UNIVERSITY of HAWAI'I®

LEEWARD
COMMUNITY COLLEGE

LEEWARD COMMUNITY COLLEGE
EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY

Draft Environmental Assessment

Prepared for:
Urban Works, Inc.

Prepared by:

PBR HAWAII
& ASSOCIATES, INC.

May 2010

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LIST OF ACRONYMS

The following is a list of terms, abbreviations, and acronyms used in this document.

A	
ADA	Americans with Disability Act
ALISH	Agricultural Lands of Importance to the State of Hawaiʻi
AM	Morning
B	
BMPs	Best Management Practices
BOR	Board of Regents, University of Hawaiʻi at Mānoa
BWS	City and County of Honolulu, Board of Water Supply
C	
CATV	Cable television
CIA	Cultural Impact Assessment
CIP	Capital Improvement Project
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
D	
DAGS	State of Hawaiʻi, Department of Accounting and General Services
dba	Doing business as
DLNR	State of Hawaiʻi, Department of Land and Natural Resources
DOD	State of Hawaiʻi, Department of Defense
DOH	State of Hawaiʻi, Department of Health
DP	Development Plan
DPP	City and County of Honolulu, Department of Planning & Permitting
DTS	City and County of Honolulu, Department of Transportation Services
E	
EA	Environmental Assessment
EB	Eastbound
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FM	Domestic/fire service (water meter)
FONSI	Finding of No Significant Impact

FPMO	UH Facilities Planning and Management Office
FTE	Full-Time Equivalent
FWCA	Fish and Wildlife Coordination Act
G	
GPD	Gallons per day
GPM	Gallons per minute
H	
H-POWER	Honolulu Program of Waste Energy Recovery
HAR	Hawaii Administrative Rules
HHCTC	Honolulu High-Capacity Transit Corridor project
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HPD	Honolulu Police Department
HRS	Hawaii Revised Statutes
K	
kVA	Kilovolt Amperes
KW	Kilowatt
L	
LCC	University of Hawai‘i Leeward Community College
LCCW	University of Hawai‘i Leeward Community College Wai‘anae
LEED	Leadership in Energy and Environmental Design
LEED NC	LEED New Construction
LOS	Level-of-service is a quantitative and qualitative assessment of traffic operations
LRDP	Long Range Development Plan
LSB	Land Study Bureau
LT	Left turn
LUC	State of Hawai‘i, Land Use Commission
LUO	Land Use Ordinance
M	
MOU	Memorandum of Understanding
MPH	Miles per hour
MSL	Mean sea level
MVA	Megavolt Amperes
N	
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System Permit
NPS	Non-point source
NRCS	Natural Resources Conservation Service
NWS	National Weather Service

O	
OCCL	Department of Land and Natural Resources, Office of Conservation and Coastal Lands
OHA	Office of Hawaiian Affairs
OSHA	Occupational Safety and Health Administration
OTWC	Oceanic Time Warner Cable
P	
PM	Afternoon
PRU	Plan Review Use approval
R	
R-5	Residential Zoning District (City and County of Honolulu)
ROH	Revised Ordinances of Honolulu
RT	Right-turn
S	
SCP	(The City and County of Honolulu Central Oahu) Sustainable Communities Plan
SF	Square feet
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
SMA	Special Management Area
SMP	Special Management Area Use Permit
STEP	Supportive Teacher Education Program
T	
TH	Through (traffic)
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
U	
UH	University of Hawai‘i
UHM	University of Hawai‘i at Mānoa
UIC	Underground Injection Control Line
USC	United States Code
USGS	U.S. Geological Survey
W	
WB	Westbound
WMP	Water Management Plan
WzA	Waipahu Silty Clay, 6 to 12 percent slopes
WzC	Waipahu Silty Clay, 6 to 12 percent slopes

Section 1.0

INTRODUCTION

1.0 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawai'i Revised Statutes (HRS) for the proposed construction of the proposed Education and Innovation Instructional Facility at the University of Hawai'i Leeward Community College (LCC).

1.1 PROJECT SUMMARY

Project Name:	LCC Education and Innovation Instructional Facility, UH Project No. LEE 05-L28
Location:	96-045 Ala Ike, Pearl City, O'ahu 96782
Tax Map Key (TMK):	(1) 9-6-003: 048 (por.)
Applicant:	University of Hawai'i System, Office of Capital Improvements
Landowner:	State of Hawai'i (State) - University of Hawai'i System (by Federal Deed to the Board of Regents (BOR) of the University of Hawai'i)
Existing use:	Portion of campus walkway and landscaping
Proposed Action:	Three-story structure with classrooms, conference rooms and offices
Project Area:	Approximately 18,328 square feet
Land Use Designations:	***State Land Use:*** Urban ***City and County of Honolulu (County)*** ***Central Oahu Sustainable*** ***Communities Plan:*** UH Leeward Community College ***County Zoning***: Agricultural (AG-2)
Special Management Area:	The project is not in the Special Management Area

Permits/Approvals Required:	Plan Review Use – Minor Modification National Pollutant Discharge Elimination System (NPDES) Permit Section 6E, Hawai'i Revised Statutes (HRS) Review Industrial Wastewater Discharge Permit Building and Grading Permits
Approving Agency:	University of Hawai'i Community Colleges
Anticipated Determination:	Finding of No Significant Impact (FONSI)

1.2 LOCATION

The main LCC campus is located between Waipahu and Pearl City, in Central O'ahu, State of Hawai'i (Figure 1). The proposed Education and Innovation Instructional Facility will be located makai of the large parking lot, in an area next to the Theatre Plaza on the LCC campus.

1.3 LAND OWNERSHIP

The State of Hawai'i - University of Hawai'i System (per Federal Deed to the Board of Regents of the University of Hawai'i) holds title to the land under the location (Figure 2) of the proposed action. Utilizing the Tax Map Key system, the land under the project site is identified as TMK (1) 9-6-003: 048.

Contact: Mr. Brian Minaai
Associate Vice President for Capital Improvements
University of Hawai'i System
1960 East-West Road, Biomedical Sciences Building, Room B-102
Honolulu, Hawai'i 96822
Phone: (808) 956-4800
Fax: (808) 956-3175
Attn: Mr. Bruce Teramoto

LEGEND

- Leeward Community College
- Project Area

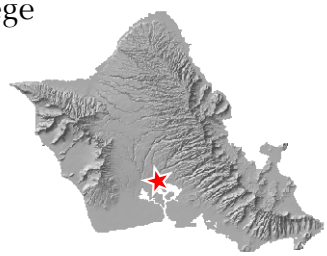

FIGURE 1
Aerial Location
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

NORTH

LINEAR SCALE (ft.)
0 200 400 800

PBR HAWAII & ASSOCIATES, INC.
May 2010

Source: ESRI World Imagery (GIS)
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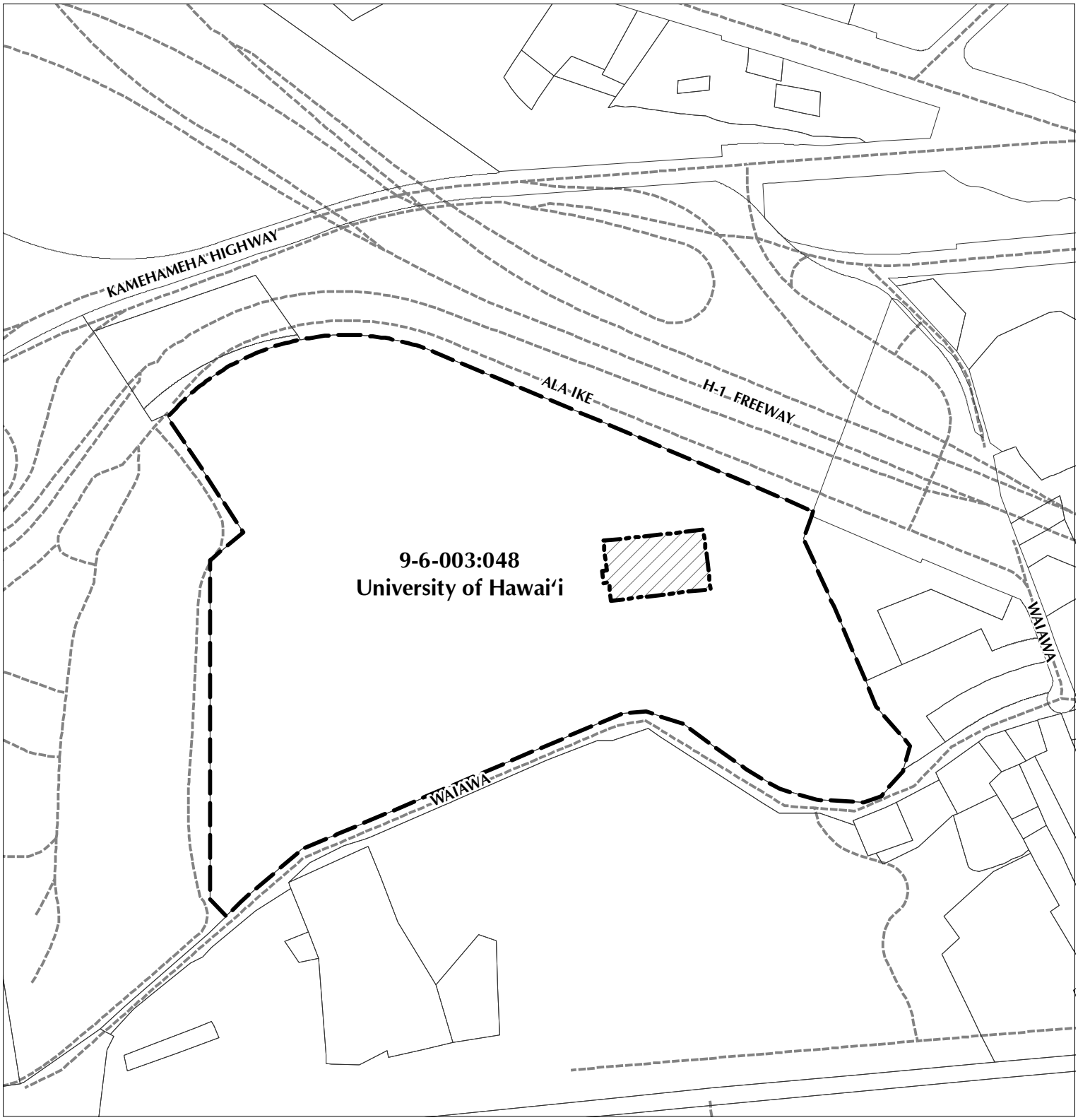

LEGEND

Leeward Community College

Project Area

FIGURE 2

Tax Map Key

Education & Innovation Instructional Facility

Leeward Community College

Island of O'ahu

NORTH

LINEAR SCALE (ft.)

0 200 400 800

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May 2010

Source: City & County of Honolulu HOLIS (2008)

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1.4 IDENTIFICATION OF APPLICANT

The University of Hawai'i System, Office of Capital Improvements is the project applicant.

Contact: Mr. Brian Minaai
Associate Vice President for Capital Improvements
University of Hawai'i System
1960 East-West Road, Biomedical Sciences Building, Room B-102
Honolulu, Hawai'i 96822
Phone: (808) 956-4800
Fax: (808) 956-3175
Attn: Mr. Bruce Teramoto

1.5 IDENTIFICATION OF ENVIRONMENTAL CONSULTANT

The environmental consultant is PBR HAWAII & Associates, Inc. dba PBR HAWAII.

Contact: Mr. Michael Shibata
Project Manager/Planner
PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813
Phone: (808) 521-5631
Fax: (808) 523-1402

1.6 IDENTIFICATION OF APPROVING AGENCY

The University of Hawai'i System, Office of Capital Improvements is the approving agency.

Contact: Mr. Brian Minaai
Associate Vice President for Capital Improvements
University of Hawai'i System
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Honolulu, Hawai'i 96822
Phone: (808) 956-4800
Fax: (808) 956-3175
Attn: Mr. Bruce Teramoto

1.7 COMPLIANCE WITH STATE OF HAWAI'I AND CITY AND COUNTY OF HONOLULU ENVIRONMENTAL LAWS

Preparation of this document falls in accordance with the provisions of Chapter 343, HRS (2007) and Title 11, Chapter 200, Hawai'i Administrative Rules (HAR) pertaining to Environmental Impact Statements. Section 343-5, HRS established nine "triggers" that require either an EA or an Environmental Impact Statement (EIS). The use of State or County lands or funds requires the preparation of an Environmental Assessment.

1.8 IDENTIFICATION OF AGENCIES CONSULTED

Various agencies (or agency documents) were consulted in preparation of this Environmental Assessment. Responses to the pre-consultation are attached in Appendix A.

Federal
Army Corps of Engineers
Department of the Interior-Fish and Wildlife Service

State of Hawai'i
Senator Clarence Nishihara
Representative Roy Takumi
Representative Mark Takai
Representative Henry Aquino
Department of Business, Economic Development & Tourism
Department of Health, Environmental Planning Office
Department of Land and Natural Resources
Department of Land and Natural Resources-State Historic Preservation Division
Department of Transportation
Office of Environmental Quality Control
Office of Hawaiian Affairs

City and County of Honolulu
Councilmember Gary Okino, Honolulu County Council
Councilmember Nestor Garcia, Honolulu County Council
Department of Community Services
Department of Design and Construction
Department of Environmental Services
Department of Facility Maintenance
Department of Parks & Recreation
Department of Planning & Permitting
Department of Transportation Services
Police Department

Fire Department
Board of Water Supply

Private
Hawaiian Electric Company

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SECTION 2.0

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

This section provides background information and a general description of the Education and Innovation Instructional Facility project site.

2.1 LOCATION

The Leeward Community College campus is located between Waipahu and Pearl City, in Central Oʻahu, State of Hawaiʻi (Figure 1). The proposed Education and Innovation Instructional Facility will be located makai of the large parking lot, in an area next to the Theatre Plaza on the LCC campus. Photographs of the site are included as Figure 3.

2.2 DESCRIPTION OF THE EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY

Leeward Community College opened its doors in the fall of 1968 as the first college in the University of Hawaiʻi system to be developed without a connection to a pre-existing technical school. LCC's guiding principle was "innovation" -- a readiness to depart from tradition in order to bring the best of its current educational practices to its students.

In 1968, Leonard T. Tuthill, LCC's first Provost, welcomed over 1,640 students into buildings that once housed Pearl City Kai Elementary School. The first semester witnessed more than twice the anticipated number of students ready to explore the "community college" experience.

In the spring of 1969, LCC moved to its current location, on approximately 50 acres near the geographic center of Oʻahu between Pearl City and Waipahu. Since its initial opening in temporary facilities, student enrollment in credit classes has grown so that the college is the second largest community college and the third largest campus of any kind in the State. Fall 2009 headcount enrollment was 7,484 students (full-time and part-time) and the full-time equivalent (FTE) enrollment was 4,341 students. Students are regularly enrolled each semester in liberal arts and career and technical educational programs offered on campus, at off-campus locations in the community, and through distance education courses. Distance education courses offered on-line or through a hybrid of classroom and on-line environments are a growing trend and are expected to continue. Of the nearly 7,484 students enrolled in Fall 2009, thirty percent of these students (2,259 students) took at least one of their courses through a distance education modality. This was an 18 percent increase from the previous year and an 87 percent increase over a three-year time period.

