23.9	20.2	18.9	0.0	0.0	28.6	28.6
LnGrp LOS				C	C	C	C	B			C	C
Approach Vol, veh/h					760			743			555	
Approach Delay, s/veh					23.0			19.1			28.6	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			12.5	45.5		52.0
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5
Max Green Setting (Gmax), s		52.5			13.5	33.5		46.5
Max Q Clear Time (g_c+I1), s		14.3			7.0	15.2		14.9
Green Ext Time (p_c), s		10.4			0.1	7.9		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	23.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	344	100	110	344	40	90	540	260	30	340	185
Future Volume (veh/h)	150	344	100	110	344	40	90	540	260	30	340	185
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	0.98		0.95	0.96		0.93	0.98		0.91
Parking Bus, Adj	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1855	1900	1900	1863	1900	1900	1861	1900
Adj Flow Rate, veh/h	160	366	71	117	366	37	96	574	150	32	362	96
Adj No. of Lanes	0	2	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	621	122	142	364	34	172	906	239	100	983	259
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	426	1378	272	172	808	75	255	2175	575	98	2360	622
Grp Volume(v), veh/h	218	0	379	520	0	0	417	0	403	257	0	233
Grp Sat Flow(s),veh/h/ln	625	0	1452	1055	0	0	1461	0	1544	1568	0	1511
Q Serve(g_s), s	0.0	0.0	13.2	17.3	0.0	0.0	8.9	0.0	14.0	0.4	0.0	7.2
Cycle Q Clear(g_c), s	19.1	0.0	13.2	30.5	0.0	0.0	16.1	0.0	14.0	14.4	0.0	7.2
Prop In Lane	0.73		0.19	0.22		0.07	0.23		0.37	0.12		0.41
Lane Grp Cap(c), veh/h	374	0	654	540	0	0	674	0	643	713	0	630
V/C Ratio(X)	0.58	0.00	0.58	0.96	0.00	0.00	0.62	0.00	0.63	0.36	0.00	0.37
Avail Cap(c_a), veh/h	374	0	654	540	0	0	945	0	924	994	0	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	13.8	21.1	0.0	0.0	16.0	0.0	15.6	13.4	0.0	13.6
Incr Delay (d2), s/veh	2.3	0.0	1.3	29.3	0.0	0.0	0.9	0.0	1.0	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.0	5.5	13.9	0.0	0.0	6.5	0.0	6.1	3.3	0.0	3.0
LnGrp Delay(d),s/veh	17.2	0.0	15.1	50.4	0.0	0.0	16.9	0.0	16.6	13.7	0.0	14.0
LnGrp LOS	B		B	D			B		B	B		B
Approach Vol, veh/h		597			520			820			490	
Approach Delay, s/veh		15.9			50.4			16.8			13.8	
Approach LOS		B			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.7		35.0		32.7		35.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.5		30.5		40.5		30.5
Max Q Clear Time (g_c+I1), s		18.1		21.1		16.4		32.5
Green Ext Time (p_c), s		10.1		5.3		10.5		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			23.2
HCM 2010 LOS			C

APPENDIX D: SIGNAL WARRANT ANALYSIS

FEHR PEERS

			Project	HPHA N School St TIAR
Major Street	N School Street		Scenario	Future (2029) Baseline
Minor Street	Kokea Street		Peak Hour	AM

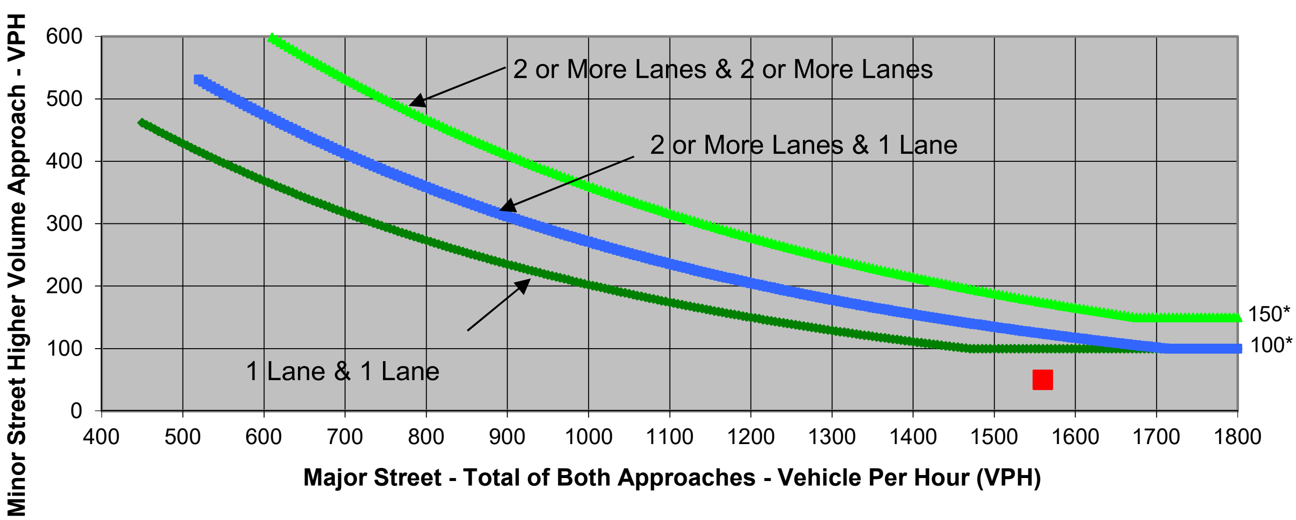
Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,130	390
Right	0	0	30	0
Total	50	0	1,160	400

Major Street Direction

	North/South
X	East/West

Warrant 3B, Peak Hour



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	N School Street	Kokea Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,560**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

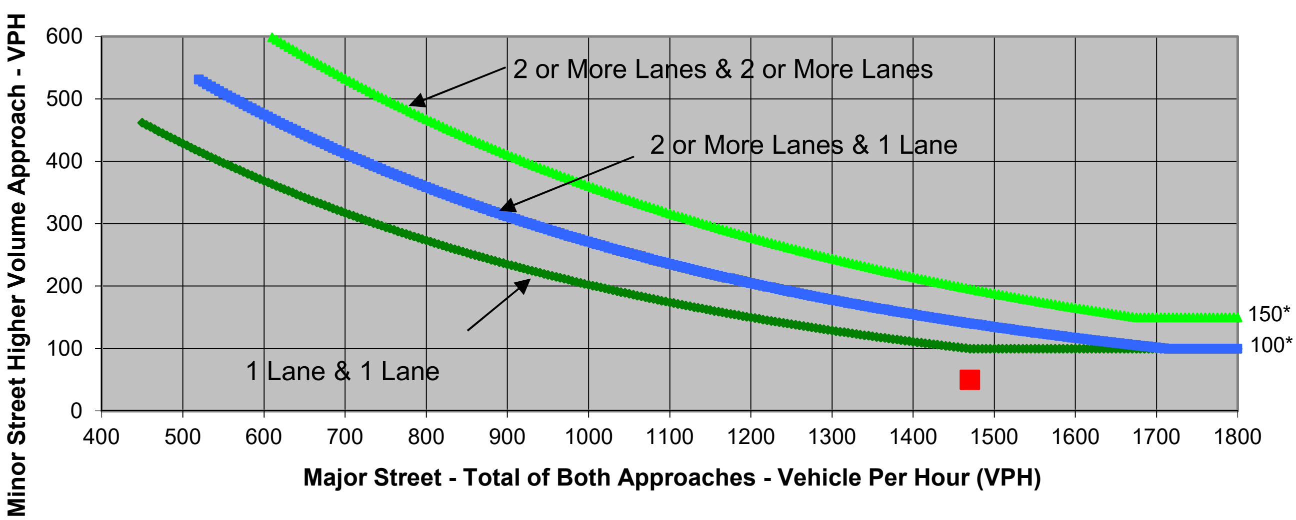
Major Street	N School Street		Project	HPHA N School St TIAR
Minor Street	Kokea Street		Scenario	Future (2029) Baseline
			Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	800	610
Right	0	0	40	0
Total	50	0	840	630

Major Street Direction

	North/South
X	East/West



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street N School Street	Minor Street Kokea Street	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,470**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	N School Street	Project	BYU-Hawaii Campus Expansion TIAR
Minor Street	Kokea Street	Scenario	Future (2029) Baseline
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,130	390
Right	0	0	30	0
Total	50	0	1,160	400

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	43.7
Approach with Worst Case Delay	EB
Total Vehicles on Approach	1,160

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Future (2029) Baseline	**14.1**	**50**	**1,610**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

			Project	BYU-Hawaii Campus Expansion TIAR
Major Street	N School Street		Scenario	Future (2029) Baseline
Minor Street	Kokea Street		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	800	610
Right	0	0	40	0
Total	50	0	840	630

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	44.8
Approach with Worst Case Delay	EB
Total Vehicles on Approach	840

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Future (2029) Baseline	**10.5**	**50**	**1,520**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

Major Street	N School Street
Minor Street	Kokea Street

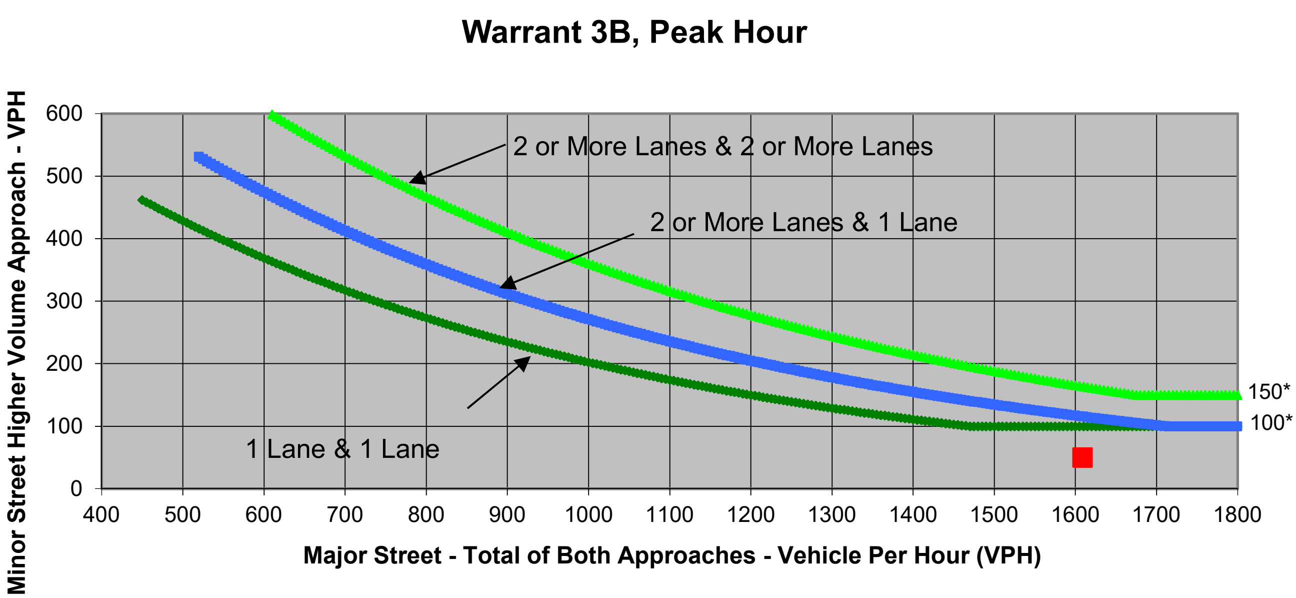
Project	HPHA N School St TIAR
Scenario	Future (2029) + 1,000 Senior
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,145	424
Right	0	0	30	0
Total	50	0	1,175	434

Major Street Direction

	North/South
X	East/West



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street N School Street	Minor Street Kokea Street	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,609**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

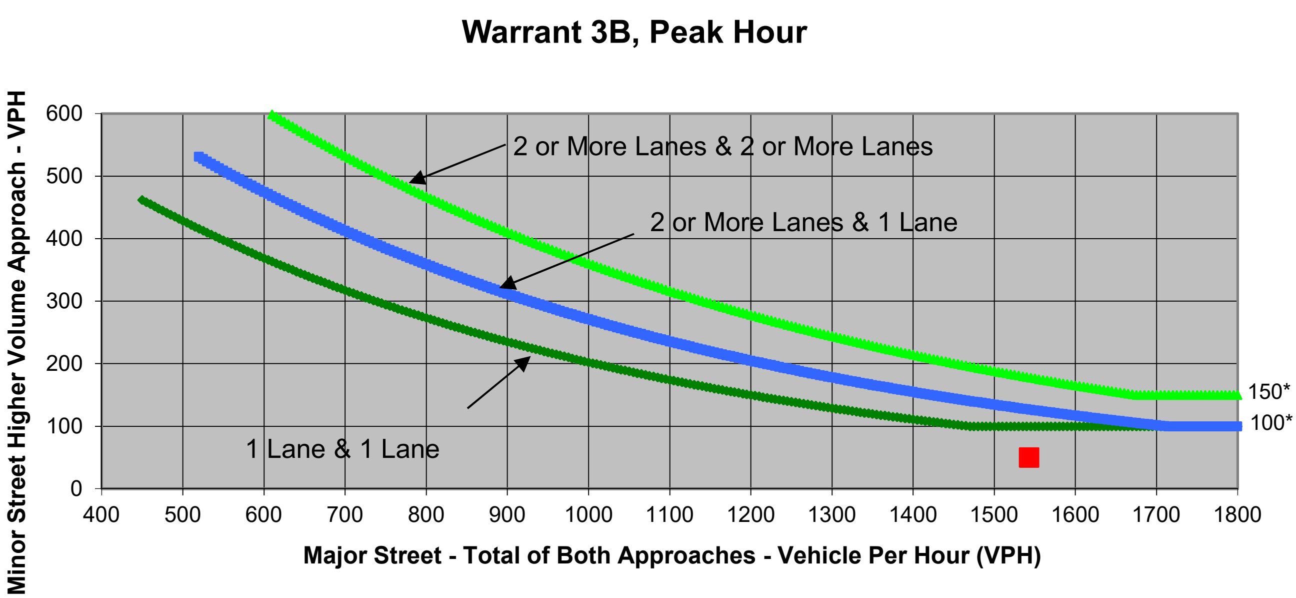
			Project	HPHA N School St TIAR
Major Street	N School Street		Scenario	Future (2029) + 1,000 Senior
Minor Street	Kokea Street		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	841	642
Right	0	0	40	0
Total	50	0	881	662

Major Street Direction

	North/South
X	East/West



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street N School Street	Minor Street Kokea Street	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,543**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	N School Street	Project	BYU-Hawaii Campus Expansion TIAR
Minor Street	Kokea Street	Scenario	Future (2029) + 1,000 Senior
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,145	424
Right	0	0	30	0
Total	50	0	1,175	434

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	43.7
Approach with Worst Case Delay	EB
Total Vehicles on Approach	1,175

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Future (2029) + 1,000 Senior	**14.3**	**50**	**1,659**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	N School Street	Project	BYU-Hawaii Campus Expansion TIAR
Minor Street	Kokea Street	Scenario	Future (2029) + 1,000 Senior
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	841	642
Right	0	0	40	0
Total	50	0	881	662

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	44.8
Approach with Worst Case Delay	EB
Total Vehicles on Approach	881

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Future (2029) + 1,000 Senior	**11**	**50**	**1,593**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

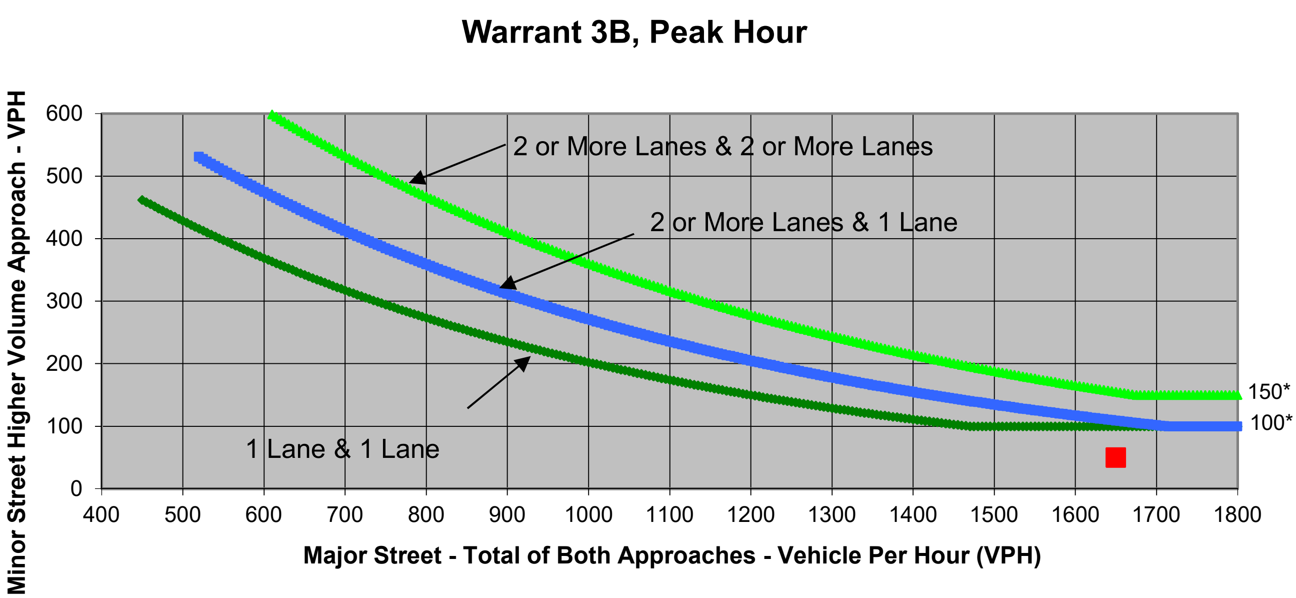
			Project	HPHA N School St TIAR
Major Street	N School Street		Scenario	Future (2029) + 600 Family & 400 Se
Minor Street	Kokea Street		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,148	462
Right	0	0	30	0
Total	50	0	1,178	472

Major Street Direction

	North/South
X	East/West



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street N School Street	Minor Street Kokea Street	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,650**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

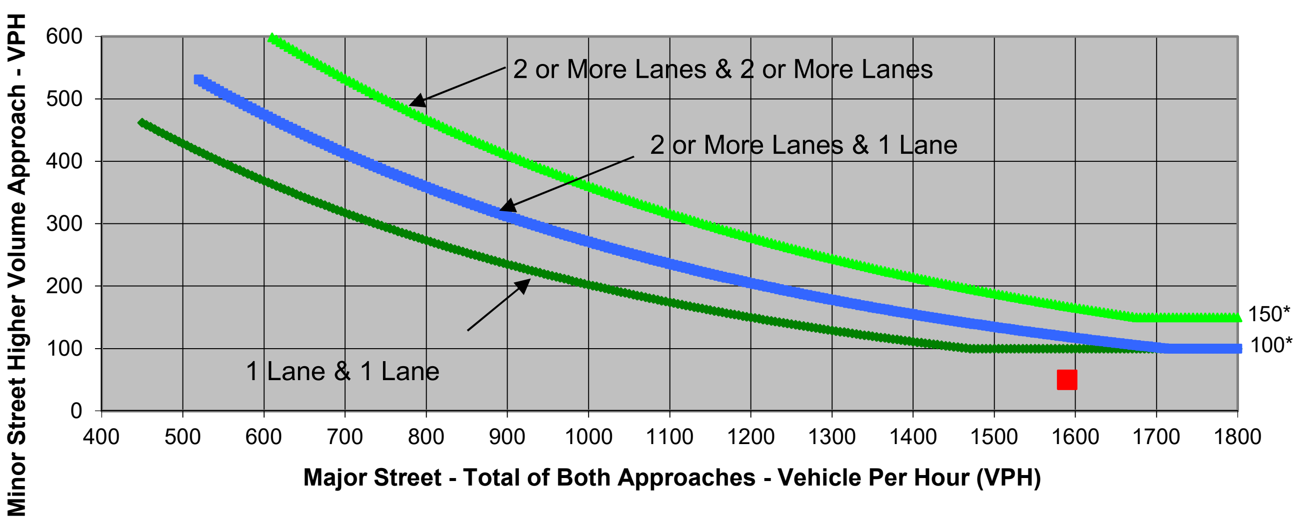
Major Street	N School Street	Project	HPHA N School St TIAR
Minor Street	Kokea Street	Scenario	Future (2029) + 600 Family & 400 Se
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	877	653
Right	0	0	40	0
Total	50	0	917	673

Major Street Direction

	North/South
X	East/West



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street N School Street	Minor Street Kokea Street	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,590**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

		Project	BYU-Hawaii Campus Expansion TIAR
Major Street	N School Street	Scenario	Future (2029) + 1,000 Senior
Minor Street	Kokea Street	Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	10
Through	0	0	1,148	462
Right	0	0	30	0
Total	50	0	1,178	472

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	43.7
Approach with Worst Case Delay	EB
Total Vehicles on Approach	1,178

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Future (2029) + 1,000 Senior	**14.3**	**50**	**1,700**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	N School Street
Minor Street	Kokea Street

Project	BYU-Hawaii Campus Expansion TIAR
Scenario	Future (2029) + 1,000 Senior
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	0	0	20
Through	0	0	877	653
Right	0	0	40	0
Total	50	0	917	673

Major Street Direction

	North/South
X	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	44.8
Approach with Worst Case Delay	EB
Total Vehicles on Approach	917

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Future (2029) + 1,000 Senior	**11.4**	**50**	**1,640**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

APPENDIX M
Draft Traffic Management Plan

Draft Traffic Management Plan

Hawaiʻi Public Housing Authority Administrative Offices Redevelopment

Prepared by:

PBR HAWAII & ASSOCIATES, INC.

December 2017

DRAFT TRAFFIC MANAGEMENT PLAN

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Background

The proposed HPHA Administrative Offices Redevelopment project is located on the site of the existing HPHA Administrative Offices (see Figure 1). The project site is located on the island of Oʻahu in the State of Hawaiʻi and is most closely associated with two ahupuaʻa, Kalihi and Kapālama. This EIS will refer to the general region as Lanakila. The site consists of a portion of one parcel identified as TMK: 1-7-029:003 (por.), a 6-acre site owned by the Hawaiʻi Public Housing Authority (HPHA) of the State of Hawaiʻi, with Ahiahi Place bisecting it. The property is bound by two existing roadways: North School Street and Lanakila Avenue (see Figure 2).

The Hawaiʻi Public Housing Authority (HPHA) will be partnering with Retirement Housing Foundation under a master development agreement to replace HPHA's existing offices with new offices, mixed-income, age-restricted senior housing, and some commercial uses. Market-rate rental units, targeted for roughly a fifth of the proposed 1,000 units, are proposed in the development to help offset development and affordable units.

The Draft EIS was preceded by the *Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment Environmental Impact Statement Preparation Notice* (EISPN). HPHA submitted the EISPN to the State of Hawaiʻi Office of Environmental Quality Control (OEQC) on August 10, 2017. Notice of the availability of the EISPN was published in the August 23, 2017 edition of the OEQC's *The Environmental Notice*, and was also posted on the OEQC website. Copies of the EISPN were provided to various government agencies, elected officials, utilities, regional public libraries, media outlets, and other individuals and community organizations. (See Section 9.2.1 for the complete list.) The public comment period for the EISPN began on August 23, 2017 and ended on September 22, 2017. A public scoping meeting was held on September 12, 2017.

During the EISPN Public Review period, the City and County of Honolulu Department of Planning & Permitting Site Development Division wrote:

> "…a traffic management plan (TMP) should be included with the DEIS documents…and the TMP should be submitted at the time of the certificate of occupancy of the buildings."

During the EISPN Public Review period, the City and County of Honolulu Department of Transportation Services wrote:

> *4. The Environmental Impact Statement (EIS) should have a Traffic Management Plan (TMP) which includes the following:*
>
> *a. A discussion of the traffic impacts that the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.*
>
> *b. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.*
>
> *c. Construction schedules should be coordinated with other nearby properties that have planned projects to ensure minimal impacts on City streets.*

d. Inform employees, residents and visitors of the City's vanpool, car share, and bikeshare programs to promote alternate modes of transportation.

e. Consider providing subsidized transit passes to employees and residents to encourage use of public transit.

f. Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

g. The TMP shall be jointly reviewed and accepted by the City's Department of Transportation Services and the Department of Planning and Permitting.

This Draft Traffic Management Plan (TMP) is intended to address comments from both the City and County of Honolulu Department of Transportation Services and the Department of Planning & Permitting, Site Development Division.

1.0 TRAFFIC AND OTHER TRANSPORTATION IMPACTS

Fehr and Peers prepared a transportation impact analysis report (TIAR) for the proposed Hawai`i Public Housing Authority (HPHA) Administrative Offices redevelopment in the Lanakila neighborhood. The proposed project would replace existing HPHA Administrative Office property into a mixed-use development comprising residential, office, and retail uses. The project will include up to 800 residential units, replacement of the existing HPHA Administrative Office Building, and up to 10,000 square feet (s.f.) of retail and commercial uses. While only 800 all-Senior units is proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

The project site is bounded by N School Street on the makai side and Lanakila Avenue on the Diamond Head side. The project is projected to be fully constructed and occupied by Year 2029.

The impacts of the proposed project to the surrounding transportation system were evaluated following guidelines established by the City & County of Honolulu Department of Planning & Permitting (DPP) Traffic Review Branch (TRB) and the Hawaii Depart of Transportation – Highways Division (HDOT). The operations of 14 existing key intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2016), as well as for Future (2029) conditions without and with the project.

The project's trip generation estimates were developed using MainStreet, a web application developed by Fehr & Peers that uses the Mixed-Use (MXD+) Trip Generation Model. This MXD model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain to the project site, as well as external transit, walk and vehicle mode splits. The vehicle trip reductions (i.e. walking, biking, transit). Based on this method, the proposed project is estimated to generate the following net new vehicle trips:

- <u>1,000 Senior Units:</u> a total of 2,869 daily trips, including 147 trips during the AM peak hour (47 inbound/100 outbound), and 227 trips during the PM peak hour (125 inbound/102 outbound)
- <u>400 Non-Age Restricted & 400 Senior Units:</u> a total of 4,305 daily trips, including 272 during the AM peak hour (54 inbound/215 outbound), and 372 trips during the PM peak hour (236 inbound/136 outbound)

Table 1, shows the intersection impacts and under which project scenario those impacts would be triggered, the type of project impact (i.e. cumulative or project specific), and the recommended mitigation measures to mitigate those impacts.

Table 1: PROJECT IMPACTS

Intersection	Future Plus 1,000 Senior	Future Plus 600 Non-Age Restricted & 400 Senior	Impact Type	Potential Traffic Mitigation Measures
1. N School Street/Kalihi Street	X	X	Cumulative	Optimize signal timings <u>or</u> change westbound left-turn phasing to "protected permitted" phasing
5. N School Street/HPHA Driveway	X	X	Project Specific	Install a traffic signal.
10. N School Street/Palama Street – Alaneo Street	X	X	Cumulative	Restripe the northbound and southbound approaches on Palama Street and Alaneo Street to include a separate left and shared through/right lane.
11. Vineyard Boulevard/Liliha Street	X	X	Cumulative	Add a second eastbound left-turn lane on N Vineyard Boulevard

Source: Fehr & Peers, 2017

All four (4) impacts would be triggered under both project scenarios. To reduce the project's transportation impact, the implementation of travel demand management (TDM) strategies is recommended to reduce the number of vehicle trips and increase the use of alternative modes. TDM strategies that could be considered include incentivizing residents and employees to carpool and take transit, providing secure on-site bicycle storage facilities, and developing parking management plans.

Overall, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes, and the safety enhancements described above. The project is also expected to not conflict with any existing facilities and planned improvements. Thus, the project's impacts to pedestrian, bicycle, and transit facilities and services are therefore considered.

2.0 CONSTRUCTION-RELATED TRAFFIC IMPACT MITIGATION

Short-term traffic impacts will result during construction for both onsite and offsite improvements. Traffic may be impacted when materials and equipment are transported to the site. Coordination with State and City roadway officials will be done in advance of any construction and will include a traffic management plan for each phase of construction. It will detail any road or lane closures and potential impacts to any of the bus stops should they be required and the construction team will work closely with the State and City on appropriate solutions to mitigate those impacts. Possible mitigation measures include:

- Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

- Construction schedules should be coordinated with other nearby properties that have planned projects to ensure minimal impacts on City streets.

- A street usage permit from the City's Department of Transportation Services should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

- Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

- The area Neighborhood Board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

- Best Management Practice controls should be included at construction site to prevent trailing of dirt and debris on City roadways.

- Any damage to the existing roadway, sidewalk or shoulder area caused by the project should be repaired to current City standards.

3.0 OPERATIONS-RELATED TRAFFIC IMPACT MITIGATION

3.1 Traffic Demand Management

In addition to roadway improvements to accommodate additional vehicle demand, the proposed project could implement some transportation demand management (TDM) strategies to reduce overall site-generated traffic volumes. Application of TDM strategies that could lead to vehicle trip reduction, use of alternative modes, and better traffic management at the site could include, but are not limited to:

- Implementation of a detailed TDM program for residents and retail employees, which would be managed by a TDM coordinator who would organize and coordinate monitoring efforts, parking and traffic management plans, and the implementation of TDM and recommendations and modifications.
- Provision of a transportation kiosk and on-line portal for information on ride-sharing, transit (Figure 3), bicycling (Figure 4), walking, and options for accessing the site without using a private automobile.
- To ensure that the project development does not affect public transit services (bus operations, bus routes, bus stops and para-transit operations); submit project plans to DTS-Public Transit Division (PTD) for review and approval. Contact DTS-PTD at 768-8396, 768-8370, 768-8374 or TheBusStop@honolulu.gov.
- Partial or fully subsidized transit passes for on-site employees and/or residents.
- Provision of bicycle racks adjacent to retail development, at communal open space, and residential buildings within the project site.
- Dedicating space on the property frontage to accommodate a future Biki bike share station
- Unbundling parking from apartment units to reduce rental costs for some units and to incentivize use of non-auto travel modes.

3.2 Complete Streets

Complete Streets are part of a transportation and design approach that aim to create a comprehensive, integrated network of streets that are safe and convenient for all people whether traveling by foot, bicycle, transit, or automobile, and regardless of age or ability. Complete Streets move away from streets designed with a singular focus on automobiles toward a design approach that is context-sensitive, multimodal, and integrated with the community's vision and sense of place. The end result is a road network that provides safe travel, promotes public health, and creates stronger communities.

The City and County of Honolulu is committed to complete streets solutions that improve safety, accessibility, and comfort for all users, encourage physical activity, and reflect community needs and character.

In 2009, the State passed a law requiring all Counties and the State DOT to adopt a Complete Streets policy. In 2016, the City and County of Honolulu finalized its Complete Streets Design Manual and hired a Complete Streets Program Administrator to move toward implementation of improvements that make Honolulu's streets and neighborhoods safe and inviting for all users, regardless of age or ability.

The City and County of Honolulu is working to implement Complete Streets by updating policies, adopting guidelines, and applying these principles in all aspects of work. This includes incorporating Complete Streets features in roadway repaving projects, as well as location-specific improvements. We understand that School Street will undergo an analysis and plan for implementing Complete Streets, but as of this writing no details were available about the timing of the Complete Streets plans for School Street http://www.honolulu.gov/completestreets. The City's recommended Complete Streets improvements to School Street could have a significant impact on the design of the walkways, landscaping, and street furniture along the project's frontage along School Street.

Possible measures to mitigate impacts by applying Complete Streets principles include:

- Inform employees, residents and visitors of the City's vanpool, car share, and bikeshare programs to promote alternate modes of transportation.

- Consider providing subsidized transit passes to employees and residents to encourage use of public transit.

- There are many employees, residents and visitors that use the adjacent bus stop on School Street. Therefore, the Applicant should adopt the bus stop (i.e., be responsible for litter removal, cleaning and maintenance of bus stop shelter, benches and floor area) at no cost to the City.