Leeward Community College Waiʻanae (LCCW) is a satellite campus located on the beautiful Waiʻanae coast of Oʻahu. It offers a variety of first and second year college credit classes in liberal arts, education, business, and career and technical areas. Students

can complete a majority of the course requirements for an Associate of Arts or an Associate of Arts in Teaching degree at LCCW. Courses are offered days and evenings, and Saturdays during the fall and spring semesters. In addition, students can access LCC online courses through LCCW. Non-credit courses are also offered at various times throughout the year.

In 1999, LCC prepared a Long Range Development Plan (LRDP) and Environmental Assessment (EA) for a 30-year plan for the LCC campus development. The EA was approved by the UH Community Colleges on February 11, 1999. The *Leeward Community College Long Range Development Plan* (LRDP) was attached to PRU No. 1999/PRU-1, which was approved by Resolution 99-359, CD-1. LCC is currently operating under Plan Review Use (PRU) Permit No. 1999/PRU-1 (Resolution No. 99-359, CD-1), approved on March 15, 2000, for the "Thirty-Year Master Plan To Allow the Construction of New School Facilities, Expansion and Interior Renovations to Existing Buildings, and Upgrading of Infrastructure Improvements" (Appendix B).

In the LRDP, the site for the proposed project was to be occupied by the "Business Ed./Language Arts" building. The New Education and Innovation Instructional Facility (EIIF) is identified as the "Social Science" building in the 1999 LRDP. In discussions with the County's Department of Planning and Permitting (DPP), it was determined that the proposed project is different from the 1999 version of the LRDP, and that a minor modification would need to be made to the existing PRU permit (Resolution No. 99-359, CD-1).

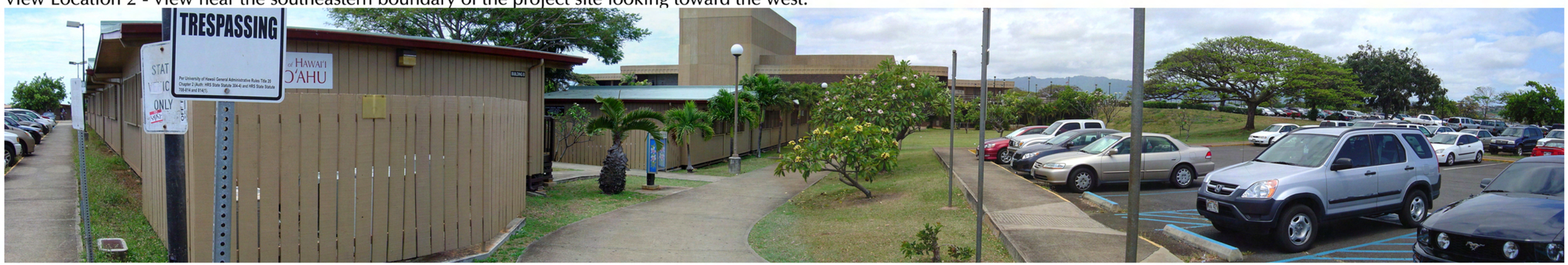
The Social Science Division (SSD) is the only department without its own dedicated facility, therefore, offices and classes are currently dispersed throughout the entire LCC campus. The proposed project will provide a single facility for the SSD, enhancing operational efficiency and improving the learning environment. The proposed EIIF project will provide spaces to support the functions and needs for SSD programs, including American Studies, Anthropology, Economics, Geography, Political Science, Psychology, Sociology, Social Sciences, Women's Studies, Interdisciplinary Studies, Human Services and Law. The Teacher Training program, which addresses Hawai'i's teacher shortage and other needs for the Leeward community, will be also facilitated in the proposed EIIF building.

Supportive Teacher Education Program - Hawai'i continues to have a critical shortage of trained teachers within the public school system. Research indicates that teacher quality is one of the most influential factors in student achievement. The mission of the LCC Supportive Teacher Education Program (STEP) is to recruit and support local students into becoming highly qualified teachers in their own communities.

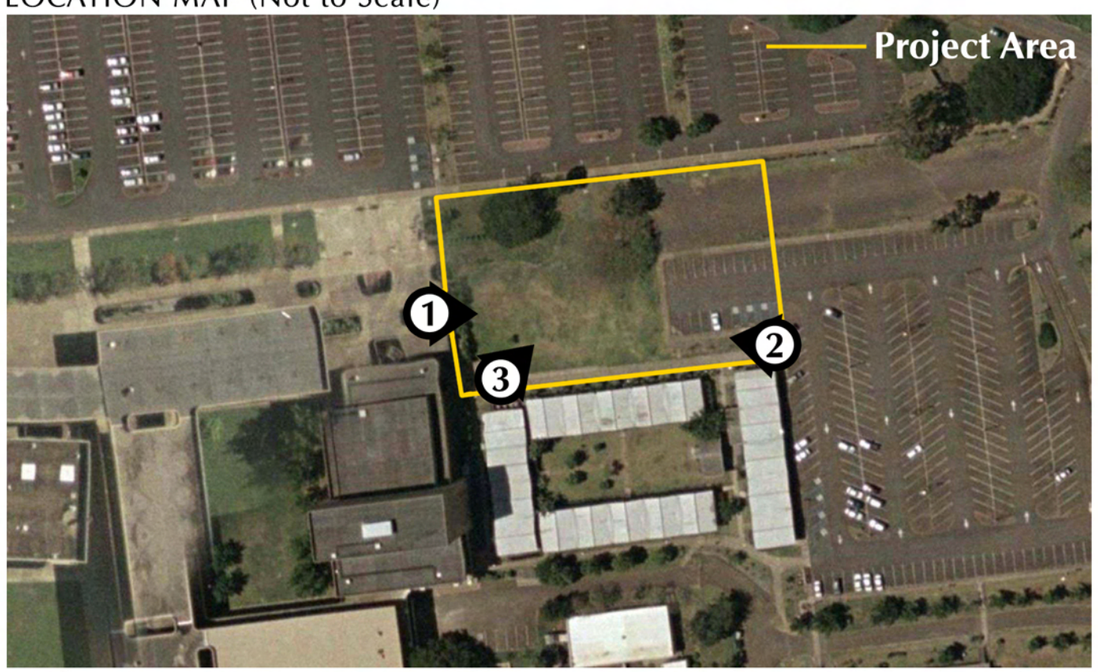
STEP is a teacher preparation program that supports students who are interested in pursuing a career in elementary, secondary, and/or special education. The STEP program

View Location 1 - View near the western boundary of the project site looking toward the east.

View Location 2 - View near the southeastern boundary of the project site looking toward the west.



LOCATION MAP (Not to Scale)



View Location 3 - View near the southwestern boundary of the project site looking toward the northeast.

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FIGURE 3
Site Photographs
Education & Innovation Instructional Facility

Leeward Community College
Island of O'ahu

NORTH

Not to Scale

PBR HAWAII & ASSOCIATES, INC.
May 2010

prepares students to successfully achieve the Associate in Arts in Teaching (AAT) degree and provides a solid foundation for those students interested in pursuing a baccalaureate degree in Education.

STEP offers the following support opportunities for developing teachers:

- Explorations in Teaching weekly seminars;
- Counseling and academic advising services;
- Service learning experiences; and
- LCC Future Teachers Club.

In addition to the LCC teacher education program, articulation and transfer agreements with four-year colleges and universities have been signed or are in various stages of the planning process. For instance, LCC and Chaminade University of Honolulu recently signed an agreement whereby Chaminade will offer their upper division teacher education classes on the LCC campus.

Teaching/Remediation Innovation Instruction Center - In order to address the remedial and developmental educational needs of students, the Innovation Instruction Center is intended to support a learner-centered culture which will help students persist and succeed in their postsecondary careers. In the UHCC system, 62% of new students place into remedial/developmental writing courses and 81% of new students place into remedial/developmental math courses.

The facility needs required to support the remedial and developmental students includes a technology-rich and adaptable environment capable of supporting self-paced and accelerated learning models. The space will include a mix of individual and group study areas and integrate tutoring, advising, and other academic and student support services.

Academic and Student Support Services:

Student Resource Center - The Student Resource Center would include state-of-the-art materials and resources (books, computers, equipment, supplies, etc.) available for use by students and faculty to enhance their instructional needs. The space would include a variety of individual and group study/work configuration spaces and would promote the use of various forms of activities and research required by students to present any kind of activity in a K-12 classroom.

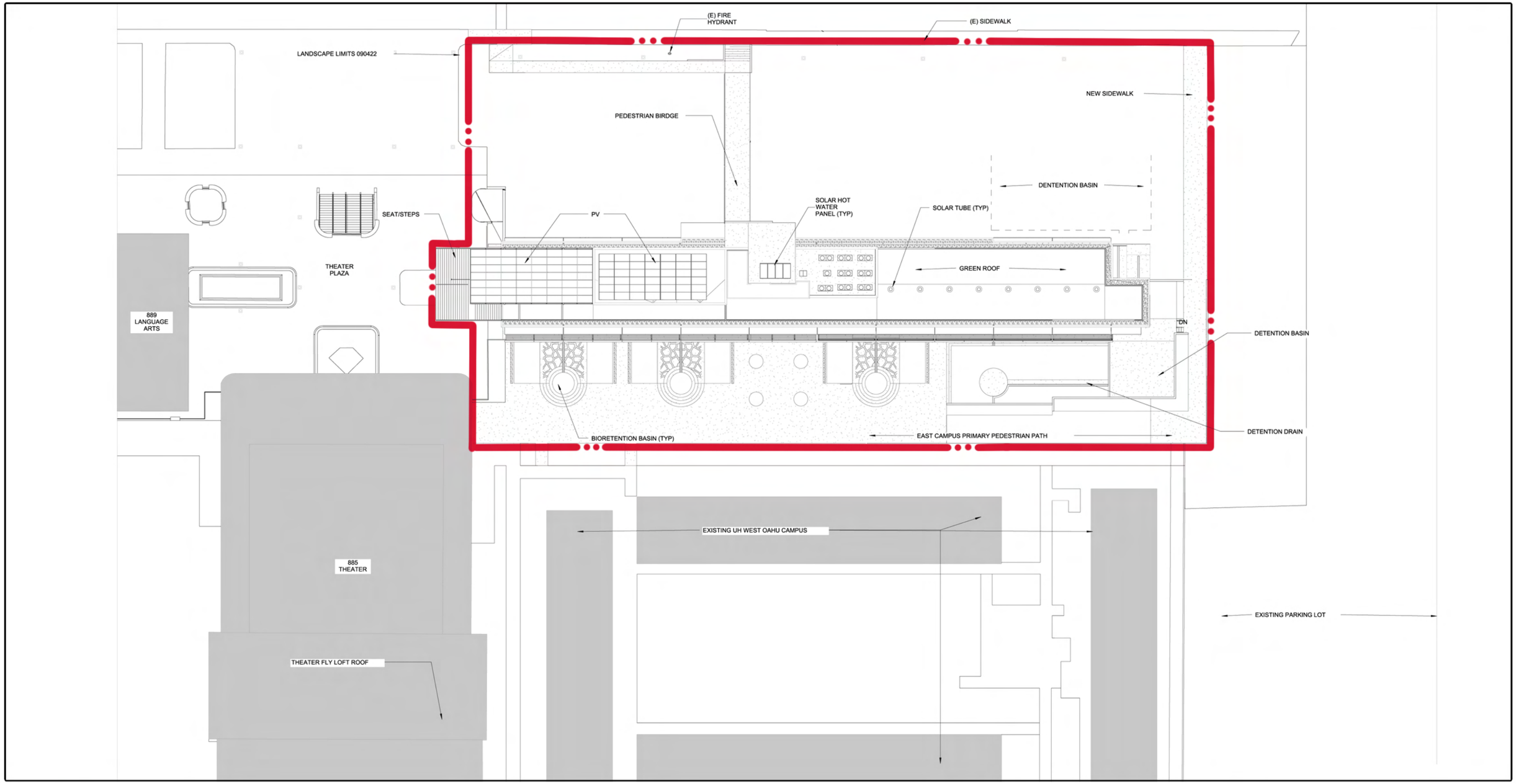
Lecture Halls – Large Meeting Area Space - One of the most pressing LCC campus space requirements is the need to schedule large classes or groups (internal or external to the campus). Two (2) lecture halls are proposed, one with a seating capacity of up to 100 students and one with a seating capacity of 50 students. Ideally, these spaces could also be combined in order to accommodate up to 150 students or guests to a class/meeting.

The new educational facility will be connected to LCC's Theater Plaza via a future staircase and a covered walkway (Figures 4 and 5). The new facility will also be connected to the Koko-head portion of LCC's parking lot via a pedestrian bridge. A pedestrian path at the lower plaza, running 'Ewa to Koko-head, will connect to the rest of the campus. Bioretention basins will be installed along this pathway. A green roof is also planned as part of an environmentally-conscious design strategy.

In total, the LCC EIIF will include approximately 18,328 square feet (sf) of space, of which 2,043 sf will be dedicated to a teacher education office suite; 2,094 sf to a teacher education/home away from home space, including a case study/seminar room and a classroom; 9,925 sf to common and shared spaces, including a conference room, student resource center, and approximately nine classrooms; and 4,265 sf to non-assignable spaces, including restrooms, stairwells, lobby areas, janitorial maintenance rooms, etc.

2.3 PROJECT COST AND IMPLEMENTATION TIMEFRAME

LCC hopes to commence construction in 2012. Construction should run a duration of 16 months to 24 months. LCC estimates construction to cost approximately $11.4 million in 2012 dollars.



LEGEND

Project Area

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FIGURE 4
Site Plan
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

NORTH

LINEAR SCALE (ft.) 0 20 40 80

PBR HAWAII & ASSOCIATES, INC.
May 2010

NORTH FACADE

SOUTH FACADE

FIGURE 5
Rendering
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

PBR HAWAII & ASSOCIATES, INC.
May 2010

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SECTION 3.0

DESCRIPTION OF THE NATURAL ENVIRONMENT,
POTENTIAL IMPACTS,
AND MITIGATIVE MEASURES

3.0 DESCRIPTION OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

This section describes the existing conditions of the physical or natural environment, potential impacts of the Education and Innovation Instructional Facility to the environment, and mitigation measures to minimize impacts.

3.1 CLIMATE

Average annual daily minimum and maximum temperatures in the Project Area are 65 and 84 degrees Fahrenheit, respectively. The annual prevailing wind direction for this area of O'ahu is east northeast, about 40 percent of the time, at approximately 10 knots (12 miles per hour). This portion of O'ahu experiences very little rainfall, with a mean annual precipitation of between 25 to 35 inches per year, most of which occurs between the months of November and April.

Potential Impacts and Mitigation Measures

The design process will take into account and address the effects of solar heat gain and exposure along both the south and west facing portions of the Education and Innovation Instructional Facility. Currently being considered for use are: a green roof, sunshading devices, high-performance glazing, and other design strategies/technologies that could help to reduce the thermal loading on these sides of the building.

It should also be noted that the existing walkway traps radiant heat when exposed to direct sunlight. The roof of the proposed structure will be located above most of the surrounding buildings (except for the Theatre) and will be designed with a green roof to reduce heat gain in order to reduce the expense to cool the proposed Education and Innovation Instructional Facility. A green roof is a roof of a building that is partially or completely covered with vegetation and soil, or a growing medium, planted over a waterproofing membrane. Other measures currently being studied to reduce the demand for air-conditioning include: use of daylighting (in this case a solar tube and maximizing window openings), and the use of appropriate thermal insulation at the building exterior walls and roof.