- On-site bike racks, secure bike storage, and secure moped parking for the employees, residents and visitors should be included.

- Ensure that all existing pedestrian, bicycle and vehicle access is maintained with the highest safety measures.

- All parking needs for the proposed facility (residents, employees and visitors) should be handled on-site.

- All loading and unloading needs, including refuse and service delivery vehicles should be handled on-site, rather than on City roadways.

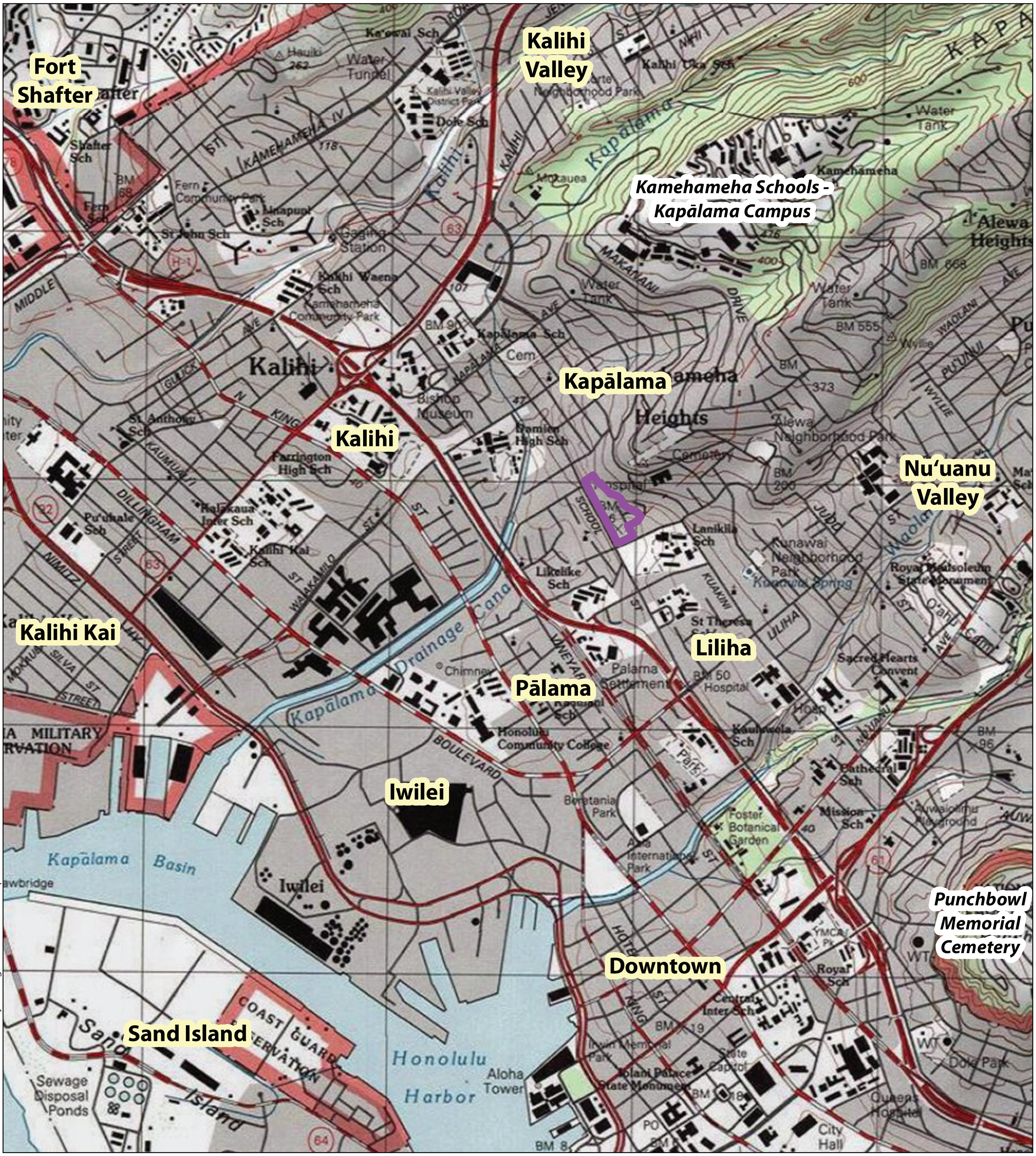
- The project should be designed to accommodate TheHandi-Van paratransit vehicles on-site, which require a minimum 31-foot turning radius, a 1 0-foot, 6-inch height clearance, and the ability to exit the site without reversing onto public roadways.

- All access driveways to the project site should be designed with the highest pedestrian and bicycle safety measures, constructed to current City standards, and meet Americans with Disabilities Act (ADA) requirements.

- Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by the Disability and Communication Access Board to ensure full compliance with the ADA.

3.3 Oahu Pedestrian Plan

The Oahu Pedestrian Plan is expected to be a long-term action plan to create vibrant, safe, and accessible streetscapes that serve as a model for the nation. The Plan will begin with an island-wide inventory of existing roadway pedestrian facilities to document their conditions and functionality for all pedestrians. The inventory will be followed by technical recommendations for pedestrian improvement projects and programs that are consistent with the City and County of Honolulu's Complete Streets Ordinance. Community engagement is important to ensure that the City has the best possible understanding of the issues roadway users face and to develop recommendations that reflect community needs and character. Opportunities for community input and review will be provided and regularly updated on the Complete Streets website's Oahu Pedestrian Plan page.



PDF: Q:\Oahu\HPHA\PDF\Regional Location (USGS base).pdf
Path: Q:\Oahu\HPHA\GIS\Project\Regional Location Map.mxd

DATE: 10/24/2017

LEGEND

Project Site

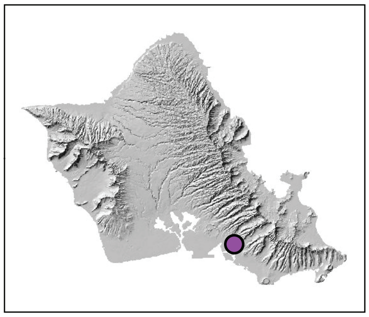


Figure 1:

Regional Location

HPHA Administrative Offices Redevelopment

Hawaiʻi Public Housing Authority

Island of Oʻahu

North

Linear Scale (feet)

0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2017. ESRI Online Basemaps.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

PDF: Q:\Oahu\HPHA\PDF\Public Facilities.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Public Facilities.mxd

DATE: 10/27/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway
- Fire Station
- Health Center
- Private School
- Public School
- Public Park

Figure 2:
Public Facilities

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority | Island of O'ahu

North

Linear Scale (feet)
0 125 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: State Department of Education, 2015. Hawaii Association of Independent Schools and State Office of Planning, 2011. City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

DATE: 10/26/2017

LEGEND

- Project Site
- Future Rail Station
- 1-mile radius from Future Rail Station
- Future Rail Line
- Bus Stop
- Bus Route

Source: City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

PDF: Q:\Oahu\HPHA\PDF\Bus Routes and Future Rail Lines.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Bus Routes and Future Rail Lines (revised).mxd

Figure 3:
Bus Routes and Future Rail Lines

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)
0 250 500 1,000

PBR HAWAII & ASSOCIATES, INC.

PDF: Q:\Oahu\HPHA\PDF\Bicycle Routes.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Bicycle Routes.mxd

DATE: 10/26/2017

LEGEND

Project Site

Existing Bicycle Routes

Proposed Bicycle Routes

Source: City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 4:
Bicycle Routes

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority

Island of O'ahu

North

Linear Scale (feet)
0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

APPENDIX N
Draft Construction Management Plan

Draft Construction Management Plan

Hawaiʻi Public Housing Authority
Administrative Offices Redevelopment

Prepared by:

PBR HAWAII & ASSOCIATES, INC.

December 2017

PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

Table of Contents

List of Figures

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Background

The proposed HPHA Administrative Offices Redevelopment project is located on the site of the existing HPHA Administrative Offices (see Figure 1). The project site is located on the island of Oʻahu in the State of Hawaiʻi and is most closely associated with two ahupuaʻa, Kalihi and Kapālama. This EIS will refer to the general region as Lanakila. The site consists of a portion of one parcel identified as TMK: 1-7-029:003 (por.), a 6-acre site owned by the Hawaiʻi Public Housing Authority (HPHA) of the State of Hawaiʻi, with Ahiahi Place bisecting it. The property is bound by two existing roadways: North School Street and Lanakila Avenue (see Figure 2).

The Hawaiʻi Public Housing Authority (HPHA) will be partnering with Retirement Housing Foundation under a master development agreement to replace HPHA's existing offices with new offices, mixed-income, age-restricted senior housing, and some commercial uses. Market-rate rental units, targeted for roughly a fifth of the proposed 1,000 units, are proposed in the development to help offset development and affordable units.

The Draft EIS was preceded by the *Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment Environmental Impact Statement Preparation Notice* (EISPN). HPHA submitted the EISPN to the State of Hawaiʻi Office of Environmental Quality Control (OEQC) on August 10, 2017. Notice of the availability of the EISPN was published in the August 23, 2017 edition of the OEQC's *The Environmental Notice*, and was also posted on the OEQC website. Copies of the EISPN were provided to various government agencies, elected officials, utilities, regional public libraries, media outlets, and other individuals and community organizations. (See Section 9.2.1 for the complete list.) The public comment period for the EISPN began on August 23, 2017 and ended on September 22, 2017. A public scoping meeting was held on September 12, 2017.

During the EISPN Public Review period, the City and County of Honolulu Department of Planning & Permitting Site Development Division wrote:

> *"A preliminary construction management plan (CMP)…should be included with the DEIS documents. The final CMP should be submitted at the time of the issuance of the building permit…"*

This Preliminary Construction Management Plan (CMP) is intended to address comments from the City and County of Honolulu Department of Planning & Permitting, Site Development Division.

1.0 CONSTRUCTION SCHEDULE

The timeline for the proposed HPHA Administrative Offices Redevelopment project is ongoing and is contingent upon of Environmental Impact Statement (EIS) acceptance, permit approvals, market forces, and funding and financing. However, for the purposes of this Preliminary CMP, the onsite construction is estimated to be completed in five phases estimated at roughly two years per phase for a total construction period of at least ten years.

The first phase is proposed at the northern end of the site, in order to reduce disruptions to the current operations of the HPHA Administrative Offices. This phase will include the construction of the replacement offices.

2.0 TRAFFIC AND OTHER TRANSPORTATION IMPACTS

Fehr and Peers prepared a transportation impact analysis report (TIAR) for the proposed Hawai`i Public Housing Authority (HPHA) Administrative Offices redevelopment in the Lanakila neighborhood. The proposed project would replace existing HPHA Administrative Office property into a mixed-use development comprising residential, office, and retail uses. The project will include up to 800 residential units, replacement of the existing HPHA Administrative Office Building, and up to 10,000 square feet (s.f.) of retail and commercial uses. While only 800 all-Senior units is proposed, this study analyzed two project alternatives for the type of residential units to be constructed:

- 1,000 Senior Units
- 600 Non-Age Restricted Mixed-Income Units and 400 Senior Units

The project site is bounded by N School Street on the makai side and Lanakila Avenue on the Diamond Head side. The project is projected to be fully constructed and occupied by Year 2029.

The impacts of the proposed project to the surrounding transportation system were evaluated following guidelines established by the City & County of Honolulu Department of Planning & Permitting (DPP) Traffic Review Branch (TRB) and the Hawaii Depart of Transportation – Highways Division (HDOT). The operations of 14 existing key intersections were evaluated during the weekday morning (AM) and evening (PM) peak hours for Existing (2016), as well as for Future (2029) conditions without and with the project.

The project's trip generation estimates were developed using MainStreet, a web application developed by Fehr & Peers that uses the Mixed-Use (MXD+) Trip Generation Model. This MXD model was developed by Fehr & Peers and the Environmental Protection Agency (EPA) and is based on statistically superior data compared to the methodology used by ITE. The model recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, travel proximity, and scale of development. The model estimates the percentage of daily and peak hour trips that remain to the project site, as well as external transit, walk and vehicle mode splits. The vehicle trip reductions (i.e. walking, biking, transit). Based on this method, the proposed project is estimated to generate the following net new vehicle trips:

- 1,000 Senior Units: a total of 2,869 daily trips, including 147 trips during the AM peak hour (47 inbound/100 outbound), and 227 trips during the PM peak hour (125 inbound/102 outbound)
- 400 Non-Age Restricted & 400 Senior Units: a total of 4,305 daily trips, including 272 during the AM peak hour (54 inbound/215 outbound), and 372 trips during the PM peak hour (236 inbound/136 outbound)

TABLE 1, shows the intersection impacts and under which project scenario those impacts would be triggered, the type of project impact (i.e. cumulative or project specific), and the recommended mitigation measures to mitigate those impacts.

TABLE 1: PROJECT IMPACTS

Intersection	Future Plus 1,000 Senior	Future Plus 600 Non-Age Restricted & 400 Senior	Impact Type	Potential Traffic Mitigation Measures
1. N School Street/Kalihi Street	X	X	Cumulative	Optimize signal timings or change westbound left-turn phasing to "protected permitted" phasing
5. N School Street/HPHA Driveway	X	X	Project Specific	Install a traffic signal.
10. N School Street/Palama Street – Alaneo Street	X	X	Cumulative	Restripe the northbound and southbound approaches on Palama Street and Alaneo Street to include a separate left and shared through/right lane.
11. Vineyard Boulevard/Liliha Street	X	X	Cumulative	Add a second eastbound left-turn lane on N Vineyard Boulevard

Source: Fehr & Peers, 2017

All four (4) impacts would be triggered under both project scenarios. To reduce the project's transportation impact, the implementation of travel demand management (TDM) strategies is recommended to reduce the number of vehicle trips and increase the use of alternative modes. TDM strategies that could be considered include incentivizing residents and employees to carpool and take transit, providing secure on-site bicycle storage facilities, and developing parking management plans.

Overall, the proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing or planned facilities. In addition, the project is expected to enhance multi-modal facilities and services, especially with the promotion of the use of passive and active spaces and non-motorized modes, and the safety enhancements described above. The project is also expected to not conflict with any existing facilities and planned improvements. Thus, the project's impacts to pedestrian, bicycle, and transit facilities and services are therefore considered.

3.0 CONSTRUCTION MANAGEMENT

The construction work is intended to be performed by the General Contractor (GC) and its various subcontractors, who will complete the site work and entire project. The GC will establish an on-site Construction Management Office to:

- oversee and coordinate construction activities, staging and scheduling;
- work with neighboring properties and HPHA as necessary to minimize impacts on existing operations and activities; and
- manage a public information program.

A designated Construction Manager (CM) will manage the GC and ensure the GC is responsible for the following items related to traffic control:

- Conformance with the Traffic Management Plan (TMP) and schedule of activities.
- Resolve traffic management conflicts, if applicable, that may arise between construction crews if actual progress or traffic control measures deviate from the planned schedules and traffic control plans during the course of construction.
- Coordinate construction activities and traffic control plans with other construction projects in the vicinity to minimize overall area traffic impact, if applicable.

The CM will also be responsible for overseeing the Public Information Program (discussed in Section 4.0 below), the duties for which include:

- Maintain the Project "Hotline" and email for receiving questions and complaints.
- Prepare and distribute project updates and construction notices via various media and the Liliha/Puunui/Alewa/Kamehameha Heights Neighborhood Board No. 14 (NB), including, if required, warning signage for pedestrians, and motorists.
- Maintain a public information and complaint action log to document and ensure timely responses to comments, questions, and complaints.
- Follow up on public complaints.
- Investigate potential modifications to the construction work to the extent appropriate and feasible.

- Respond to each complaint regarding the actions taken or reasons why no action could be taken.
- Attend NB meetings regularly to provide periodic updates on construction progress.
- Notify first responders (Emergency Medical Service, Fire Department and Police Department) about major changes to traffic as a result of construction.

4.0 PUBLIC INFORMATION PROGRAM

The Public Information Program will consist of the following elements:

- Project website or Facebook page to provide updates.
- Email blasts to provide updates.
- Project "Hotline" (telephone and voicemail) and email for receiving questions and complaints.
- Presentations to the NB
- Warning signage for pedestrians, and motorists.
- Public information and complaint action log to document and ensure timely responses to comments, questions, and complaints.

5.0 CONSTRUCTION-RELATED TRAFFIC IMPACT MITIGATION

Large construction vehicles are anticipated to access the project site during demolition and construction of the project. Short-term traffic impacts will result during construction for both onsite and offsite improvements. Traffic may be impacted when materials and equipment are transported to the site. Coordination with State and City roadway officials will be done in advance of any construction and will include a traffic management plan (TMP). The City and County of Honolulu Department of Planning and Permitting wrote that "…the TMP should be submitted at the time of the certificate of occupancy of the buildings." It will detail any road or sidewalk closures and potential impacts to any of the bus stops should they be required and the construction team will work closely with the State and City on appropriate solutions to mitigate those impacts. Possible mitigation measures include:

- Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

- Construction schedules should be coordinated with other nearby properties that have planned projects to ensure minimal impacts on City streets.

- A street usage permit from the City's Department of Transportation Services should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

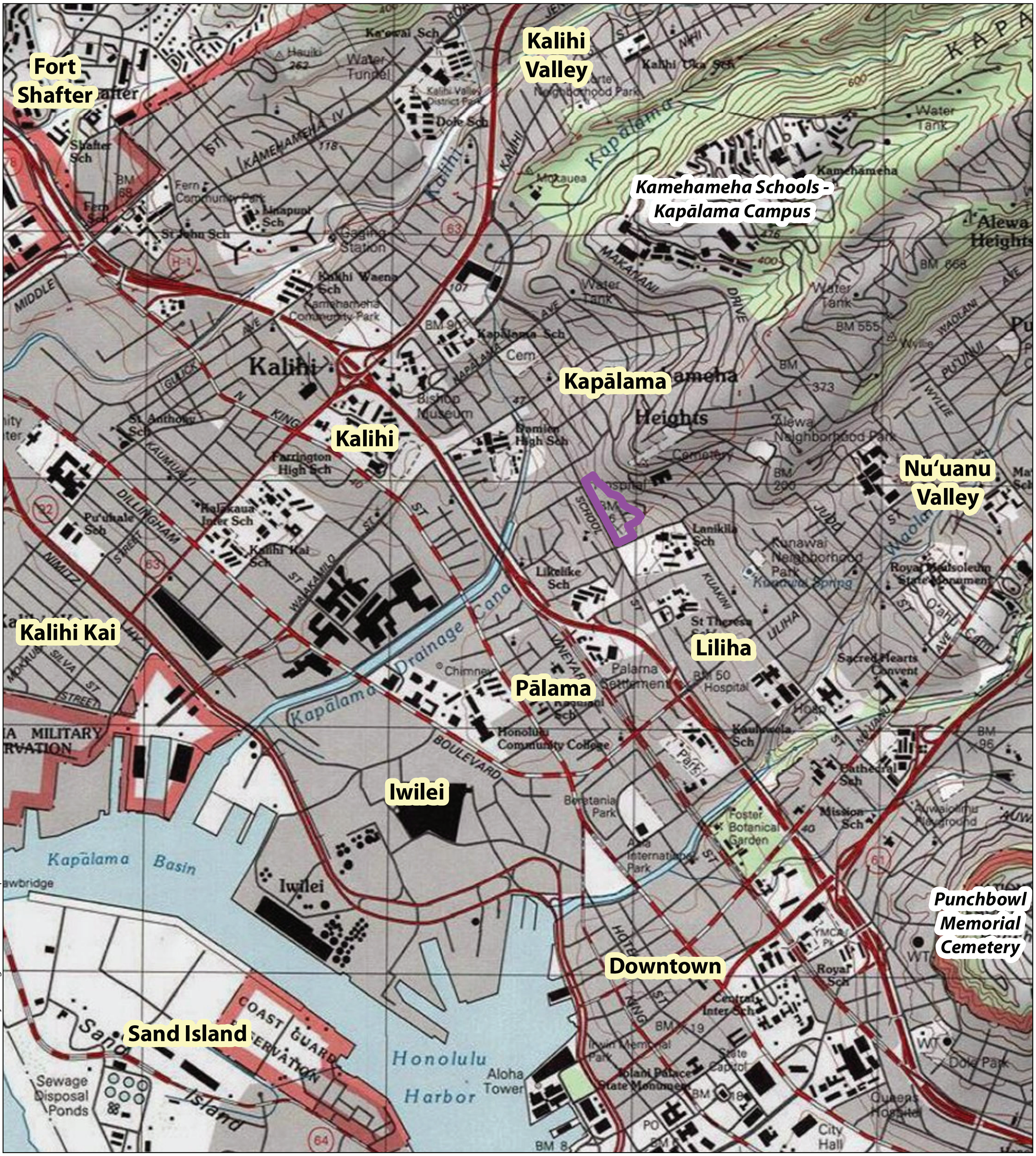
- Clear delineation supported by directional signage will be placed at strategic locations to inform users of the available pedestrian routes surrounding the property. These routes will be made safe following acceptable safety standards for all users and may include covered walkways, barricades and supplemental protection screening as necessary, and as determined by the CM.

- Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

- The area NB, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

- Best Management Practice controls should be included at construction site to prevent trailing of dirt and debris on City roadways.

- Any damage to the existing roadway, sidewalk or shoulder area caused by the project should be repaired to current City standards.



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DATE: 10/24/2017

LEGEND

Project Site

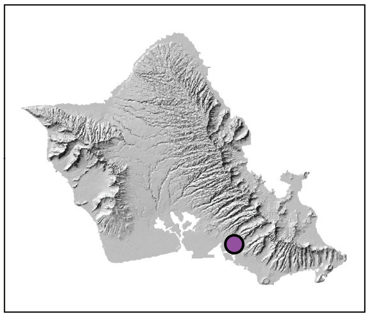


Figure 1:

Regional Location

HPHA Administrative Offices Redevelopment

Hawaiʻi Public Housing Authority

Island of Oʻahu

North

Linear Scale (feet)

0 500 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2017. ESRI Online Basemaps.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

PDF: Q:\Oahu\HPHA\PDF\Public Facilities.pdf
Path: Q:\Oahu\HPHA\GIS\Project\Public Facilities.mxd

DATE: 10/27/2017

LEGEND

- Project Site
- Tax Parcels
- Roadway
- Fire Station
- Health Center
- Private School
- Public School
- Public Park

Figure 2:
Public Facilities

HPHA Administrative Offices Redevelopment

Hawai'i Public Housing Authority — Island of O'ahu

North

Linear Scale (feet): 0, 125, 250, 500

PBR HAWAII & ASSOCIATES, INC.

Source: State Department of Education, 2015. Hawaii Association of Independent Schools and State Office of Planning, 2011. City and County of Honolulu, 2017. ESRI Online Basemaps, 2016.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

APPENDIX O

EISPN Comments and Response Letters

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
1845 Wasp Boulevard, Building 176
Honolulu, Hawaii 96818
Phone: (808) 690-9600/Fax: (808) 690-9599

September 20, 2017

Mr. Greg Nakai, Planner
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaiʻi 96813

Dear Mr. Nakai:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for the Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment, Honolulu, Hawaiʻi, Tax Map Key: 1-6-009:003 (por.)

Thank you for your letter regarding availability of the subject EISPN for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document.

We appreciate the opportunity to participate in the review process.

Sincerely,

SSA

Stephen S. Anthony
Center Director

cc: Mr. Hakim Ouansafi, Executive Director
Hawaiʻi Public Housing Authority
1002 North School Street
Honolulu, Hawaiʻi 96813

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Stephen Anthony
Center Director
U.S. Geological Survey
Pacific Islands Water Science Center
1845 Wasp Boulevard, Building 176
Honolulu, Hawai‘i 96818

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Anthony:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 20, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge that the U.S. Geological Survey (USGS) Pacific Islands Water Science Center is unable to review the Environmental Impact Statement Preparation Notice (EISPN) and thus has no comments to offer relative to the project at this time. Your letter will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DAVID Y. IGE
GOVERNOR

RODERICK K. BECKER
Comptroller

AUDREY HIDANO
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

SEP 15 2017

(P)1306.7

Mr. Greg Nakai, Planner
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hi 96813

Dear Mr. Nakai:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment, Kalihi, Oahu, Hawaii
TMK: (1) 1-6-009:003 (por.)

Thank you for the opportunity to provide comments for the subject project. The State of Hawaii owns and operates the Lanakila Multi-Purpose Senior Center and the Lanakila Health Center which is adjacent to the proposed development.

We offer the following comments related to the project:

1. The proposed realignment of Ahiahi Street appears to encroach upon the Lanakila Senior Center Property. Road construction shall not infringe on the property and adequate setbacks shall be provided.

2. The construction of Ahiahi Street shall not affect parking to the Senior Center. Parking stalls to the Senior Center shall remain and if needed, be aligned with the new road.

3. The increased vehicular traffic to the area should be addressed. In particular, as the project is adjacent to the Senior Center, are any type of controls or safety measures planned?

4. Sidewalks and pedestrian traffic should be addressed. The new Ahiahi Street may prompt the State of Hawaii to close the path between the Senior Center and the Health Center.

5. There is ground settlement in the area and an underground stream. A soil survey and groundwater survey should be performed due to the geology of the site. Effects of new

construction, including construction vibrations and changes to the underground hydraulic flow, should be addressed.

If you have any questions, your staff may contact Mr. Kimo Marion of the Planning Branch at 586-0491.

Sincerely,

KEITH S.KOGACHI
Acting Public Works Administrator

KM:lnn

c: Mr. Hakim Ouansafi, HPHA Executive Director
Mr. John Messina, DOH Capital Projects Coordinator
DAGS CSD

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED® AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

Mr. Keith Kogachi
Acting Public Works Administrator
State of Hawai‘i
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawai‘i 96810-0119

Attn: Mr. Kimo Marion, Planning Branch

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Kogachi:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter (your reference number (P)1306.7) dated September 15, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

1. As the proposed redevelopment will occur entirely within the HPHA property (TMK 1-6-009:003), the proposed realignment of Ahiahi Street will not encroach upon the Lanakila Senior Center property. Measures will be taken to ensure that road construction will not infringe upon the Lanakila Senior Center property, and that adequate setbacks will be provided.

2. Although the existing parking lot currently shared with the Senior Center is proposed to be removed as part of the realignment of Ahiahi Street, the parking stalls will be replaced by an equivalent number of parking stalls either along the realigned road or within the new parking structure.

3. DAGS’ concerns about increased vehicular traffic in the area will be included in the Draft EIS. As the proposed project is adjacent to the Lanakila Multi-Purpose Senior Center any planned controls or safety measures will be included in the Draft EIS.

4. As requested, the DEIS will also address sidewalks and pedestrian traffic.

5. We appreciate the information provided on ground settlement and an underground stream. Typically, a geotechnical study is performed prior to design. A preliminary vibration study will also be performed and included in the Draft EIS.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-15741

September 15, 2017

To: Hakim Ouansafi, Executive Director
Hawaii Public Housing Authority

From: for Leo R. Asuncion, Director
Office of Planning

Environmental Impact Statement Preparation Notice for the Hawaii Public Housing Authority Administrative Offices Redevelopment Project
TMK: (1)-6-009:003 (por)

Thank you for the opportunity to provide comments on the Environmental Impact Statement Preparation Notice (EISPN) for the Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment project. The EISPN review material was transmitted to our office via letter dated August 11, 2017.

It is our understanding that HPHA has partnered with the Retirement Housing Foundation to redevelop its administrative office property into a mixed-use affordable and market-priced housing and commercial use area. This proposed project will replace the existing HPHA administrative offices located on North School Street in Honolulu. The project will consist of up to 1,000 affordable rental apartments, 10,000 square feet of ground floor retail space, 34,000 square feet of community/flex multi-use spaces, vehicular parking areas, open space, new landscaping, and the relocation of HPHA offices along the Ewa end of the project area.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to Hawaii Administrative Rules (HAR) § 11-200-17(h) – relationship of the proposed action to land use plans, policies, and controls for the affected area; this project must demonstrate that it is consistent with state environmental, social, and economic goals, and policies. Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act, provides goals, objectives, policies, planning coordination and implementation, and priority guidelines for growth, development, and the allocation of resources throughout the state.

   The Draft Environmental Impact Statement (DEIS) should include a discussion on the project's ability to meet all parts of HRS Chapter 226. The analysis should examine consistency with these statutes or clarify where it is in conflict with them. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination, followed by discussion paragraphs.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea." (HRS § 205A-1).

   HRS Chapter 205A-5(b) requires all state and county agencies to enforce the CZM objectives and policies. The DEIS should include an assessment as to how the proposed action conforms to each of the goals and objectives as listed in HRS § 205A-2. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. Pursuant to HAR § 11-200-17(i) – probable impact of the proposed action on the environment, and impacts of the natural and human environment – in order to ensure that the coastal resources near the project site remain protected, the negative effects of stormwater inundation ensuing from any construction and development activities should be evaluated.

   Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage canals and infrastructure currently in place, soil absorption characteristics of the area, and the amount of permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal ecosystem.

   OP has a number of resources available to assist with onsite stormwater management and polluted runoff mitigation. OP recommends consulting these guidance documents and stormwater evaluative tools when developing strategies to address polluted runoff. They offer useful techniques to keep land-based pollutants and sediment in place, and prevent nearshore water contamination while considering the best management practices (BMP) suited for the project and the types of contaminants affecting the project area. The evaluative tools that should be used during the design process include:

   - Stormwater Impact Assessments can be used to identify and analyze information on hydrology, sensitivity of coastal and riparian resources, and management measures to control runoff, as well as consider secondary and

cumulative impacts to the area.
http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf

- Low Impact Development (LID), A Practitioners Guide covers a range of structural BMP's for stormwater control management, onsite infiltration techniques, water reuse methods, and building layout designs that minimize negative environmental impacts.
http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

4. The proposed work may be subject to the City and County of Honolulu, Department of Planning and Permitting's (DPP) updated rules on storm drainage, water quality, and erosion control. DPP should be consulted on its updated stormwater drainage standards and LID requirements as they pertain to this project.

   Pursuant to the updated City and County of Honolulu Administrative Rules Relating to Water Quality, Title 20, Department of Planning and Permitting, Chapter 3, new stormwater drainage standards require the installation of onsite stormwater control management and permanent LID use for new development, redevelopment, and any incremental development performed on the Island of Oahu. Land disturbing actions that impact one acre or more of land, or involve any work that may have water quality impacts due to its location or land-use activity, are subject to these new standards.

5. Pursuant to Act 127, Session Laws of Hawaii 2016, a Special Action Team on affordable housing was established in 2016 to make recommendations on actions to promote affordable rental housing. One of the key goals of Act 127 is to achieve 22,500 completed affordable rental housing units by December 31, 2026. As this project seeks to develop a mixed-use complex with affordable rental units with up to 1,000 affordable rental units, the DEIS should include analysis on how this project aligns with the goal of Act 127.

6. The DEIS should address how the project will mitigate potential traffic and pedestrian impacts that would result from increased population density, commercial, and office uses at the site. The DEIS should discuss what measures might be taken to reduce reliance on individual automobiles, reduce parking requirements, and enable residents and facility users to maximize use of bus and transit service in the area or access goods and services onsite or in the area to meet their daily needs.

7. Similarly, the DEIS should identify how the project can maximize its physical relationship to its bounding streets to improve the pedestrian environment and streetscapes to promote active lifestyles for residents and neighbors, improve pedestrian connections between the project, neighboring health/community centers, park, and other commercial areas, and capitalize on the mid-block signalized cross-walk on North School Street in doing so.

8. The DEIS should consider alternative site plans that would incorporate the HPHA administrative offices within the mixed-use center to encourage: (1) clustering of HPHA services near adjacent public services on Lanakila Avenue and the co-location of other public services within the complex; (2) capitalizing on proximity to the signalized cross-walk to improve access to onsite services and reduce pedestrian and vehicular conflicts when accessing the site; and (3) the reduction of impervious surface area and allow green space for residents at the western end of the project site.

9. The DEIS should describe the measures that could be taken to address the expressed desire in HPHA's solicitation for "high quality design" that would incorporate state-of-the-art energy conservation and green practices in the project.

10. The list of approvals does not reference a zone change; the DEIS should address this. The site is currently zoned R-5; the proposal contemplates mixed use, which is not permitted in R-5 zones. The site is outside of the City and County of Honolulu's Kalihi Neighborhood Transit-Oriented Development plan area, and at this time, is probably not under consideration for mixed-use TOD zoning by the City and County of Honolulu.

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our CZM program at (808) 587-2845 or Ruby Edwards of our Land Use Division at (808) 587-2817.

c: Glenn Nakai, PBR HAWAII & Associates, Inc.

PBR HAWAII
& ASSOCIATES, INC.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 22, 2017

Mr. Leo Asuncion, Director
Office of Planning
State of Hawai‘i
P.O. Box 2359
Honolulu, Hawai‘i 96804

Attn: Mr. Joshua Hekekia, CZM Program; Ms. Ruby Edwards, Land Use Division

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Asuncion:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter (your Ref. No. P-15741) dated September 15, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

1. The Draft Environmental Impact Statement (DEIS) will include a discussion on the project's ability to meet all parts of Hawai‘i Revised Statutes (HRS) Chapter 226 (the Hawai‘i State Planning Act), pursuant to Hawai‘i Administrative Rules (HAR) 11-200-17(h). This analysis will examine consistency with the statutes or clarify where it is in conflict with them. If any of these statutes are not applicable to the project, the analysis will affirmatively state such determination, followed by discussion paragraphs.

2. The DEIS will include an assessment of how the proposed action conforms to each of the goals and objectives of the Coastal Zone Management (CZM) program, as listed in HRS Chapter 205A-2.

3. Pursuant to HAR Section 11-200-17(i), the DEIS will evaluate potential negative effects of stormwater inundation ensuing from construction and development activities, and will include a discussion on measures to be taken for onsite stormwater management and polluted runoff mitigation.

4. Upon the recommendation of the City and County of Honolulu Department of Planning and Permitting (DPP), the DEIS will include a narrative explaining the project's post-construction stormwater quality management strategy pursuant to Section 20-3-50 of the updated Rules Relating to Water Quality. The project’s compliance with the City’s Storm Drainage Standards and Rules Relating to Water Quality will be verified at the time that the construction/grading plans are submitted to DPP for review.

5. The DEIS will include analysis on how the project aligns with the goal of Act 127, Session Laws of Hawai‘i 2016, to promote affordable rental housing.

6. The DEIS will address potential traffic and pedestrian impacts and mitigation measures, as well as measures to reduce reliance on individual automobiles, reduce parking requirements, and promote bus and transit use by residents and facility users.

7. The DEIS will also identify the ways in which the project can improve the pedestrian environment, pedestrian connections, and streetscapes to promote active lifestyles for residents and neighbors.

8. We appreciate your suggestions for alternative site plans that incorporate the HPHA administrative offices within the mixed-use center to encourage: (1) clustering of HPHA services near adjacent public services on Lanakila Avenue, (2) locating services in closer proximity to the signalized crosswalk, and (3) reducing impervious surface area at the western end of the project site.

9. HPHA's RFP solicitation stated the following program requirements: "Create a sustainable new community of high quality design that meets or exceeds industry standards and incorporates state-of-the-art energy conservation and green practices in a LEED-certifiable project..." To achieve the above policy, HPHA will require Retirement Housing Foundation to build the project to achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) "Silver" rating or equivalent.

10. The DEIS will include a list of approvals, including zoning-related approvals, that may be necessary for the redevelopment.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

DAVID Y. IGE
GOVERNOR

ARTHUR J. LOGAN
MAJOR GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

August 29, 2017

Mr. Greg Nakai, Planner
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813

Dear Mr. Nakai

Subject: Environmental Impact Statement Preparation Notice (EISPN) for Hawaii Public Housing Authority (HPHA) Administrative Offices Redevelopment

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the proposed project.

Should you have any questions or concerns, please have your staff contact Ms. Shao Yu Lee, our Land Manager on Oahu, at (808) 733-4222.

Sincerely,

NEAL S. MITSUYOSHI, P.E.
Colonel, Hawaii National Guard
Chief Engineering Officer

c: Mr. Hakim Ouansafi, Hawaii Public Housing Authority (HPHA)
Mr. David Kennard, Hawaii Emergency Management Agency (HI-EMA)
Ms. Havinne Okamura, HI-EMA
Mr. Albert Chong, HI-EMA

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Col. Neal Mitsuyoshi
Chief Engineering Officer
State of Hawai‘i, Department of Defense
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, Hawai‘i 96816

Attn: Ms. Shao Yu Lee, O‘ahu Land Manager

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Col. Mitsuyoshi:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated August 29, 2017, regarding the subject project. As the planning consultant for RHF, we appreciate your participation in the environmental review process, and your input that the State of Hawai‘i Department of Defense has no comments to offer relative to the project at this time. Your letter will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

September 13, 2017

Mr. Hakim Ouansafi, Executive Director
Hawaii Public Housing Authority
1002 North School Street
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice for Administrative Offices Redevelopment, Honolulu TMK: 1-6-009:003

Dear Mr. Ouansafi:

The Department of Education (DOE) has reviewed the Environmental Impact Statement Preparation Notice (EISPN) for the redevelopment of Administrative Offices (School Street) Redevelopment (project).

We read that the DOE will be one of the agencies to be consulted in the preparation of the Draft Environmental Impact Statement (DEIS) for the project. We look forward to that opportunity to discuss the impact of the project on the DOE schools in the area.

The impact will depend on the type of units built. There is no school impact from senior units, so the total number of units and the mix between senior and family units will be critical in determining the project's impact. Currently the project area is served by Lanakila Elementary School, Kawananakoa Middle School, and McKinley High School.

Lanakila Elementary School is currently at its classroom capacity and is expected to exceed capacity in the next several years, without taking into account this project's impacts. Kawananakoa Middle School is also close to classroom capacity and is expected to exceed capacity in the next few years. McKinley High School serves a much larger area and although there is currently some excess classroom capacity, that space will be taken by students in other residential developments in urban Honolulu.

The original plans for two thousand new units would strain the capacity of neighborhood schools. Revised ideas for fewer units and some significant portion of units dedicated to seniors would reduce the anticipated impact.

There also seems to be some confusion as to whether this project will be with in the City's Transit Oriented Development zoned areas. We have been told the City considers this project outside of the

TOD areas, but the State has assumed the project would be part of a TOD area. The DOE is clear that this project is outside of the Kalihi to Ala Moana School Impact Fee District.

The DOE appreciates the opportunity to offer comments on the EISPN. If you have any questions, please call Heidi Meeker of the Planning Section, Facilities Development Branch, at 784-5095.

Respectfully,

Kenneth G. Masden II
Public Works Manager
Planning Section

KGM:jmb

c: √Greg Nakai, Planner, PBR Hawaii & Associates, Inc.
Ruth Silberstein, CAS, Kaimuki/McKinley/Roosevelt Complex Areas

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Kenneth G. Masden II
Public Works Manager, Planning Section
State of Hawai‘i, Department of Education
Office of School Facilities and Support Services
P.O. Box 2360
Honolulu, Hawai‘i 96804

Attn: Ms. Heidi Meeker, Planning Section, Facilities Development Branch

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Masden:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 13, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

We appreciate your comment that the impact of the redevelopment will depend on the number and types of units built, as senior units will have no school impact, while family units could. The Draft Environmental Impact Statement (DEIS) will take this into consideration when assessing the potential impacts to area schools.

We appreciate the information provided on area DOE facilities, as well as the information that the DOE considers this project to be outside of the Kalihi to Ala Moana School Impact Fee District.

We are grateful for your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 17-211

September 14, 2017

Mr. Greg Nakai, Planner
PBR HAWAII & ASSOCIATES, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813
Email: HPHAschoolstreet@pbrhawaii.com

Dear Mr. Nakai:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Hawai'i Public Housing Authority Administrative Offices (School Street) Redevelopment
TMK: 1-6-009:003 (por)

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your EISPN to our office via the OEQC link:
http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-08-23-OA-EISPN-HPHA-Administrative-Offices-School-Street-Redevelopment.pdf

We understand from the OEQC publication form project summary that *"Hawai'i Public Housing Authority (HPHA) has partnered with Retirement Housing Foundation under a predevelopment agreement to redevelop the property into a mixed-use community to increase the amount of affordable housing provided in this bus transit available neighborhood. To provide new residential housing, the existing HPHA administrative offices will be replaced with a new HPHA administrative office building; up to 1,000 affordable rental apartments; 10,000 square feet of ground floor retail space; 34,000 square feet of community/flex multi-use space; vehicular access via existing driveways; parking; and open spaces and new landscaping."*

Hawaii's environmental review laws require Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to consider health in the discussion and the mitigation measures to reduce negative impacts. In its definition of 'impacts,' §11-200-2, Hawaii Administrative Rules (HAR) includes health effects, whether primary (direct), secondary (indirect), or cumulative. Further, §11-200-12(b)(5), HAR, lists public health as one of the criteria for determining whether an action may have a significant impact on the environment.

We advocate that you consider health from a broad perspective; one that accounts for the social, economic, and environmental determinants of health and wellbeing. Community well-being can be impacted by access to physical activity, health care, feelings of social connectedness and safety. Design solutions that take these factors into consideration positively contribute to the social determinants of health in a community, improving the well-being of those who live there by influencing health promoting behaviors. Social determinants contribute to preventable chronic diseases such as asthma, diabetes, obesity, and cardiovascular disease.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments to support sustainable healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments. EPO has an updated environmental Geographic Information System (GIS) website page http://health.hawaii.gov/epo/egis It compiles various maps and viewers from our environmental health programs.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: http://health.hawaii.gov/shwb/files/2016/05/constdem16.pdf Additional information is accessible at: http://health.hawaii.gov/shwb. For specific questions call (808) 586-4226.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.hawaii.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

In 2015, Hawaii passed Act 97 which amended Hawaii's Renewable Portfolio Standards by setting a goal for Hawaii to become one hundred percent renewable by the year 2045. To reach this goal Hawaii should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is essential that EV charging stations be added to any planned parking areas open to the EV driving public. All future plans should strive to encourage the use of personal bicycles though the development of designated bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We hope this information is helpful. If you have any questions please contact us at DOH.epo@doh.hawaii.gov or call us at (808) 586-4337. Thank you for the opportunity to comment.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

c: Mr. Hakim Ouansafi, Executive Director, HPHA (via email: Hakim.Ouansafi@hawaii.gov)
DOH: CWB, CAB, IRHB, HEER, CDPHPD {via email only}

Attachment: U.S. EPA EJSCREEN Report for Project Area

Please be advised:
The Environmental Planning Office (EPO), along with the Clean Air, Clean Water, and Wastewater Branches will be moving in December 2017. The new address, for EPO, **as of January 1, 2018**, will be :
Environmental Planning Office, DOH, Hale Ola, 2827 Waimano Home Road #109, Pearl City, Hawaii 96782
Please feel free to come and visit our new offices anytime. Please note that there is a security guard at the bottom of the hill (before entering DOH property). Our office phone numbers, email and website will all remain the same.

Attachment: U.S. EPA EJSCREEN Report for Project Area

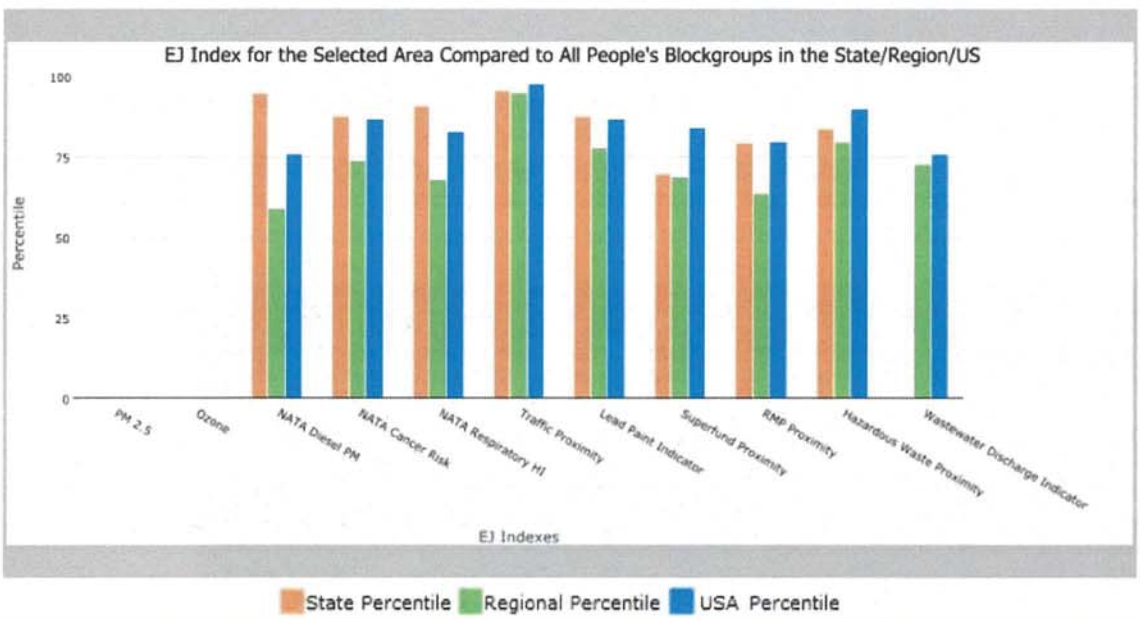
EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.328178,-157.862923, HAWAII, EPA Region 9

Approximate Population: 49,549

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	95	59	76
EJ Index for NATA* Air Toxics Cancer Risk	88	74	87
EJ Index for NATA* Respiratory Hazard Index	91	68	83
EJ Index for Traffic Proximity and Volume	96	95	98
EJ Index for Lead Paint Indicator	88	78	87
EJ Index for Superfund Proximity	70	69	84
EJ Index for RMP Proximity	80	64	80
EJ Index for Hazardous Waste Proximity	84	80	90
EJ Index for Wastewater Discharge Indicator	N/A	73	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.328178,-157.862923, HAWAII, EPA Region 9

Approximate Population: 49,549

Input Area (sq. miles): 3.14

September 13, 2017

Digitized Point

1:2,257

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

1 mile Ring Centered at 21.328178,-157.862923, HAWAII, EPA Region 9

Approximate Population: 49,549

Input Area (sq. miles): 3.14

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	N/A	N/A	N/A	9.9	N/A	9.14	N/A
Ozone (ppb)	N/A	N/A	N/A	41.8	N/A	38.4	N/A
NATA* Diesel PM (µg/m^3)	0.419	0.149	92	0.978	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	45	34	90	43	50-60th	40	70-80th
NATA* Respiratory Hazard Index	1.6	1	88	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	3900	1000	92	1100	92	590	96
Lead Paint Indicator (% Pre-1960 Housing)	0.33	0.16	80	0.24	66	0.29	63
Superfund Proximity (site count/km distance)	0.071	0.1	61	0.15	51	0.13	55
RMP Proximity (facility count/km distance)	0.34	0.39	69	0.98	43	0.73	52
Hazardous Waste Proximity (facility count/km distance)	0.12	0.1	77	0.12	71	0.093	79
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	0.04	N/A	13	59	30	40
Demographic Indicators							
Demographic Index	65%	51%	87	47%	75	36%	85
Minority Population	95%	77%	84	59%	89	38%	93
Low Income Population	36%	26%	75	36%	54	34%	57
Linguistically Isolated Population	24%	6%	95	9%	90	5%	95
Population With Less Than High School Education	25%	9%	95	17%	71	13%	83
Population Under 5 years of age	5%	6%	42	7%	40	6%	44
Population over 64 years of age	19%	16%	70	13%	82	14%	78

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Laura Leialoha Phillips McIntyre, AICP
Program Manager
Environmental Planning Office
State of Hawai‘i, Department of Health
P.O. Box 3378
Honolulu, Hawai‘i 96801

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. McIntyre:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 14, 2017 (your reference EPO 17-211) regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following response.

We reviewed the Environmental Planning Office's (EPO) standard comments relating to Environmental Health programs. We understand that all standard comments specifically applicable to the proposed project must be adhered to. The organization of this letter follows the list of standard comments on your website.

<u>Clean Air Branch</u>
We acknowledge that there is a potential for fugitive dust emissions during all phases of construction. The Draft Environmental Impact Statement (DEIS) will address construction-related impacts related to fugitive dust. All construction activities will comply with the provisions of Section 11-60.1-33, Hawai‘i Administrative Rules (HAR) related to Fugitive Dust. Adequate measures to control dust during various phases of construction will be required to be implemented by whatever contractor is employed by RHF to effect the project’s development.

<u>Clean Water Branch</u>
We reviewed and understand the standard comments provided by the Clean Water Branch (CWB).

1. **Potential Impacts to State Waters.** The DEIS will identify the type and class of State waters off the coast of Honolulu (including Honolulu Harbor) as "A". Any potential impacts to these waters caused by the construction and/or operation of the proposed project will meet the provisions of the: a) anti-degradation policy (Chapter 11-54-1.1, HAR); b) designated uses (Chapter 11-54-3, HAR); and c) water quality criteria (Chapter 11.54-4 through 11-54-8, HAR). However, direct discharges of storm water runoff into State waters are not expected to occur due to Best Management Practices to reduce airborne dust and waterborne silt during construction.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

2. **National Pollutant Discharge Elimination System permit coverage.** As the area to be disturbed will exceed one acre, a National Pollutant Discharge Elimination System (NPDES) permit for Storm Water Associated with Construction Activity will be necessary.

3. **Clean Water Act.** Pursuant to the "Clean Water Act," a Section 401 Water Quality Certification from the State Department of Health, Clean Water Branch will be obtained if it is determined that the project may result in any discharge into navigable waters or as otherwise triggered.

4. **State Water Quality Standards (Chapter 11-54 and 11-55, HAR).** All discharges related to the construction and operation of the proposed project will comply with the State's Water Quality requirements contained in Chapters 11-54 and 11-55, HAR.

Hazard Evaluation and Emergency Response Office

We understand that the Hazard Evaluation and Emergency Response (HEER) Office provides leadership, support, and partnership in preventing, planning for, responding to, and enforcing environmental laws relating to releases or threats of releases of hazardous substances. We do not expect hazardous substances, pollutants, or contaminants to be present at the project site. However, if any of these are found at the project site, HEER will be contacted to determine the appropriate actions to comply with the relevant environmental laws.

Indoor and Radiological Health (IRH) Branch

The proposed redevelopment will comply with the provisions of Chapter 11-46 regarding Community Noise Control. If noise created during the construction phase of the project is expected to exceed the maximum allowable levels, then a noise permit will be obtained before the commencement of work.

Safe Drinking Water Branch

We note that the Safe Drinking Water Branch administers programs to protect drinking water sources from contamination.

1. **Public Water System.** A public water system will not be developed as part of the proposed project. Potable water will be supplied by the City and County of Honolulu Board of Water Supply, which draws water from a series of groundwater wells and shafts.

2. **Underground Injection Control.** Wastewater generated by the users of the proposed redevelopment will be collected by the County wastewater system.

Solid and Hazardous Waste Branch

Any construction waste generated by the project will be disposed of at a solid waste disposal facility that complies with the applicable provisions (Chapter 11-58.1, HAR "Solid Waste Management Control"). Solid waste that cannot be recycled will be disposed of at landfills, the incinerator, or transfer stations. A waste-to-energy combustor, H-POWER (Honolulu Program of Waste Energy Recovery) located at the Campbell Industrial Park incinerates about 1,800 tons of combustible waste per day. The electricity generated is bought by Hawaiian Electric Company. Currently, the H-POWER facility receives all residential and commercial packer truck wastes on the island. Waste contractors will be asked to submit disposal receipts and invoices to ensure proper disposal of waste. The proposed redevelopment will also comply with the provisions of Chapters 11-260 to 11-280, HAR, relating to hazardous waste.

Wastewater Branch
Wastewater generated at the proposed redevelopment will be collected by the County wastewater system. No cesspool is being proposed. All wastewater plans will conform to applicable provisions (Chapter 11-62, HAR, "Wastewater Systems").

In addition to the State standard comments addressed above, we have reviewed the environmental Geographic Information System (eGIS) resources on the Department of Health (DOH) Environmental Planning Office (EPO) website for applicability to the proposed redevelopment. We have also reviewed the Hawaiʻi Environmental Health Portal and its links to various sources of state environmental data. Additionally, we have reviewed the materials available on EJSCREEN, as well as the draft Office of Environmental Quality Control (OEQC) viewer.

We acknowledge your comment regarding the State's goal to transition to one hundred percent renewable energy by the year 2045, and your recommendations to incorporate electric vehicle (EV) charging stations, reduce harmful vehicle emissions, reduce vehicle miles traveled (VMTs), encourage alternative modes of transport including bicycles and bikeshare programs, and increase physical activity. The proposed redevelopment will take these recommendations into consideration in order to support the State's goal to transition to one hundred percent renewable energy.

We concur with your Department's advice to consider health from a broad perspective ("…one that accounts for the social, economic, and environmental determinants of health and wellbeing.") RHF has a proven track record of developing communities that provide access to physical activity, health care, feelings of social connectedness and safety.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

DAVID Y. IGE
GOVERNOR

PANKAJ BHANOT
DIRECTOR

BRIDGET HOLTHUS
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment and Support Services Division
1010 Richards Street, Suite 512
Honolulu, Hawai'i 96813

September 1, 2017

Re: 17-0397

PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Attn: Greg Nakai

Dear Mr. Nakai:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment

This is in response to your letter dated August 11, 2017 requesting the Department of Human Services (DHS) review and comment on the above-named project.

The DHS has reviewed the map of the proposed administrative offices redevelopment area for Hawaii Housing Authority. A check on DHS' internal data system and Google Maps has found two DHS licensed group child care facilities in the near vicinity that may be affected during the construction phase of the redevelopment.

If you should have any question regarding this matter, please contact Ms. Lisa Galino, Child Care Program Specialist at (808) 586-5234.

Sincerely,

Scott Nakasone

Scott Nakasone
Assistant Division Administrator

c: Pankaj Bhanot, Director
Hakim Ouansafi, Executive Director, Hawaii Public Housing Authority

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Scott Nakasone
Assistant Division Administrator
State of Hawai‘i, Department of Human Services
Benefit, Employment and Support Services Division
1010 Richards Street, Suite 512
Honolulu, Hawai‘i 96813

Attn: Ms. Lisa Galino, Child Care Program Specialist

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Nakasone:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter (your reference number 17-0397) dated September 1, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comment that there are two Department of Human Services (DHS) licensed group child care facilities in the vicinity that may be affected during the construction phase of the redevelopment. The Draft Environmental Impact Statement (DEIS) will include a discussion of the potential impacts during construction on noise and air quality, as well as any mitigation measures that may be implemented.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Ho`opono - Services for the Blind Branch

Ms. Kathleen Fujimoto
Hoʻopono – Services for the Blind Branch
State of Hawaiʻi, Department of Human Services
Division of Vocational Rehabilitation
1901 Bachelot Street
Honolulu, HI 96817

Received via website on 9/8/2017

Subject: Blind Vendor facility at HPHA School Street Redevelopment Project As the State Licensing Agency for the blind vendor program we are informing HPHA of our intent to operate a blind vendor facility and select a location and type of facility to be operated by a blind licensee. Ho`opono, Services for the Blind is a state agency within the Division of Vocational Rehabilitation, Department of Human Services. We oversee a program known as the Blind Vendor Program, under HRS 102-14 Use of public buildings by blind or visually handicapped persons, and HAR 17-403 Vending Facilities Program. HAR 17-403-19 requires that the SLA be provided written notice by certified mail of intent to construct, alter, or purchase and afforded the opportunity to select the location and type of facility prior to the completion of the final space layout. Thank you for this opportunity.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Kathleen Fujimoto
Ho‘opono - Services for the Blind Branch
State of Hawai‘i, Department of Human Services
Division of Vocational Rehabilitation
1901 Bachelot Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Fujimoto:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your comment, received September 8, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following response.

HPHA acknowledges the intent of Ho‘opono Services for the Blind to operate a blind vendor facility on the premises of the subject project. Pursuant to Hawai‘i Administrative Rules (HAR) 17-403-19, HPHA will provide your agency written notice by certified mail of HPHA's intent to construct the subject project, and your agency will be afforded the “first right of refusal” if the proposed HPHA replacement office building includes a vending facility or store. If a vending facility is included in the architectural space program, your agency will have the opportunity to review the final space layout..

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
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DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 20, 2017

Hawaii Public Housing Authority
Attention: Mr. Hakim Ouansafi, Executive Director
1002 N. School Street
Honolulu, Hawaii 96813

Dear Mr. Ouansafi:

SUBJECT: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division and (b) Land Division – Oahu District on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

cc: Greg Nakai, Planner; PBR HAWAII & Associates, Inc.
Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

'17 AUG 16 AM 10:50 ENGINEERING

RECEIVED
LAND DIVISION
2017 AUG 23 AM 10:46
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 16, 2017

MEMORANDUM

~~TO:~~ **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
From: X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
__Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

To:
~~FROM:~~ for Russell Y. Tsuji, Land Administrator

SUBJECT: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment

LOCATION: 1002 N. School Street, Honolulu, Island of Oahu; TMK No. (1) 1-6-009: por. 003

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of Hawaii Public Housing Authority

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **September 20, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✔) Comments are attached.

Signed: __________
Print Name: Carty S. Chang, Chief Engineer
Date: 8/22/17

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment, 1002 N. School Street, Honolulu, Island of Oahu; TMK No. (1) 1-6-009: por. 003

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a designated Flood Hazard.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zone designations can be found using the Flood Insurance Rate Map (FIRM), which can be accessed through the Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may take precedence over the NFIP standards as local designations prove to be more restrictive. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

The applicant should include water demands and infrastructure required to meet project needs. Please note that the projects within State lands requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: ______________
CARTY S. CHANG, CHIEF ENGINEER

Date: 8/22/17

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 16, 2017

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
_X_ Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
_X_ Commission on Water Resource Management
__Office of Conservation & Coastal Lands
_X_ Land Division – Oahu District
_X_ Historic Preservation

FROM: for Russell Y. Tsuji, Land Administrator
SUBJECT: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment
LOCATION: 1002 N. School Street, Honolulu, Island of Oahu; TMK No. (1) 1-6-009: por. 003
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of Hawaii Public Housing Authority

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments by **September 20, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: Darlene Bryant-Takamatsu

Print Name: Darlene Bryant-Takamatsu
Date: 8/21/17

cc: Central Files

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

JEFFREY. T. PEARSON, P.E.
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

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 21, 2017

Hawaii Public Housing Authority
Attn: Hakim Ouansafi, Executive Director
1002 North School Street
Honolulu, HI 96813

PBR HAWAII & Associates, Inc.
Attn: Greg Nakai, Planner
101 Bishop Street, Suite 650
Honolulu, HI 96813

Dear Sirs,

Subject: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment, TMK (1) 1-6-009:003.

This letter is in response to a request for review and comments of the above-referenced subject by the Department of Land and Natural Resources (DLNR) that we received August 16, 2017. We reviewed the proposed EISPN for the Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment.

We would like to comment that the project area is a portion of State land encumbered by Governor's Executive Order No. 1274 setting aside land to the Hawaii Housing Authority for Lanikila Emergency Homes purposes. In view of the proposed uses, including administrative offices, affordable housing, and commercial facilities, we believe the above mentioned Executive Order document needs to be amended to document the actual uses on the subject lands.

If there are any questions, please feel free to contact us at 587-0447.

Sincerely,

Darlene Bryant-Takamatsu

Darlene J. Bryant-Takamatsu
Land Agent

PBR HAWAII
& ASSOCIATES, INC.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 22, 2017

Mr. Russell Tsuji
Land Administrator
State of Hawaiʻi, Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaiʻi 96809

Attn: Ms. Lydia Morikawa

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, OʻAHU, TMK 1-6-009:003 (POR.)

Dear Mr. Tsuji:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 20, 2017, regarding the subject project. As the planning consultant for RHF, we provide the following responses to the comments from the Department of Land and Natural Resources (DLNR) Divisions listed below:

1. **Engineering Division.** We acknowledge the Engineering Division's comments that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR) whenever development within a designated Flood Hazard area is undertaken. The Draft Environmental Impact Statement (DEIS) will include a Flood Insurance Rate Map (FIRM) indicating that the project is located within Zone X, an area determined to be outside the 0.2% annual chance floodplain.

   Retirement Housing Foundation and/or its civil engineering consultant will provide information in the Draft EIS on water demands and infrastructure requirements to meet project needs. The Draft EIS will also note that projects within State lands requiring water service from the Board of Water Supply are required to pay a resource development charge in addition to Water Facilities charges for transmission, and/or daily storage. Water demands and calculations will be provided to the DLNR Engineering Division for inclusion in the State Water Projects Plan Update projections.

2. **Land Division - Oʻahu District.** We acknowledge the comment by Land Division - Oʻahu District that the project area is a portion of State land encumbered by Governor's Executive Order No. 1274 setting aside land to the Hawaiʻi Housing Authority for Lanakila Emergency Homes purposes. The DEIS will note that this Executive Order needs to reflect the actual uses on the subject lands, and may require amendment.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
DIR 1036, 1052
STP 8.2231

September 25, 2017

Mr. Hakim Ouansafi
Executive Director
Hawaii Public Housing Authority
1002 North School Street
Honolulu, Hawaii 96813

Dear Mr. Ouansafi:

Subject: Hawaii Public Housing Authority (HPHA), Administrative Offices Redevelopment
Draft Environmental Assessment
Honolulu, Hawaii
TMK: (1) 1-6-009:003 (por.)

Department of Transportation's (DOT) comments on the subject project are as follows:

Airports Division

1. The HPHA site is located approximately 2.7 miles from the end of Runway 22L and 2.8 miles from the end of Runway 26R of the Daniel K. Inouye International Airport. The applicants need to be aware of the duties of the state and county agencies to implement the State of Hawaii Office of Planning Technical Assistance Memo related to this project and all projects within 5 miles of an airport: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf

2. Federal Aviation Administration (FAA) regulations require the submittal of FAA Form 7460-1, Notice of Proposed Construction or Alteration, in accordance with Code of Federal Regulations, Title 14, Part 77.9. Planned building heights and any additional height of any cranes needed during construction need to be included in the submittal of a FAA Form 7460-1. This form and criteria for submittal can be found at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp

3. The project property is located between the 60 to 55 Day-Night Sound Level noise contours as shown on the Honolulu International Airport 2008 Noise Exposure Map. While noise mitigation measures may not be mandated in the design of the project, the applicants and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations.

Highways Division

1. A Traffic Impact Analysis Report (TIAR) should be prepared and submitted to the DOT for review and acceptance.

2. The TIAR analysis should include, but not be limited to North School Street intersections with Kalihi Street/Likelike Highway, Vineyard Boulevard, Liliha Street and Pali Highway and ramps to and from Lunalilo Freeway.

3. The TIAR should include the future Mayor Wright Housing redevelopment project potential traffic as the density of that project can be expected to exacerbate traffic issues in the Kalihi area.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

FORD N. FUCHIGAMI
Director of Transportation

c: Greg Nakai, PBR HAWAII & Associates, Inc.
Bob Fard, Retirement Housing Foundation

PBR HAWAII
& ASSOCIATES, INC.

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED® AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

December 22, 2017

Mr. Jade Butay, Interim Director
State of Hawai‘i, Department of Transportation
869 Punchbowl Street
Honolulu, Hawai‘i 96813

Attn: Mr. Norren Kato, DOT Statewide Transportation Planning Office

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Butay:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your department's letter (your reference number DIR 1036, 1052 STP 8.2231) dated September 25, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses to the comments from the Department of Transportation (DOT) Divisions listed below:

<u>Airports Division</u>

1. The Draft Environmental Impact Statement (DEIS) will include the information that the HPHA site is located approximately 2.7 miles from the end of Runway 22L and 2.8 miles from the end of Runway 26R of the Daniel K. Inouye International Airport, and that state and county agencies are obligated to implement the State of Hawai‘i Office of Planning Technical Assistance Memo related to all projects within 5 miles of an airport.