3.2 TOPOGRAPHY

LCC is located on a bluff that overlooks Pearl Harbor and the surrounding Waipahu and Pearl City communities. Elevations of LCC range from 98 feet above mean sea level (msl) at the western corner of the larger parking lot to 32 feet above msl at the southern corner of the site with grades ranging from 2% to 50%. The mauka portions of the LCC, especially the larger parking lot are generally level while the steeper grades transition

throughout the campus in the makai direction. The steepest embankments occur along the makai boundaries of the campus.

Also, because of the large amount of human development on the LCC campus, the areas around the project site have experienced profuse grading activity, as evidenced by the terraced condition of the site, where the proposed project will occur. The Education and Innovation Instructional Facility project site is relatively level on the eastern portion of the site, but then splits with one portion rising up to meet the grade of the large parking lot fronting the Theatre, and the other portion sloping downward to meet the level of the Theatre box office and entrance.

Potential Impacts and Mitigation Measures

To reduce the apparent massing and height of the building when viewed from mauka areas, the proposed structure will be built into the hillside (similar to the existing buildings immediately makai of the larger parking lot) requiring significant grading, with the mauka wall of the lowest floor serving as a retaining wall. The grading will not change the topographic nature of the parcel relative to the surrounding lands, since the development of the existing campus involved similar grading. Civil site work shall include removal of existing pavement, clearing and grubbing, grading, and perimeter walkways.

A National Pollutant Discharge Elimination System (NPDES) permit will be required for the project since the demolition, construction and staging areas results in the disturbance of over one (1) acre of land area. Best Management Practices (BMP) will be implemented to prevent pollution and protect the environment. In addition, The project will have an erosion and sedimentation control plan prepared to address all construction activities.

3.3 SOILS

Three soil suitability studies prepared for lands in Hawai‘i principally focus on the relative agricultural productivity of different land types. These studies are: 1) the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soil Survey; 2) the University of Hawai‘i Land Study Bureau Detailed Land Classification; and 3) the State Department of Agriculture’s Agricultural Lands of Importance to the State of Hawai‘i (ALISH).

3.3.1 Natural Resources Conservation Service (NRCS)

The ***Natural Resource Conservation Service, Soil Survey for the Island of O'ahu***, classifies the soil underlying LCC as: Waipahu silty clays (WzA, WzC) (Figure 6).

Waipahu silty clay, 0 to 2 percent slopes (WzA). Permeability is moderately slow. Runoff is slow or very slow, and the erosion hazard is none to slight.

Waipahu silty clay, 6 to 12 percent slopes (WzC). On this soil, runoff is medium and the erosion hazard is moderate.

3.3.2 Land Study Bureau Detailed Land Classification

The University of Hawai'i Land Study Bureau document, *Detailed Land Classification, Island of O'ahu***,** classifies soils based on a productivity rating. Letters indicate class of productivity with A representing the highest class and E the lowest. The soils of the entire LCC campus are classified as Urban (Figure 7).

3.3.3 Agricultural Lands of Importance to the State of Hawai'i (ALISH)

The Agricultural Lands of Importance to the State of Hawai'i (ALISH) system classify important agricultural lands as Prime, Unique, or Other Agricultural Land. The Education and Innovation Instructional Facility project site lands are not classified (Figure 8).

Potential Impacts and Mitigation Measures

Construction of the Education and Innovation Instructional Facility will not have a deleterious effect on the soil in the project site. The soils at the project site are not well suited for crop cultivation. In addition, the site has been previously modified to accommodate the development of the existing campus. As such, the proposed development should not impact the availability of agricultural land for cultivation.

3.4 NATURAL HAZARDS

Natural hazards like flooding, tsunami inundation, hurricanes, earthquakes, and volcanic eruptions have historically impacted Hawai'i Island.

Flooding

According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program, the project site is located in "Zone X", out of the 500-year flood plain (Figure 9).

The site sits in a dry and arid environment where the risks of flooding are low due to a combination of factors, including low rainfall, and the topography of the site.

Tsunami

Since the early 1800s, approximately 50 tsunamis have inundated Hawai'i's shores. Seven historical events have caused major damage. Two tsunami were generated locally. The proposed Education and Innovation Instructional Facility is located well outside the defined tsunami inundation area.

Hurricanes

Since 1980, two hurricanes have had a devastating effect on Hawai'i: Hurricane 'Iwa in 1982 and Hurricane 'Iniki in 1992. Long-term prediction of future hurricanes is virtually impossible. However, one should reasonably anticipate the prospect of another hurricane impacting the islands.

Earthquake & Volcanic Hazards

In Hawai'i, volcanic activity produces most earthquakes in contrast to other areas sitting on tectonic plate margins. Thousands of earthquakes occur in Hawai'i each year. However, the vast majority of them are undetectable through normal human senses. A few historical earthquakes have reached moderate and even disastrous magnitudes.

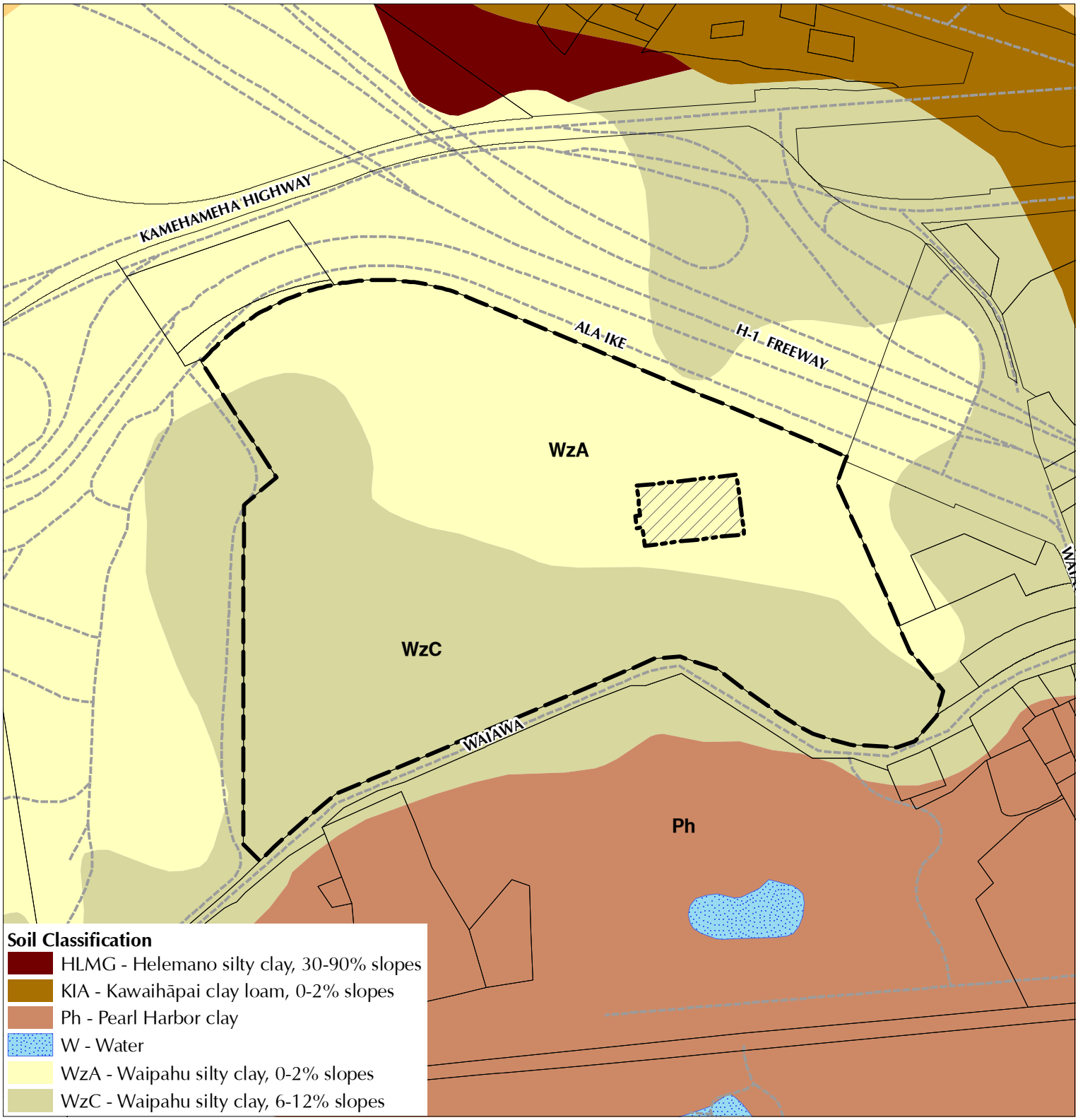
The last earthquakes felt statewide were magnitudes of 6.7 and 6.0. These earthquakes occurred at Kīholo Bay along Hawai'i Island's Kona Coast on October 15, 2006. These earthquakes resulted in more than $100 million in damages to the northwest area of Hawai'i Island and minimal damage on O'ahu. From that same event, O'ahu was also subject to an earthquake induced electrical blackout that paralyzed the city of Honolulu and shut down the Honolulu International Airport for nearly a day.

Potential Impacts and Mitigation Measures

The Education and Innovation Instructional Facility should not have any impact or any deleterious effects on natural hazard conditions and no unique mitigative measures are planned, other than observing the International Building Code in the design of the facility (to address the potential impacts from hurricanes and earthquakes).

3.5 FLORA & FAUNA

The LCC has been subject to intense human utilization since its construction starting in 1969. Within the immediate proximity of the project site, there are no known habitats for rare, threatened, or endangered flora or faunal species. The main landscaping features of the site include a grassed area between the Theatre Plaza and the portion of the Education and Innovation Instructional Facility that sits over an existing parking lot.



LEGEND

Leeward Community College Project Area

FIGURE 6

Natural Resource Conservation Service Soil Survey

Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

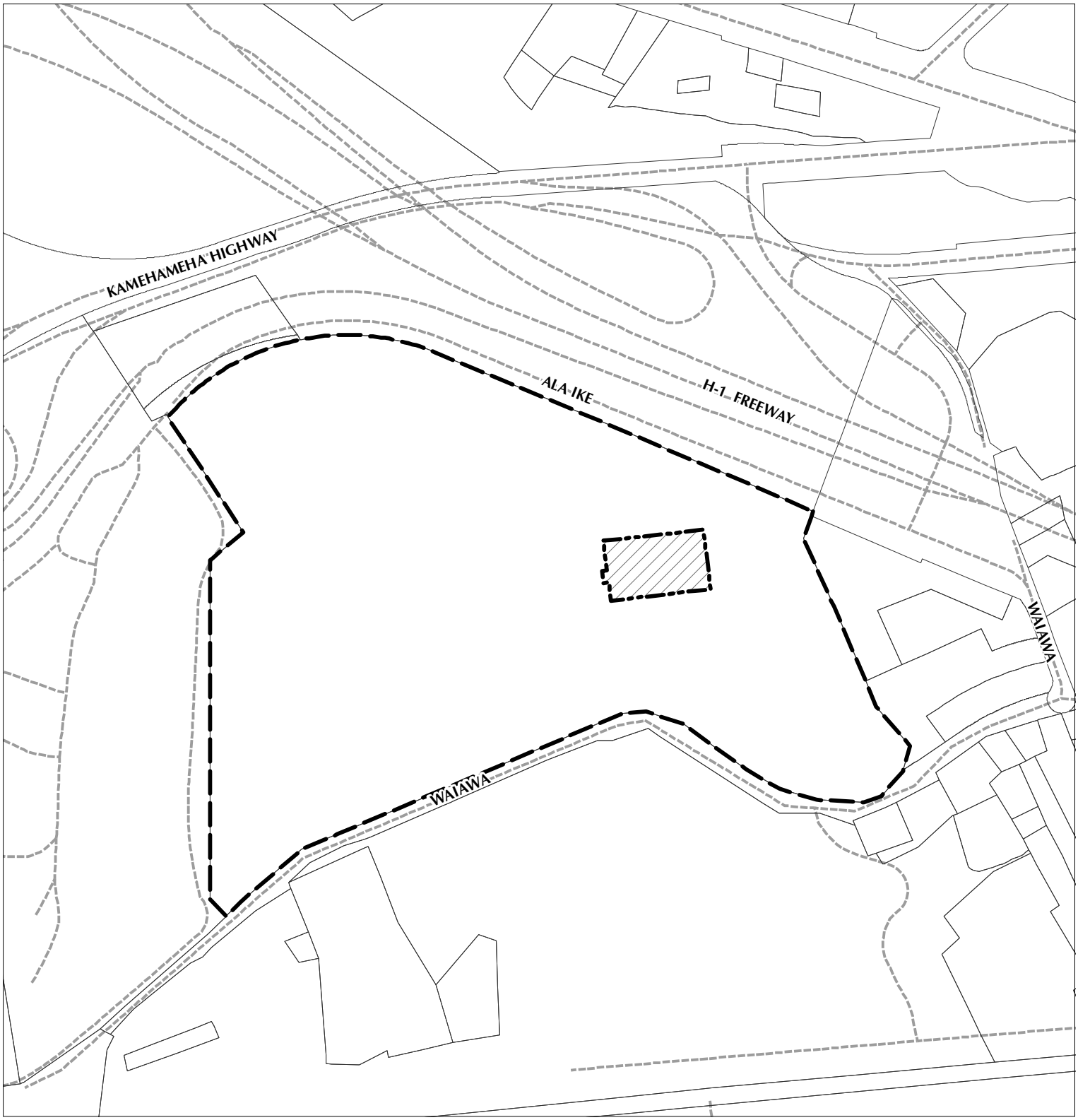
NORTH

LINEAR SCALE (ft.) 0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

May 2010

Source: Natural Resources Conservation Service (2007)
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs



LEGEND

Leeward Community College

Project Area

Land Classification

Unclassified

FIGURE 7

Detailed Land Classification

Education & Innovation Instructional Facility

Leeward Community College

Island of O'ahu

NORTH

LINEAR SCALE (ft.)

0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

May 2010

Source: Land Study Bureau (1972)

Disclaimer: This graphic has been prepared for general planning purposes only.

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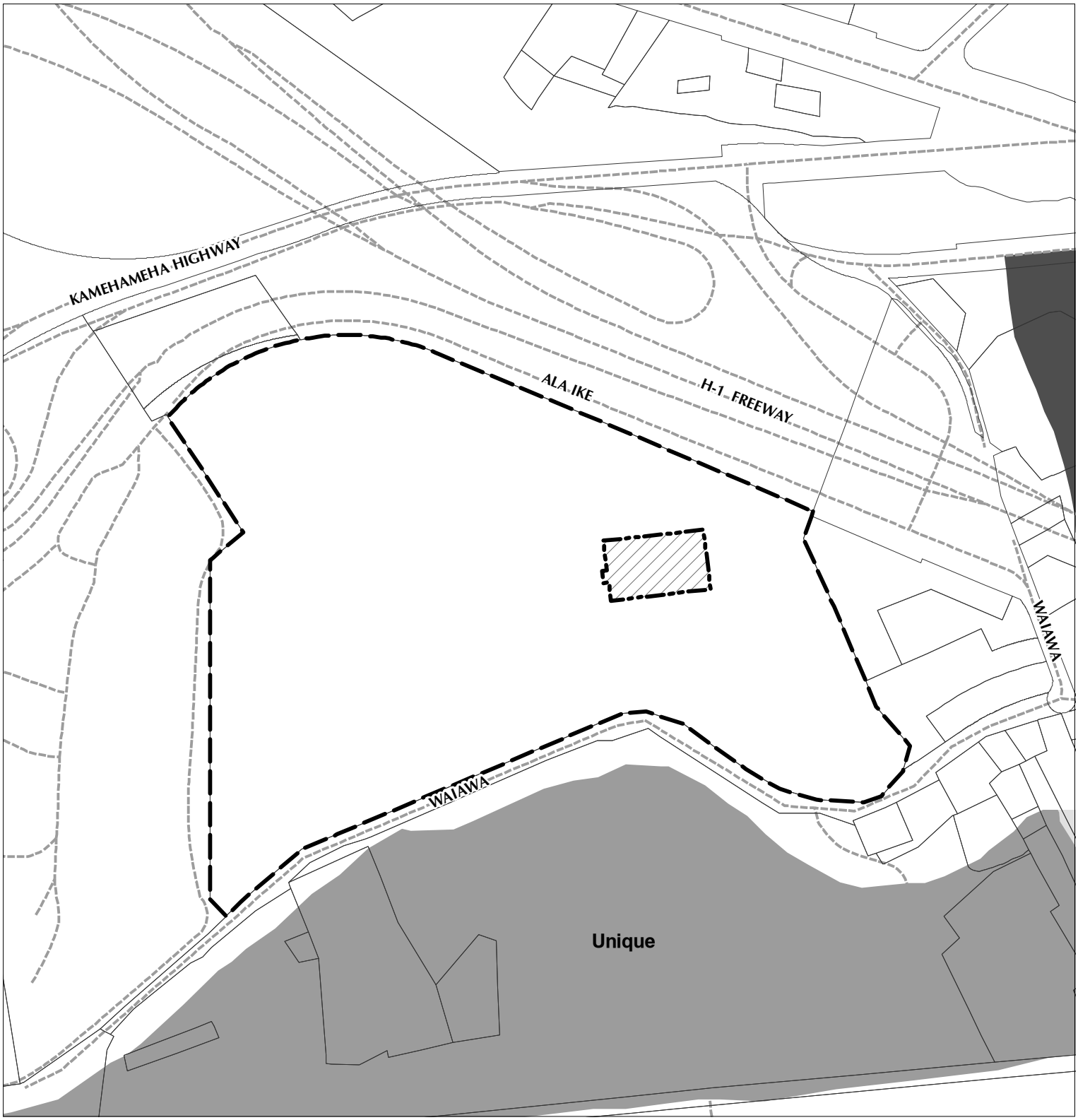


LEGEND

Leeward Community College

Project Area

Classification

Prime ALISH Lands

Unique ALISH Lands

Other ALISH Lands

Unclassified Lands

Source: State Department of Agriculture (1977)
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs

FIGURE 8
Agricultural Lands of Importance
to the State of Hawai'i

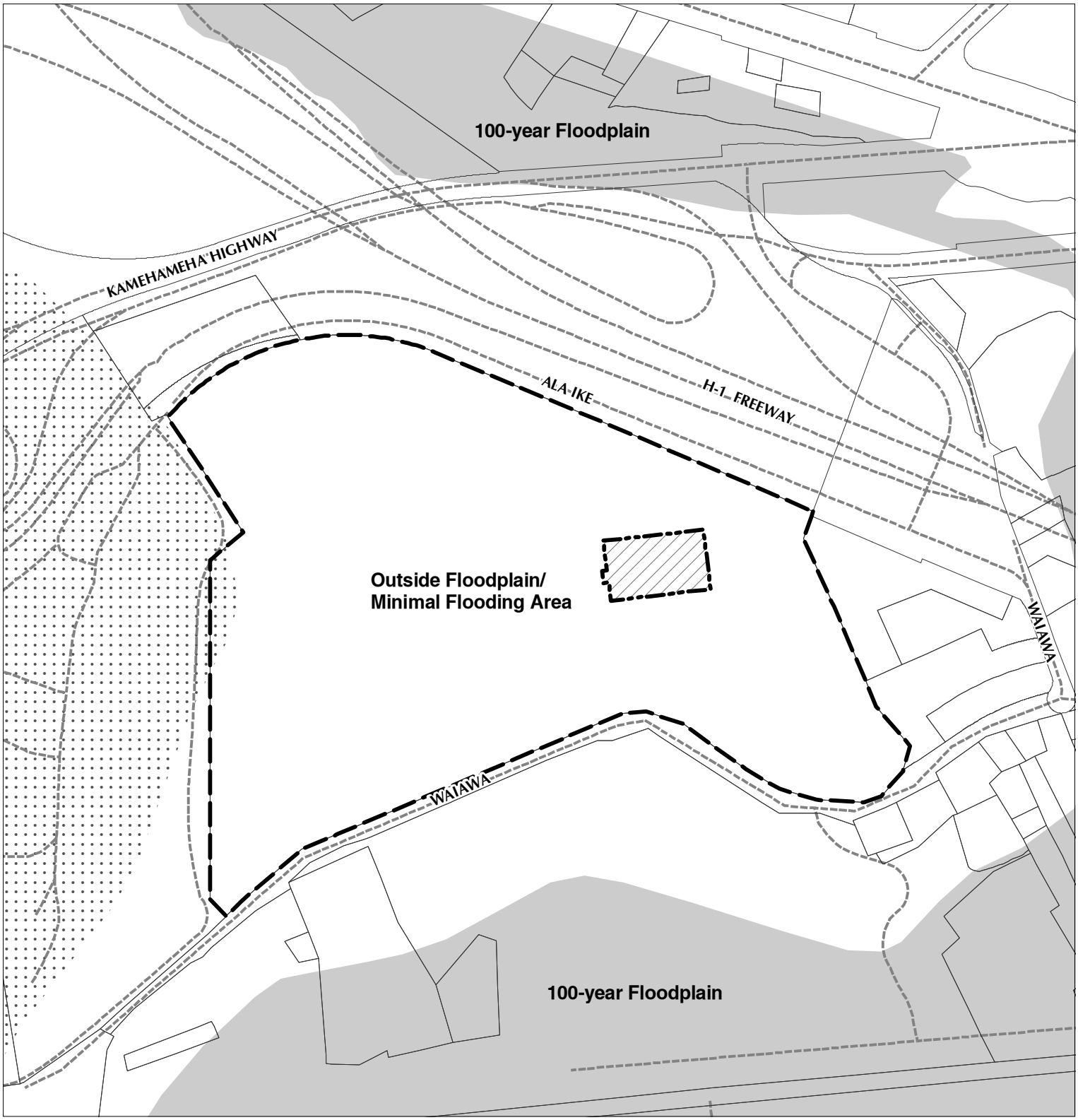
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

NORTH

LINEAR SCALE (ft.)
0 200 400 800

PBR HAWAII & ASSOCIATES, INC.
May 2010



LEGEND

- Leeward Community College
- Project Area

FIRM Zone

- 100-Year Floodplain
- Outside Floodplain/Minimal Flooding Area
- Undetermined Flood Hazards

Source: Federal Emergency Management Agency
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs

FIGURE 9
Flood Insurance Rate Map
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

NORTH

LINEAR SCALE (ft.) 0 200 400 800

PBR HAWAII & ASSOCIATES, INC.
May 2010

Potential Impacts and Mitigation Measures

The proposed project will involve the removal of a portion of an existing paved parking lot, as well as a portion of the grassed area between the parking lot and Theatre Plaza. However, the proposed project will not have any impact on endangered flora or faunal species. No mitigation measures are planned.

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SECTION 4.0

DESCRIPTION OF THE HUMAN ENVIRONMENT,
POTENTIAL IMPACTS,
AND MITIGATIVE MEASURES

4.0 DESCRIPTION OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

This section describes the existing conditions of the human environment, potential impacts of the Education and Innovation Instructional Facility, and mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND CULTURAL RESOURCES

4.1.1 Archaeological Resources

The project site consists of a portion of an existing paved parking lot and a grassed lawn, and has been heavily modified by construction related to the LCC campus. Previous studies have revealed historic properties (human burials) on the opposite side of the LCC campus on lands from the proposed EIIF building site below the bluff where a large population of early Chinese immigrants settled.

Potential Impacts and Mitigation Measures

Hawai'i Revised Statutes Section 6E-8 mandates the review of proposed state projects on historic sites by the State Historic Preservation Division (SHPD). The University does not anticipate any adverse impact to archeological resources as a result of construction. The succession of construction projects and grading activities has extensively disturbed the project area, making the possibility of encountering any remaining surface, or sub-surface features unlikely. Based on prior grubbing and grading activities, and paving of the existing parking lot, it is unlikely that the proposed project would not have an adverse impact on any significant historic properties. During the pre-consultation period, SHPD commented that "no historic properties affected." Should the inadvertent discovery of significant cultural materials and/or burials occur during construction, all work in the immediate area of the find must cease and the SHPD be notified.

4.1.2 Cultural Resources

The *Final Environmental Assessment and Finding of No Significant Impact for the Leeward Community College Second Access* (November 2007), included a *Cultural Impact Assessment for the Leeward Community College Second Access Project, Waipio and Waiawa Ahupuaa, Ewa District, Oahu (TMK 9-4-8:10, 23, 25 9-6-03)* prepared by Cultural Surveys Hawaii, Inc. (CSH) in August 2005. CSH contacted Hawaiian organizations, agencies and community members in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the LCC campus area. The organizations consulted by CSH included the State Historic Preservation Division, the Office of Hawaiian Affairs, the Oahu Burial Council and the Waipahu Neighborhood Board. CSH determined that there were cultural practices related to fishing (the shoreline is makai of the LCC campus property). Additionally, historic

documentation and interviews refer to burials associated, culturally and historically with the early Chinese settlement on the opposite side of the LCC campus from the proposed EIIF building site below the bluff. It should be noted that the project site consists mostly of an existing paved and landscaped area, and does not appear to provide any resources of use or interest to native Hawaiian cultural practitioners, such as fishing, burials, food gathering, shelter, tool or weapon making, kapa-making, traditional medicines, lei making, etc. The closest site on University lands where native Hawaiian culture is actively practiced is along the shoreline, which is approximately 2,000 feet from the project site.

Potential Impacts and Mitigation Measures

The proposed Education and Innovation Instructional Facility is located away from the shoreline and should not have an adverse impact on the native Hawaiian cultural practices occurring there. Should iwi kupuna or Native Hawaiian cultural or traditional deposits be found during ground disturbance or excavation, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Based on historical research and the heavily modified nature of the LCC campus, it is reasonable to conclude that, pursuant to Act 50, the exercise of Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities within the project parcels will not be affected and there will be no direct adverse effect upon cultural practices or beliefs.

4.2 ROADWAYS AND TRAFFIC

LCC is situated on a parcel of land makai of the Waiawa Freeway Interchange which accommodates the H-1 Freeway, H-2 Freeway, Farrington Highway, and Kamehameha Highway. The following is a breakdown of the roadways most pertinent to the LCC campus.

Farrington Highway. Farrington Highway is a State Principal Arterial Highway that connects Central and West O'ahu. The division and grade separation of the divided highway is quite pronounced in the vicinity of LCC, with the highway at a lower elevation than the LCC campus. Farrington Highway connects to Kamehameha Highway in the vicinity of Pearl Highlands Shopping Center. The posted speed limit on the west-bound (WB) side is 35 miles per hour (mph) and 30 mph on the east-bound (EB) side. Farrington Highway (WB) and Waiawa Drive form a stop-controlled intersection and Farrington Highway (EB) and Waiawa Drive form a signalized intersection.

Ala Ike Street. This two-lane local road provides sole access to the LCC campus. Ala Ike Street acts as a spine that collects vehicles from LCC's parking lot. Ala Ike Street runs in a west-east orientation, running parallel with the H-1 Freeway and then connecting the

residential neighborhood east (makai) of LCC to the Waiawa Drive Overpass. Ala Ike Street has a curb and gutter and sidewalk improvements on its western end, and curb and gutter for half of its length on the eastern side. It ends in a cul-de-sac approximately 720 feet makai of the Waiawa Drive Overpass. Two unstriped, single-lane roads radiate off of the cul-de-sac and lead to further residential areas. The western leg that projects from the cul-de-sac travels along the western, makai border of LCC. However, there does not appear to be any connectivity to LCC via this makai portion of roadway. No speed limit signs are posted on Ala Ike Street.

Waiawa Drive. Waiawa Drive is a two-lane collector road that provides access over the H-1 Freeway via the Waiawa Drive Overpass which emanates from a T-intersection with Ala Ike Street and heads mauka of the LCC campus. The EB and WB approaches of Ala Ike Street are stop-controlled at this T-intersection. At its mauka terminus, Waiawa Drive forms two separate intersections with Farrington Highway (approximately 220 feet apart). The makai-most intersection provides access to Farrington Highway EB and is signalized. The mauka-most intersection provides access to Farrington Highway WB with the NB Waiawa Drive approach being stop-controlled. The posted speed limit on Waiawa Drive is 25 mph.

A traffic study was prepared for the project by PB Americas, Inc. in March 2010 to identify traffic conditions. This report is included as Appendix C.

Turning movement counts were recorded at the three intersections in the vicinity of LCC on October 28, 2009 and supplemented with counts taken in November 2007. These intersections were: Ala Ike Street and Waiawa Drive, Waiawa Drive and Farrington Highway (EB), and Waiawa Drive and Farrington Highway (WB). Data was collected from 7 a.m. to 9 a.m. and 11:30 a.m. to 1:30 p.m. The two-hour periods were selected after discussions with the LCC administrative staff and a review of the LCC schedule of classes revealed that traffic into and out of the campus would be heaviest at these times. Data from 3 p.m. to 6 p.m. was collected from November 2007. The peak hours were found to be: 7:30 a.m. to 8:30 a.m. in the morning, 12:00 p.m. to 1:00 p.m. in the afternoon, and 4:00 p.m. to 5:00 p.m. in the evening.

At the Ala Ike Street and Waiawa Drive intersection, the EB Ala Ike through-left turn movement operates poorly during the mid-day peak hour (Level of Service [LOS] F). It reflects the queuing of vehicles leaving the LCC parking lot after mid-day classes are finished. The synchronization of class dismissals at LCC in the mid-day leads to the release of hundreds of outbound vehicles onto Ala Ike Street during short periods of time. Upon observation, it was determined that similar congested conditions occur around 11 a.m. and 1 p.m., as well. This Farrington Highway (EB) and Waiawa Drive intersection operates at LOS B during the AM peak hour, LOS C during the mid-day peak hour, and LOS B during the PM peak hour. During the mid-day peak hour, the NB Waiawa Drive left turn at the Farrington Highway (WB) and Waiawa Drive intersection

experiences excessive delay (LOS F) due to the lack of sufficient gaps in the Farrington Highway WB traffic and the increase in vehicles from LCC seeking these gaps. The WB Farrington Highway movements run free and therefore experience minimal control delay. A summary of the existing intersection LOS is shown in Table 4-1.

Table 4-1
Existing Intersection Level of Service Summary

INTERSECTION	Existing Conditions		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour
	LOS	LOS	LOS
Ala Ike Street/Waiawa Drive	**Unsignalized**		
EB Ala Ike Street (LT-TH)	D	F	C
WB Ala Ike Street (RT-TH)	A	A	A
SB Waiwa Drive (LT-RT)	A	A	A
Farrington Highway (EB)/Waiawa Drive	**B**	**C**	**B**
EB Farrington (LT)	B	A	B
EB Farrington (Double TH)	B	B	B
EB Farrington (RT)	B	B	A
NB Waiawa Drive (TH)	C	C	C
NB Waiawa Drive (RT)	C	E	C
SB Waiawa Drive (LT)	C	B	C
SB Waiawa Drive (TH-LT)	D	C	C
Farrington Highway (WB)/Waiawa Drive	**Unsignalized**		
WB Farrington Highway (TH-LT)	A	A	A
WB Farrington Highway (TH)	A	A	A
NB Waiawa (LT)	E	F	D

Notes:
LT – Left Turn Lane
RT – Right Turn Lane
TH – Through Lane

Source: PB Americas, Inc.