2. The DEIS will include the information provided regarding the required submittal of Federal Aviation Administration (FAA) Form 7460-1, Notice of Construction or Alteration, in accordance with Code of Federal Regulations, Title 14, Part 77.9. The DEIS will also note that planned building heights and any additional height of any cranes needed during construction need to be included in the submittal of FAA Form 7460-1.

3. The DEIS will note that the project property is located between the 60 to 55 Day-Night Sound Level noise contours as shown on the Honolulu International Airport 2008 Noise Exposure Map. The DEIS will also include the DOT's comment: “While noise mitigation measures may not be mandated in the design of the project, the applicants and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations.”

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Highways Division

1. A traffic study will be prepared and submitted to the DOT for review.

2. The traffic study will include the intersections and streets recommended.

3. The traffic study will take into consideration the potential traffic resulting from the future Mayor Wright Housing redevelopment project.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

September 7, 2017

PBR Hawaii & Associates, Inc.
Attn: Greg Nakai, Planner
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Nakai,

Subject: Environmental Impact Statement Preparation Notice for the Hawaii Public Housing Authority Administrative Offices Redevelopment

Thank you for the opportunity to review and comment. The Department of Design and Construction has no comments at this time.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(699553)

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Robert Kroning, P.E.
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street 11th Floor
Honolulu, Hawai‘i 96813

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Kroning:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter [your reference number RJK:ms (699553)] dated September 7, 2017, regarding the subject project. As the planning consultant for RHF, we appreciate your participation in the environmental review process, and your input that the Department of Design and Construction has no comments at this time. Your letter will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 17-487

August 31, 2017

Mr. Greg Nakai
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Nakai:

Subject: HPHA Administrative Offices (School Street) Redevelopment

Thank you for the opportunity to review and comment on the subject project.

Our comments are as follows:

- Once construction phase commence, install approved Best Management Practices (BMP) fronting all drainage facilities on School Street, Lanakila Avenue, Ahiahi Street, Kuakini Street and Hala Drive.

- During construction and upon completion of project; any damages/deficiencies to School Street, Lanakila Avenue, Ahiahi Street, Kuakini Street and Hala Drive right-of-way shall be corrected to City Standards and accepted by the City.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

w/ for Ross S. Sasamura, P.E.
Director and Chief Engineer

cc: Hawaii Public Housing Authority - Attn: Hakim Quansafi

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Ross Sasamura, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluʻohia Street, Suite 215
Kapolei, Hawaiʻi 96707

Attn: Mr. Kyle Oyasato, Division of Road Maintenance

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, OʻAHU, TMK 1-6-009:003 (POR.)

Dear Mr. Sasamura:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter (your reference number DRM 17-487) dated August 31, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

1. The Draft Environmental Impact Statement (DEIS) will note that, once construction commences, approved Best Management Practices (BMPs) will be installed fronting all drainage facilities on School Street, Lanakila Avenue, Ahiahi Street (and Kuakini Street and Hala Drive, if appropriate).

2. The DEIS will also indicate that, during construction and upon completion of the project, any damages/deficiencies to School Street, Lanakila Avenue, Ahiahi Street, Kuakini Street, and Hala Drive right-of-way will be corrected to City Standards and accepted by the City.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaiʻi 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

BOARD OF WATER SUPPLY

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

August 28, 2017

Mr. Bob Fard
Retirement Housing Foundation
911 North Studebaker Road
Long Beach, California 90815-4900

Dear Mr. Fard:

Subject: Your Letter Dated August 10, 2017 Requesting Comments on the Environmental Impact Statement Preparation Notice for the Proposed Hawaii Public Housing Authority Administration Offices (School Street) Redevelopment at 1002 North School Street, Honolulu, Oahu – Tax Map Key: 1-6-009: 003

Thank you for your letter regarding the Hawaii Public Housing Authority redevelopment project.

The existing water system is adequate to accommodate the proposed development. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply 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.

Water conservation measures are recommended for all proposed developments. These measures include utilization of non-potable 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.

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

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

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Ernest Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawai‘i 96843

Attn: Mr. Robert Chun, Project Review Branch

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Lau:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated August 28, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

We appreciate the information that the existing water system is adequate to accommodate the proposed redevelopment. However, we also acknowledge that the Board of Water Supply's (BWS) final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

The Draft Environmental Impact Statement (DEIS) will include a discussion of water conservation measures such as those recommended by the BWS.

The DEIS will note that there is a BWS Water System Facilities Charges for resource development, transmission, and daily storage.

As recommended, on-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

We thank you for your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

August 30, 2017

Mr. Greg Nakai, Planner
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Nakai:

Subject: Hawaii Public Housing Authority (HPHA) Administrative Office Redevelopment
Honolulu, Hawaii
Tax Map Key: 1-6-009: 003 (Por.)

In response to your letter dated August 11, 2017, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and determined that there will be no significant impact to fire department services. In addition, HFD requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (46 m) from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; Uniform Fire Code [UFC]™, 2012 Edition, Section 18.2.3.2.2.)

   A fire department access road shall extend to within 50 feet (15 m) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the

exterior of the facility or building. On-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; UFC™, 2012 Edition, Section 18.3.1, as amended.)

3. Submit civil drawings to the HFD for review and approval.

Should you have any questions, please call Battalion Chief Wayne Masuda of our Fire Prevention Bureau at 723-7151 or email at wmasuda@honolulu.gov.

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/DB:ps

cc: Mr. Hakim Ouansafi, HPHA

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Socrates Bratakos
Assistant Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawai‘i 96813

Attn: Battalion Chief Wayne Masuda, Fire Prevention Bureau

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Bratakos:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated August 30, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comment that the Honolulu Fire Department (HFD) has determined that there will be no significant impact to fire department services.

The following information will be included in the Draft Environmental Impact Statement (DEIS):

1. The proposed redevelopment will comply with requirements regarding fire department access roads (NFPA 1; UFC, 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.1).

2. The proposed redevelopment will provide an adequate county-approved water supply for the required fire flow for fire protection (NFPA 1; UFC, 2012 Edition, Section 18.3.1).

3. Civil drawings will be submitted to the HFD for review and approval at the appropriate stage in the development process.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

2017/ELOG-1642 (nc)

September 22, 2017

Hawai'i Public Housing Authority
Attn: Hakim Ouansafi, Executive Director
1002 North School Street
Honolulu, Hawaii 96813

PBR HAWAII & Associates, Inc.
ATTN: Greg Nakai, Planner
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Ouansafi and Mr. Nakai:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for the Hawai'i Public Housing Authority (HPHA) Administrative Offices, School Street Redevelopment
Tax Map Key: 1-6-009:003

We have the following comments on the EISPN for the HPHA Administrative Offices Redevelopment on School Street, which includes replacement HPHA offices, mixed-income housing (affordable and market priced), and neighborhood commercial-type uses.

Planning Division

The Draft Environmental Impact Statement (DEIS) should include the following:

1. Discussion on how the proposed project meets the planning principles and guidelines for the Primary Urban Center Development Plan and the Oahu General Plan.

2. Exhibits showing the proposed heights of the new apartment and administrative buildings. These elevation views could then be assessed for their potential to block makai views from the residences on Keola Street and block mauka views from properties on the makai side of North School Street.

3. Evaluation of building design and siting alternatives that bring storefronts closer to the street to generate more street presence and pedestrian activity.

4. Description of improvements that are contemplated in the street right-of-ways to promote pedestrian access and walkability. Will the concrete pathway adjacent to the sidewalk on North School Street and Lanakila Avenue remain? If so, will it be extended to improve connectivity with the surrounding properties?

5. Description of landscape buffers and screening the redevelopment will provide to adjacent properties.

6. Discussion on what open space amenities the residents of the redevelopment will enjoy.

7. Market analysis of what type of retail uses this proposed redevelopment will support.

8. Indication as to whether driveway entries would have sufficient width to accommodate the turning radii of larger vehicles such as The HandiVan and emergency response vehicles.

9. Specifications on proposed exterior lighting, which should be full-cut-off to avoid light spillage on adjacent properties.

<u>Land Use Permit Division</u>

1. The DEIS should fully explain what modifications or waivers will be sought from City codes and requirements, including the zoning code, fees, park dedication, and the like. The DEIS should also specify whether City permits will be sought to address those requests. The Applicant should include a full exploration of the land use permits that could be utilized for the project and which permits the Applicant intends to use. For example, as a public use and structure, the project could qualify for a Zoning Waiver Permit to waive zoning requirements. As an affordable housing project, it could qualify for exemptions under a Chapter 201H approval. Alternatively, the State may use its preemptive powers to exempt elements of the project from certain County requirements.

   For your information, City Ordinance 16-26 allows an Interim Planned Development – Transit (IPD-T) Permit to be utilized for projects up to one mile from a planned rail station. The project area is within one mile of a future station, but we note the project site is in the R-5 Residential District. Pursuant to Land Use Ordinance Section 21-9.100-5(a)(4), zoning lots that are eligible for an IPD-T Permit must be in the Apartment, Apartment Mixed Use, Business, Business Mixed Use, Resort, Industrial, or Industrial-Commercial Mixed Use Districts.

<u>Site Development Division</u>

1. The City's park dedication ordinance applies to this project. The Applicant should include in the DEIS a description of the onsite private parks and recreational facilities to serve the residents of the proposed housing project.

2. A preliminary construction management plan (CMP) and a traffic demand management plan (TMP) should be included with the DEIS documents. The final CMP should be submitted at the time of the issuance of the building permit and the TMP should be submitted at the time of the certificate of occupancy of the buildings.

3. The DEIS needs to include a narrative explaining the project's post-construction storm water quality management strategy pursuant to Section 20-3-50 of the Rules Relating to Water Quality. The project's compliance with the City's Storm Drainage Standards and Rules Relating to Water Quality will be verified at the time that the construction/grading plans are submitted to Department of Planning and Permitting for review.

4. The municipal sewer system is not adequate to support the proposed 1,000-unit HPHA Administrative Offices (School Street) Redevelopment project. The Awa Street Wastewater Pump Station (WWPS) is unable to support the increase in sewer flows. The Awa Street WWPS Project will address this inadequacy and is tentatively scheduled for completion in June 2020.

Transit Oriented Development (TOD) Division

1. The TOD Division supports the purpose and objectives of the Project, namely the provision of high-quality design, new low-income public housing, mixed-use development, and redevelopment of HPHA offices that will integrate with the existing neighborhood.

2. TOD is intended to encourage development that is less auto-reliant and supports using transit, walking, and biking. The increase in allowable density recommended in the TOD Plan, and obtainable through the IPD-T Permit provided all prerequisites are met, is specifically intended to increase housing supply among other mixed uses near the Kapalama and Iwilei rail stations, and to increase rail and bus ridership.

   To achieve this outcome, the TOD Plan recommends that parking for multifamily dwellings should be 0 – 1 per dwelling unit, depending on size.

   Projects that provide conventional levels of parking will attract residents, office workers, commercial tenants, and customers, who do not plan to walk, bike, or take transit, and the resulting traffic will overwhelm already crowded existing area streets. Projects that do not reduce their parking provision should not be allowed to build beyond the densities allowed under current zoning.

3. While greater density and height may be granted through the IPD-T permit, the importance of contextual integration is important in this location. Attention should be paid to adjacent and surrounding building heights and densities. We recommend the Project explore high-density, low-rise massing of a maximum of 4 to 5 stories high.

4. Walkability and connectivity is of great importance for a mixed-income development in a TOD area. Improvement to streets on and off site would be of great benefit to existing residents and the users of the project. Attention should be given to providing street trees along the sidewalk for shade and improving pedestrians' crossings of School Street and Lanakila Avenue. Improving connectivity for pedestrians and cyclists to Palama Street and Houghtailing Street will greatly enhance the project's accessibility to rail and bus corridors. Similarly, Ahiahi Street should be improved to be more pedestrian and cyclist friendly by providing shade and secure bicycle parking, so that internal circulation is easily accommodated on foot or by bicycle.

   Canopy trees and a planter strip should be located between the street curb and sidewalk to provide shade and pedestrian protection, as referenced in 3.2 of the TOD Plan. A reference photo is provided on the bottom of page 3-16 of the TOD Plan. Sidewalks should be widened to provide comfort along School Street and Lanakila Street.

5. The new HPHA offices proposed in the Conceptual Master Plan should be located close to the property line along School Street, creating an active frontage with "eyes on the street". If the height difference between the lot and sidewalk is unchanged, stairs should be provided so that pedestrians along School Street could easily access the offices from nearby bus stops. The parking in the front should be moved to the mauka side of the office building.

6. While we understand that there are existing trees to be preserved, every effort should be made to locate the apartments close to the property line along School Street. This will help create a more active School Street, get rid of any unusable open space, and possibly create more courtyard space in the proposed Conceptual Master Plan.

7. Please preserve the existing bus shelters and consider adding additional amenities such as additional lighting, shade, and seating, in the area where residents and office workers are waiting. The existing bus stop near the proposed HPHA offices do not have a bus shelter. Please consider integrating a bus shelter or waiting area with the redevelopment of that area.

Should you have any questions regarding these comments, please contact Noelle Cole of our staff, at 768-8055.

Very truly yours,

Eugene H. Takahashi

Eugene H. Takahashi
Acting Division Chief
Planning Division

EHT: ncc

PBR HAWAII
& ASSOCIATES, INC.

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED® AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED® AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED® AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

MARC SHIMATSU, ASLA
Senior Associate

DACHENG DONG, LEED® AP
Senior Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

MICAH McMILLEN, ASLA, LEED® AP
Associate

NATHALIE RAZO
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

printed on recycled paper

December 22, 2017

Mr. Eugene Takahashi
Acting Division Chief, Planning Division
Department of Planning and Permitting
City and County of Honolulu
650 South King Street 7th Floor
Honolulu, Hawaiʻi 96813

Attn: Noelle Cole

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, OʻAHU, TMK 1-6-009:003 (POR.)

Dear Mr. Takahashi:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter [your reference number 2017/ELOG-1642(nc)] dated September 22, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

PLANNING DIVISION

The Draft Environmental Impact Statement (DEIS) will include:

1. Discussion on how the principles and guidelines for the Primary Urban Center Development Plan and the Oahu General Plan are met by the proposed project;
2. Exhibits showing the proposed heights of the new apartment and administrative buildings;
3. Evaluation of building and site design alternatives that bring storefronts closer to the street (while balancing the concerns raised by some in the community to preserve as many of the existing mature trees along School Street);
4. Anticipation of the Department of Transportation Services on its Complete Streets program (if applicable). Actual design details of the concrete pathway adjacent to the sidewalk on North School Street and Lanakila Avenue are unknown at this time;
5. General mention of the role of landscaping and security ("eyes on the street");
6. General mention of the open space amenities being considered, especially since this is an all-senior residential project;
7. A market analysis of what types of retail uses this proposed redevelopment will include;
8. Mention that driveway entries will have sufficient width to accommodate the turning radii of larger vehicles such as TheHandiVan and emergency response vehicles; and
9. Mention that exterior lighting should be full-cut-off to avoid light spillage on adjacent properties.

LAND USE PERMITS DIVISION

1. The DEIS will include a description of the land use permits that could be sought for the project. A decision on approval process that may be sought requires further consultation with DPP, Hawaii Public Housing Authority and Retirement Housing Foundation.

It is acknowledged that while the project area is located within one mile of a future station, since the project site is in the R-5 Residential District, it would not be eligible for an Interim Planned Development - Transit (IPD-T) Permit, without rezoning the project area to Apartment District first.

SITE DEVELOPMENT DIVISION

The DEIS will include:

1. Mention of the Park Dedication Ordinance and that coordination with the Department of Parks and Recreation is on-going;
2. Drafts of a preliminary construction management plan (CMP) and a traffic demand management plan (TMP);
3. A narrative explaining the project's post-construction storm water quality management strategy pursuant to Section 20-3-50 of the Rules Relating to Water Quality; and
4. Your comment that, although the municipal sewer system is currently not adequate to support the proposed redevelopment, the Awa Street Wastewater Pump Station (WWPS) Project scheduled for completion in June 2020 will address this inadequacy.

TRANSIT ORIENTED DEVELOPMENT (TOD) DIVISION

We have clarified with your Department that the comments from the TOD Division were based on the assumption that the proposed project would be pursuing an IPD-T permit, but as noted earlier, it is acknowledged that while the project area is located within one mile of a future station, since the project site is in the R-5 Residential District, it would not be eligible for an Interim Planned Development - Transit (IPD-T) Permit.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

2017/ELOG-1642 (nc)

October 12, 2017

Agency:
Hawai'i Public Housing Authority
Attn: Hakim Ouansafi, Executive Director
1002 North School Street
Honolulu, Hawai'i 96813

Consultant:
PBR HAWAII & Associates, Inc.
ATTN: Greg Nakai, Planner
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813

Dear Mr. Ouansafi and Mr. Nakai:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) for the Hawai'i Public Housing Authority (HPHA) Administrative Offices, School Street Redevelopment
Tax Map Key: 1-6-009:003

The following is meant to supplement the letter issued on September 22, 2017, regarding departmental comments for the HPHA Administrative Offices Redevelopment on School Street EISPN:

1. Because the EISPN does not state what land use permits will be sought by the Applicant, and because the project site falls within one mile of a planned rail station, comments previously submitted by the Department of Planning and Permitting addressed the possibility of an Interim Planned Development–Transit (IPD-T) Permit.

   We note the project site is in the R-5 Residential District. Pursuant to Land Use Ordinance Section 21-9.100-5(a)(4), zoning lots that are eligible for an IPD-T Permit must be in the Apartment, Apartment Mixed Use, Business, Business Mixed Use, Resort, Industrial, or Industrial-Commercial Mixed Use Districts. Therefore, if the Applicant intends to pursue an IPD-T Permit, the Draft Environmental Impact Statement (DEIS) should state whether the Applicant will apply for a zone change prior to the application for an IPD-T Permit.

2. Whether or not the Applicant intends to pursue an IPD-T permit (pursuant to a zone change), the DEIS should fully explain what permits are anticipated for the project by the Applicant, what modifications or waivers, if any, will be sought from City codes and requirements, or if the State plans to use its preemptive powers to exempt elements of the project from certain County requirements.

Should you have any general questions regarding these supplemental comments, please contact Noelle Cole of Planning Division, at 768-8055. For specific questions on zoning and permitting, please contact Liz Krueger of Land Use Permits Division, at 768-8017.

Very truly yours,

Eugene H. Takahashi

Eugene H. Takahashi
Acting Division Chief
Planning Division

EHT:js

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Eugene Takahashi
Acting Division Chief, Planning Division
Department of Planning and Permitting
City and County of Honolulu
650 South King Street 7th Floor
Honolulu, Hawai‘i 96813

Attn: Ms. Noelle Cole, Planning Division; Ms. Liz Krueger, Land Use Permits Division

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Takahashi:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter [your reference number 2017/ELOG-1642(nc)] dated October 12, 2017, which supplemented your previous letter dated September 22, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments. The DEIS will state what land use permits may be sought by the Applicant, including the ones suggested by your Department.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

~~LOUIS M. KEALOHA~~
CHIEF

CARY OKIMOTO
~~JERRY INOUYE~~
DEPUTY CHIEFS

OUR REFERENCE MT-DK

August 24, 2017

Mr. Greg Nakai, Planner
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Nakai:

This is in response to a letter from PBR HAWAII & Associates, Inc. (dated August 11, 2017), requesting comments on an Environmental Impact Statement Preparation Notice for the Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment project.

The Honolulu Police Department has reviewed the information provided and has concerns regarding the potential economical and residential expansion around the project site.

It is anticipated that the development of commercial businesses and residential homes will increase the vehicle and pedestrian traffic in the project area. In addition, the population increase will cause an overall boost in demand for emergency services, including services provided by our department. If this project becomes a reality, without increased patrol officer staffing, we will most likely experience delays in police response to calls for service. The additional resources and staffing would require an increase in our current budget.

If there are any questions, please call Major Crizalmer Caraang of District 5 (Kalihi) at 723-8202.

Thank you for the opportunity to review this project.

Sincerely,

CARY OKIMOTO
Acting Chief of Police

By Mark Tsuyemura
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

cc: Mr. Hakim Ouansafi
Hawaii Housing Authority

Serving and Protecting With Aloha

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Chief Susan Ballard
Honolulu Police Department (HPD)
801 South Beretania Street
Honolulu, Hawai‘i 96813

Attn: Major Crizalmer Caraang, District 5 (Kalihi)

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Chief Ballard:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your department's letter (your reference number MT-DK) dated August 24, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

The Draft Environmental Impact Statement (DEIS) will include an assessment of potential impacts to vehicle and pedestrian traffic in the project area, and will identify appropriate mitigation measures.

The DEIS will also include a discussion on the potential impacts on the demand for emergency services, including services provided by your department. Since future residents of this affordable rental housing project (no public housing proposed) will be all seniors already living on O‘ahu, they are already being served by the Honolulu Police Department, and as a result, delays in police response to calls for service are not anticipated.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP8/17-700861R

September 19, 2017

Mr. Bob Fard
Sr. Director of Acquisitions
Retirement Housing Foundation
911 N. Studebaker Road
Long Beach, California 90815-4900

Dear Mr. Fard:

SUBJECT: Environmental Impact Statement Preparation Notice for Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment, Honolulu, Oahu, Hawaii

In response to your letter dated August 10, 2017, we have the following comments:

1. We have the following comments in regards to a Transportation Impact Analysis Report (TIAR):

   a. The TIAR should be replaced with a Transportation Assessment (TA) that analyzes the multi-modal nature of the Kalihi neighborhood and recognizes the need for traffic control devices that encourage walking, bicycling, and transit use as the primary access modes for the proposed project. The TA should identify parking management strategies both on- and off-street that will support the area.

   b. A multi-modal circulation plan that includes plan graphics should be completed to include vehicle, bicycle, and pedestrian circulation impacts and potential conflicts in the surrounding area roadways (North School Street, Lanakila Avenue, Ahiahi Street, etc.) and measures to mitigate these impacts by applying Complete Streets principles.

c. The 1,000 unit mixed-income (affordable and market priced) housing and commercial use will increase traffic in the area. Include a description of how this will affect the current operations in the area and the improvements that will be completed to the major intersections and roadways to accommodate the increase in vehicles, pedestrians and bicyclists.

d. When possible use person trips instead of vehicle trip rates from the Institute of Transportation Engineers Trip Generation Manual and assign these trips to the transportation system. This will require analysis of crossing treatments using National Cooperative Highway Research Program Report 562 methodology for pedestrian measures.

e. In addition to the calculated Level of Service (LOS), the observational LOS should be provided.

f. Define performance measures for use in the study:

- V/C ratio targets that are >1 for 1st and/or 2nd highest peak hours
- Identify where vehicle LOS will not be used
- Pedestrian LOS
- Bicycle LOS or Level of Traffic Stress
- Transit Capacity and Quality of Service

2. A parking analysis should be completed to determine the number of stalls that will be provided and its effect on the surrounding area. Include a description of how the Applicant plans on monitoring and managing the parking use between the various users.

3. The project location will be less than 2 miles from a rail station. Include a description of how the residents will be able to access the rail station.

4. The Environmental Impact Statement (EIS) should have a Traffic Management Plan (TMP) which includes the following:

a. A discussion of the traffic impacts that the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

b. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

c. Construction schedules should be coordinated with other nearby properties that have planned projects to ensure minimal impacts on City streets.

d. Inform employees, residents and visitors of the City's vanpool, car share, and bikeshare programs to promote alternate modes of transportation.

e. Consider providing subsidized transit passes to employees and residents to encourage use of public transit.

f. Best practice TMPs provide the City with information by which to monitor construction areas. The City will require cameras where sidewalks are closed to help assess effectiveness of management.

g. The TMP shall be jointly reviewed and accepted by the City's Department of Transportation Services and the Department of Planning and Permitting.

5. This project is in an existing public transit service area. To ensure that the project development does not affect public transit services (bus operations, bus routes, bus stops and para-transit operations); submit project plans to DTS – Public Transit Division (PTD) for review and approval. Contact DTS-PTD at 768-8396, 768-8370, 768-8374 or TheBusStop@honolulu.gov.

6. There are many employees, residents and visitors that use the adjacent bus stop on School Street. Therefore, the Applicant should adopt the bus stop (i.e., be responsible for litter removal, cleaning and maintenance of bus stop shelter, benches and floor area) at no cost to the City.

7. On-site bike racks, secure bike storage, and secure moped parking for the employees, residents and visitors should be included.

8. All parking needs for the proposed facility (residents, employees and visitors) should be handled on-site.

9. All loading and unloading needs, including refuse and service delivery vehicles should be handled on-site, rather than on City roadways.

10. The project should be designed to accommodate TheHandi-Van para-transit vehicles on-site, which require a minimum 31-foot turning radius, a 10-foot, 6-inch height clearance, and the ability to exit the site without reversing onto public roadyways.

11. All access driveways to the project site should be designed with the highest pedestrian and bicycle safety measures, constructed to current City standards, and meet Americans with Disabilities Act (ADA) requirements.

12. Best Management Practice controls should be included at construction site to prevent trailing of dirt and debris on City roadways.

13. Ensure that all existing pedestrian, bicycle and vehicle access is maintained with the highest safety measures.

14. Any damage to the existing roadway, sidewalk or shoulder area caused by the project should be repaired to current City standards.

15. The area Neighborhood Board, as well as the area residents, businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

16. A street usage permit from the City's Department of Transportation Services should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

17. Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by the Disability and Communication Access Board to ensure full compliance with the ADA.

We reserve further comment pending review of the EIS.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

(Fm)

Wes Frysztacki
Director

cc: Greg Nakai, PBR Hawaii

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Wes Frysztacki, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street 3rd Floor
Honolulu, Hawai‘i 96813

Attn: Ms. Renee Yamasaki

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Frysztacki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter (your reference number TP8/17-700861R) dated September 19, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

1. The Draft Environmental Impact Statement (DEIS) will include the findings of a traffic study that will address the Department of Transportation Services' (DTS's) comments regarding:
    a. The multi-modal nature of the neighborhood and the need for traffic control devices that encourage walking, bicycling, and transit use, as well as appropriate parking management strategies;
    b. A multi-modal circulation plan that analyzes potential impacts and mitigation measures that apply Complete Streets principles;
    c. Potential impacts of the redevelopment on area traffic, and appropriate measures to mitigate these impacts;
    d. Where possible, use of person trips rather than vehicle trips in the analysis;
    e. Provision of observational Level of Service (LOS) in addition to the calculated LOS; and
    f. Definitions of performance measures as provided by DTS.

2. The DEIS will incorporate a parking analysis that will include the number of stalls to be provided, the potential impacts on the surrounding area, and a description of how parking use between various users will be monitored and managed.

3. The DEIS will include a description of how residents will be able to access the rail station.

4. The DEIS will incorporate a Traffic Management Plan (TMP) that will:
    a. Discuss traffic impacts and mitigation measures that apply Complete Streets principles;
    b. Note that construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets;

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

c. Note that construction schedules should be coordinated with other nearby properties that have planned projects;
d. Promote alternate modes of transportation such as the City's vanpool, car share, and bikeshare programs for the redevelopment's employees, residents, and visitors;
e. Consider the provision of subsidized transit passes to employees and residents to encourage use of public transit;
f. Include a means by which the City may monitor construction areas to help assess effectiveness of traffic management; and
g. Be jointly reviewed and accepted by the City's DTS and the Department of Planning and Permitting (DPP).

5. The DEIS will note that project plans will be submitted to DTS - Public Transit Division (PTD) for review and approval to ensure that the project does not affect public transit services.

6. Your recommendation that the Applicant should adopt the adjacent bus stop on North School Street has been shared with the developer. Such a commitment would only be possible if the project is implemented as proposed.

7. The DEIS will note your recommendation that on-site bike racks, secure bike storage, and secure moped parking for the employees, residents, and visitors should be included in the project if its successfully built.

8. The DEIS will indicate that all parking needs (for residents, employees, and visitors) will be handled on-site, although accommodations for other means of transportation will be provided (such as car sharing, Biki, bicycle parking, etc.).

9. The DEIS will note that all loading and unloading needs, including refuse and service delivery vehicles, will be handled on-site.

10. The DEIS will include the design requirements for accommodating TheHandi-Van para-transit vehicles on-site.

11. The DEIS will indicate that all access driveways to the project site will be designed with the highest pedestrian and bicycle safety measures, constructed to current City standards, and meet Americans with Disabilities Act (ADA) requirements.

12. The DEIS will indicate that Best Management Practice controls will be included at the construction site to prevent trailing of dirt and debris on City roadways.

13. The DEIS will include your recommendation to ensure that all existing pedestrian, bicycle, and vehicle access within the project site is maintained with the highest safety measures.

14. The DEIS will note that any damage to the existing roadway, sidewalk, or shoulder area caused by the project should be repaired to its pre-construction condition.

15. The DEIS will note that the area Neighborhood Board, as well as area residents, businesses, emergency personnel, and Oahu Transit Services, Inc., should be kept apprised of the proposed project and the impacts that the project may have on the adjoining local street area network.

16. The DEIS will note that a street usage permit from DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane on a City street.

17. The DEIS will note that project plans should be reviewed and approved by the Disability and Communication Access Board (DCAB) to ensure full compliance with the ADA.

We appreciate your participation in the environmental review process. Your letter will be included in the DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

From: YoloCare [mailto:no-reply@yolocare.com]
Sent: Thursday, September 14, 2017 4:27 PM
To: RHF Information <info@rhf.org>
Subject: New submission from New Contact Us

Name
Senator Donna Mercado Kim
Phone
(808) 587-7200
Email
senkim@capitol.hawaii.gov
Message
I would like to be added to you information distribution list for materials and future public meetings.

Message was sent from: http://schoolstredevelopment.org/contact-us/

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

The Honorable Donna Mercado Kim
Senate District 14
Hawai‘i State Capitol
415 South Beretania Street, Room 218
Honolulu, HI 96813
senkim@capitol.hawaii.gov

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Senator Kim:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message dated September 14, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your request and have added your contact information to the list of interested parties.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 202
HONOLULU, HAWAII 96813-3065
TELEPHONE: (808) 768-5010 • FAX: (808) 768-5011

CAROL FUKUNAGA
HONOLULU CITY COUNCIL, DISTRICT 6
PHONE: 768-5006 FAX: 768-1226
EMAIL: cafukunaga@honolulu.gov

September 22, 2017

PBR Hawaii & Associates, Inc.
ATTN: Greg Nakai, Planner
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Re: Comments on Hawaii Public Housing Authority Administrative Offices (School Street) Redevelopment

Dear Mr. Nakai,
Thank you for the opportunity to comment on the Prep Notice for an Environmental Impact Statement for the above-listed project.

In light of the overwhelming need for affordable and low-income housing in Honolulu, I am submitting my comments expressing strong support for the HPHA's efforts with the proposed redevelopment project. In particular, I appreciate the agency's approach to the School Street redevelopment in the following areas:

1. Undertaking a Master Planning process that is intended to engage community members and stakeholders as co-designers of the redevelopment project.

2. Establishing a framework for high-quality design that meets or exceeds industry standards for conservation and green practices in a LEED-certifiable project, as well as seeking neighborhood integration to strengthen the economic vitality of the area.

3. Undertaking a full Environmental Impact Statement (EIS) process to provide public review of the impacts of differing combinations of housing units, and corresponding traffic, environmental and social impacts upon the surrounding neighborhood.

I look forward to reviewing the Draft Environmental Impact Statement (EIS) documents, and working with HPHA's master plan consultants and community stakeholders in redeveloping the project site.