Potential Impacts and Mitigation Measures

Projected Year 2015 Traffic Operations without Project

By the year 2015, UH West O'ahu is anticipated to be relocated to East Kapolei. For the purposes of the traffic study, PB Americas, Inc. projected LCC's enrollment to be 9,077 students, up 19% from the combined enrollment of LCC and UH West O'ahu in 2009. The anticipated increase in enrollment will create an overall increase in traffic volumes at the three intersections nearest the campus.

In addition, the background traffic along Farrington Highway (both in the EB and WB directions) and Ala Ike Street, east of the Waiawa Drive Overpass, is projected to grow at an annualized rate of 0.9% according to the 2030 Oahu Travel Demand Forecasting Model (OTDFM).

The LCC campus will also be impacted by the construction of Segments C and D of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) in the Year 2015. Three new structures are also projected to be constructed near the rail line which will follow the median of Farrington Highway in the vicinity of LCC. The Transit Maintenance Facility is slated to be constructed on the parcel of land west of Leeward Community College. The LCC transit station is slated to be constructed on the western end of the LCC campus, straddling Ala Ike Street. The Pearl Highlands transit station is projected to be constructed just mauka of the Farrington Highway (WB) and Waiawa Drive intersection. The bus pull-out that is currently on the makai side of Farrington Highway (WB) will be moved to the mauka side and will form the fourth leg of the Farrington Highway (WB) and Waiawa Drive intersection. This intersection will be signalized via the HHCTCP by the year 2015. The County will signalize the Farrington Highway (WB)/Waiawa Drive intersection as part of the Pearl Highlands transit station construction.

The two movements that will be impacted most are the EB Ala Ike through-left movement at the Ala Ike Street and Waiawa Drive intersection and the NB Ala Ike right turn at the Farrington Highway (EB) and Ala Ike Street intersection. The EB through-left at Ala Ike and Waiawa is projected to continue to operate at LOS F during the mid-day. The NB right at Farrington Highway (EB) and Ala Ike will operate at LOS F, an increase from LOS E in the existing conditions (Table 4-2).

The signalization at Farrington Highway (WB) and Waiawa Drive is anticipated to greatly improve the operation of that intersection, particularly for the NB left turns from Waiawa Drive.

Table 4-2
Year 2015 Project Intersection Level of Service Summary

INTERSECTION	Without Project			With Project		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour	AM Peak Hour	Midday Peak Hour	PM Peak Hour
	LOS	LOS	LOS	LOS	LOS	LOS
Ala Ike Street/Waiawa Drive	**Unsignalized**			**Unsignalized**		
EB Ala Ike Street (TH)	E	F	D	E	F	D
WB Ala Ike Street (RT-TH)	A	A	A	A	A	A
SB Waiwa Drive (LT-RT)	A	A	A	A	A	A

INTERSECTION	Without Project			With Project		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour	AM Peak Hour	Midday Peak Hour	PM Peak Hour
	LOS	LOS	LOS	LOS	LOS	LOS
Farrington Highway (EB)/Waiawa Drive	**C**	**D**	**B**	**C**	**D**	**B**
EB Farrington (LT)	C	B	B	C	B	B
EB Farrington (Double TH)	C	B	B	C	B	B
EB Farrington (RT)	B	B	A	B	B	A
NB Waiawa Drive (TH)	C	C	C	C	C	C
NB Waiawa Drive (RT)	C	F	C	C	F	C
SB Waiawa Drive (LT)	C	C	C	C	C	C
SB Waiawa Drive (TH-LT)	D	C	C	D	C	C
Farrington Highway (WB)/Waiawa Drive	**A**	**B**	**A**	**A**	**B**	**A**
WB Farrington Highway (TH-LT)	A	B	A	A	B	A
WB Farrington Highway (TH)	A	B	A	A	B	A
NB Waiawa (LT)	A	B	B	A	B	B
Notes: LT – Left Turn Lane RT – Right Turn Lane TH – Through Lane						

Source: PB Americas, Inc.

Projected Year 2015 Conditions with Project

The number of new trips generated by the LCC EIIF are 17 during the AM peak hour, 15 during the midday peak hour, and 14 during the PM peak hour. As shown in Table 4-2, traffic operations in horizon year 2015 are not significantly impacted by the LCC EIIF development.

Traffic operations at the Ala Ike Street and Waiawa Drive intersection will operate similarly to the year 2015 without Project scenario. The EB Ala Ike through-left movement will continue to operate at excessive delay in the mid-day peak hour (LOS F).

The Farrington Highway (EB) and Waiawa Drive intersection will operate similarly as the year 2015 without Project scenario. The LOS in the AM peak hour is anticipated to remain at C, the mid-day peak hour is expected to be unchanged at LOS D, and the PM peak hour LOS is expected to be unchanged at LOS B.

The Farrington Highway (WB) and Waiawa Drive intersection is also anticipated to operate similarly as the year 2015 without Project scenario. The AM peak hour is anticipated to operate at LOS A, the mid-day peak hour is anticipated to operate at LOS B, and the PM peak hour is expected to operate at LOS A.

Construction activities may generate short-term traffic impacts to the motoring public, bicyclists, students, faculty, staff, and visitors to LCC mostly in the immediate vicinity of the LCC EIIF construction site. The campus has a long frontage to a large parking lot and has many unobstructed points of entry. As such, mitigation measures will be implemented to minimize construction-related traffic. When appropriate, construction personnel or off-duty police will be required to direct and facilitate traffic during construction activities.

The LCC EIIF project is not anticipated to have a significant long term impact on the surrounding roadways. Construction activities at the EIIF site will occur during daylight hours, but to the extent feasible, construction activities that may affect roadways are planned to be restricted to avoid peak-hour traffic. Should the need to transport any oversized equipment/overweight loads on State highway facilities, a DOT Highways Division permit will be prepared.

Parking

No additional parking stalls are proposed as part of the construction of the EIIF project. Currently, 1,642 standard parking stalls and 36 handicapped parking stalls are provided on campus. Using the parking calculations based on the County's Land Use Ordinance, Table 21-6.1, indicating the off-street parking requirement for Schools and Auditorium uses. The new building will require 80 parking stalls, and the current requirement for the existing facilities is 912 stalls. Therefore, the total required parking for the proposed project and existing facilities is 992 stalls. The current surplus of parking spaces sufficiently meets and exceeds the parking requirements for the proposed EIIF.

Current Public Transportation

TheBus, which is the public transportation service provided by the City and County of Honolulu, provides various bus routes to and from the LCC campus. These routes include:

No. 73 – This is a shuttle that connects the LCC campus with a bus stop along Farrington Highway. (The bus stop along Farrington Highway is a 15-minute, uncovered walk from the campus).

No. 42 – This bus route connects 'Ewa Beach with Waikīkī, with a stop along Farrington Highway. Bus riders can either walk to the campus from the bus stop or ride (shuttle) Bus No. 73.

While a one-way fare is $2.00, monthly adult passes offering unlimited rides are available for $40 a month. TheBus offers a reduced fare called the U-Pass for $100 per semester.

Effective July 1, 2007, as the result of legislative action, the University has implemented a Pre-Tax Bus Pass option for University employees. This program is authorized under Section 132(f) of the Internal Revenue Code, known as the Transportation Equity Act for the 21st Century. Eligible University employees living and working on the island of Oʻahu will be given the opportunity to purchase monthly bus passes through payroll deduction, on a pre-tax basis, thereby saving on FICA, Federal and State income taxes.

Future Public Transportation

The County is planning for a high-capacity transit corridor project between the City of Kapolei and the University of Hawaiʻi at Mānoa. The Honolulu High-Capacity Transit Corridor Project (HHCTCP) has evaluated transit alternatives for the 23-mile long corridor between Kapolei and UH Mānoa. On December 22, 2006, the City Council adopted Bill 79 (2006), CD2, FD2 (Ordinance 07-001) which selected the fixed guideway alternative as the Locally Preferred Alternative (LPA). The LPA route travels between Kapolei and the University of Hawaiʻi at Mānoa, starting at or near the intersection of Kapolei Parkway and Kalaeloa Boulevard, down Saratoga Avenue to Kualakaʻi Parkway (green route) or along Kamokila Boulevard (yellow route), as determined by the County administration before or during preliminary engineering. The route then continues to Farrington Highway across Ft. Weaver Road, to Kamehameha Highway to Salt Lake Boulevard and Aolele Street, as determined by the County administration before or during preliminary engineering to downtown Honolulu via Dillingham Boulevard. After leaving Dillingham Boulevard, the alignment would continue along Nimitz Highway, Halekauwila Street and Kapiʻolani Boulevard to UH Mānoa with a branch to Waikīkī. The County will now undertake preliminary engineering and is in the process of finalizing the environmental impact statement for the LPA. As the first project, the City Council selected a minimum operable segment (MOS) that will begin near the Kroc Center on North-South Road to Farrington Highway, through Waipahu, Pearl City (with a stop at the LCC campus), ʻAiea, and via Salt Lake Boulevard through downtown Honolulu to Ala Moana Center. As of this writing, we understand that the portion of the alignment between the Kroc Center and Waipahu, the location of the transit maintenance and storage facility, and the location of potential transit stations are being finalized.

The Fixed Guideway alignment that is adjacent to the LCC campus would be on elevated structures. The fixed guideway could be as narrow as 25 feet wide. If the structures are elevated, they would be supported by six foot wide columns and the structure could be about 30 feet tall.

At this time, no decision has been made regarding the technology that would be used for the Fixed Guideway Alternative. This decision will be made at a later stage of project development. The County is preparing a Final EIS and is in the process of requesting approval from the Federal Transit Administration to begin preliminary engineering (project design).

If a transit station is built on a portion of the LCC campus, this would provide greater accessibility to the campus for those faculty, staff and students who rely on public transportation, as the transit station will be closer to the campus than the existing bus stop off-campus on Farrington Highway. Additionally, since the rail line will be elevated, there will be conflicts with cars on roads and the travel time for users of the rail line will be on schedule. The convenience of the rail transit may encourage ridership to/from the campus and subsequently reduce the need for personal motorized vehicles, increase the safety of students, faculty and staff and reduce the time for commuting. Additionally, the LCC campus will enable East Kapolei, Waipahu, Pearl City and ʻAiea residents to attend an institution of higher learning without commuting to Honolulu. Increased use of public transportation means fewer residents driving their own vehicles and less traffic on roadways.

4.3 NOISE

Existing noise levels at and immediately adjacent to the proposed site mimic those typical of a campus parking lot. The project site is bordered on one side by the modular buildings of the UH West Oʻahu campus. The windows of the UH West Oʻahu buildings facing the project site are air conditioned.

Potential Impacts and Mitigation Measures

Construction activities for the Education and Innovation Instructional Facility will inevitably create temporary noise impacts. The building contractor may employ mitigation measures to minimize those temporary noise impacts including the use of mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, Hawaiʻi Administrative Rules, all project activities must comply with all community noise controls.

Once in operation, the Education and Innovation Instructional Facility will generate noise consistent with classroom activity. Noise levels will elevate when classes change. Because the surrounding buildings are fully enclosed and air-conditioned, the proposed facility will not create noise impacts or noise-related disruption to students and staff using these buildings. No mitigation measures are proposed as the noise generated as a result of the proposed project represents no substantial change from current noise occurrences.

4.4 AIR QUALITY

The State's good air quality is largely a function of the predominant tradewinds blowing from the northeast. The typical tradewind pattern blows man-made and volcanic pollutants out from metro Honolulu toward the ocean. However, during non-tradewind periods, man-made and volcanic pollutants tend to accumulate on island impacting visibility.

Potential Impacts and Mitigation Measures

LCC recognizes the potential for impacts to air quality during construction. This could occur from additional traffic generated by construction vehicles, machinery, and dust generated during demolition of existing parking pavement and excavation.

An effective dust control plan will be implemented as necessary. All construction activities will comply with the provisions of Title 11, Chapter 59, HAR related to Ambient Air Quality Standards and Section 11-60.1-33, HAR related to Fugitive Dust. Measures to control dust during various phases of construction include:

- Providing an adequate water source at the site prior to start-up construction activities;
- Irrigating the construction site during periods of drought or high winds;
- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion;
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities; and
- Installing silt screening in the areas of disturbance.

In the long-term, the proposed project will likely not have an impact on air-quality in the immediate vicinity.

4.5 VISUAL RESOURCES

The proposed Education and Innovation Instructional Facility will be located near the front of the LCC campus and nearby the tallest LCC campus building, the Campus Theatre. The County's Central Oahu Sustainable Communities Plan does not recognize any view planes encompassing the LCC site that requires consideration and accommodation.

Potential Impacts and Mitigation Measures

The dense nature of the LCC campus and the congruence of the proposed construction's mass and height with those of surrounding buildings will not induce adverse impacts to any recognized view planes. From the H-1 Freeway (north of the site), the Education and Innovation Instructional Facility will be mostly obscured from views by the lower elevation of the highway, as well as distance between the H-1 Freeway and the LCC campus buildings. Similarly, from the south (makai) and west, existing structures will mostly obscure the proposed Education and Innovation Instructional Facility building. The proposed project will be most visible from the College Garden Apartments project, which is located on the eastern border of the LCC property. The proposed project will be setback approximately 250 feet from eastern property line. Most of the College Garden Apartments are located on a terrace below the driveway to the University of Hawaii at West Oahu portion of the greater LCC property. Only one end of one building of the College Garden Apartment is "fully" is viewable from the project site, but this side of the building has very small windows which appear to be in place for air circulation purposes. In addition, the University's own design review process will help ensure that the proposed building is architecturally compatible with surrounding structures. Because no visually adverse impacts are expected, no additional mitigative measures are proposed.

4.6 SOCIAL & ECONOMIC CHARACTERISTICS

According to the County's Central Oahu Sustainable Communities Plan (SCP) (2002),

> *"Central Oahu plays a key role in implementing the directed growth policies of the* ***General Plan of the City and County of Honolulu****.*
>
> *The towns of Waipahu and Wahiawa serve as gateways to Ewa and the North Shore. Historically, they have been headquarters for the sugar and pineapple plantations and support centers for the military. Beginning in 1968, Central Oahu also began to play a role as a major area for housing development. At that time, Castle & Cooke began development of Mililani Town, a 3,500 acre planned low-density suburban community which offered affordable single family housing to first time buyers. Subsequently, additional housing has been developed above Waipahu and the H-1 Freeway in Village Park, Gentry Waipio, Waikele, Royal Kunia, and other development projects.*
>
> *In 1989, the Honolulu City Council approved changes to the* ***General Plan*** *which designated the urban fringe areas in Central Oahu as one of Oahu's principal residential development areas. Since then, Central Oahu, along with the Primary Urban Center (PUC) and the Secondary Urban Center and urban fringe areas in Ewa, has provided the bulk of the new housing developed on the island.*

> *… In support of the **General Plan** policies, the Central Oahu Sustainable Communities Plan… Helps relieve urban development pressures on rural and urban fringe Sustainable Communities Plan Areas (Waianae, North Shore, Koolauloa, Koolaupoko, and East Honolulu) so as to preserve the "country" lifestyle of the rural areas and sustain the stable, low density residential character of the urban fringe areas.*

The 2002 Central Oahu SCP was based on the 2000 Census. According to the 2000 Census, the population of the City and County of Honolulu numbered 876,156 individuals. The population, number of housing units and number of non-construction jobs in Central O'ahu and 'Ewa (the primary districts being served by the LCC campus) in 2000 was as follows:

Table 4-3
Year 2000 Housing Units and Non-Construction Jobs

Sustainable Communities Plan/ Development Plan Area	2000 Population	Number of Housing Units in 2000	Number of Non-Construction Jobs in 2000
Central O'ahu	148,208	45,878	44,356
'Ewa	68,696	20,797	14,689

Potential Impacts and Mitigation Measures

The 2002 Central Oahu SCP is in the process of being updated to accommodate a planning horizon of the year 2030. The County Department of Planning and Permitting's consultant, Belt Collins provided an overview of projections for the Central O'ahu and 'Ewa Districts to the year 2030 on its website http://www.beltcollins.com/centraloahu/.