Sincerely,

Carol Fukunaga

Councilmember Carol Fukunaga
District 6 (Makiki-Punchbowl, Papakolea,
Downtown-Chinatown, Kaka'ako, Nu'uanu-Liliha to Aiea Heights)

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Councilmember Carol Fukunaga
Honolulu City Council, District 6
City and County of Honolulu
530 South King Street Room 202
Honolulu, Hawai‘i 96813

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Councilmember Fukunaga:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 22, 2017, regarding the subject project. As the planning consultant for RHF, we appreciate your attendance and participation in the community meetings as part of the Master Planning process, as well as your letter expressing strong support for the subject project.

We are grateful for your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

From: Suzanne Oakland <suzanne.oakland@catholiccharitieshawaii.org>
Sent: Wednesday, September 20, 2017 4:41 PM
To: HPHAschoolstreet
Subject: Scoping Meeting on September 12, 2017

Dear Greg:

There has been concern expressed by a number of seniors that 1,000 housing units is too much for the proposed School Street Redevelopment. A number of residents have expressed concern and would like to see the number of units reduced to two to three hundred units. They asked me to express this concern to those receiving community feedback, since many of them did not know the potential scope of units under consideration. They also suggested that future flyers of community meetings, relating to the School Street Redevelopment, contain a clearer description of what the proposal entails.

Many residents said they were caught off guard when they learned that 1,000 units may be under consideration as well as it being senior housing and possibly family housing. A succinct, clear description on meeting flyers of what the project may involve would be most appreciated by the residents of this neighborhood.

They have expressed interest in having more senior housing in this area and find this use very compatible with the existing community.
They would also like to see a senior center component integrated into the proposed senior housing development where a variety of activities can take place as well as the preservation of parking spaces currently used by the Lanakila Multi-Purpose Senior Center. Additionally, covered areas where vans, buses and taxis could drive seniors to and from their place of residence and the senior center protected from the rain is also being expressed by surrounding residents as well as covered, landscapted walkways for seniors who walk and catch the bus to traverse safely.

Thank you for your kind consideration of these requests.

Me ke aloha pumehana,

Susie

Suzanne Chun Oakland
Program Coordinator
Lanakila Multi-Purpose Senior Center
1640 Lanakila Avenue
Honolulu, Hawaii 96817
(808) 847-1322
suzanne.oakland@catholiccharitieshawaii.org

www.CatholicCharitiesHawaii.org

Catholic Charities Hawaii…helping people in need to help themselves, regardless of their faith.

it, if any); destroy any hard copies you may have created; and notify Catholic Charities Hawaii immediately at 808-847-1322.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Suzanne Chun Oakland
Program Coordinator
Lanakila Multi-Purpose Senior Center
1640 Lanakila Avenue
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Oakland:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your e-mail message dated September 20, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

We acknowledge the concerns expressed by residents regarding the number and type of proposed housing units, as well as their desire to see the number of units reduced.

We appreciate the feedback regarding inclusion of a description of the proposed project on future flyers for community meetings. Although the flyers for the subsequent October 18th and 19th community meetings had already been mailed by the time we received this feedback, the suggestion has been noted and will be taken into consideration in the event that future community meetings are held.

It should be noted, however, that the purpose of the September 12th Environmental Impact Statement (EIS) Public Scoping meeting was intended to receive comments on what topics and issues the Draft EIS should address. Any detailed information was provided in the EIS Preparation Notice (EISPN) itself.

The purpose for the October 18th and 19th community meetings was to continue the master plan engagement process, which is slightly different from the EIS process. Some information on the master plan process is available on the website: http://schoolstredevelopment.org/.

Regarding the EIS process, residents will be able to comment on the Draft EIS when it is published. The comment period will be open for a period of 45 days.

We acknowledge the interest expressed by residents in having more senior housing in this area and that they find this use very compatible with the existing community. We

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

also acknowledge the senior residents' desire to have: 1) a senior center component integrated into the proposed senior housing development where a variety of activities can take place; 2) the parking spaces currently used by the Lanakila Multi-Purpose Senior Center preserved; 3) pick-up and drop-off areas for vans, buses, and taxis that are covered to provide protection from the rain; and 4) covered, landscaped walkways for seniors who walk and catch the bus to traverse safely.

We will share your comments with the project site planners. Our initial reaction is that while the current parking spaces used by the Lanakila Multi-Purpose Senior Center may not be preserved in place, certainly accommodations will be provided for parking and covered pick-ups/drop-offs.

We appreciate your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

Hawai‘i
Construction
Alliance

P.O. Box 179441
Honolulu, HI 96817
(808) 348-8885

September 8, 2017

Mr. Hakim Ouansafi, Executive Director
Hawai‘i Public Housing Authority
1002 North School Street
Honolulu, Hawai‘i 96817

RE: Comments on EISPN for HPHA Administrative Offices Redevelopment

Dear Director Ouansafi,

The Hawai‘i Construction Alliance is comprised of the Hawai‘i Regional Council of Carpenters; the Operative Plasterers' and Cement Masons' Union, Local 630; International Union of Bricklayers & Allied Craftworkers, Local 1; the Laborers' International Union of North America, Local 368; and the Operating Engineers, Local Union No. 3. Together, the member unions of the Hawai‘i Construction Alliance represent 15,000 working men and women in the basic crafts of Hawai‘i's construction industry.

We have been extremely concerned about the chronic deficiency of rental apartment housing across the state, which is negatively affecting families throughout the entire community – including our members. We are pleased, therefore, to see that HPHA is proposing to develop mixed-income rental units along School Street at the site of its administrative offices. Furthermore, we appreciate the outreach that HPHA has done and will continue to do in regard to refining the final project.

The EISPN indicates that an "Economic and Fiscal Impacts" study will be performed as part of the project's EIS, and further indicates that construction of the facility is expected to have "significant positive impacts such as substantially improving the economic welfare…of the community or State."

As part of evaluating the project's economic and fiscal impacts, we hope the EIS will affirm that construction of the project will be subject to HRS Chapter 104, which require prevailing wages to be paid to construction laborers and mechanics who work on the site. The Chapter 104 prevailing wage requirement is essential to ensuring that local construction workers are paid properly at living wages for their skills and labor, and to ensuring that local contractors are able to competitively bid on construction of the project.

Mahalo for the opportunity to provide these comments.

Aloha,

Tyler Dos Santos-Tam
Executive Director
Hawai‘i Construction Alliance
execdir@hawaiiconstructionalliance.org

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Tyler Dos Santos-Tam
Executive Director
Hawai‘i Construction Alliance
P.O. Box 179441
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Dos Santos-Tam:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 8, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

We appreciate your support for the subject project and its potential to help address the chronic deficiency of rental apartment housing across the state.

As recommended, the Draft Environmental Impact Statement (DEIS) will include an economic and fiscal impacts study affirming that construction of the project will be subject to HRS Chapter 104, which requires prevailing wages to be paid to construction laborers and mechanics who work on the site.

We are grateful for your participation in the environmental review process. Your letter will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Good Shepherd Preschool

Shiu King Rita Tamwat
Good Shepherd Preschool
638 N. Kuakini Street
Honolulu, HI 96817

Received via website on 9/20/2017:

Good Shepherd Preschool, located at 638 N Kuakini St, is against this project for the following reasons:

1. The amount of traffic it will generate in our already busy neighborhood will have a huge negative impact on our school's staff and families.

2. North Kuakini Street is very congested in the mornings and afternoons; it is very hard to enter and exit our driveway safely. An increase in cars on the road will make an already dangerous situation even worse, putting our preschoolers at risk.

3. There are many children walking in the area; to and from Lanakila Elementary School, Kawananakoa Middle School, Likelike Elementary School and St. Theresa Catholic School. More traffic puts these children at risk when crossing the streets.

4. Our school wanted to expand its student capacity, as we have enough space on our property to do so. However, we were denied because more students would produce more traffic in the area. Why were we denied an increase of twenty students, yet a project to add 3000 people is being proposed?

Again, Good Shepherd Preschool does not want this project built, as it will jeopardize the safety of our preschool families and staff and the children in our neighborhood. Thank you for your consideration.

Sincerely,
Shiu King Rita Tamwat
Preschool Director

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Shiu King Rita Tamwat
Good Shepherd Preschool
638 N Kuakini Street
Honolulu, Hawaiʻi 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, OʻAHU, TMK 1-6-009:003 (POR.)

Dear Shiu King Rita Tamwat:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 20, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding potential traffic impacts and associated safety issues for your preschool families, students, and staff, and for students of other schools in the area. The Draft Environmental Impact Statement (DEIS) will include a discussion of traffic impacts and measures to mitigate these impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Robert Arakaki

Robert Arakaki
1446 Alewa Drive
Honolulu Hawaii 96817

Received via website on 9/8/2017:

I am very concerned about the height for some of the proposed buildings. In the context of the surrounding neighborhood the three proposed towers 20 stories tall would be a monstrosity. As such they would destroy the residential character of the Lanakila community, replacing it with an urban core similar to Kakaako. I urge that the design be scaled back so that no building be over 10 stories high. I would prefer the buildings be 4 to 5 stories high. This would be more in keeping with the character of the neighborhood. I strongly oppose any building over 10 stories.

Comment on the proposed School Street Redevelopment Project

Received via website on 9/22/17

Comment from:
Robert Arakaki
1446 Alewa Drive
Honolulu, HI 96817
r-arakaki@hawaiiantel.net

The community input process was severely flawed. The initial sketches failed to include a low-density design for 200 to 400 units. All the original designs were for a thousand units and included buildings that were twenty stories high. In other words, residents at the charette were presented only with several high-density designs. The close similarity of designs presented means that residents were not given a real choice. The process cannot be considered fair and democratic but skewed to a particular outcome favored by certain parties. HPHA and RHF should "go back to the drawing board."

The design is out of character with the Lanakila neighborhood which is zoned as a low-density residential. What HPHA and RHF propose is to build a massive high-density urban-style project in a low-density residential neighborhood. What is being proposed here is the construction of high rises like that in Kakaako. Such massive high rises would destroy the residential quality of the Lanakila neighborhood.

The proposed high density housing project would unfairly burden a neighborhood that already has a concentration of low-income housing projects: Puahala Homes, Kapuna Apartments, Hale Poai, Halia Hale, and Lanakila Garden. The latest design would only exacerbate the current situation. The proposed mixed income approach can be acceptable providing that it does not result in high density projects. While mixed use, mixed income housing has many pluses is doubtful that this would be suitable for the Lanakila neighborhood given the need for economy of scale.

The Kalihi-Palama area already suffers from a disproportionate concentration of low income housing relative to other areas and neighborhoods on the island of Oahu. To concentrate low income housing in one area goes against the best practices in urban planning. The State of Hawaii should look to building mixed income, mixed use housing projects in areas like Kakaako or along the proposed mass transit route. It should also look into a more even distribution of low income housing across Oahu.

The design would set the precedent for the construction of massive high rises at the foot of Kapalama/Alewa Heights. Such encroachment of urban development on the mountain would radically alter the historic nature of the Hawaiian ahapuaa. It would set a precedent for high density urban construction from the ocean up to and onto the mountain which would result in Honolulu looking like congested urban centers like Hong Kong. HPHA should take a planning approach that looks to distributing low income housing more evenly across the island of Oahu.

The School Street redevelopment project is a historic opportunity for HPHA to improve the quality of life in the Lanakila neighborhood by setting aside 2 acres of the property for a passive use park or community garden. A passive use park would enhance the quality of life for area residents and members of the Lanakila Senior Center. This alternative approach would complement Lanakila District Park which consists of a baseball field and a basketball court, both of which are not heavily used by senior citizens. The construction of a passive use park and/or community garden would allow for the retention of the trees currently surrounding HPHA's administrative buildings. These trees are a valuable asset to the neighborhood and should be retained, not destroyed. It is likely that many area residents would welcome this approach. It behooves HPHA and RHF to present this option for the consideration of local residents.

PBR HAWAII
& ASSOCIATES, INC.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 22, 2017

Mr. Robert Arakaki
1446 Alewa Drive
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Arakaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your messages received online on September 8 and September 22, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will describe the public engagement and community input process, as well as the alternatives that were considered and the rationale for the selection of the preferred alternative in light of project objectives. The DEIS will also discuss building heights and design; potential visual impacts to the neighborhood and measures to mitigate these impacts; and the retail demand for the mixed-use component of the redevelopment.

The DEIS will clarify that the residential component of the proposed project will not involve public housing, and proposes 100% senior affordable rental housing. It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a severe shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. To address this need, this project is one of a number of affordable housing projects that the State has planned for neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu's Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

We acknowledge your suggestions to develop the project site into a passive park and/or community garden, and to retain the trees currently surrounding HPHA's administrative buildings. As currently proposed, the project will retain these trees and provide open green spaces along School Street.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

Comment From: Judy Asman

Judy Asman
15 Craigside Place
Honolulu Hawaii 96817

Received via website on 9/6/2017:

In effort to decrease cars on the road...and this project is on bus line...minimize Parking..paid parking only and add some green and shady gathering space for residents and shoppers...clean up nearby cemetery and post closing hours for park and new space...maybe any businesses close by 10:00 (residential neighborhood) " chemical free zone...no sale of beer, wine, liquor, cig etc.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Judy Asman
15 Craigside Place
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Asman:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 6, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your suggestions for the redevelopment, including minimizing parking and having it be paid parking only; adding green and shaded gathering spaces; and restricting hours for new businesses.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Susan Carvalho

Susan Carvalho
2240a Mahalo Street
Honolulu Hawaii 96817

Received via website on 8/29/2017:

This older community will not be able to handle the extra requirements for sewer, water, police and fire services. Will monies be appropriated for extra police and fire personnel, sewer and water services? More traffic lights? Why not consider the location where OCC exists, after they are relocated.

December 22, 2017

Ms. Susan Carvalho
2240A Mahalo Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Carvalho:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on August 29, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding sewer, water, police, and fire services, as well as traffic. The Draft Environmental Impact Statement (DEIS) will address these issues, and will discuss potential impacts and mitigation measures. We also acknowledge your suggestion to explore alternative sites such as OCCC.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Yukari Cash

Yukari Cash
2248 Aupuni Street
Honolulu Hawaii 96817

Received via website on 9/15/2017:

I am against the development project as planned. Three highrises and up to 1,000 rental units are more than this area can support. Traffic and crime can be expected to get worse. It's questionable whether the existing infrastructure (water, sewer, electricity, etc.) can support a project of this magnitude. This project will destroy the look and character of the neighborhood, making it more like Kakaako.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Yukari Cash
2248 Aupuni Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Cash:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 15, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts and mitigation measures regarding traffic, crime and public safety, infrastructure, and visual resources of the neighborhood.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Mary Helen DeLapp

Mary Helen DeLapp
1222 Alani Street
Honolulu Hawaii 96817

Received via website on 9/18/2017:

The development of this size and proportion would be very detrimental to Kalihi due to traffic, noise, safety and crime will increase drastically. It will impact traffic with the increased business and residential cars with a development of this size. Rush hour traffic will be increased. I avoid the School St. and Likelike intersection during rush hour, traffic would be equally bad in the Palama St. and Liliha St. area with a development of this size. School St. is a heavy used corridor and the traffic will only worsen with a development of this capacity. Safety will be compromised with the additional street traffic near St. Theresa School, Likelike Elementary School and Lanakila Elementary School. Crime would be on the increase with an additional 1,000 residence. And the neighborhood parking will also be greatly impacted. The utilities in Kalihi is an aging infrastructure. Will the sewer and water be updated throughout Kalihi from Liliha to Ft. Shafter? Will Kalihi turn into constant road work being dug up to support the sewer and water throughout Kalihi with this added development?

Why doesn't the HPHA invest in making Kuhio Park Terrace more sustainability area instead of building another high rise on the other end of Kalihi?

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Mary Helen DeLapp
1222 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. DeLapp:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 18, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts and mitigation measures regarding traffic, parking, noise, public safety, and infrastructure.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Jamesner Dumlao

Jamesner Dumlao
1641-A Old Palama Street
Honolulu Hawaii 96817

Received via website on 8/28/2017:

It is imperative that whatever project is completed, that it comports with the existing regulations and character of the surrounding community.

You state on your website that you estimate 800 to 1000 rental units being built, but you cannot say how tall the structure will be. That strikes me as odd at best. Even at the community presentation that I attended several months ago, you could not provide a definitive answer (and apparently still cannot). How can you truly address the "environmental impact" of such a development if you cannot even address this straight-forward question?

The height and density of the building must be consistent with the surrounding community. No building in the immediate environs appears higher than 12 stories or so.

Per capita, Kalihi has the highest concentration of subsidized and/or state public housing units on Oahu. This is a State-wide issue and the burden must be shared equally. It is a matter of fairness too.

School street is already one of the most congested pathways into town and the increased traffic congestion that the proposed number of units will demand is too much to bear for the existing community infrastructure.

Please address the issues I raised.

PBR HAWAII
& ASSOCIATES, INC.

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED®AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED®AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED®AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

MICAH McMILLEN, ASLA, LEED®AP
Associate

December 22, 2017

Mr. Jamesner Dumlao
1641-A Old Pālama Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Dumlao:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on August 28, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding expected building heights, subsidized and/or State public housing, and traffic along School Street. The Draft Environmental Impact Statement (DEIS) will address these issues, including potential impacts and mitigation measures.

It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a severe shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. This project is one of a number of affordable housing projects that the State has planned for various neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu’s Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Fe Garay

Fe Garay
1730 Apt. B Olona Lane
Honolulu Hawaii 96817

Received via website on 9/6/2017:

Glad to know when projecct be finished & how much is monthly rental fee. Thank you.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Fe Garay
1730 Olona Lane Apt. B
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Fe:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 6, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will indicate that the timeline for the proposed project is contingent upon Environmental Impact Statement (EIS) acceptance, permit approvals, market forces, and funding and financing. As such, it is not currently known exactly when the demolition and construction would start. However, for the purposes of the DEIS, we assumed that demolition and construction would start in 2020, and onsite construction is estimated to be completed in five phases at roughly two years per phase for a total construction period of at least ten years.

Although the DEIS will not include estimated rental rates for the apartments, it will state that the proposed project includes 800 affordable rental units that will be targeted to senior households earning 30% to 60% of area median income (AMI). The 2017 income limits for the targeted affordable income groups for Honolulu County will be included in the DEIS.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Ally Ha

Ally Ha
2937 Laelae Way
Honolulu Hawaii 96819

Received via website on 9/16/2017:

The proposed site for the development is located in a community and neighborhood that's already densely populated with resource constraints, particularly regarding sewage/waste, education system and traffic. There is already a disproportionate amount of housing developments in Kalihi, when compared to other communities, so why not look at other sites and communities?

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Ally Ha
2937 Laelae Way
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Ha:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 16, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts and mitigation measures regarding schools, traffic and roads, and wastewater and solid waste systems.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Thomas Hackett

Thomas Hackett
81 Kawananakoa Place, Unit D
Honolulu Hawaii 96817

Received via website on 9/7/2017:

Any large residential development like this should include more than adequate parking for the residents as well as their guests. At least 2 stalls per unit because everyone wants to drive their own car. Two people sharing a 1 bedroom probably means 2 cars. 3-4 people sharing a 2 bedroom probably means 3-4 cars (assuming they're all driving age). Please don't even consider putting in just 2 or 3 guest parking stalls for the building, it should be more like 20-30. Buildings like Sakura, and other nearby apartment buildings, on Nuuanu Ave. have residents using street parking which causes additional congestion and problem during rush hour times. Who would want to live in a building that doesn't have enough parking anyway? Why not make a nice building that has ample parking.

Please do not put in the incredibly tiny compact stalls that are seen in most places around town. The parking stalls should be ample sized, like the ones you would see at Home Depot. It seems like a majority of local residents want to drive large vans, SUVs and pickup trucks but try to park them in compact stalls.

December 22, 2017

Mr. Thomas Hackett
81 Kawananakoa Place, Unit D
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Hackett:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 7, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the provision of on-site parking for the redevelopment. This issue will be addressed in the Draft Environmental Impact Statement (DEIS).

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Gregory Kam

Gregory Kam
822 Iholena Place
Honolulu Hawaii 96817

Received via website on 9/6/2017:

Please ensure to provide adequate safety features for our growing senior community with adequate first responders, Police , Fire fighters etc and educational facilities for our future generation's children. In addition the preservation and expansion of other community facilities for our growing numbers of Seniors to utilize now and into the future!

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Gregory Kam
822 Iholena Place
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Kam:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 6, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the provision of adequate safety features for the growing senior community, such as first responders, police, and firefighters, as well as the inclusion of educational and community facilities. The Draft Environmental Impact Statement (DEIS) will discuss these issues, including potential impacts and mitigation measures.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Adrian Keanu

Adrian Keanu
P.O. Box 17433
Honolulu Hawaii 96817

Received via website on 8/12/2017:

Aloha –
I would like to begin with this: In Texas, the Department of Housing and Community Affairs was sued under the Fair Housing Act, under a disparate-impact claim. The Department caused continued segregated housing patterns because of the way its allotted tax credits resulted in low-income housing being built predominantly in black neighborhoods. After assuming the Department's reasons were valid, the federal court nonetheless found that the Department did not show there were less discriminatory ways to address low income housing. The case was appealed to the United States Supreme Court, which held that disparate impact claims ARE cognizable under the Fair Housing Act.

With respect to the HPHA project, the entire neighborhood was against this development from the start, yet at a neighborhood board meeting, the politicians present stated they heard "mixed reactions" from the public, despite 100% o the testimony being AGAINST the project. That's when I knew the politicians would (for whatever personal or business interests they have in this project), shove this project down our throats no matter how the neighborhood felt about it.

Your statement that this is a "bus transit-available neighborhood" is a joke, as you know most units will have one or more cars, which is acknowledged by your building at least 500 parking stalls to address part of the influx of more cars.

As pointed out by residents at various meetings, the side roads in this area CANNOT BE EXPANDED to accommodate additional cars, as they could be in other parts of the island. Traffic here is already bad, and this project will make it a nightmare. Other areas of the island have room to expand existing roadways; we don't.

Additionally, this area ALREADY has its share -- I would say MORE than its share -- of low income housing. This was also pointed out by residents of this area, but apparently ignored by politicians.

Also, all the designs we were shown for this 1,000 (or more) unit project show no architectural aesthetics, as if giving us the ugliest/cheapest design didn't matter to the HPHA, like it would have mattered in other neighborhoods. So what is the difference? The racial makeup of our neighborhood? There are a lot of "brown" people here, so they don't deserve any better to you? You are deliberately turning the brown neighborhoods of Honolulu into ghettos, and it is a disgrace. I have had enough of Hawaii's favoritism for certain neighborhoods and racial groups, at the expense of others. While the City and State spend millions of dollars beautifying select neighborhoods, they spend millions more turning less favorable neighborhoods into ghettos. It is a disgrace, because it is racially motivated.

I am utterly fed up with the HPHA, and its lip service about trying to do what's best for Hawaii. You are doing what's best for certain favored neighborhoods, at the expense of others.

I will conclude how I began: this project has a disparate (negative) impact on our neighborhood. There are less discriminatory ways to address Hawaii's low income housing needs, such as spreading out the housing among other neighborhoods; choosing locations that has room to expand roads to address traffic congestion; and building structures that have some sort of aesthetics to them and/or building much, much, much, much fewer units. I won't hold my breath that the HPHA will take any of this into account, based upon the way the neighborhood's views were ignored in the past. However, as a Native Hawaiian, I felt compelled to speak out in defense of my neighborhood.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Adrian Keanu
P.O. Box 17433
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Keanu:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your comment received online on August 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a severe shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. This project is one of a number of affordable housing projects that the State has planned for neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu’s Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

The Draft Environmental Impact Statement (DEIS) will clarify that the residential component of the proposed project will not involve public housing, but will comprise 100% senior affordable rental housing. In addition, the DEIS will include discussions on potential impacts to traffic, roads, and parking, and will provide possible mitigation measures. The DEIS will also describe the master planning process, during which neighborhood residents provided input on various aspects of the project, such as architectural style and aesthetics, at a number of community meetings.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Toby Kravet

Toby Kravet
1934 Naio Street
Honolulu Hawaii 96817

Received via website on 9/14/2017:

I am opposed to all new uses of the public housing headquarters site, save senior housing, for the simple reason that it will put more traffic, perhaps a significant amount, on School and Kuakini Streets which are indispensable routes in the Honolulu direction from Kamehameha Heights and other adjacent areas. Also, the rush hour H1 freeway traffic, from the Kalihi Street entrance to the Puanhou Street exit, is already bumper to bumper and this would make it worse. Impact on traffic has been largely ignored or underestimated with many other developments on Oahu, and it is time this is considered. I am not opposed to senior housing as it is my experience that seniors are apt to spend more time at home and make greater use of public transportation. Thank you for the opportunity to offer my thoughts.

Toby Kravet

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Toby Kravet
1934 Naio Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Kravet:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 14, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your support for senior housing, as well as your comments and concerns regarding traffic. The Draft Environmental Impact Statement (DEIS) will include a discussion on potential impacts to traffic as well as measures to mitigate these impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

August 15, 2017

Retirement Housing Foundation
911 N. Studebaker Road
Long Beach, CA 90815-4900

Aloha Mr. Fard,

I am writing in response to your August 10, 2017 letter and as my EIS commenting of the proposed development project in Honolulu Hawaii:

TMK: 1-6-009:003
1002 N. School Street, Honolulu, Hawaii

As someone who has lived in this neighborhood most of my life, I mahalo (thank) you for the opportunity.

If your EIS consultant has not already researched and shared the history of this aina (land) with you, I have attached several documents that may offer you and your hui (group) new perspective or connection as your hui redevelops this aina.

Though I have in the past testified against the redevelopment, I have come to accept that change is inevitable and hope that the redevelopment will ultimately do pono (righteous) to the aina and the long-time residents of this neighborhood.

With regards,

Loy Kuo

Loy Kuo
820 N. Judd St
Honolulu, Hawaii 96817

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mourners. The Cavalry Guard rode as an escort on each side of the hearse. The procession moved at a quickstep march, and as it passed thus hurriedly through the town and up Nuuanu avenue, nothing could have been more striking or imposing, the flickering light of the torches casting a glare over the whole procession, which moved along so rapidly that those only who were on the watch had an opportunity to witness it.

Pacific Commercial Advertiser Feb 4, 1864

INSANE ASYLUM.—Some steps are being taken on the part of the Government for the selection of a site on which to erect an Insane Asylum—an institution needed now more than anything else. The most proper location for it would undoubtedly be in the vicinity of the jail, perhaps just north of it or in its rear. The force always in attendance to guard and overlook the prison, can without much inconvenience be brought in to assist either to guard or keep the asylum when required. It has been suggested to locate it near the Queen's Hospital. But it does not appear exactly proper to place it near a sanitary institution, where its proximity may work injuriously to the patients of the hospital. Natives have a natural dread of crazy people, especially foreigners, and one result of such a location of it might be, that it would prevent them from voluntarily going there to be cured of their diseases. The former spot has so many recommendations and advantages, that we trust it may be selected, even if land has to be purchased for the purpose.

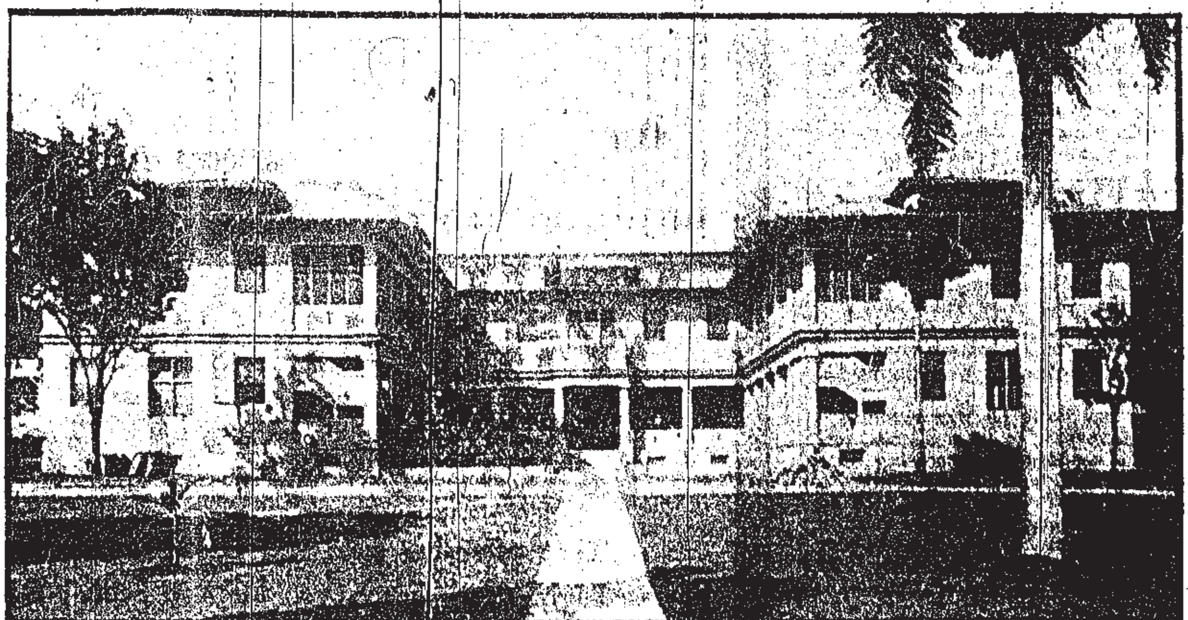
A NEW COASTER.—The schooner *Marilda*, lately in the Fanning's Island cocoanut oil trade, has been purchased by Messrs. Aldrich, Walker & Co., and Capt. Stott, to take the place of the *Emma Rooke* on the Hilo route. We have not learned what sum was paid for her, but $6,000 was asked by her late owners. The schoner *Onomea*, now due from Boston, it is said, is also intended for the Hilo route.

Commercial Advertiser

Second Pages

[illegible]LU, HAWAII TERRITORY, FRIDAY, JUNE 20, 1913.

Spacious New Home for Insane Patients of Territory Completed and Ready for Occupancy



NEW OAHU INSANE ASYLUM.

Completed at a cost of $43,000 out of a $50,000 fund, to be occupied for first time next week.

It was announced by Dr. W. A. Schwallie, medical superintendent of the Oahu Insane Asylum yesterday that arrangements are now complete for transferring patients in his charge to the new building recently completed by the Territory. The structure has accommodations for 120 patients. These accommodations will be filled when the transfer from the present quarters is made next Monday morning.

The building was built at a total cost of $43,000, the legislature having appropriated $50,000 for the work. Out of the balance the sum of $3000 has already been expended in furnishing the building, leaving a surplus of $4000.

Superintendent Schwallie has already arranged for the erection of a modern, sanitary dining room adjoining the new building. The cost of this will be met from the $4000 surplus.

The plans of the new asylum were prepared under the direction of H. L. Kerr, the architect. The work being done by E. C. Petit, formerly of New York, who is in charge of Kerr's designing department. Special attention has been given to the fireproofing of the new structure.

Reinforced concrete staircases lead from the main floor to the second floor, and these are partially exposed. Every opportunity has been utilized to lessen danger to the patients in the event of fire and to prevent loss of life through possible panics.

The entire building is of reinforced concrete with the exception of the roof which is covered with Spanish tiling. The building is devoted exclusively to the housing of patients, the offices being located in another building. There is a spacious operating room and a laboratory. There are sections devoted to different classes of patients and others to special cases. The floors are surrounded by spacious lanais all of which are screened.

The entire roof ridge has a superimposed ventilating cover which keeps the building cool throughout.