Table 4-4
Year 2030 Housing Units and Non-Construction Jobs

Sustainable Communities Plan/ Development Plan Area	2030 Population	Number of Housing Units in 2030	Number of Non-Construction Jobs in 2030
Central O'ahu	196,080	65,855	66,924
'Ewa	177,590	57,938	63,076

The proposed project will enhance the capacity for future school teachers at LCC. Modernization of the STEP program will help to ensure that LCC maintains a robust educational program, and continues to attract students from Central O'ahu and 'Ewa.

LCC does not anticipate hiring additional faculty or staff for the teaching education unit. The demands of meeting the teaching needs will be handled in a variety of ways, including collaboration with two-year and four-year educational institution partners and increasing the number of courses offered through distance education.

The scope of the construction project will contribute positively to the construction industry.

4.7 INFRASTRUCTURE AND UTILITIES

4.7.1 Water System

LCC is served by the City's Board of Water Supply (BWS) system. Water service is provided by an eight-inch main that extends from the BWS Waipahu "228" System at the intersection of Waipahu Street and Kahualena Street. Water pressures are governed by the BWS Waipahu Reservoir which has a spillway elevation of 228 feet mean sea level (msl). Two water meters located at the northwest corner of the LCC campus monitor the on-site water consumption. The 1999 LRDP indicated that the existing water pressure is insufficient. Since the report was prepared, two separate waterline improvement projects were completed to address the insufficient water pressure/supply. One of the upgrades included the installation of a 12-inch waterline throughout the campus, including a waterline located directly to the north of the proposed EIIF project site.

Potential Impacts and Mitigation Measures

The proposed domestic water connection will be made to the recently installed 12-inch waterline that provides service to the campus.

During the pre-consultation process, the Board of Water Supply wrote "The existing water system is presently 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 your building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval." Close coordination will be maintained with BWS to ensure that the water system will not be adversely impacted and to minimize interruption of water services to adjacent areas. During the design phase, the construction drawings will be submitted to the BWS for review and approval.

When water is made available, LCC will pay the BWS Water System Facilities Charges for resource development, transmission and daily storage. BWS Cross-Connection Control and Backflow Prevention requirements will be fulfilled prior to the issuance of

the building permit. On-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

4.7.2 Wastewater System

The campus' on-site sewer system is comprised of line sizes ranging between four (4) to 10-inches and extends to every building that requires service. An existing 10-inch sewer line connects to the County Sewer system which terminates at the Pearl City Sewage Pump Station. Wastewater generated at LCC is conveyed by a series of gravity lines, pump stations, and force mains to the Honouliuli Wastewater Treatment Plant.

Potential Impacts and Mitigation Measures

The proposed project is not anticipated to have any significant adverse impact on the County's wastewater collection system. Wastewater service for the proposed project will be connected to the existing wastewater collection system.

During the pre-consultation period, the County's Department of Design and Construction wrote that a sewer connection application should be filed with the Department of Planning and Permitting, Wastewater Branch, to determine adequacy of existing sewer lines.

4.7.3 Drainage System

A network of drain inlets and pipes collects storm runoff from most of the campus and directs the storm water to the southwest corner near the tennis courts. From there it leaves the campus via a 48-inch drain pipe westward in a 15-foot drain easement through the adjacent U.S. Government land. Approximately 500 feet beyond the school boundary this off-site storm drain turns southward through private property and ultimately discharges into Pearl Harbor Middle Loch.

There is an existing concrete-lined trapezoidal ditch running along the entire southern boundary of the LCC campus. For the most part, the ditch slopes downhill from the eastern end to the westward end with the low point occurring near the tennis courts. The ditch intercepts surface runoff not collected by the on-site network of drain inlets and drains. The lined ditch has inlets that are connected, via a 24-inch drain, to the 48-inch off-site drain described above.

Potential Impacts and Mitigation Measures

Traditionally, development of a new building would result in the increase of impervious area of the project site, resulting in an increase in the volume of runoff. However, as presently designed, the project will include a "green roof," an infiltration trench, and detention basins which are likely to reduce the volume of runoff. Rainfall is being

proposed to be captured for reuse in irrigating project landscaping. The proposed drainage system is designed to retain a volume of runoff for a certain storm event based on City and County requirements. Any runoff in excess of that will be conveyed to the existing drainage system. No significant impacts to the drainage patterns in the vicinity of the project area are anticipated during construction of the proposed project.

Drainage improvements will be designed in accordance with County requirements for storm capacity. During construction, potential surface runoff will be addressed in accordance with the County grading ordinance. Following construction, exposed soils will have been built over, paved over or landscaped to control erosion.

4.7.4 Electrical and Telecommunications Systems

Electrical

LCC is serviced with dual 12.47 kV feeders by the Hawaiian Electric Company (HECO). HECO feeders terminate at LCC's primary service equipment located in the Air Conditioning Cooling Tower Plant where they are primary metered.

The 12.47 kV power is distributed to transformer stations on the LCC campus through an underground power raceway system which is owned and maintained by the State of Hawai'i. The operating power to the buildings is delivered from existing indoor switchgear (unit substation) consisting of two primary switches, an oil-filled, pad-mounted transformer and a secondary distribution panel section.

The existing building switchgears have not been upgraded since their initial installation and show typical signs of component degrading such as corrosion and mechanical operation deficiency. There is also an outdoor rated transformer and secondary switchboard that provides power to the UH-West O'ahu campus buildings. The UH-West O'ahu outdoor transformer appears to be badly corroded and is due for replacement in the short-term.

Telecommunications

LCC is served by Hawaiian Telcom for telephone service.

Potential Impacts and Mitigation Measures

Electrical

The proposed project will utilize a new pad-mounted transformer to either upgrade or replace the existing corroded pad-mounted transformer serving the UH-West O'ahu campus.

Development plans will show all affected HECO facilities, and address any conflicts between the proposed plans and HECO's existing facilities. Pre-final development plans

will be forwarded to HECO for review. Should the relocation of or additional facilities be required, a formal request will be submitted and coordinated through the appropriate HECO department(s).

Telecommunications

The telecommunications distribution system for the EIIF project will consist of a hierarchical star topology structured cable system (SCS) consistent with the SCS already installed on the LCC campus. The proposed project is not anticipated to have any significant adverse impact on existing electrical and telecommunications systems.

4.7.5 Solid Waste

No solid waste is being generated on the project site except for grass clippings during lawn mowing or rubbish that might be discarded on portion of the site covering the parking lot.

Potential Impacts and Mitigation Measures

The proposed project will generate solid waste during construction. The contractor will be required to dispose of all waste in compliance with the County's Department of Environmental Management requirements.

The LCC will incorporate provisions for the Education and Innovation Instructional Facility into the existing solid waste management plan. Solid waste disposal will be in accordance with the guidelines set forth by the County's Department of Environmental Services.

4.8 PUBLIC SERVICES AND FACILITIES

4.8.1 Police Protection

The site is located within Honolulu Police Department District 3. District 3 covers the area from Red Hill to Village Park and Waipahu, which is a total area of approximately 66 square miles with a population of 160,000 (2000 census).

Potential Impacts and Mitigation Measures

LCC does not anticipate that the Education and Innovation Instructional Facility will create an increased demand on existing police protection services. During the pre-consultation period, the County's Police Department wrote that "This project should have no significant impact on the facilities or operations of the Honolulu Police Department."

4.8.2 Fire Protection

The Pearl City, Waipahu, Waikele and Waiau Fire Stations are all located near the LCC campus.

Potential Impacts and Mitigation Measures

LCC does not anticipate that the Education and Innovation Instructional Facility will create an increased demand on existing fire protection services. During the pre-consultation period, the County's Fire Department commented that the project shall comply with the following: 1) Provide a fire apparatus access road to within 150 feet of the first floor of every facility or building constructed; 2) Provide a County-approved water supply capable of supplying adequate flow for fire protection, with onsite fire hydrants provided if facility or building is over 150 feet from the fire access road and water supply; and 3) Submit civil and construction drawings to HFD for review and approval. The proposed project is located adjacent to the main campus parking lot and will be accessible to fire trucks.

4.8.3 Health Care Services

Health care facilities that provide emergency services, located near the Education and Innovation Instructional Facility, include Hawai'i Medical Center West in 'Ewa and Kapi'olani Pali Momi Medical Center in 'Aiea. A variety of health care providers can be found nearby in Waipahu and Pearl City.

Potential Impacts and Mitigation Measures

Although there may be an unavoidable and occasional need for emergency health care services by students or employees of the Education and Innovation Instructional Facility; the project is not expected to significantly increase the need for emergency service, and is not expected to have a long-term adverse impact on emergency medical providers or their ability to service the community.

4.8.4 Recreational Facilities

Recreational facilities near the LCC campus include on-campus recreational opportunities, as well as nearby facilities such as Lehua Community Park, Sunset Memorial Park, Waipahu District Park, Hans L'Orange Park, Pacheco Playground and Manana Community Park.

Potential Impacts and Mitigation Measures

The use is not anticipated to displace any existing or create any additional demand on recreational facilities in the vicinity of the project. During the pre-consultation period, the

County's Department of Parks and Recreation wrote that "…the proposed project will not impact any program or facility of the department."

4.8.5 Schools

The LCC campus is located in Central O'ahu, between Waipahu and Pearl City. The proposed Education and Innovation Instructional Facility will be located makai of the large parking lot, in an area next to the Theatre Plaza on the LCC campus.

A number of public and private elementary, middle and high schools are located in the vicinity of the LCC campus including Lanakila Baptist Elementary School, August Ahrens Elementary School, St. Joseph Elementary School, Lehua Elementary School, Pearl City Elementary School, Waipahu Intermediate School, Waipahu High School.

Potential Impacts and Mitigation Measures

The project will directly benefit LCC by providing additional facilities and classrooms for its Social Science Division. Currently, the department's offices and classes are dispersed throughout the entire LCC campus. The proposed project will provide a single facility for the SSD, enhancing operational efficiency and improving the learning environment. The proposed EIIF project will provide spaces to support the functions and needs for SSD programs, including American Studies, Anthropology, Economics, Geography, Political Science, Psychology, Sociology, Social Sciences, Women's Studies, Interdisciplinary Studies, Human Services and Law. The Teacher Training program will be also facilitated in the proposed EIIF building.

Because no residential development is involved with the project, no increases in public school enrollments will occur. Community colleges in general, provide a less intimidating and less expensive alternative to four-year campuses to ensure that high school graduates and adults further their education.

SECTION 5.0

LAND USE CONFORMANCE

5.0 LAND USE CONFORMANCE

State and County land use plans and policies and required permits and approvals relevant to the Education and Innovation Instructional Facility are described below.

5.1 STATE OF HAWAI'I

5.1.1 State Land Use Law, Chapter 205, Hawai'i Revised Statutes

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, Agricultural, or Conservation. These districts are defined and mapped by the State Land Use Commission in order to ensure compatibility with neighboring land uses and protection of public health.

The proposed Education and Innovation Instructional Facility is located within the State Urban District (Figure 10).

5.1.2 Coastal Zone Management Act, Chapter 205A, Hawai'i Revised Statutes

The Coastal Zone Management Area, as defined in Chapter 205A, HRS, includes all the lands of the State. Therefore, the proposed Education and Innovation Instructional Facility lies within the Coastal Zone Management Area.

The Coastal Zone Management (CZM) Program aims to provide recreational opportunities, protect historic resources, protect scenic and open space resources, protect coastal ecosystems, provide facilities for economic development, reduce hazards, and manage development. Program objectives and applicability to the proposed Education and Innovation Instructional Facility are discussed below:

RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Policy A: Improve coordination and funding of coastal recreational planning and management; and

Policy 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;*
- *(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;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(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;

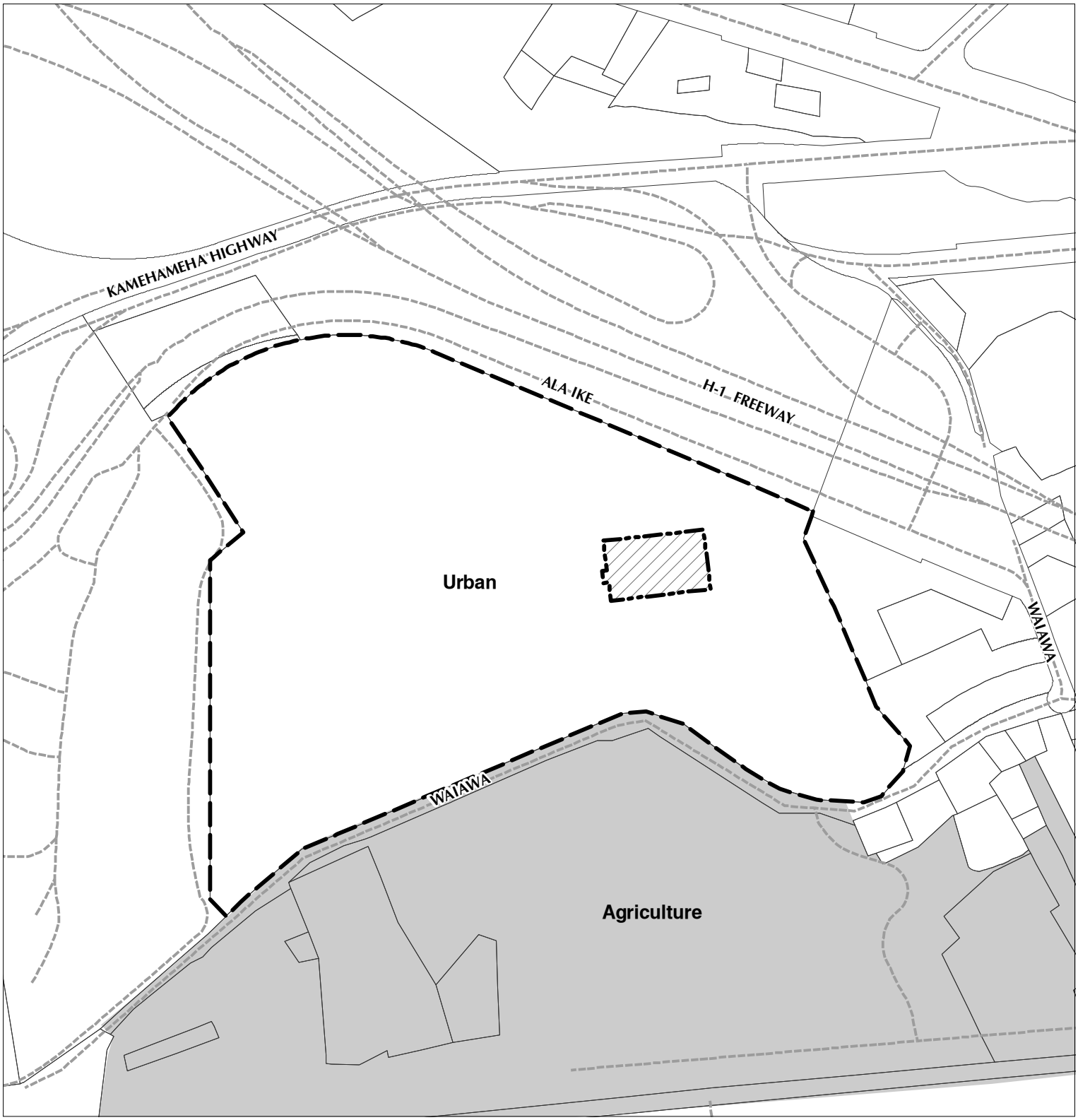
(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(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.