CLASS DAY EXERCISES BY GRADUATING CLASS

ASSESSOR ONLY OFFICIAL WHO WILL NOTICE HIS LAND COMPLAINS IRATE OWNER OF "SWEET HOME"

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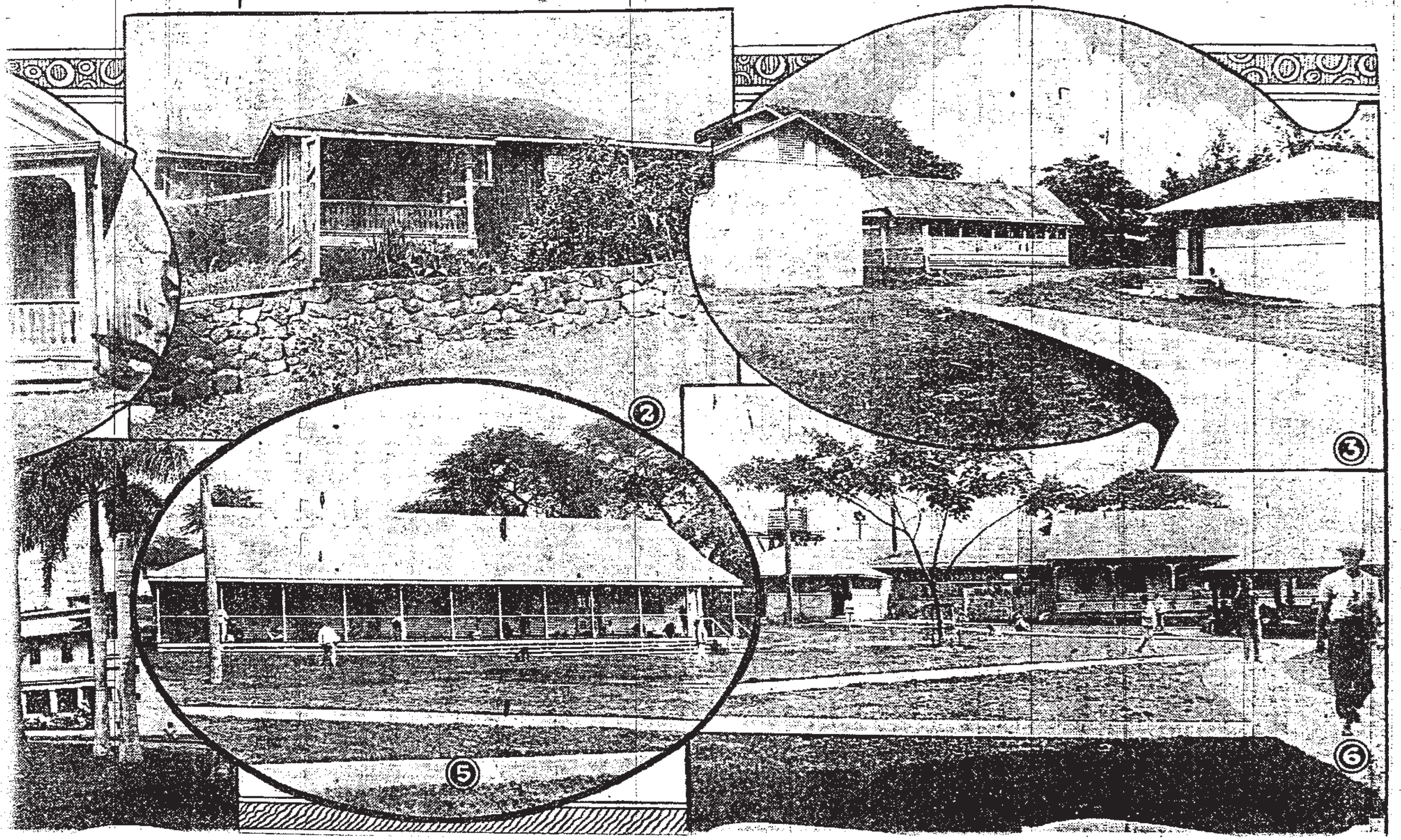
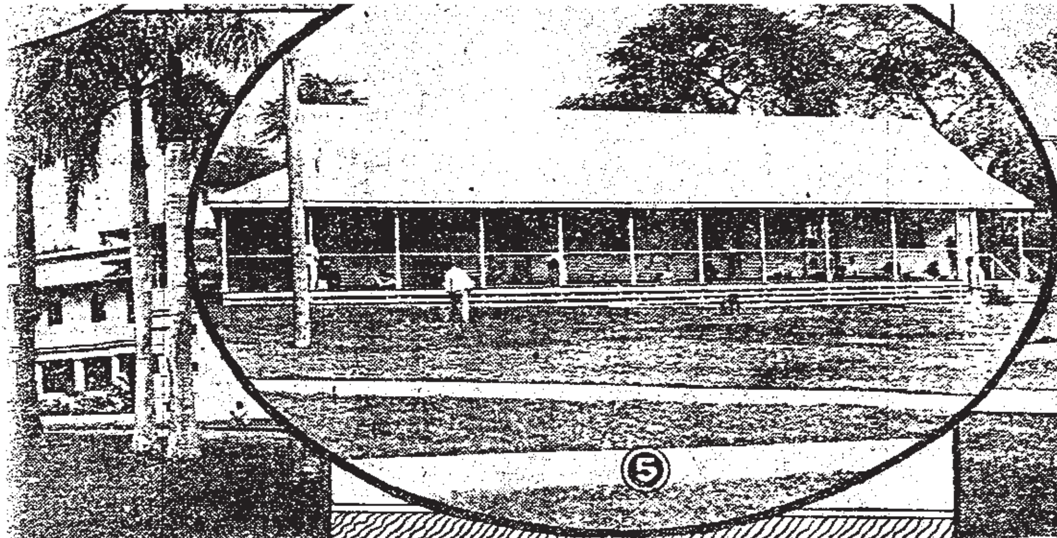
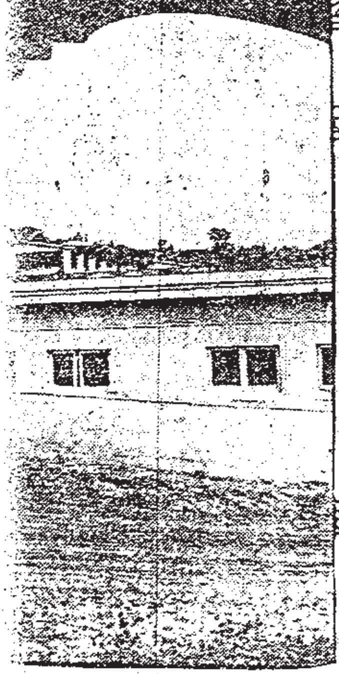
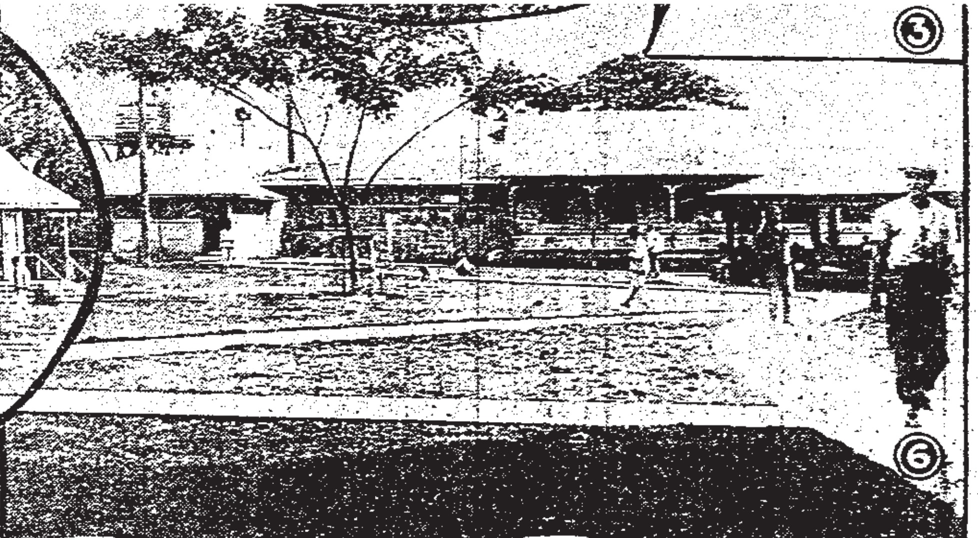
Made to Legislature For Better Quarters On Oahu For Territorial Insane Asylum









(1) The oldest house [illegible] over 45 years ago.
(2) Another old cottage.
(3) A view of the women's section.
(4) New concrete hospital building and a dormitory over 40 years old.
(5) A [illegible]-year-old men's dormitory.
(6) Men's bath-house and 30-year-old pavilion.
(7) The new sanatorium buildings.
(8) Dr. W. A. Schwallie.
(9) View of crowded men's quarters for sanitarium.

...commodation of [illegible] patients, too far from the city for their proper segregation, too limited in space for the occupation of those physically able to do manual labor, and, because of the limited acreage, too expensive to maintain.

Only 71 acres are allotted to its [illegible] inmates, which is an instance of comparison. Napa Hospital in California has almost an acre of land for each patient.

Great Need for Water

Needed most of all by the territorial asylum is an abundance of water for irrigation and hydrotherapy...

...dows whose frames are so rotten that often, for the safety of the [illegible], it became necessary...

...in its very contrast to such surroundings, stands...

After some agitation an act was passed setting some [illegible] acres of government land [illegible] the minister of [illegible] lands [illegible] on the Honolulu [illegible] to provide funds and [illegible] of the present location of the buildings suitable for the care and reform school. This had good [illegible] management of the insane, and [illegible] was thought to be a desirable [illegible] appropriations.

From then on [illegible] as Dr. George [illegible] the [illegible] acre tract [illegible] valley was considered. This [illegible] part of [illegible] excellent agricultural [illegible] which would provide ample [illegible] for [illegible] cases [illegible] of water.

But in September, 1880, [illegible]...

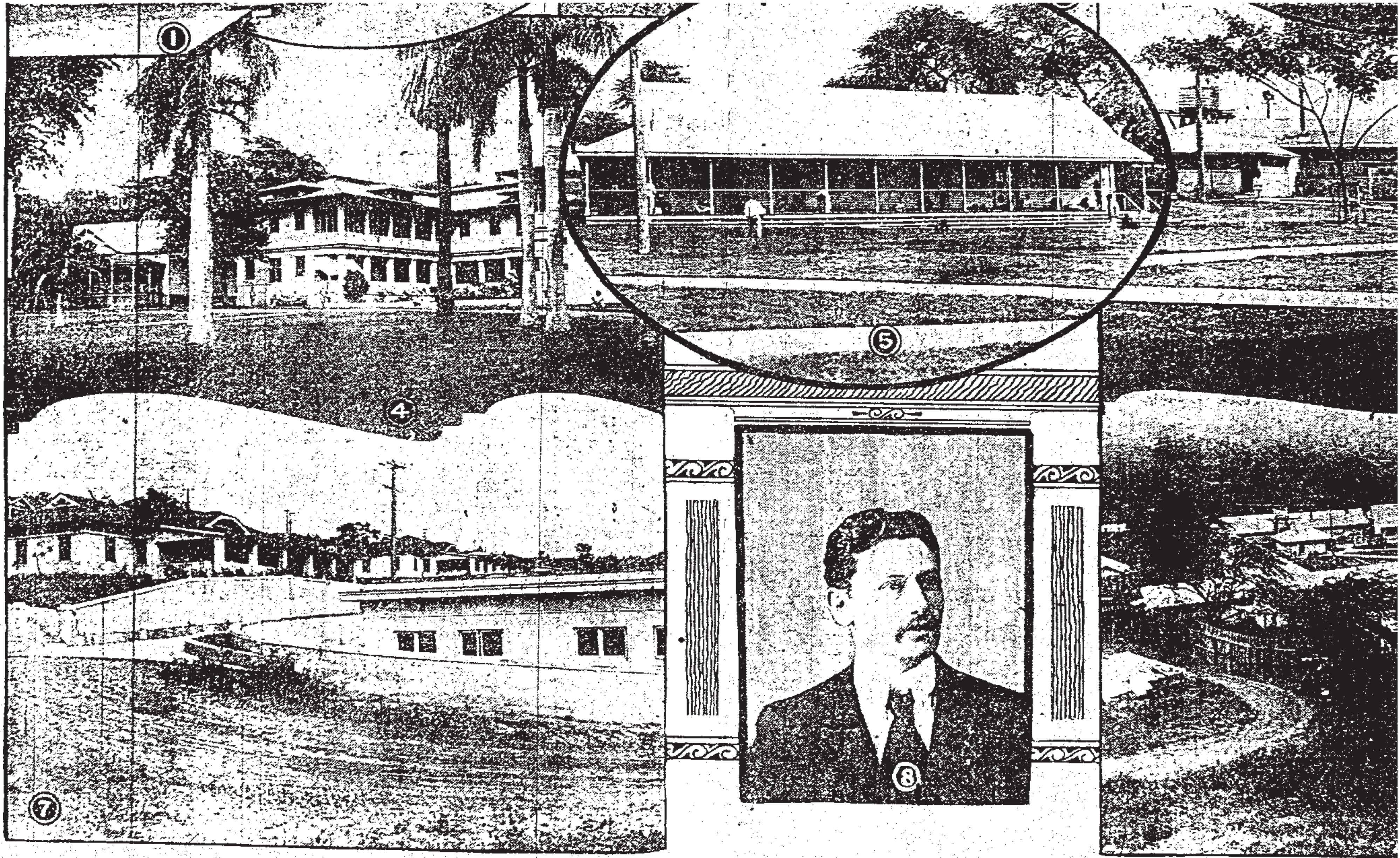
a change of some sort has become an absolute necessity.

When a patient is committed to the hospital it does not follow that he will always remain. Statistics show that under three years there is always hope of recovery.

Lunacy Not Hopeless

A lunatic is a sick man, to be cared for as such. When he is treated with kindness and placed under the most approved sanitary and hygienic conditions results have always been surprising.

[illegible] destruction



(1) The oldest house, built over 45 years ago.
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(6) Men's bath-house and 30-year old pavilion.
(7) The new sanitarium buildings.
(8) Dr. W. A. Schwallie.
(9) View of crowded men's quarters for sanitarium.

By LORIN TARR GILL

Suppose you were adjudged insane!

And, by due act of law, you were committed to the Oahu Insane Asylum!

Suppose you were locked at night in an ancient, worm-eaten fire trap among persons afflicted with mental diseases all the way from the mildest forms of insanity to those of utter degeneration of the brain cells; suppose you had nothing to do all day but to mill around in a restricted and crowded area populated with ...

And that is why, according to Dr. F. E. Trotter, president of the board of health, the governor has directed the superintendent of public works, Lyman H. Bigelow, to draw up plans for the necessary buildings for the new asylum. He is to be assisted in this by S. W. Tay, sanitary engineer of the board of health. These plans will be an outline of the necessary buildings and equipment, with the estimated cost of both—the plans being prepared so as to permit future extensions.

Governor Farrington has an ...

commodation of its patients, too near the city for their proper sequestration, too limited in space for the occupation of those physically able to do manual labor, and, because of the limited acreage, too expensive to maintain.

Only 21 acres are allotted to its 450 inmates, while, as an instance of comparison, Napa Hospital in California has almost an acre of land for each patient.

Great Need for Water

Needed most of all by the territorial asylum is an abundance of water ...

dows whose frames are so rotten that often, for the safety of the ...

in its very contrast to such surroundings, stands an unperishable ...

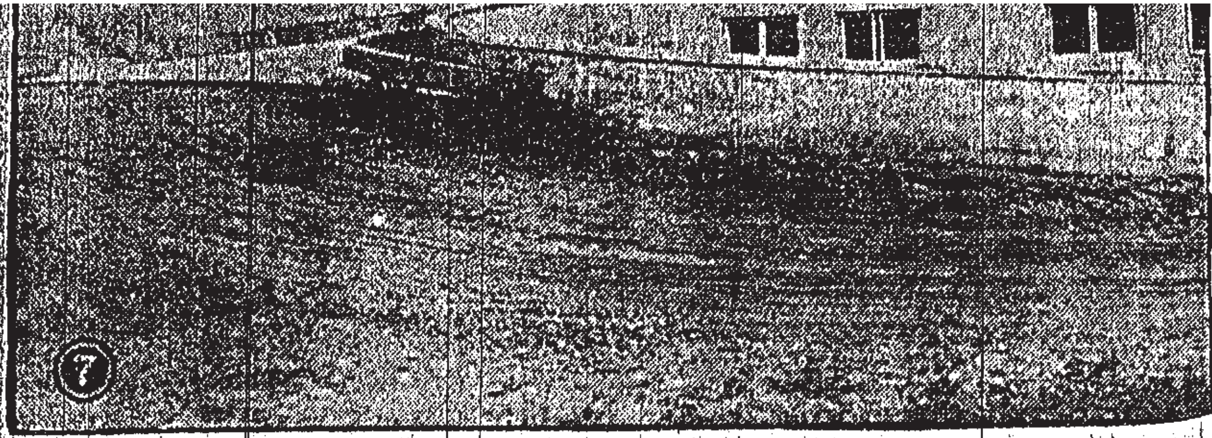
After some agitation an act was passed authorizing the minister of the interior to provide lands and buildings suitable for the care and management of the insane, and to call for appropriations.

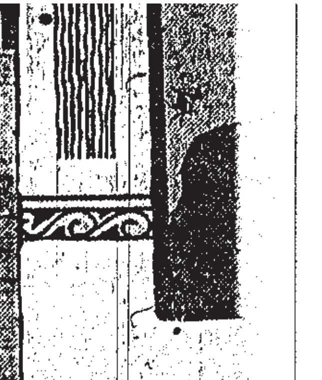
"From then on," as Dr. George Herbert said in his detailed report in the early part of 1901, "a dark era, only a few notes being obtainable and these making distasteful reading."

But in September, 1886, the matter was accomplished, and the six ... of the monarchy were ...

using so... ment la... side of ... reform s... and was... location.

In the ... Palolo V... besides ... land, wh... ercise fo... treatmen... could be... was only... office.





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(5) A 40-ye
(6) Men's
(7) The ne
(8) Dr. W.
(9) View c

By LORIN TARR GILL

Suppose you were adjudged insane!

And, by due act of law, you were committed to the Oahu Insane Asylum!

Suppose you were locked at night in an ancient, worm-eaten fire-trap among persons afflicted with mental diseases all the way from the mildest forms of insanity to those of utter degeneration of the brain cells; suppose you had nothing to do all day but to mill around in a restricted and crowded area populated with several hundred other unfortunate specimens like yourself, where there was not a chance to do enough work so that you could become physically tired and sleep at night—would you not, in time, pass from a disturbed mental condition into a violent one? The chances are that you would.

And yet, though these very conditions exist at the territorial hospital for the insane at Honolulu, the percentage of violent patients is small as compared with that of similar institutions on the mainland.

To a great extent this is due to the fact that the mildness of our climate makes it possible to keep most of the afflicted ones out of doors the whole of every day, 365 days in the year.

But right there the good work stops!

Once out—and even the most disturbed of the patients spend their waking hours out of their cells—there is nothing for the great majority to do but lie on the grass under the kiawe trees, loll on the bare lanais of the dormitories, or huddle in disconsolate groups at various places on the lawn and wait for one of their number to furnish a little excitement.

Community Neglect

Governor Wallace R. Farrington expresses himself on this subject most forcibly:

"There is no doubt but what conditions at the insane asylum have been improved over those of ten years ago," he said recently, "but there is no institution in the territory whose patients have suffered more from community neglect."

"The officials are doing wonders with what they have," he continued, "but, in the final analysis, the treatment of Hawaii's insane is almost medieval on account of the lack of proper equipment."

And that is why, according to Dr. F. E. Trotter, president of the board of health, the governor has directed the superintendent of public works, Lyman H. Bigelow, to draw up plans for the necessary buildings for the new asylum. He is to be assisted in this by S. W. Tay, sanitary engineer of the board of health. These plans will be an outline of the necessary buildings and equipment, with the established cost of both—the plans being prepared so as to permit future extensions.

"Governor Farrington has authorized C. T. Bailey, commissioner of public lands, and myself," said Dr. Trotter, "to investigate possible sites for the asylum. And when the governor has the report of the superintendent of public works and the commissioner of public lands upon both the cost of the equipment and the necessary money involved, he will be in a position to make recommendations to the legislature.

Wants Concrete Proposition

"The governor wants a concrete proposition, you see," Dr. Trotter finished, "and he wants to know what the new asylum will cost so that he can put the matter up to the people through the legislature."

"And it is certain to be brought before that body, as every member of the legislature on this island promised the people that special attention would be given the asylum," said Governor Farrington. "There is no question as to the territory's responsibility in this particular matter."

Dr. W. A. Schwallie, since his appointment to the superintendency of the asylum in 1913, has consistently made the best of the poor facilities. And in his yearly reports to the board of health he has suggested the need for a new site and buildings.

In Governor Farrington's opinion, there is no question as to the necessity for improved equipment at the insane asylum.

"And this involves a change of location," he stated. "It is a shame to have patients confined in such a small space. If we had a larger tract of land, many of them could be engaged in work that would interest them, occupy their minds, and improve their health."

For the present site of the Oahu Insane Asylum is, and has been for years, too small for the proper accommodation of its patients, too near the city for their proper sequestration, too limited in space for the occupation of those physically able to do manual labor, and, because of the limited acreage, too expensive to maintain.

Only 31 acres are allotted to its 450 inmates, while, as an instance of comparison, Napa Hospital in California has almost an acre of land for each patient.

Great Need for Water

Needed most of all by the territorial asylum is an abundance of water for irrigation and hydro-therapeutic treatments, a healthful situation, and enough land for agricultural purposes.

For the 300 male inmates of the institution, nearly all are agriculturists. Many are physically able to cultivate the soil and most of them would welcome a chance to work instead of whiling away the hours doing nothing. In the days of their mental balance they have done manual labor, and most of them have not forgotten.

In that case the monthly bill for vegetables, instead of totaling from $300 to $350—and it is impossible for them to obtain sufficient green food—would be cut to almost nothing. The labor for upkeep would be voluntary. No one at the insane asylum is ever compelled to work.

Now, even in the present restricted situation, eight or ten Chinese and Hawaiians are cultivating a small taro patch—the principal drawback of which is that the land is worn out and the water supply is decreasing, and that many would-be workers cannot be allowed in wet fields. The supply of taro always falls short of the demand.

Buildings Run Down

A few of the women pass the time in crocheting and others are paid for making the blue denim garments of the institution.

But the buildings!

Picture, if you can, a dozen dilapidated wooden structures, the oldest of the vintage of the '70s and the youngest over 15 years of age—the wood of which, though concealed by successive coats of paint, is so perforated with wormholes that, in places, a blow would crumble it to dust.

Imagine strong doors that are not strong, rooms that must be repaired every few months against the attacks of violent patients, and windows whose frames a
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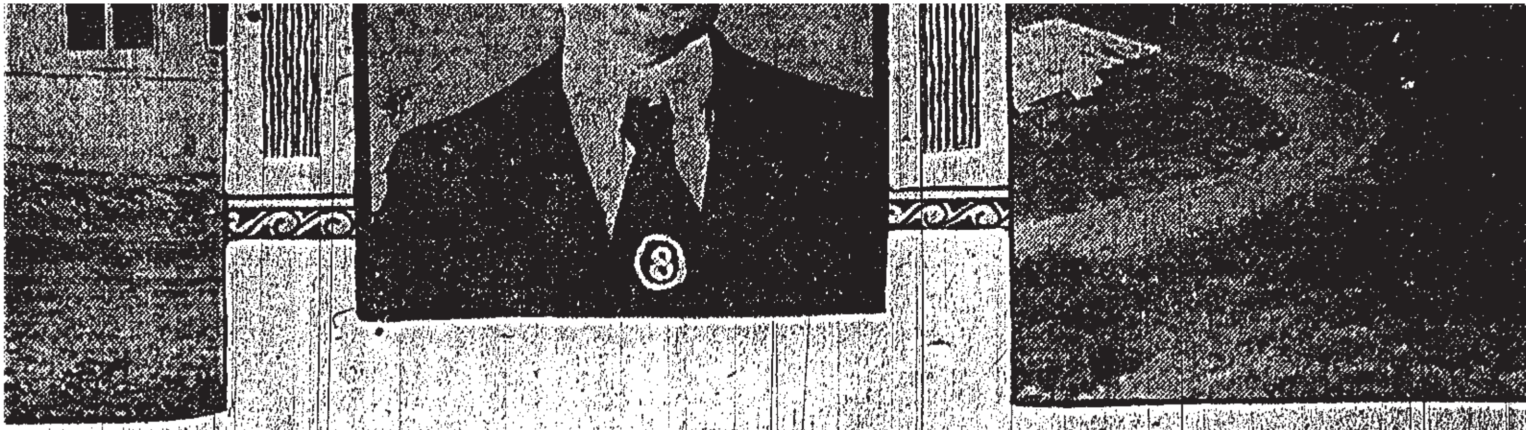

(1) The oldest house, built over 45 years ago.
(2) Another old cottage.
(3) A view of the women's section.
(4) New concrete hospital building and a dormitory over 40 years old.
(5) A 40-year-old men's dormitory.
(6) Men's bath-house and 30-year-old pavilion.
(7) The new sanitarium buildings.
(8) Dr. W. A. Schwallie.
(9) View of crowded men's quarters for sanitarium.

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Danger From Fire

The absorbent unsanitary wooden floors are kept perpetually moist by the frequent and necessary application of disinfectants.

One can sympathize with Dr. Schwallie when he says that conditions are such that he never knows what may happen to his charges, and that he spends most of his nights in the dread of fire.

What a terrible harvest those flames would reap, were they loosed among those helpless beings!

In one of the men's dormitories, a number of the cells are dark. Their gloom—high, grated openings admit only the feeblest rays of light —would drive even a sane person to violence.

But at that, there are all too few cells for the housing of violent patients. At times two have been forced to room together—homicidal maniacs have been lodged with those not so homicidal.

When one of the disturbed patients is violent at night under those conditions, the whole dormitory is awakened.

And one morning in February, 1920, one of the occupants of such rooms was found murdered.

Even now there are beds in the hallways for such of the recent arrivals as constitute the overflow population.

There is no proper arrangement for tubercular patients. They are inadequately segregated.

Truly, as the grand jury reported as the result of its investigation in February, 1920, the insane asylum is a "menace and an abscess festering in our midst," and "a disgrace to Honolulu and the Territory of Hawaii."

Yet, holding the eye of the visitor in its very contrast to such surroundings, stands an imperishable monument to what might be done.

It is a concrete, fireproof building; a combination dormitory, laboratory and hospital, with scientific examination and operating rooms, concrete staircases, screened lanais and a roof of Spanish tiling. It was built in 1913 at a cost of $43,000.

Just behind this handsome structure is a concrete open air dining room, or "half-building" which was erected with cement left from the main building—a long hall from the times when the inmates were fed from tin plates as they sat around in the grass and dirt!

Above is the sanitarium—a complete group of fireproof concrete buildings, including three cottages for patients, a dining room and doctor's cottage and a hydro-therapeutic establishment. These were erected in 1917 for the care of alcoholic and drug addicts, as well as the giving of all modern treatments for the cure of the insane.

According to Dr. Schwallie, it is sometimes inconvenient that the baths are so far from the asylum, yet many of the patients from below have been greatly benefited.

It has been suggested that these buildings would make an ideal location for a tuberculosis sanitarium, and that the lower concrete structure would serve admirably as a city and county hospital.

In 1919, Governor McCarthy suggested that the asylum land be acquired by the city and county for a jail. This is now located at the old territorial prison.

Need For Segregation

As early as 1863 the need for proper segregation of the insane of Hawaii became apparent. Before that time the mentally afflicted were treated simply as dangerous characters and sent to jail to mingle with criminals.

After some agitation an act was passed authorizing the minister of the interior to provide lands and buildings suitable for the care and management of the insane, and to call for appropriations.

"From then on," as Dr. George Herbert said in his detailed report in the early part of 1901, "a dark era, only a few notes being obtainable and these making distasteful reading."

But in September, 1886, the matter was accomplished, and the six insane wards of the monarchy were removed from prison to the present site.

"In 1887, with the assistance of Mr. L. A. Thurston, things shaped into a better course," continues Dr. Herbert.

Then followed the method of progression of all similar institutions and an advance in the care of the unfortunate sufferers, who, as Dr. Herbert finally concludes, enjoyed the change "from being treated like animals in a pen where they could take a limited amount of exercise and fresh air before being locked up in cells again for the rest of the 24 hours."

Appropriation In 1900

In the early part of 1900, $30,000 was appropriated by the Council of State for new buildings for the insane asylum, but, as funds were greatly depleted by the plague, nothing was done.

In May, 1902, the board of health asked the legislature for an appropriation to remove the asylum from the School street site and to construct new buildings upon government land. In October there was an appropriation of $75,000 for the purpose.

It was first decided to locate the new asylum in Kalihi on the government ground almost encircling the old Allen Herbert place, which had been purchased by the late Alexander Young.

Then in July, 1903, this was objected to as being between Honolulu and Pearl Harbor, in the direct path of the city extension, with the Oahu railway on one side and the electric cars on the other.

A couple of weeks later the Kapiolani estate offered to trade a 31-acre tract of land extending from Diamond Head to the back of Kapiolani Park.

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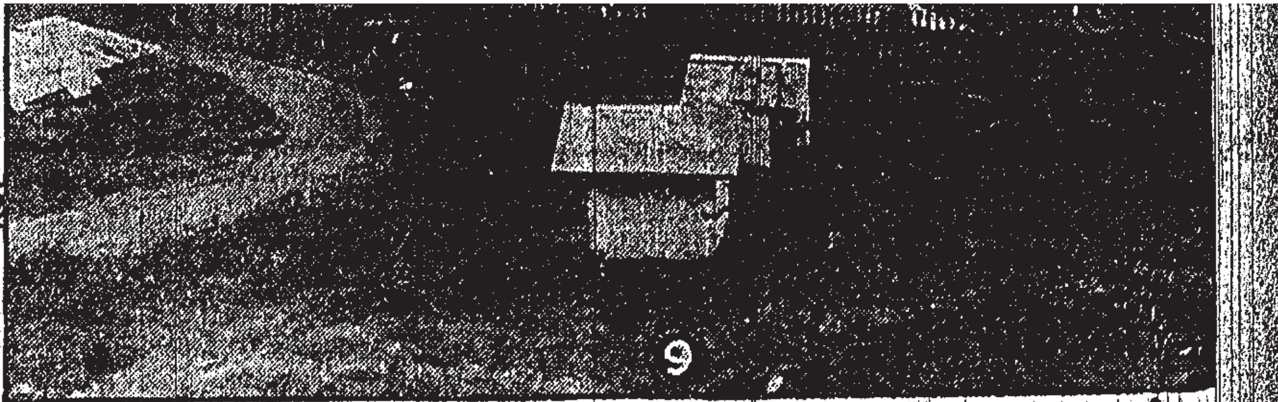

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There was also the question of using some 1000 acres of government land a mile on the Honolulu side of the present location of the reform school. This had good soil and was thought to be a desirable location.

In the fall a 700-acre tract in Palolo Valley was considered. This, besides being excellent agricultural land, which would provide good exercise for the milder cases under treatment, had plenty of water, could be made self-sustaining, and was only 40 minutes from the postoffice.

In November, 1903, the board of health recommended the Palolo site. And the $75,000 was to be used for its improvement. But later it, too, was given up.

Build on Old Site

The following March it was decided to go ahead on the old site. By May several new buildings were under construction and the superintendent's cottage was nearing completion. In June of that same year plans were submitted to the board of health for concrete main buildings, in addition to the extra cottage.

In January, 1905, the contractors asked that the contract be canceled. In August, 1906, they paid their forfeit.

In June, 1913, the present concrete hospital and dormitory was ready for occupancy, after an appropriation of $50,000—and the legislature of 1917 appropriated the same sum for the construction of still more new buildings.

In 1919 another $150,000 was added to this, but the bonds were not sold.

In February, 1921, there was some discussion of acquiring a site at Kulionou—land running mauka from Waialae bay on the inland side of the road to Koko Head.

The 1921 legislature cut the appropriation to $150,000, with the recommendation that sufficient land on the Waikiki side of the asylum which was not already owned by the territory, be acquired.

And in July of this last year the question of a complete new site again arose.

* * *

But, whatever may be the choice of those best qualified to judge in this matter of a new location and buildings for the Oahu Insane Asylum, it is generally conceded that a change of some sort has become an absolute necessity.