Discussion: The proposed Education and Innovation Instructional Facility will be located inland, away from the shoreline; therefore, it is anticipated that there will be no direct effect on existing coastal or inland recreational resources. According to the Environmental Protection Agency (EPA) website, unlike pollution from industrial and sewage treatment plants, non-point source (NPS) pollution comes from many diffuse sources. "NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes, and faulty septicsystems;



LEGEND

Leeward Community College

Project Area

Land Use District

Urban

Agriculture

Source: State land Use Commission (2008)
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs

FIGURE 10
State Land Use Districts
Education & Innovation Instructional Facility

Leeward Community College

Island of O'ahu

NORTH

LINEAR SCALE (ft.)
0 200 400 800

PBR HAWAII & ASSOCIATES, INC.

May 2010

Atmospheric deposition and hydromodification are also sources of nonpoint source pollution."

Of the above, the construction of the proposed project could pose the potential for sediment from improperly managed construction sites, however, the establishment and implementation of best management practices (BMPs) during construction will reduce wind- and water-borne soil erosion. This will include watering of exposed soils during earthmoving, and providing silt traps downslope of the construction site.

The BMPs will be implemented to prevent pollution and protect the environment. Temporary erosion control measures will be installed prior to any clearing, demolition and/or construction activities. Structure BMPs include silt fence at the downstream perimeter of the project site, sediment control filters at drain inlets, stabilized construction ingress/egress, and concrete truck was pad. An erosion and sedimentation control (ESC) plan was prepared to address all construction activities.

During the operation of the project, there is also the potential for excess fertilizers, herbicides, and insecticides from the landscaped portions of the proposed project running off the site during a storm event. However, LCC has existing detention basins that moderate the amount of runoff.

HISTORIC RESOURCES

Objective: 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.

Policy A: Identify and analyze significant archaeological resources;

Policy B: Maximize information retention through preservation of remains and artifacts or salvage operations; and

Policy C: Support State goals for protection, restoration, interpretation, and display of historic resources.

Discussion: Due to the extensive disturbance the proposed Education and Innovation Instructional Facility site has experienced for development of the existing campus, it is unlikely that subsurface historic resources are present. Should any archaeological or cultural remains be encountered during construction, all work in the immediate vicinity of the find will cease and the State Historic Preservation Division will be contacted for establishment of appropriate mitigation in accordance with Chapter 6E, Hawai'i Revised Statutes.

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policy A: Identify valued scenic resources in the coastal zone management area;

Policy 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;

Policy C: Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

Policy D: Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion: The proposed Education and Innovation Instructional Facility will be located inland, away from the shoreline; therefore, it is anticipated that there will be no effect on the quality of the coastal scenic resources. In addition, the proposed facility will be located mauka of existing LCC buildings, and will likely be screened from view from the shoreline.

COASTAL ECOSYSTEMS

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policy A: Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

Policy B: Improve the technical basis for natural resource management;

Policy C: Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

Policy 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

Policy 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.

Discussion: Best Management Practices (BMPs) will be employed during construction to reduce the erosion of soils and fugitive dust during construction. Controlling runoff particularly will ensure that the construction will not increase inputs of sediment into Waiawa Stream.

ECONOMIC USES

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policy A: Concentrate coastal dependent development in appropriate areas;

Policy 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

Policy 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:
(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 Education and Innovation Instructional Facility will contribute to Hawai'i's economy through promotion of the Supportive Teacher Education Program (STEP). The STEP is not dependant on coastal resources and is located away from the shoreline makai of and on property separate from the campus.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policy A: Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution hazards;

Policy B: Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards;

Policy C: Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

Policy D: Prevent coastal flooding from inland projects.

Discussion: The proposed Education and Innovation Instructional Facility location inland from and above the coastline virtually negates any potential hazard from tsunami, storm waves, stream flooding. The measures to mitigate or negate the impacts from the construction and operation of the proposed project on pollution of the nearshore environment were previously described.

MANAGING DEVELOPMENT

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policy A: Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

Policy B: Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

Policy 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.

Discussion: Due to the Education and Innovation Instructional Facility's inland location from the shoreline, it should not be considered a "significant coastal development." Its benign location relative to the coastline should not require an involved public participation process concerning coastal effects, although this EA provides an opportunity for input.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

Policy A: Promote public involvement in coastal zone management processes;

Policy 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

Policy C: Organize workshops, policy dialogues, and site- specific mediations to respond to coastal issues and conflicts.

Discussion: Due to the Education and Innovation Instructional Facility's inland location from the shoreline, it should not be considered a "significant coastal development." Its benign location relative to the coastline should not require an involved public participation process concerning coastal effects, although this EA provides an opportunity for input.

BEACH PROTECTION

Objective: Protect beaches for public use and recreation.

Policy 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;

Policy 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

Policy C: Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion: The proposed Education and Innovation Instructional Facility will be located inland from the ocean. The proposed project will not require the construction of erosion-protection structures seaward of the shoreline.

MARINE RESOURCES

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policy A: Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

Policy B: Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

Policy 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;

Policy 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

Policy E: Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: The proposed Education and Innovation Instructional Facility will be located inland, away from the shoreline; therefore, it is anticipated that there will be no direct effect on existing coastal marine resources.

5.1.3 Hawai'i State Planning Act, Chapter 226, Hawai'i Revised Statutes

The Hawai'i State Plan, Chapter 226 HRS (2007) provides guidelines for the future growth of the State of Hawai'i. The Hawai'i State Plan identifies goals, objectives, policies, and priorities for allocating the State's resources, including public funds, services, human resources, land, energy, and water. The plan was enacted to achieve "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." Chapter 226 HRS (2007).

Discussion: Planning objectives outlined in Chapter 226 support the expansion of the Education and Innovation Instructional Facility. Section 226-21 relating to education states that it shall be the policy of the State to "…ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs." As noted elsewhere, Hawai'i continues to have a critical shortage of trained teachers within the public school system. Research indicates that teacher quality is one of the most influential factors in student achievement. The mission of the LCC Supportive Teacher Education Program (STEP) is to recruit and support local students into becoming highly qualified teachers in their own communities.

5.2 CITY AND COUNTY OF HONOLULU

5.2.1 General Plan

The City and County of Honolulu's General Plan is the policy document for the long-range development of the Island of O'ahu. The General Plan is a statement of general conditions to be sought in the 20 year planning horizon and policies to help direct attainment of the plan's objectives.

Specific General Plan goals and policies applicable to the proposed Education and Innovation Instructional Facility project are discussed below.

Health and Education

Objective B – To provide a wide range of educational opportunities for the people of Oahu.
Policies
(1) Support education programs that encourage the development of employable skills.

Objective C – To make Honolulu the center of higher education in the Pacific.
Policies
(1) Encourage continuing improvement in the quality of higher education in Hawaii.

Discussion: As previously noted, STEP is a teacher preparation program that supports students who are interested in pursuing a career in elementary, secondary, and/or special education. The STEP program prepares students to successfully achieve the Associate in Arts in Teaching (AAT) degree and provides a solid foundation for those students interested in pursuing a baccalaureate degree in Education.

5.2.2 Central Oahu Sustainable Communities Plan

The City and County of Honolulu has adopted the Central Oahu Sustainable Communities Plan (SCP) as one of eight community-oriented plans to guide public policy, investment and decision making through the 2025 planning horizon. The document contains policies specific to Honolulu's primary urban center. These policies are then implemented through ordinances such as the Land Use Ordinance (zoning code).

Besides denoting LCC on the Central Oahu SCP Urban Land Use and Public Facilities maps (Figure 11), the SCP makes the following references to the Leeward Community College:

> ***Bike Paths.*** *As part of the Pearl Harbor Historic Trail, a major bike path should run east-west along the OR&L right-of-way (with branch routes to the Waipahu Cultural Garden and Leeward Community College)…*
>
> *Other existing community facilities shown on the Urban Land Use Map in Appendix A include hospitals, colleges, correctional facilities, and cemeteries. Key facilities include Leeward Community College, Wahiawa Hospital, and the Waiawa Correctional Facility…*

Discussion: The proposed Education and Innovation Instructional Facility is not inconsistent with the above references to LCC in the Central Oahu SCP.

5.2.3 Land Use Ordinance

The Land Use Ordinance (LUO), Chapter 21 of the Revised Ordinance of Honolulu, implements the goals and objectives of the General Plan and the Central Oahu SCP. All lands within the City and County of Honolulu are zoned into specific districts. According to the Department of Planning and Permitting, the project site is zoned Agricultural (AG-2) (Figure 12).

According to the LUO Master Use Table (Table 21-3), universities and colleges are permitted in all zoning districts regulated by the City and County of Honolulu with Plan Review Use (PRU) approval.

Discussion: The proposed Education and Innovation Instructional Facility is consistent with the LUO in that it is part of a long-established college campus (since 1969). LCC is currently operating under Plan Review Use (PRU) Permit No.1999/PRU-1 (Resolution No. 99-359, CD-1), approved on March 15, 2000, for the "Thirty-Year Master Plan To Allow the Construction of New School Facilities, Expansion and Interior Renovations to Existing Buildings, and Upgrading of Infrastructure Improvements." The *Leeward Community College Long Range Development Plan* (LRDP) was attached to PRU No. 1999/PRU-1, which was approved by Resolution 99-359, CD-1 (Appendix B). In the LRDP, the site for the proposed project was to be occupied by the "Business Ed./Language Arts" building. The New Education and Innovation Instructional Facility is identified as the "Social Science" building in the 1999 LRDP. In discussions with the County's Department of Planning and Permitting (DPP), it was determined that the proposed project is different from the 1999 version of the LRDP, and that a minor modification would need to be made to the existing PRU permit (Resolution No. 99-359, CD-2).

LEGEND

Leeward Community College

Project Area

Sustainable Community Plan Zones

- Transit Node
- Lower-Density Residential
- Medium and Higher-Density Residential/Mixed Use
- District Commercial
- Industrial
- Major Parks and Open Space
- Preservation
- Institutional

Source: City & County of Honolulu HOLIS (2008), Department of Planning & Permitting
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs

FIGURE 11
Central Oahu Sustainable Communities Plan

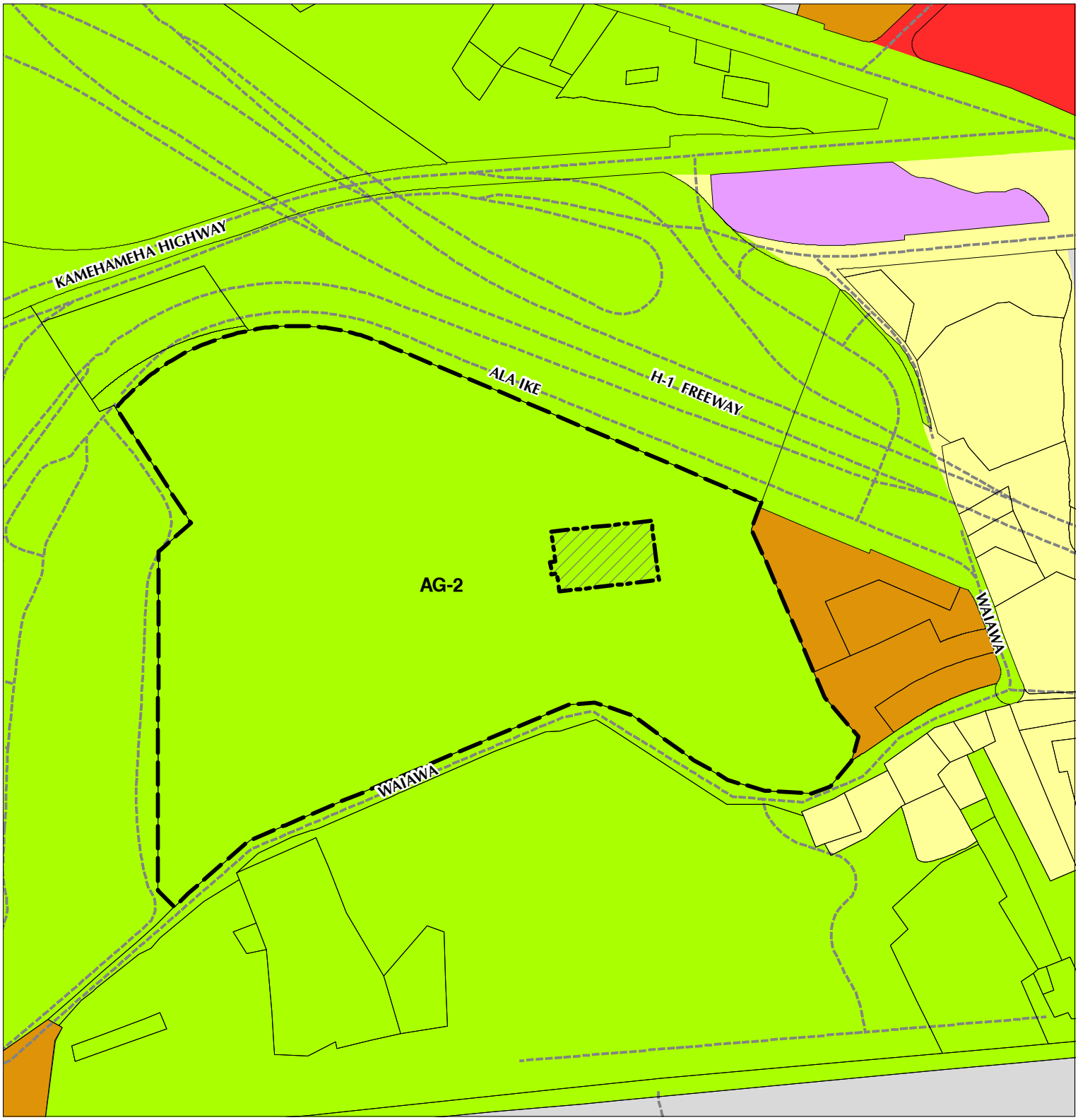
Education & Innovation Instructional Facility

Leeward Community College
Island of O'ahu

NORTH

NOT TO SCALE

PBR HAWAII & ASSOCIATES, INC.
May 2010



LEGEND

Leeward Community College

Project Area

Zone

A-2	AG-2
B-2	R-5
I-2	F-1

Source: City & County of Honolulu HOLIS (2008)
Disclaimer: This graphic has been prepared for general planning purposes only.
File Location - Q:\Oahu\Leeward CC\PDFs

FIGURE 12
City and County of Honolulu Zoning
Education & Innovation Instructional Facility

Leeward Community College — Island of O'ahu

NORTH

LINEAR SCALE (ft.)
0 200 400 800

PBR HAWAII & ASSOCIATES, INC.
May 2010

5.3 LIST OF REQUIRED PERMITS AND APPROVALS

Anticipated permits and approvals that may be required are outlined in Table 5-1, below.