When a patient is committed to the hospital it does not follow that he will always remain. Statistics show that under three years there is always hope of recovery.

Lunacy Not Hopeless.

A lunatic is a sick man, to be cared for as such. When he is treated with kindness and placed under the most approved sanitary and hygienic conditions results have always been surprising.

In the past, complete destruction of the unbalanced mind was regarded as inevitable. Now the percentage of improvements and cures has been increased so that lunacy is no longer considered hopeless.

During the last fiscal year alone, the percentage of releases at the asylum was 56. And in the preceding year, 76.

Diversional occupation of the insane is conceded by all who are competent to judge to be one of the remedial agents in their treatment. It diverts the patient's mind from himself, and often frees him from his illusions, delusions, or hallucinations; it brings on a healthful fatigue and sound, refreshing sleep. This does more to reinstate reason than all the barred and windowless cells in existence.

At the Oahu Insane Asylum, which draws its inmates from a cosmopolitan intermingling of races from all parts of the world—people of all stations, occupations, and degrees of intelligence—the percentage of recoveries from mental disease compares most favorably with that of similar institutions on the mainland.

May it not be true then, that, given the means, occupational therapy may be the cause of restoring more of the mentally afflicted to health than even previous records have shown, and of reducing the proportion of the violently insane to a much greater extent than has heretofore been considered possible.

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Sunday 9/8/1929 P. 1

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NEW PARK IN VIEW; RESULT OF JUDD VISIT

Asylum Removal May Give Two Acres for Purpose

As a result of Governor Judd's inspection visit Friday to the School street plant of the territorial hospital, the probability of a new city park swam into view yesterday.

When the hospital removes late this year to its new Kaneohe location, quite possibly, the governor said, the Kalihi Boys school and the Kalihi Girls school both may be removed to the vacated School street premises.

The girls would likely occupy the sanitarium, mauka of the asylum proper, and the boys the main building, inside the palisade. Such a transfer would make two areas of land available for new uses on the ewo side, land for a city park, and on the waikiki side part of the hospital's taro patch for Lanakila school, and part for a playground serving the boys' and girls' schools.

MUST BE ALTERED

Both Kalihi schools, Judd said, require extensive alterations, if they are to remain where they are. He believes it would be cheaper, and in every other way more satisfactory to transfer them to the School street site and possibly to place them both under a consolidated management.

The plans, he emphasized, are still in the tentative stage and will be further considered by Dr. F. E. Trotter, president of the board of health, and Charles T. Bailey, the land commissioner, before being placed before the governor in definite form.

Police Search For Road-hog Auto Driver

Search for an unidentified road-hog driver, who forced an automobile driven by Felix Canaya, employed at the Halemano camp, Waialua, off the road near Waialua, Wednesday, resulting in the death of Canaya's 2-year-old son, John, is being made by Waialua police, it was announced yesterday by Deputy Sheriff Thomas Clarke.

Following the accident, Canaya was held by Clarke on a manslaughter charge. Further questioning of Canaya resulted in charges by Canaya that he was forced off the road by a "white man", who attempted to pass a parked truck on the road. The driver of the automobile alleged to have caused the accident failed to stop, according to Canaya.

The injured in the Canaya automobile were taken to the Waialua hospital by Charles Butchart of Waialua plantation. At the hospital the child died a short time later of a fractured skull.

Big Survey Of Investments In China Planned

(By the United Press)

NEW YORK, Sept. 7—Professor C. F. Remer, formerly connected with St. John's university, Shanghai, and a recognized authority on the economic problems, both domestic and international, of China, has been assigned the important task of making an extensive study of foreign investments in that country.

The Social Science Research council of the United States has voted $17,000 for the survey, to be made under the general direction of the Brookings institution at Washington.

The project involves cooperation between investigators in the United States, Great Britain, Japan and China. Three preliminary surveys

DAYS O AND S BE R

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By RAY

Honolulu harb bear some resem old days when a spars stood out the waterfront first time in sev ing ships will be time.

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SEA WALL WORK WILL BE ABANDONED

Construction Project At Kailua Dropped; Pier Bids Due

Construction of a sea wall at Kailua, North Kona, Hawaii, has been abandoned. Superintendent Bigelow of the public works department suggested abandonment in his monthly progress report rendered yesterday to Governor Judd, and the governor and the Kona Civic club concurred.

The 1927 legislature appropriated $20,000 for reconstruction of the sea wall then existing, and the 1929 legislature instructed the public works department to use any unexpended balance of the appropriation "for the construction of a sea wall and filling in of the government land on the west side of the wharf at Kailua."

The cattle pen which was to be included in this project, Bigelow wrote, will be taken care of by the board of harbor commissioners at an early date.

Bids for reconstruction of Piers 13 and 14, Honolulu harbor, assigned to the Inter-Island Steam Navigation Co., will be opened at the offices of the board of harbor commissioners this noon. There will then remain only three major projects authorized by Governor Judd for which contracts remain to be awarded.

TO DIVERT FLOOD WATER

These are the Nawiliwili retaining wall, to divert flood waters from the Wilcox stream, for which bids already have been opened and the contract probably will be awarded tomorrow; receiving and treatment building of the new territorial hospital at Kaneohe, for which bids will be opened Jan. 18; and reconstruction of the Kapuaiwa building, occupied by the secretary of the board of health and the bureau of vital statistics.

Contracts awarded since Bigelow's last report, dated Dec. 12, are the following: Additions to the archives building, $34,800; new building for the bureau of agriculture and forestry, $50,600; new territorial Normal school building, $129,000.

Projects for which the plans are still unfinished, but on which Bigelow reported that good progress has been made and that they will be ready for advertisements at an early

Will Serve Injunction On Serrao

Oscar P. Cox, United States marshal, will leave at 4 o'clock this afternoon by the Haleakala for Hilo, where he will serve temporary prohibition injunction papers upon Jose Gomes Serrao, Mrs. Jose Gomes Serrao, and Jose Gomes Serrao, Jr., which were issued out of the federal court on Saturday. Cox will also make a demand on the elder Serrao for possession of the liquor the latter has now on hand.

The Serraos were indicted several weeks ago by the federal grand jury on prohibition charges. Later, Walter P. King, prohibition administrator, revoked Serrao's federal liquor permit. Serrao was given 30 days in which to dispose of his liquor legally. At the expiration of that time, King says, the liquor then on hand will be seized, confiscated and destroyed.

The law firm of Thompson, Beebe & Winn represents the Serraos.

PERSONNEL OF CRIME BOARD IS ANNOUNCED

Governor Gives Out Names Of Those To Make Survey

Governor Judd yesterday announced the personnel of his advisory commission on crime, penology and juvenile delinquency, as selected by Chairman Roy A. Vitousek. A report for submission to the legislature is expected not later than Dec. 1, this year.

Community elements comprised by the mem' rship include the bench and the bar, the executive administration of the territory, social welfare work, the medical profession and those whom the governor described as "interested good citizens." The list of members follow:

Roy A. Vitousek, former deputy city and county attorney and, as chairman of the house committee on finance, a leader in the last session of the legislature.

A. G. M. Robertson, former chief

INSANE ARE MOVED INTO NEW HOSPITAL

Army Credited with Fine Job In Making Transfer

"The army has done a fine job, an exceptionally fine job," said Governor Judd, after his return yesterday from a visit to the new territorial hospital at Kaneohe, in which last night were quartered 561 patients who that morning had been removed from the old School street asylum. Except for Captain Abrahamsen, veteran guard, who will remain as custodian, the old asylum today is vacant.

"That transfer moved punctually, smoothly and with a minimum of disorder", the governor continued. "There were only four minor disturbances. Maj. Gen. Fox Connor and the staff of the Hawaiian department deserve the thanks of the community."

Directing the transfer were Superintendent A. B. Eckerdt of the asylum, Captains John A. Russel and Herbert A. Gardner, GMC, assisted by Dr. J. R. Enright, pathologist, and Miss Linna Armstrong, superintendent of women.

THIRTY-THREE TRUCKS

Thirty-three covered army trucks made up the procession. Inside with the patients rode one or two attendants, as the character of those over whom they kept watch seemed to require, and outside two soldiers on the driver's seat.

Loading of the trucks began at 8 a.m. and the first of them was in motion at 9:15 o'clock. By 10 o'clock the vanguard of the fleet was at the top of the Pali grade and at 11:15 the last truck had trundled through the Kaneohe gate of the new hospital.

The new institution is complete in itself, operating its own laundry, kitchen, bakery, refrigerating plant, water and sewer system. For the present, the sanitarium for treatment of alcoholics and drug addicts adjoining the old School street asylum will remain in operation where it is.

Bids for a new receiving and treatment building at Kaneohe will be opened Jan. 18. The appropriation available is $195,000.

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Rapid Transit company a temporary permit to operate gasoline buses over Kapiolani boulevard. The permit expires June 30, 1938.

SCHOOL NAMED

The new public school in Damon tract at Moanalua was officially designated as "Kaloaloa school." Mrs. Clara K. Mokumaia, principal of Moanalua school, who is expected to be appointed to direct the new school, invited Mayor Wright and members of the board to attend the dedication ceremonies to be held between 2:45 and 5 p. m. Thursday.

REFERRED TO ATTORNEY

Wilfred C. Tsukiyama, city-county attorney, was asked by the board to rule on the question of whether an employe of one municipal department may properly accept renumeration from another department.

The question was raised by Auditor Edwin P. Murray in connection with a bill for $1,700 submitted on behalf of Solomon Kenn, chief inspector of the liquor commission. Kenn was employed by the building department to draft the plans for a 12-classroom building at Kauluwela school. The work was done outside of his regular office hours as a member of the liquor commission staff.

Library 25, Will Observe Open House

The Library of Hawaii will celebrate the twenty-fifth anniversary of its founding Tuesday, Feb. 1. In honor of the occasion open house will be held at the library between 4 and 6 p. m.

The program for the open house will begin with a concert by the Royal Hawaiian band under the library monkey-pod tree from 4 to 4:30. During that time the library trustees will hold an informal reception in the main lobby. Beginning at 4:30 p. m. there will be the following short program in the auditorium: welcome address by W. W. Thayer, president of the library trustees; talk on the history of the library by Walter F. Frear, governor of Hawaii in 1913; remarks by A. Lewis, Jr., president of the library trustees in 1913;

MISS FLORENCE S. ORR AND PRECIOUS METAL

Vote $500,000 For C-C Works

Jan 26, 1938 p.9 c.1

(Continued from Page 1)

provement, $2,000; maintenance of Koolauloa roads, $2,750; installation of street lights on Beretania street between Alapai and S. King streets, $5,000; installation of traffic control lights at Kapiolani boulevard and Kalakaua avenue, Kapiolani boulevard and South street and Kalakaua avenue and King street, $6,000; engineering on Bingham tract, Manoa, Nuuanu and Wahiawa sewer projects, $6,-000; Makiki Heights road widening, operation of steam shovel, $480; establishing of grades on Coral, Auahi and Pohukaina streets, $350; Wahiawa road maintenance, $5,000; damages in connection with Kapalama flood control project, $590; paving of East Manoa road, $2,000.

$15,000 FOR WPA

The board also approved on final reading a resolution introduced last week appropriating an additional $15,000 for materials and equipment for the WPA improvement of Campbell avenue, Kapahulu road and Kaimuki avenue.

The City Planning commission recommended that Kuakini street be extended from Liliha street to Skyline drive, in response to a petition from Alewa Heights residents. It was pointed out that the extension of Kuakini street would provide a much needed direct outlet from Alewa Heights to town. The board referred the proposal to the public works committee.

Appropriation of $4,522 for the acquisition of property owned by Mrs. Minnie Cunningham at Kaimuki and 6th avenues, needed for the elimination of a dangerous jog in Kaimuki avenue, was passed on first reading.

IMMEDIATE START

The projects approved by the board have the backing of Mayor Fred Wright. At a conference attended by members of the board and department heads yesterday the mayor urged that immediate steps be taken to have work started on the Pali road improvement and the Waipahu cut-off. The

One Person Only Can Open Safe Holding Rare Medicament

By **SPENCER DAVIS**

In a lead-lined vault on the second floor of the territorial board of health building, 53 precious pieces of radium valued at $16,800 remain under lock and key in the custody of Florence S. Orr at all times except when in use by physicians.

Not one of the 53 radium units, collected over a period of 16 years by the board of health, has been lost. Nor has the power of the radium exhausted itself. Yet more than $46,800 was spent in collecting the 480 milligrams of radium which today is worth $30,000 less than was paid for it.

The depreciation in value resulted from the discovery of a great store of the powerful healing agent in Canada recently, according to Dr. Frederick E. Trotter, territorial health commissioner.

ELABORATELY SAFE

The only person in the Territory with the combination to the safe in which the radium is stored is Miss Orr, who is secretary of the board of health. Miss Orr is under $2,500 bond and charged with its safe keeping. The radium likewise is insured. Because of the drop in its value, a local insurance company carrying the account has cut the annual premium rate from almost $800 to $550 a year.

Particles of the precious radioactive metal are contained in protective lead slugs known as plaques. Other milligrams are contained in platinumiridium tubes or concentrated in fine needle points for the treatment of disease.

NO CHARGE FOR POOR

Like books in a lending library, the 53 plaques, tubes and needles may be borrowed by territorial physicians from the board of health at a nominal rate. No charge for the use of radium is made for poor patients who cannot afford payment. The minimum e Honolulu Chamber of Commerce.

he United States must main- an army and navy powerful ugh to demand respect in the otic world of today, Rear Adal Orin G. Murfin, command- of the fourteenth naval dist, said yesterday in his an- message for Navy Day, ch is being observed here to- with an extensive program. Many things have happened he past few monts to awaken natural interest of everybody iternational affairs and hence ur own state of prepared-," Admiral Murfin said.

he progress of the world as hole toward what might pos- be chaos has been so ious as to be unforgettable to king members of society. Ef- in the interests of peace ld never be relaxed, even in

ontinued on Page 15 Col. 3)

upply Ship ue On Nov. 5

rst supply ship following the aiian Detachment to Pearl or will come on Nov. 5, naval orities announced yesterday. e is the USS Bridge and will oaded with supplies for the detachment.

llowing her into port will be eavy cruiser Houston, which heduled to arrive Nov. 7. It pected that Vice Admiral ohus Andrews, commander e detachment, will shift his rom the aircraft carrier En-ise to the Houston.

e other fighting ship, the cruiser Indianapolis, is l to come to Pearl Harbor on as she completes an over- on the West Coast.

Day

Welfare Taxes Finally ... With Territory's Relief

Advertiser 10/27/1939 P.1

Use Found For Asylum

Asing Urges Building Be Revamped, House Planned City Hospital

Renovation of the old insane asylum building on School street for use as a city-county hospital is under consideration by the finance committee of the board of supervisors.

At the suggestion of Supervisor John M. Asing the committee yesterday instructed Building Superintendent A. W. Heen to make a survey of the structure and to report on the estimated cost of necessary repairs and alterations.

Supervisor Asing said that the building is sufficiently large to care for the needs of the city-county and that its renovation would save thousands of dollars. A new roof would have to be built and partitions would have to be removed and other interior changes carried out to put the structure in condition for use as a hospital. The building is of concrete.

"I believe that the renovation of this building would be a wiser and more economical plan than spending $500,000 for a new hospital building," Supervisor Asing said. "At least we can look it over and see whether it can be fixed up."

Elks Will Honor Old-Timers Today

"Old-timers" will be honored tonight at the Elks club at Waikiki at a special dinner given by the BPOE, No. 616. The weekly meeting will be held at the same time.

No Loans From Treasury Asked

For the first time since the new social security department began operations on July 1 it will not be necessary to obtain an advance from the territorial treasury to meet relief needs at the beginning of the new month.

Because the welfare and relief tax is due on the twentieth of each month for salaries paid during the previous month, the social security department has had to borrow necessary money from the treasury and repay it from collections made later.

On July 1 an advance of $75,000 was made for this purpose and $51,974 was repaid later. On Aug. 1 the department borrowed $60,000, for September payments $55,000 was advanced and for the October relief checks a loan of $50,000 was made. Total advanced for the four months was $240,000 and total amount repaid at various times as tax collections were received was $193,435.56, leaving a balance of $46,564.44.

Treasury officials have received notice there will be no request to borrow this month against November collections.

U. H. Air School Starts Next Week

The University of Hawaii's aviation school, sponsored by the Civil Aeronautics Authority, probably will start late next week, President David L. Crawford said yesterday.

Dr. Crawford said the university has just received the final registration blanks from Washington, D. C. Physical examinations for student applicants are now being conducted. The class is limited to 40.

Save Native Youth

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MONDAY MORNING
SEPTEMBER 30, 1940

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History From Our Files

Seventy Years Ago—1870

Tax Collectors for Maui for 1870 are: Lahaina, T. C. Forsyth; Wailuku, H. Kuihelani; Makawao, Kapoikai; Hana, T. Lyons; Molokai and Lanai, D. Kaopeahina.

Our reporter visits the Insane Asylum, which is in its fifth year. He finds the gentlemanly superintendent Mr. B. R. Davison, and his lady very attentive and courteous and conduct us throughout the buildings and grounds. The latter in the way of plants and shrubs gives evidence of the work of the former proprietor of the place, Mr. Jno. E. Barnard.

Sixty Years Ago—1880

Kalakaua R. signs An Act providing a settlement of $300 per annum for life to Henry S. Swinton. The Act reads in part: Henry S. Swinton has

nated by the Democratic party without any previous notice. Pua declares he is an independent.

Dr. Smith, the president of Oahu College, will deliver an address on "Bible Study," Sunday afternoon at the Young Men's Christian Association.

Leave your orders for Home Made Poi at Women's Exchange. Fresh Tuesdays and Fridays, 112 Hotel street.

Thirty Years Ago—1910

E. J. Lord, the contractor, returns from Hawaii and Lanai. On Hawaii he engaged in placing dams at upper intakes of the Lower Hamakua Ditch, to conserve more of the water in the streams, which has heretofore been allowed to go to waste.

Governor Frear appoints Willard Brown a member of [illegible]

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Loy Kuo
820 N. Judd Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Loy:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated August 15, 2017, regarding the subject project. As the planning consultant for RHF, we are grateful for your support of the redevelopment, and for the background information provided regarding the history of the project site. The Draft Environmental Impact Statement (DEIS) will include a Cultural Impact Assessment that contains a significant discussion of the former uses of the site and references many of the articles you kindly shared.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Gary Lau

Gary Lau
1731A Aupuni Street
Honolulu Hawaii 96817

Received via website on 9/6/2017:

There should be no parking on both sides of School Street from Lanakila to Aupuni anytime. Housing will make the streets only 1 lane if they park on the streets going in both directions especially if the tenants have more than 1 car. Traffic will be terrible going in both directions if allowed any time of the day. I know I live close by.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Gary Lau
1731A Aupuni Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Lau:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 6, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the project's potential impacts to traffic, particularly if on-street parking were allowed on School Street. The Draft Environmental Impact Statement (DEIS) will discuss these potential impacts and provide possible mitigation measures.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Jacky Li

Jacky Li
1705 Olona
Honolulu Hawaii 96817

Received via website on 9/13/2017:

I am against the proposal to build couple of high rises on the current site for the low/modern income levels. Currently I have see a rise of crimes in the area and have my shares of crimes happened to me. There is already many low-incoming housing projects such as Kuhio Park Terrace, Kalihi Valley Housing, Dillingham, King Street, Mayor Wright, Puuhala and other small ones here and there around the area. There is also the problem with the traffic. I believe the sensible to do is to have a senior center with senior housings for them. Some seniors waited a long time to get into a senior housing project. I think it is time to address the needs of the elderly folks. Thank you.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Jacky Li
1705 Olona Lane
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Jacky:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 13, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding public safety and traffic. The Draft Environmental Impact Statement (DEIS) will discuss these issues, including potential impacts and mitigation measures.

We appreciate your support for senior housing. The DEIS will clarify that the residential component of the proposed project will not involve public housing, but will be 100% senior affordable rental apartments.

We are grateful for your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Gayle Nakama

Gayle Nakama
PO Box 19264
Honolulu Hawaii 96817

Received via website on 9/7/2017:

The housing project whether low income, affordable or senior needs to be scaled back further. We already have enough problems as it is in this area and you are bringing more. Look at the low income housing we already have across the street, Dillingham, Kam IV, Waiakamilo, Mayor Wright and KPT. Kalihi has enough. Making it affordable doesn't fly either, we all know how projects work.

Our area will accept seniors for so long as no low income or affordable units are included, why? Because the seniors will be intimidated by the low income folks as are an underlying problem in most low income projects.

Get real, we who own our homes want to see our investments prosper, not brought down. Too many housing projects bring property values DOWN, DUH!! There's state owned land in other areas, why not look into Niu Valley where Hakim lives? Why only Kalihi? When you are able to give me a satisfactory answer I will then comment further. If not, build it elsewhere.

Comment From: Gayle Nakama

Gayle Nakama
PO Box 19264
Honolulu Hawaii 96817

Received via website on 9/13/2017:

As stated previously, this project will impact the lives of many here in the neighborhood. Traffic, crime, sewers, property values and more will be a severe problem. This area has the most housing projects within a two-three mile radius. WE DO NOT NEED MORE, especially a horrific project such as the proposed design with three huge buildings towering some 22-23 stories high and various other small buildings. Okay, I don't mind a senior housing, but keep it to a minimum, say 200-300. The majority of the public living within this area don't want it, others are slowly coming up to join in the fight and fight we will!

Traffic is already critical here during the morning rush hours, and don't tell me that older Kupuna don't drive okay. They are busy like me getting my folks to their doctor, dentist, Longs Drugs, Safeway and other errands within the area. On any given morning from my home to Kawananakoa Intermediate where I took my grandniece last year, leaving at 7:30 would result in at least a half hour commute one way and 15 minutes back. This is ridiculous. There have been knife wielding crazies at Lanakila District park in the afternoons, sex offenders running around and most of them are from the housing project. Why would we want another project?

Take a good look at Kukui Plaza, the so called model affordable housing project! Within itself it's a haven for drug dealers, robberies, break ins, thefts, car stripping, kids being beat up and threatened for money. Get real. Mayor Wright is across the street and this contributes to the overall crime problems that we have here. Of course, most of these matters are kept under wraps but thru conversations we are aware of what is going on. Most folks fear retaliation that's why complaints are mostly never made. WE DON'T WANT THOSE PROBLEMS HERE.

I could give a rat's ass as to what happens elsewhere, I really could but how much is too much? Ask yourself if you would, could tolerate what we in this area live thru every single day?

We want to preserve what little property values we have, that for most of us, is all we have and you want to take that away from us? Statistically, it has been proven that too many housing projects impact a community, we concur, we already bear more that our share. Get it out of here.

My team realizes that a senior housing project would be a blessing for the many older folks that reside in the area, but a too big project brings too big problems, Keep it small and keep it simple.

I'd like to be kept informed about everything that goes on within this EIS and other studies.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Gayle Nakama
PO Box 19264
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Nakama:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your comments received online September 7 and 13, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding project scale, unit counts, building heights, tenant mix, infrastructure, traffic, and public safety. The Draft Environmental Impact Statement (DEIS) will address these issues, and will include possible measures to mitigate impacts.

The DEIS will clarify that the residential component of the proposed project will not involve public housing, but proposes 100% senior affordable rental housing. This project is one of a number of affordable housing projects that the State has planned for neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu’s Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

The DEIS will also include as an appendix a research brief that addresses the issue of the impact of affordable housing on nearby property values.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Arlene Nakamura

Arlene Nakamura
1215 Pohaku Pl
Honolulu Hawaii 96817

Received via website on 8/17/2017:

Kalihi has so many illegal homeowners who rent their homes and don't pay taxes on their tenants who park where ever they want and nothing is done about it. So, if you add to this to the mix, then traffic, parking spaces, people fighting over space, etc., will cause problems in the area. Kalihi has enough issues without putting more people into the area, you should be looking at areas that have more space (ie. Ewa Beach, Kapolei, etc.), but stop trying to overcrowd the area.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Arlene Nakamura
1215 Pohaku Place
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Nakamura:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on August 17, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding traffic and parking, as well as your suggestion to explore alternative sites. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts to traffic and parking, as well as possible measures to mitigate such impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

September 21, 2017

Mr. Greg Nakai
PBR Hawaii + Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Nakai,

Re: EISPN for HPHA Administrative Offices
(School Street) Redevelopment

After review of the EISPN, I find HPHA's proposed redevelopment at School Street to be unacceptable for the following reasons:

1. The proposed site is designated for lower density residential use. The proposed tall and massive structures would be out of character in this neighborhood and would stick out like a sore thumb.
2. The density being proposed is sure to heavily impact our roads, especially School Street, which is important in relieving the pressure of the East-West corridor of traffic. After the Hale Poai and Kapuna I senior housing projects were built, there were many complaints about the slowing of traffic on School Street because of the numerous pedestrian crossings to the bus stops. The addition of 800 or more units, and their visitors, would severely impact all roads in the vicinity. This kind of development is really better situated along the rail route, where tenants can benefit from this public transportation system for which taxpayers have paid so dearly.
3. This project could overwhelm water and sewer capacity. History has demonstrated that traffic studies and sewer capacity evaluations often underestimate the impact of new development on our infrastructure. Examples are Kakaako and nearby Nuuanu Avenue, below the Judd Street condominiums, where odor from strained capacity sometimes occurs, and this poses a health and sanitation concern. Sewer capacity and traffic studies should be carefully undertaken with prior misjudgements in mind.
4. The EISPN describes a master planning process and a desire to create a diverse new community. This small Lanakila community is already inundated with several hundred low income housing units. Puahala Homes, Maluhia Elderly Housing, Kapuna I, Hale Poai, Halia Hale and Lanakila Gardens are all located in the immediate vicinity. The addition of another several hundred low income units does not create diversity, it creates density. In fact, the whole Kalihi-Palama community already has more than its share of low income housing. This is not good community planning. Can any low income housing units be found in Aina Haina/Niu Valley? Master planning is not simply a matter of holding placative charrettes to allow residents to mitigate a proposal of ridiculous magnitude. True community master planning involves creating real diversity and careful planning to meet the needs of the community. Police stations, fire stations, medical and emergency facilities, schools,

parks, libraries, etc must be strategically planned to serve the public easily and effectively. Even senior housing should be evenly distributed throughout the greater community, so friends and families can visit without difficulty. A great concentration of seniors in one location will draw friends and families from near AND far, and that not only wastes time and resources, but also keeps cars on the roads longer. An abundance of Handi Vans will not help either. We should plan to minimize time on our already congested roads.

History has shown that the concentration of low income housing presents many social problems, and HPHA should know this. If HPHA needs new offices, I'm sure our Lanakila community would welcome an improvement of sensible size for that purpose that would include, if possible, open areas aimed at improving the quality of life for the existing low income families, the many seniors who already live across School Street, and the surrounding community. Open markets and garden plots, for example, would be well-received and could also provide some revenue for the State. I'm sure our community would be happy to provide more positive suggestions for such a plan. HPHA's proposal to add more low income units, however, is unacceptable, as voiced unanimously by this community at HPHA's earlier plan presentation to the Liliha/Puunui/Alewa/Kamehameha Heights Neighborhood Board No. 14. The rail route was felt to be the appropriate location for this type of affordable housing development. It is regrettable that HPHA and others still fail to recognize our community's voice, expressed at our own open forum, the Neighborhood Board, established by the City and County of Honolulu, with the participation of State representatives.

Sincerely yours,

Francis Nishimura

Francis Nishimura
926 Keola Street
Honolulu, HI 96817

cc: Governor David Ige
Senator Karl Rhoads
Representative Takashi Ohno
Councilmember Carol Fukunaga
Chair Wesley Fong and Members, Neighborhood Board 14
Hakim Ouansafi, HPHA

PBR HAWAII
& ASSOCIATES, INC.

THOMAS S. WITTEN, FASLA
Chairman / Principal

R. STAN DUNCAN, ASLA
President / Principal

RUSSELL Y. J. CHUNG, FASLA, LEED®AP BD+C
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Vice-President / Principal

GRANT T. MURAKAMI, AICP, LEED®AP BD+C
Vice-President / Principal

TOM SCHNELL, AICP
Principal

KIMI MIKAMI YUEN, LEED®AP BD+C
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ANN MIKIKO BOUSLOG, PhD
Project Director

RAMSAY R. M. TAUM
Cultural Sustainability Planner

RAYMOND T. HIGA, ASLA
Senior Associate

CATIE CULLISON, AICP
Senior Associate

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

MARC SHIMATSU, ASLA
Associate

MICAH McMILLEN, ASLA, LEED®AP
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 22, 2017

Mr. Francis Nishimura
926 Keola Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Nishimura:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your letter dated September 21, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will discuss potential impacts and possible mitigation measures regarding: 1) building heights and visual resources; 2) traffic; 3) infrastructure, including water and sewer systems; and 4) public services and facilities. The DEIS will also include discussions on: the public engagement and community input process; the alternatives considered; and the rationale for the selection of the preferred alternative and the project site, in light of project objectives.

The DEIS will clarify that the residential component of the proposed project will not involve public housing, but will be 100% senior affordable rental housing.

It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a severe shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. This project is one of a number of affordable housing projects that the State has planned for various neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu’s Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

We acknowledge your suggestion to include open spaces, open markets, and garden plots at the project site. As currently proposed, the project will provide open green spaces along School Street.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

Comment From: Karin Nomura

Karin Nomura
1853A Kaikunane Loop
Honolulu Hawaii 96817

Received via website on 9/14/2017:

To whom it may concern,

While I support low income housing as a whole - feel that the area in which the plan is being built has become over saturated. We suffer from:

-traffic (depending on the time, the drive for one block has taken me 1/2 an hour, which is ridiculous); because of the heavy traffic on some roads, every single time it rains, the roads become pot hole filled again (with depending on the amount of rain, the size of the pot hole)With again, while I support having offices; small storefronts; etc. as it means increasing the job market, again, more traffic in a congested area; parking already an issue; possible increase in more people coming to a location that's original intent was residential.
-the area is old, so many of the items like our sewer system are put under duress as r-5 residential lots are then forced to support the extra tenants that come with condo's, apartments, etc. With while I don't know how many people the units will hold, see that the plan is for 800-1000 units, which means the load in which the sewer system was geared for, will increase by this much, if not double, triple, depending on how many people will be allocated to each unit. Not to mention electricity - just this week alone, with no heavy gusts or rain in my immediate area, my electricity has gone out twice. Will the need for electricity and water, that will be increased, worried over if it will be enough to support the growing area.
-With I don't know about other people, but for me, I purchased my home, because I like the trade winds; living in a residential area; being able to look out my window and enjoy the view. But with all of these changes being made to what was once residential being rezoned, I've been slowly losing what I originally loved about my area, to population growth; buildings; etc. With, as a growing or saturated area, having to deal with the growth that goes with it - which has included hearing about crimes; noise; etc.
With on top of this, having to deal with responders who claim they don't have the number of people, "short staffed" (hear this a lot), "we're not equipped to handle", etc. needed to protect those that live in the area. It's just too populated. With on top of the already inability to - mentioned directly from those who service the area - hearing more about wanting to add, to an already problem area just doesn't seem to be a reasonable solution to fix another problem area.

December 22, 2017

Ms. Karin Nomura
1853A Kaikunane Loop
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Nomura:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 14, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts and mitigation measures regarding traffic, roads, parking, infrastructure, views, noise, crime and safety, and emergency services.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Jeffrey Okazaki

Jeffrey Okazaki
2029 A Lee Place
Honolulu Hawaii 96817

Received via website on 9/13/2017:

I am a 64 year resident of this area and find it quite sad and disappointing that we are proposing projects with no master plan to show such a need and good justification for these projects. Has this been vetted with other city/state agencies? For example, Board of Water Supply? Electric Company? Transportation Division? or Fire Department? This reminds me of the location/relocation of the prison at Dillingham. Where is the planning? What is the justification? This appears to be ill conceived and without any merit. After review of this proposal, it just does not make sense. Demographics or otherwise. Did the study seriously consider other areas such as the east side or Hawaii Kai area? What about Kaneohe? or Kailua? even Kaimuki or Kapolei? Please, show us a good, bona fide study with meat and supporting facts/documents because we need to really make the best decisions based on this review with community input from the inception. Please fix the state and city governments so that the best effort on these projects are developed and submitted for comment. Otherwise, be prepared to pay another bill similar to that of the rail project. That is, be prepared to foot the bill for the long term in terms of cost to support the projects in the out years with more security, safety and other infrastructure support needs for the community.

PBR HAWAII
& ASSOCIATES, INC.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 22, 2017

Mr. Jeffrey Okazaki
2029 A Lee Place
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Okazaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 13, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and provide the following responses.

The Draft Environmental Impact Statement (DEIS) will clarify that the residential component of the proposed project will comprise 100% senior affordable rental housing. It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. This project is one of a number of affordable housing projects that the State has planned for neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu's Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island's agricultural and rural lands.

The DEIS will provide further details on the need and justification for this project, as well as the rationale for the selection of the preferred alternative and the project site. The DEIS will also describe the master planning process that has included input from the community.

Other State and City agencies have indeed been consulted through the Environmental Impact Statement Preparation Notice (EISPN) process, and their comments and input will be included in the DEIS.

The DEIS will also discuss public safety and infrastructure, including potential impacts and mitigation measures.

We appreciate your participation in the environmental review process. Your message will be included in the DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

Comment From: D. Otsu

D. Otsu
3234 Allan Place
Honolulu Hawaii 96817

Received via website on 9/21/2017:

I regularly visit residents just a mere block from where this development will occur. I have great concerns about how having so many residents and units built in a small area can be supported by the small surrounding streets. I'm talking in particular about POHAKU street and HALA DRIVE which is already dangerously narrow and will not sustain having one lane blocked should police or ambulance be needed if the residential homes are erected to the capacity you intend.

Moreover, there is no space on either side of the street to widen the existing surrounding streets mentioned. I walk up Pohaku St. and often get close to being hit and that's with the existing traffic right now. It's a safety issue for all pedestrians who catch the bus and walk to their homes up lower Alewa Heights.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

D. Otsu
3234 Allan Place
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear D. Otsu:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 21, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will include discussions on potential impacts to traffic, roadways, access, and pedestrian safety, as well as possible measures to mitigate such impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Kris Salas

Kris Salas
1218 Alani Street
Honolulu Hawaii 96817

Received via website on 9/18/2017:

I've lived in Kalihi in the last 14 years and I find that population has grown 75%. When there is a shutdown of the freeway due to an accident. The people use the resident roads to avoid the traffic. It causes a conjestion on our road. the resident road are so narrow that it is so difficult to get into your drive way du to them blocking the road. I feel that the kalihi is over populated right now and we don't need anymore crimes and conjestions in our neigberhood.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Kris Salas
1218 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Kris:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 18, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will include discussions on potential impacts to traffic and public safety, as well as possible measures to mitigate these impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Brandon Sasaki

Brandon Sasaki
1222 Alani Street
Honolulu Hawaii 96817

Received via website on 9/21/2017:

To HPHA and PBR,

I am writing to comment on the proposed 1000 unit project being built at the corner of School and Lanakila streets on the current site of HPHA.

I believe that this huge housing development is too big for the current area and facilities. Point one, School Street is only 2 lane road on each side. With the parked cars, buses, handivans and emergency vehicles, it essentially becomes a one lane. Unless you are planning to widen it, this street would not be able to handle the extra capacity or easily 1000-2000 more cars.
Secondly, we have enough public housing in this area that is poorly managed and run by the state/city and county. How are you planning to prevent the same conditions from happening here? How will you keep the homeless out of every park area, when you can barely do that now?
Safety is another concern. The police force seems already just adequate. What do you intend to do once you concentrate certain populations (approximately 2000-3000 people) together in a small 6 acre area? This very well could increase gangs, loitering (reminder: an elementary school is right across the street) and other crimes. If you intend to mix low income and seniors, you are asking for trouble on many levels.
Why build this monolithic structure here? Yes, housing is needed, but there are better areas, nearer to the proposed rail transit line. We are far away from the nearest transit station, do you expect our seniors to walk that distance? It won't happen. Therefore, they will use the bus, but that means you will need to double the current buses on this line, which going back to point one will completely congest this area.
The road and utility infrastructure in this area is inadequate for such a dense population. Crossing the street is a nightmare for both driver and pedestrians.
As a young college educated person who grew up in this area, I feel we need to preserve this area as is to keep the area desirable and keep us here. Build a smaller structure (200 units or so). Keep it only seniors and make sure everything supports this before you start building. My generation cannot keep coming up with more money to pay for something that could have been constructed right in the first place.
I thank you for your time and await your reply.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Brandon Sasaki
1222 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Sasaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 21, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will clarify that the residential component of the redevelopment will not include public housing, but instead proposes 100% senior affordable rental apartments, which will be operated and maintained by the management arm of RHF.

In addition, the DEIS will discuss potential impacts to traffic, pedestrian safety, public transportation, public safety, and infrastructure. Possible measures to mitigate such impacts will also be included. Finally, we acknowledge your preference for approximately 200 seniors-only units.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Pat Sasaki

Pat Sasaki
1222 Alani Street
Honolulu Hawaii 96817

Received via website on 8/23/2017:

We understand that you are planning to redevelop the HPHA. We live in the close vicinity and are concerned about the type of affordable housing and how many units are projected to be built with this project. There is already a disproportionate amount of government state sponsored housing in this particular area and it is currently congested population and automobiles. Can you please send me diagram of the planned redevelopment project and any additional information of proposed tenants, both residential and commercial.

Pat Sasaki
Phone

(808) 222-2795
Email

wsliliha@yahoo.com
Message

Comment From: Patricia Sasaki

Patricia Sasaki
1222A Alani Street
Honolulu Hawaii 96817

Received via website on 9/19/2017:

Dear HPHA, State of Hawaii Department of Housing, RHF and PBR,

I recently attended an Environmental Impact Statement Public Scoping (EISPS) Meeting at HPHA on September 12, 2017.
I am shocked at the lack of attempt by HPHA (and the others addressed above) to give adequate notice to the community regarding a project of this major impact.

According to many of the constituents of the community present, many found out about this meeting in a circumvented way, one from a friend in New York. Others found out through Representative Takashi Ohno on around 9/7/17, the meeting was then held on 9/12/17 and public response deadline was 9/22/17. That is a mere 15 days to respond to a project of this significant magnitude and repercussions to our community!

My neighbors and I have 'heard' of a HPHA School Street Redevelopment Project and I have also seen a flyer that was vague and did not mention anything about the 1000 proposed low income/mixed housing units being planned.

My biggest concern is the impact of this increased population on traffic and utilities in this area.

First of all, School Street and Lanakila Streets are inadequate to handle more traffic. Both are 2 lanes in each direction at best. The traffic now is very poor during rush hour. It can take 20 minutes to get onto the freeway in either direction. What will be the impact of adding one to two thousand more cars on the streets in the mornings, midday and afternoons? Imagine, a couple thousand more cars/buses/handi-vans and pedestrians.

Someone mentioned that seniors do not drive or do not drive during peak hours, which I can attest is not true as we have senior parents. They may not drive, but we do and have to pick them up to take them shopping and to appointments. And they all want to go early. So a 9:00 Doctors appointment means I have to leave home at 7:00 rush hour to make it to their place, get them ready and into the car to go off to the doctors by 9:00. Or they will take the bus and handivans. So the number of our buses will double and loading time will increase with each bus loading more elderly.

The H-1 freeway will also be adversely affected, as most will siphon into these thoroughfares at the same times. School Street also serves as a by pass when the freeway is jammed. You may add 30 minutes daily for commuters going from east to west and visa versa.

How will the police, fire and emergency services be able to navigate on a gridlocked streets?

It will affect the residential parking which is already so bad that most 2 lane roads are now one lane. It will take parking from the schools and the children of these complexes will add to the already overcrowded classrooms.

How about noise pollution? We have a siren audible every hour or so, what kind of stress will we have when it becomes constant?

The utilities in this vicinity are aged and in need of repair. How will you handle the needs of the 1000 more units (2-3 thousand more people)? I already suffer from low water pressure and intermittent electrical and cable outages.

I agree we need more senior housing, but a reasonable number is 200-300 units.

Thank your for your time and I look forward to hearing your response to my inquires.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Patricia Sasaki
1222 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Sasaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your messages received online on August 23 and September 19, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns and provide the following response.

Regarding your request for a diagram of the proposed project, a copy of the conceptual site plan was included in the Environmental Impact Statement Preparation Notice (EISPN) that was published on August 23, 2017, and which is still available on the Hawai‘i State Office of Environmental Quality Control's (OEQC's) website: http://health.hawaii.gov/oeqc/. The forthcoming Draft Environmental Impact Statement (DEIS) will also include the conceptual site plan, as well as further information regarding the project.

We are grateful for your attendance at the Environmental Impact Statement (EIS) Public Scoping Meeting that was held at the HPHA offices on September 12, 2017. The purpose of the EIS Public Scoping Meeting was for participants to provide input regarding what topics and issues should be addressed in the DEIS. As was mentioned during that meeting, there have been numerous opportunities for public input during the master planning process (community meetings and charrettes that were held in October 2016, November 2016, January 2017, and October 2017), and there will be an additional opportunity for public comment during the 45-day public review period that will begin upon publication of the DEIS.

To address your other concerns, the DEIS will include discussions on potential impacts and mitigation measures regarding traffic, parking, emergency services, schools, noise, and infrastructure. We also acknowledge your preference for 200-300 units.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Stephen/Elvanette Silva

Stephen/Elvanette Silva
1211 Ahiahi Street
Honolulu Hawaii 96817

Received via website on 9/23/2017:

Please STOP the building of 1000 housing units on the corner of school and lanakila streets. We already have problems with rush hour traffic, congestion on the street with pedestrians especially, as well as cars, emergency vehicles. As a result SAFETY problems would be increased. We would have more problems with noise, utilities and parking as well. Please STOP this project.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Stephen and Elvanette Silva
1211 Ahiahi Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. and Mrs. Silva:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 23, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding traffic, emergency services, public safety, noise, utilities, and parking. The Draft Environmental Impact Statement (DEIS) will discuss these issues, including potential impacts and mitigation measures.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Louise Storm

Louise Storm
2455-A Huene Street
Honolulu Hawaii 96817

Received via website on 9/8/2017:

I am interested in who will manage the buildings so that they do not get run down like some other government buildings. It's not just the stories about KPT and Mayor Wright Homes.

I worked 10 years at the Hawaii State Library, where Library Admin and DAGS seemed to be responsible for upkeep. When I retired a couple of years ago, we still had several significant leaks from the roof even in the public areas whenever there was a heavy rain; a huge, ugly drip type stain in the public stair well where someone had spilled something long ago; public bathrooms that were ill-lit and grungy, basement corridors narrowed for years because they were lined with discarded equipment; an emergency exit door to Punchbowl Street that was physically blocked because the door lock didn't work; etc. (I sincerely hope things have improved there since I've been gone.)

I bet there are many more state buildings that need more TLC, but upkeep is more crucial if people, especially seniors, will be occupying the structure.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Louise Storm
2455-A Huene Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Storm:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 8, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the management of the proposed redevelopment.

As currently proposed, RHF will manage and operate the project through its operations arm, Foundation Property Management. RHF's policy is to continue to own and operate the projects it develops and generally does not sell a project it has developed. This information will be included in the Draft Environmental Impact Statement (DEIS).

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

From: YoloCare [mailto:no-reply@yolocare.com]
Sent: Saturday, August 12, 2017 9:58 PM
To: RHF Information <info@rhf.org>
Subject: New submission from New Contact Us

Name
Jane tada
Email
jftada@hawaii.rr.com
Message
Thank you re the EISPN. We do need more low/mod housing for seniors. My questions if your approximate time lines goes according to schedule: when would demolition start and when would the project be completed. Thank you.

Message was sent from: http://schoolstredevelopment.org/

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Jane Tada
jftada@hawaii.rr.com

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Tada:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on August 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your support for more affordable housing for seniors and provide the following response to your questions.

The Draft Environmental Impact Statement (DEIS) will indicate that the timeline for the proposed project is contingent upon Environmental Impact Statement (EIS) acceptance, permit approvals, market forces, and funding and financing. As such, it is not currently known exactly when the demolition and construction would start. However, for the purposes of the DEIS, we assumed that demolition and construction would start in 2020, and onsite construction is estimated to be completed in five phases at roughly two years per phase for a total construction period of at least ten years.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

From: YoloCare [mailto:no-reply@yolocare.com]
Sent: Sunday, September 10, 2017 12:20 PM
To: RHF Information <info@rhf.org>
Subject: New submission from New Contact Us

Name
Karen Takamatsu
Phone
(808) 392-5484
Email
corki808@gmail.com
Message
I was told you email updated regarding this project to interested parties. Could I please be added to the list also?

Message was sent from: http://schoolstredevelopment.org/contact-us/

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Karen Takamatsu
corki808@gmail.com

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Takamatsu:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message dated September 10, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your request and have added your contact information to the list of interested parties.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Phyllis Tom

Phyllis Tom
2733 Liliha Street
Honolulu Hawaii 96817

Received via website on 9/21/2017:

I am in favor of 100 percent senior housing instead of mixed units of affordable housing. As the baby boomers continue to age, affordable becomes less available. Our island has become overpriced, however evidence shows crime increases with the low income and homeless population. Who wants to be neighbors with low income crime and the homeless? The responsibility of establishing safe communities must be part of the environmental impact studies. Erecting buildings are simple, the real problem must be addressed to avoid devalued communities. Don't band aid a problem and appear to solve it until it erupts and becomes another pocket of an area on Oahu to avoid. Create welcomed communities to perpetuate an increased population of "good neighbors."

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Phyllis Tom
2733 Liliha Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Tom:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 21, 2017, regarding the subject project. As the planning consultant for RHF, we appreciate your support for 100% senior housing, and we acknowledge your comments and concerns regarding public safety. This issue will be addressed in the Draft Environmental Impact Statement (DEIS).

The DEIS will also clarify that the residential component of the redevelopment will not include public housing, but instead proposes 100% senior affordable rental apartments.

We are grateful for your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Corinne Uehara

Corinne Uehara
2252 Date Street
Honolulu Hawaii 96826

Received via website on 9/7/2017:

Oahu needs more housing to help the low income families and the homeless. I am for this development. I work in the Liliha area.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Corinne Uehara
2252 Date Street
Honolulu, Hawai‘i 96826

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Uehara:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 7, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your support of the proposed redevelopment in light of the need for more affordable housing on O‘ahu.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Melvin Won

Melvin Won
2604 Waolani Avenue
Honolulu Hawaii 96817

Received via website on 9/7/2017:

This project is needed for the community. It looks like the problems of high rent and homelessness is being addressed. My concern is the State's Senior Community Center in the adjoining parcel. At present, the parking lot is shared with the city and this project will all but eliminate parking for the two adjoining State parcels in that area. Could the State be invited to partner in this project with the two adjoining lots? The State could build a multi-deck parking and office structure in these two parcels which will service the senior community from all nearby areas, including the senior housing occupants in this project, and provide needed office space for their providers of senior services. The result will be better senior services and adequate parking for the senior community and the State.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Melvin Won
2604 Waolani Avenue
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Won:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 7, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your support for the redevelopment in light of the need for affordable housing, as well as your comments and suggestions regarding parking for the adjoining Lanakila Multi-Purpose Senior Center. While the current parking spaces used by the Senior Center may not be preserved in place, certainly accommodations will be provided for parking on the project site.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Carol Wong

Carol Wong
1128-D Alewa Drive
Honolulu Hawaii 96817

Received via website on 9/15/2017:

I would rather have this project built for our senior citizens ONLY. We do not need another housing project for the homeless or low income in our side of town when we already have many.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Carol Wong
1128-D Alewa Drive
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Wong:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 15, 2017, regarding the subject project. As the planning consultant for RHF, we appreciate your support for senior housing and acknowledge your comment regarding housing for homeless or low-income people. The Draft Environmental Impact Statement (DEIS) will clarify that the residential component of the redevelopment will not include public housing, but proposes 100% senior affordable rental apartments.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Tracy Yamashita

Tracy Yamashita
1835 Sereno St.
Honolulu Hawaii 96817-2318

Received via website on 9/7/2017:

I know some people are saying why here but if not then where? Most of the people who live in this area can't afford to live elsewhere because it would be to far. There is a reason why there are so many affordable housing within the urban area!!!

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Tracy Yamashita
1835 Sereno Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Yamashita:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 7, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your support for the redevelopment in light of the need for affordable housing within the urban area of Honolulu.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming Draft Environmental Impact Statement (DEIS).

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Amy Young

Amy Young
1218 Alani Street
Honolulu Hawaii 96817

Received via website on 9/20/2017:

I am against the development of the proposed 800-1000 low income/senior/affordable mixed-use project being planned on the HPHA State property.
There is already a big issue with too much traffic and being 84 years old, I already dread ever having to cross school street. Too many people will get hit and run over if you add another 1000-2000 cars to what we have now.
The crime will go up if you bring in low imcome and at such a huge increase in the population. We already have a bunch of low income and the crime is significant enough that most people will not walk the neighborhoods at night.
You cannot mix low income with elderly as they will become targets.
You will get rid of some beautiful trees in front of the HPHA, what do you plan to repalce them with. Kalihi/Lanakila is already becoming a concrete jungle.
Please consider limiting the housing units to only 200-300 and only seniors. That would be reasonable and might work.

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Amy Young
1218 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Young:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 20, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will discuss potential impacts to traffic and pedestrian safety, crime and public safety, and trees, and will include possible measures to mitigate such impacts. We also acknowledge your preference for 200-300 seniors-only units.

The DEIS will clarify that the residential component of the redevelopment will not include public housing, but instead proposes 100% senior affordable rental apartments.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

Comment From: Angie Young

Angie Young
P.O. Box 17524
Honolulu Hawaii 96817

Received via website on 9/23/2017:

I am opposed to such a large development on school street! A 1,000 unit building on School Street is just too large. A smaller development is more appropriate. The affordable housing unit should be built for seniors only. The residential building should not be built for senior and families. There is already senior residential units currently across the street from the planned site. Adding more senior residential units won't cause a hardship to the current traffic conditions. Many of them catch the bus, and do not drive. The bus line is right on School Street making it easy for seniors to get to and from. Also this development is perfect for seniors in that it is very close to 3 major hospitals, Queen's, Kuakini, and St. Francis. Also, adding more units for families will increase crime in the area, it will add to traffic, and parking will become a problem in the neighborhood and community. Do Not Build a 1,000 unit building on School Street!!!

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Angie Young
P.O. Box 17524
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Young:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 23, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

We recognize your support for a seniors-only project in light of your observations that many seniors catch the bus and do not drive, and that the project site is conveniently located on a bus line and within close proximity to hospitals and medical facilities. The Draft Environmental Impact Statement (DEIS) will confirm that the residential component of the project will not involve public housing, but will comprise 800 age-restricted (senior) affordable rental apartments. The DEIS will also look at potential impacts to traffic, parking, public transportation, and public safety, and will discuss possible measures to mitigate these impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

From: YoloCare [mailto:no-reply@yolocare.com]
Sent: Monday, September 04, 2017 11:55 AM
To: RHF Information <info@rhf.org>
Subject: New submission from New Contact Us

Name

Dorothy

Phone

(898) 224-8615

Email

kalbinumberone@gmail.com

Message

I am a 70+ year resident living in a single family home located very close to the proposed development of the School St. redevelopment project.
The nearby Kapuna Apartment structure is at least10 stories high and accommodates 162 units. The proposed 3 high rise structures would each be more than twice that height with accommodation of perhaps 6 times more possible units. I felt the impact of Kapuna apartment soon after it was occupied and experienced the extra busy traffic on streets and side streets especially with limited parking here. The massive proposed structures appear to uncomfortably tower over - maybe engulf the quiet family homes in the area.
Other units nearby - Puahala Homes, Hale Po'ai, Lanakila Gardens etc. total approximately 500+ units. The additional proposed development does not necessarily assure us that there will be a mere additional 1000 additional residents but compound that with another family member or additional members in each unit and it could mean an influx of thousands - an immense population growth in this congested area.
I no longer know many of my neighbors and am finding it difficult to keep up with our community policing efforts which we effectively organized at one time among members living in our once comfortable area of family homes on our street.
I realize there is a need for more lodging for many families and individuals but it will be so thoroughly unfair that this immediate neighborhood should be selected to have to include such a massive increase of an already crowded population of condominiums, apartment buildings, busy traffic and become an added burden on our infrastructure problems.
Surely there are other neighborhoods that can - and should - accommodate their share of the statewide problem.

Message was sent from: http://schoolstredevelopment.org/contact-us/

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Dorothy
kalbinumberone@gmail.com

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Dorothy:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your message received online on September 4, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment.

The Draft Environmental Impact Statement (DEIS) will include discussions on building heights, number of units, public safety, traffic, and infrastructure, and will address potential impacts and mitigation measures. The DEIS will also discuss the selection of the site and the preferred alternative in light of project objectives.

The DEIS will clarify that the residential component of the proposed project will not involve public housing, but will be 100% age-restricted (senior) affordable rental housing. It is widely recognized that there is a housing crisis statewide, as housing prices become increasingly unaffordable for residents. There is a severe shortage of affordable rental housing options particularly within proximity of downtown Honolulu, the civic, urban, and employment center of O‘ahu. To address this shortage, this project is one of a number of affordable housing projects that the State has planned for various neighborhoods across O‘ahu, and is critical to achieving the State’s goal of providing at least 22,500 affordable rental housing units, ready for occupancy between January 1, 2017, and December 31, 2026, pursuant to Act 127, Session Laws of Hawai‘i 2016. Moreover, this project implements major components of the City and County of Honolulu’s Primary Urban Center Development Plan, which calls for higher density development near the urban core in order to contain urban growth and preserve the island’s agricultural and rural lands.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

APPENDIX P

EIS Scoping Meeting Notes and Written Comments

PBR HAWAII
& ASSOCIATES, INC.

NOTES FROM EIS SCOPING MEETING
SEPTEMBER 12, 2017

LOCATION: HPHA Administrative Offices

PRESENT:
Jessie Faige, Office of Senator Karl Rhoads
Jenna Takenouchi, Office of Representative Takashi Ohno
Robert Arakaki, Neighborhood Resident
Floyd Cash, Neighborhood Resident
Yukari Cash, Neighborhood Resident
Tim Garry, Neighborhood Resident
Craig Hirai, HHFDC
Carole Kaapu, Neighborhood Board (No. 14)
Lydia Miyashiro, Neighborhood Resident
Gayle Nakama, Neighborhood Resident
Pat Sasaki, Neighborhood Resident
Wilfred Sasaki, Neighborhood Resident
Marie Vorsino, Parents and Children Together
Tricia Won, Maluhia
Benjamin Park, HPHA
Sarah Beamer, HPHA
Vincent Shigekuni, PBR HAWAII
Ramsay Taum, PBR HAWAII
Greg Nakai, PBR HAWAII
Brittany Wheatman, PBR HAWAII

MATERIALS DISTRIBUTED:
Scoping Meeting Agenda
Comment Cards

SUBJECT: Public Scoping Meeting for the HPHA Administrative Offices Redevelopment Draft EIS

The scoping meeting began with a brief presentation by PBR HAWAII to review the previously published EIS preparation notice, the general project steps and timeline (planning, design, and construction), methods and opportunities for submitting public comments (including online comments), and upcoming project milestones. The presentation was followed by an open discussion in which attendees had the opportunity to take turns sharing their thoughts as well as ask the project team from PBR HAWAII questions about the preparation of the Draft EIS and general components of the project thus far.

The points summarized below represent the questions, concerns, and comments shared by attendees during the meeting, except where indicated otherwise, which are organized by respective topic.

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaiʻi 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

I) Zoning, Unit Count, and Population Increase
- Unclear whether the project design is considering a maximum or minimum building height (outside of current zoning restrictions).
- Current zoning allows for low-density residential, which does not conform with preliminary designs to accommodate 1,000 units.
- The alternatives for 2,000 or 1,000 units is too high, many community members in attendance were more comfortable with an alternative of 300-400 units.
- Existing resident's views will be obstructed by multiple tall apartment buildings.
- Building heights similar to the one across the street might be more OK.
- Replacement offices ok but not commercial, since proposed commercial will also impact traffic, parking and put a strain on infrastructure.

II) Infrastructure (traffic, sewage, parking, etc.)
- Traffic is already a big issue and additional residents and/or commercial development will exacerbate this (e.g. more cars and less available parking).
- Lifestyles of new residents in senior housing will still impact traffic and parking during peak hours.
- Already a lot of ambulances that go through the neighborhood and more will be going through with the addition of senior housing.
- The project is likely to put huge demand on sewer capacity.

III) Location and Housing Type
- Various community members in attendance were concerned that this and surrounding neighborhoods already have too many low-income public housing projects (therefore, new public housing projects should be located in other neighborhoods). The project team from PBR HAWAII clarified that many factors go into choosing locations, one of which is the benefit of using existing State-owned land for State projects instead of acquiring land from a different landowner. Some attendees do not want any type of low-income, mixed-income or mixed-use developments in the neighborhood.
- Residents are concerned about the impacts of the (public housing) project on their property values (feel that the project could decrease their property value).
- The project team from PBR HAWAII clarified that the types of housing being considered for the project include affordable housing options, not public housing.
- All senior housing was seen as more preferable than families.
- Residents were concerned about how potential future improvements to Puahala Homes (located within the same HPHA property) would also affect this project. PBR HAWAII clarified that the EIS will address all potential impacts of other projects if they are confirmed.

IV) EIS and Project Approval Process
- Many attendees asked about the specific process of getting the project approved. The team from PBR HAWAII gave some examples of how similar projects might obtain approval throughout the entire process, but explained that there are multiple ways for a project to go about these processes (which has not been finalized for this particular

project).

- In response to questions about the EIS timeline, the PBR HAWAII project team clarified that no set timeframe is in place for the EIS (typically, this process will take over a year if all goes well).
- Many attendees expressed that they have been receiving conflicting information about types of housing being considered, unit count, building design, and other components of the project.
- More could be done to notify the community about these meetings.
- The PBR HAWAII project team clarified that the EIS will include technical studies for traffic.

V) Other Issues/Comments

- The project will impact the existing residents dramatically.
- There is too much development in the area in general (Hawaii is losing its sense of “Aloha”).
- Parks or green space should also be considered as part of this project (or something to benefit the entire community).
- Concerns that the community will not be considered throughout the process, or that the project will try to bypass community involvement

September 12, 2017

HPHA School Street Redevelopment EISPN Public Review Comment

Name: Robert Arakaki Organization: –

Mailing Address: 1446 Alewa Dr

Honolulu, Hawaii 96817

Comments:

There is a need for a "floor" – minimum number of units and a "ceiling" – maximum number of units in the project. There is a need for a design drawing of a 400 unit proposal.

Please return to PBR HAWAII this evening

Note: You must include your name and a mailing address if you wish to receive a written response to your comment. Please also note that your entire comment, including your personal identifying information (address, etc.) may become publicly available.

Alternatively, you may submit your written comment online at the project's comment input website:

http://schoolstreet.hpha.commentinput.com

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Robert Arakaki
1446 Alewa Drive
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Arakaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your written comment received at the Environmental Impact Statement (EIS) Public Scoping Meeting on September 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comment regarding a minimum and maximum number of units, as well as your suggestion for a design drawing of a 400-unit alternative. The Draft Environmental Impact Statement (DEIS) will describe the alternatives considered and the rationale for the selection of the preferred alternative in light of project objectives.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

September 12, 2017

HPHA School Street Redevelopment EISPN Public Review Comment

Name: Timothy GARRY **Organization:** NeiGHBOR to project.

Mailing Address: 1143 HAlA DR. Honolulu, 96817

Comments: To High, to MANY units. STRESS to AREA. AREA ZONED For Lower density. This project kills my neighbors AND my DowNTown AND HArbor view's. Completely UNACCEPTABLE! Also impact of Future development of the PuahAlA Housing Site.

*****Please return to PBR HAWAII this evening*****

Note: You must include your name and a mailing address if you wish to receive a written response to your comment. Please also note that your entire comment, including your personal identifying information (address, etc.) may become publicly available.

Alternatively, you may submit your written comment online at the project's comment input website:

http://schoolstreet.hpha.commentinput.com

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Mr. Timothy Garry
1143 Hala Drive
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Mr. Garry:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your written comment received at the Environmental Impact Statement (EIS) Public Scoping Meeting on September 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will provide discussions on potential impacts and mitigation measures regarding building heights, unit counts and density, zoning, and visual impacts.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

September 12, 2017

HPHA School Street Redevelopment EISPN Public Review Comment

Name: Carole Kaapu Organization: NB#14

Mailing Address: P.O. Box 30283, Honolulu, HI 96820

Comments: To minimize the traffic in the community.

1. 100% senior housing
2. Commercial space needs ~~also~~ to be more walk ~~oriented~~ oriented rather than car.
3. Analyze traffic flow especially at peak times - morning rush, afterschool, afternoon rush.

Please return to PBR HAWAII this evening

Note: You must include your name and a mailing address if you wish to receive a written response to your comment. Please also note that your entire comment, including your personal identifying information (address, etc.) may become publicly available.

Alternatively, you may submit your written comment online at the project's comment input website:

http://schoolstreet.hpha.commentinput.com

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Carole Kaapu
P.O. Box 30283
Honolulu, Hawai‘i 96820

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Kaapu:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your written comment received at the Environmental Impact Statement (EIS) Public Scoping Meeting on September 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your suggestions to minimize traffic impacts. The Draft Environmental Impact Statement (DEIS) will confirm that the residential component of the project comprises 100% senior affordable rental apartments. The DEIS will also include discussions on walkability and connectivity, as well as analyses of existing traffic conditions, potential traffic impacts, and possible mitigation measures.

We are grateful for your support and appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

September 12, 2017

HPHA School Street Redevelopment EISPN Public Review Comment

Name: Pat Sasaki **Organization:** Resident

Mailing Address: 1222 alani St

Comments: There is too much public housing in this vicinity. The only way we would agree to this is if this were 100% senior housing.

School Street needs to be widened for bus OR need to ~~[illegible]~~ make School Street non-public parking

*****Please return to PBR HAWAII this evening*****

Note: You must include your name and a mailing address if you wish to receive a written response to your comment. Please also note that your entire comment, including your personal identifying information (address, etc.) may become publicly available.

Alternatively, you may submit your written comment online at the project's comment input website:

http://schoolstreet.hpha.commentinput.com

PBR HAWAII
& ASSOCIATES, INC.

December 22, 2017

Ms. Pat Sasaki
1222 Alani Street
Honolulu, Hawai‘i 96817

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED HAWAII PUBLIC HOUSING AUTHORITY (HPHA) ADMINISTRATIVE OFFICES REDEVELOPMENT, 1002 N. SCHOOL STREET, HONOLULU, O‘AHU, TMK 1-6-009:003 (POR.)

Dear Ms. Sasaki:

On behalf of Retirement Housing Foundation (RHF), the developer selected to redevelop the Hawaii Public Housing Authority's (HPHA's) Administrative Offices at 1002 N. School Street, thank you for your written comment received at the Environmental Impact Statement (EIS) Public Scoping Meeting on September 12, 2017, regarding the subject project. As the planning consultant for RHF, we acknowledge your comments and concerns regarding the proposed redevelopment. The Draft Environmental Impact Statement (DEIS) will clarify that the residential component of the proposed project will not include public housing, but instead proposes 100% senior affordable rental housing. The DEIS will also include discussions on potential impacts and mitigation measures regarding roadways, public transportation, and parking.

We appreciate your participation in the environmental review process. Your message will be reproduced in the forthcoming DEIS.

Sincerely,

PBR HAWAII

Greg Nakai
Planner

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com