Table 5-1
Required Permits and Approvals

AGENCY	PERMIT/APPROVAL
STATE OF HAWAI'I	
Department of Land and Natural Resources, Historic Preservation Division	• Section 6E, Hawaii Revised Statutes (HRS) Review
Department of Health	• NPDES
CITY AND COUNTY OF HONOLULU	
Department of Planning and Permtting	• Plan Review Use – Minor Modification
Department of Planning and Permitting	• Grading Permit
Department of Planning and Permitting	• Building Permit
Department of Environmental Services	• Industrial Wastewater Discharge Permit

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Section 6.0

ALTERNATIVES

6.0 ALTERNATIVES

In compliance with the provisions of Section 11-200-17(f), HAR relating to Environmental Impact Statements, an environmental assessment must discuss potential alternatives to the proposed action.

The alternatives considered include:

6.1 NO ACTION

The no-action alternative is no change to the existing site. Under this alternative the proposed Education and Innovation Instructional Facility will not be constructed. This would be inconsistent with LCC's 1999 Long Range Development Plan which identifies the project site for siting of a new LCC instructional facility. Without the proposed project, Hawai'i will continue to have a critical shortage of trained teachers within the public school system.

6.2 ALTERNATIVES

In order to accommodate the proposed Education and Innovation Instructional Facility, several sites were studied within the existing LCC campus. The sites studied, include: the Continuining Education and Workforce Development (CE) complex in the northeast corner of the campus property, and the UH West O'ahu complex on the eastern edge of the built campus. The CE complex site was rejected as it is near the HHCTC alignment and proposed LCC Transit Station site. The UH West O'ahu complex site was also rejected because the timing of the development of the permanent UH West O'ahu campus in East Kapolei is currently uncertain.

Another alternative would be to move the Education and Innovation Instructional Facility off-campus. However, this alternative was rejected because it would be financially prohibitive due to the expensive land prices on O'ahu.

These alternatives, as well as the No Action alternative discussed in Section 6.1, above are considered at a minimum, inconsistent with the campus' long range development plan, and are considered not feasible if the LCC is to follow its "30-year" LRDP.

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SECTION 7.0

FINDINGS, SUPPORTING REASONS, AND
ANTICIPATION DETERMINATION

7.0 FINDINGS, SUPPORTING REASONS, AND ANTICIPATED DETERMINATION

To determine whether the Education and Innovation Instructional Facility may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed project have been evaluated, including potential primary, secondary, short-range, long-range, and cumulative impacts. Based on this evaluation, the Approving Agency (University of Hawai'i System, Office of Capital Improvements) is anticipated to issue a Finding of No Significant Impact (FONSI) for the Education and Innovation Instructional Facility. The supporting rationale for this anticipated finding is presented in this chapter.

7.1 PROBABLE IMPACT, INCLUDING CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment that result from the action when added to other past, present, and foreseeable future actions by other agencies or persons. As discussed throughout this document, in 1999, the University prepared a Long Range Development Plan (LRDP) that was to guide campus development over 30 years (ending year 2029). Assumed cumulative impacts could be those related to increased traffic and greater demand on water, sanitary sewer and storm drainage capacity.

Subsequent to the approval of the 1999 LRDP, on June 26, 2006, Governor Lingle signed HB2175, thus requiring each State agency to design and construct buildings to meet the LEED Silver certified level, or a comparable standard. The law applies to all new State-owned construction of 5,000 square feet or greater, including K-12 public schools. As a result, the design of all new University buildings must include resource conservation through energy efficiency, water conservation, recycling and other environmentally sensible practices. Ostensibly, the University's sustainability initiatives will result in making new buildings more efficient, improving stormwater conveyance practices and encouraging alternative transportation. In addition, all new buildings are subject to an Environmental Assessment and the development of the projects will include appropriate mitigation measures to address any impacts. Regarding the exact sustainable design features of the Education and Innovation Instructional Facility, the design of the project is in its formative stage and various energy- and water-saving technologies are being contemplated and compared.

Based on the fact that it is now LCC's additional initiative to replace and renovate existing structures using environmentally sensible design and construction, it is assumed that the cumulative impacts from the proposed Education and Innovation Instructional Facility will be minimal.

Social-economic impacts resulting from the proposed LCC projects are anticipated to be beneficial. Construction generates employment and economic opportunities. Expansion of the Education and Innovation Instructional Facility center will allow the University of Hawai'i to continue to provide training for future educators. Overall, the net cumulative impact is expected to have a positive effect on future educators, and consequently, kindergarten to high school students.

As previously mentioned, the HHCTC Fixed Guideway alignment is sited through the LCC campus, as well as a transit station.

If a transit station is built on a portion of the LCC campus, this would provide greater accessibility to the campus for those faculty, staff and students who rely on public transportation, as the transit station will be closer to the campus than the existing bus stop off-campus on Farrington Highway. Additionally, since the rail line will be elevated, there will be no conflicts with cars on roads and the travel time for users of the rail line will be on schedule. The convenience of the rail transit may encourage ridership to/from the campus and subsequently reduce the need for personal motorized vehicles, increase the safety of students, faculty and staff and reduce the time for commuting. Additionally, the LCC campus will enable East Kapolei, Waipahu, Pearl City and 'Aiea residents to attend an institution of higher learning without commuting to Honolulu. Increased use of public transportation means fewer residents driving their own vehicles and less traffic on roadways. This would be supportive of the University's sustainability initiatives.

7.2 SIGNIFICANCE CRITERIA

Based upon the previous information presented in this document the proposed permitting and construction of the Education and Innovation Instructional Facility will likely have no significant environmental impacts. This determination is based upon the Significance Criteria outlined in Chapter 343, HRS, as amended and Title 11 Chapter 200 HAR 1996, discussed below.

(1) *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*

The site's status as an existing paved and landscaped area, plus prior land disturbance suggests that the site is absent any resources potentially subject to irrevocable loss as a result of construction. While there will be a temporary loss of lawn area, currently the project is being planned with a "green roof."

(2) *Curtails the range of beneficial uses of the environment;*

The Education and Innovation Instructional Facility will not curtail the range of beneficial uses of the environment as the site is currently developed.

(3) ***Conflicts with the State's long term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;***

The Environmental Policies enumerated in Chapter 344, HRS promote conservation of natural resources, and an enhanced quality of life for all citizens. The proposed Education and Innovation Instructional Facility will not significantly impact natural resources due to the fact that the site is already developed with a sidewalk and a grassed lawn.

(4) ***Substantially affects the economic or social welfare of the community or State;***

The Education and Innovation Instructional Facility will positively influence social welfare by facilitating the training of teachers and teachers' aides.

(5) ***Substantially affects public health;***

The potential impacts related to noise, air or water quality during construction will be addressed through construction management practices in compliance with Federal, State and County requirements. LCC's initiative to build sustainably will help to ensure that the proposed Education and Innovation Instructional Facility will not negatively affect public health.

(6) ***Involves substantial secondary impacts, such as population changes or effects on public facilities;***

LCC anticipates no increase in student population as a result of the proposed Education and Innovation Instructional Facility. The future classrooms to accommodate STEP are proposed to address needs at the current and planned enrollment levels. The Innovation Instruction Center is intended to support a learner-centered culture which will help students persist and succeed in their postsecondary careers. In the UHCC system, 62% of new students place into remedial/developmental writing courses and 81% of new students place into remedial/developmental math courses.

The Student Resource Center would include state-of-the-art materials and resources (books, computers, equipment, supplies, etc.) available for use by students and faculty to enhance their instructional needs. The space would include a variety of individual and group study/work configuration spaces and would promote the use of various forms of activities and research required by students to present any kind of activity in a K-12 classroom.

One of the most pressing LCC campus space requirements is the need to schedule large classes or groups (internal or external to the campus). Two (2) lecture halls are proposed,

one with a seating capacity of up to 100 students and one with a seating capacity of 50 students. Ideally, these spaces could also be combined in order to accommodate up to 150 students or guests to a class/meeting.

(7) *Involves a substantial degradation of environmental quality;*

No substantial environmental degradation is anticipated. LCC has committed itself to a development initiative of environmental sustainability. The project will need to meet minimum applicable statutes and regulations as well as the more stringent self imposed sustainability requirements.

(8) *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;*

The proposed action will not have any substantial negative secondary impacts on the environment. Implementation of the proposed project will not commit the University or the City and County of Honolulu public facilities to any other larger actions, and will not generate any additional actions having a cumulative effect on the environment.

(9) *Substantially affects a rare, threatened or endangered species or its habitat;*

The Education and Innovation Instructional Facility will occupy a site that is already committed to a portion of an existing paved parking lot and a grassed lawn. The site contains no habitat for rare, threatened or endangered plant or animal species.

(10) *Detrimentally affects air or water quality or ambient noise levels;*

Air Quality: No State or Federal air quality standards will be violated during or after the construction of Education and Innovation Instructional Facility.

Water Quality: No State or Federal water quality standards will be violated during or after the construction of Education and Innovation Instructional Facility.

Ambient Noise Levels: Construction activities for the development of the property will inevitably create temporary noise impacts. The developer may employ mitigation measures to minimize those temporary noise impacts including the use of mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, Hawai'i Administrative Rules, the project activities will comply with all community noise controls.

(11) *Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;*

The project site does not lie in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, estuary, freshwater or coastal waters. Likewise, the Education and Innovation Instructional Facility is not anticipated to have any impact on any natural hazard conditions and no mitigative measures are planned.

(12) ***Substantially affects scenic vistas and view planes identified in County or State plans or studies; or,***

Adverse affects to mauka views will not occur due to the surrounding built environment (the existing buildings of the LCC campus).

(13) ***Requires substantial energy consumption.***

The proposed project will not require substantial energy consumption. As mentioned above, energy saving design elements will be integrated into building design.

7.3 ANTICIPATED DETERMINATION

On the basis of impacts and mitigation measures examined in this document and analyzed under the above criteria, it is anticipated that the Education and Innovation Instructional Facility will not have a significant effect on the physical or human environments. Pursuant to Chapter 343, HRS, the approving agency, the University of Hawai‘i System, Office of Capital Improvements, will have to make a determination on a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement is warranted.

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Section 8.0

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8.0 REFERENCES CITED

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Appendix A

COMMENT LETTERS AND RESPONSES

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

May 7, 2009

Regulatory Branch

File No. POH-2009-159

Mr. Vincent Shigekuni, Vice President
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Shigekuni:

This letter is in response to your request, dated April 22, 2009, for early consultation comments on the preparation of the Draft Environmental Assessment (DEA) for the **Education and Innovation Instructional Facility at Leeward Community College** located in TMK 196003048 (por.) Island of Oahu, Hawai'i.

The U.S. Army Corps of Engineers (Corps) asserts jurisdiction over traditional navigable waters (TNWs) (e.g., Pacific Ocean), under Section 10 of the Rivers and Harbors Act (RHA) of 1899; wetlands adjacent to TNWs, non-navigable tributaries that have perennial flow or continuous seasonal flow, and wetlands directly abutting such tributaries. For other types of waters, including those that do not have relatively permanent flows, as well as any wetlands adjacent to such tributaries, we must determine jurisdiction on a case-by-case basis using a fact-specific analysis to assess the flow characteristics and functions of the tributary and its adjacent wetlands to determine if in combination they significantly affect the chemical, physical, and biological integrity of downstream navigable waters, particular emphasis being given to hydrological and ecological factors.

We recommend your DEA identify all streams and wetlands on the project site and in the immediate vicinity of the proposed project, characterize the hydrology and ecology of those features, and provide a description of all ground-disturbing activities associated with the project construction occurring on the project site. Thank you for the opportunity to comment. If you have any questions, please contact Ms. Meris Bantilan-Smith, of my Regulatory staff at 808-438-7701 (FAX: 808-438-4060) or by electronic mail at Meris.Bantilan-Smith@usace.army.mil. Please include File No. POH-2009-159 in any future correspondence regarding this project. Please be advised you can provide comments on your experience with the Corps' Honolulu District Regulatory Branch by accessing our web-based customer survey form at http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED® AP
Executive Vice-President

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Associate

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Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Mr. George P. Young, P.E.
Chief, Regulatory Branch
Department of the Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawai'i 96858-5440

Attn: Ms. Meris Banitlan-Smith

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Young:

Thank you for your letter dated May 7, 2009 (your File No. POH-2009-159). We greatly appreciate your recommendations and will address them in the Draft EA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
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Tel: (808) 521-5631
Fax: (808) 535-3163

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
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

May 11, 2009

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Vincent Shigekuni, Vice President

Ladies and Gentlemen:

Subject: Pre-Consultation for the Draft Environmental Assessment for the Proposed Education and Innovation Instructional Facility at Leeward Community College

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 comment.

Other than the comments from Engineering Division, Land Division-Oahu District, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Charlene E Unoki

Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2009 MAY -6 A 11:05
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

April 23, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
~~Div. of Boating & Ocean~~ Recreation
x Engineering Division
~~Div. of Forestry~~ & Wildlife
Div. of State Parks
Commission on Water Resource Management
Office of Conservation & Coastal Lands
x Land Division –Oahu District

FROM: Morris M. Atta
SUBJECT: Pre-Consultation for the Proposed Education and Inovation Instructional Facility at Leeward Community College
LOCATION: Ewa, Oahu, TMK: (1) 9-6-3:48
APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 10, 2009.

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 my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: _____
Date: 5/6/09

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorrisAtta
Ref.:PreConLeewardComCollegeFacility
Oahu.677

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The Flood Insurance Program does not have any regulations for developments within Flood Zone X.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note 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 Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu 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 should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) _____

_____

( ) Other: _____

_____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 5/6/09

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
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

April 23, 2009

MEMORANDUM

FROM: ~~TO:~~ **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
__Office of Conservation & Coastal Lands
x Land Division –Oahu District

TO: ~~FROM:~~ Morris M. Atta
SUBJECT: Pre-Consultation for the Proposed Education and Inovation Instructional Facility at Leeward Community College
LOCATION: Ewa, Oahu, TMK: (1) 9-6-3:48
APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 10, 2009.

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 my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: _____
Date: 4/24/09

PBR HAWAII
& ASSOCIATES, INC.

PRINCIPALS

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President

R. STAN DUNCAN, ASLA
Executive Vice-President

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Kapolei, Hawai'i 96707-2005
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Fax: (808) 535-3163

May 10, 2010

Mr. Morris M. Atta, Administrator
State of Hawai'i
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai'i 96809

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Atta:

Thank you for your letter dated May 11, 2009. We greatly appreciate the information provided and will incorporate it into the Draft Environmental Assessment.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
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

May 29, 2009

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Vincent Shigekuni, Vice President

Ladies and Gentlemen:

Subject: Pre-Consultation for the Draft Environmental Assessment for the Proposed Education and Innovation Instructional Facility at Leeward Community College

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 Division of Aquatic Resources for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Charlene E Unoki
for Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
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

AQUATIC RESOURCES: 2273

DIRECTOR	
COMM. FISH.	
AQ RES/ENV	
AQ REC	
PLANNER	
STAFF SVCS	
RCUH/UH	
STATISTICS	
AFRC/FED AID	
EDUCATION	
SECRETARY	
OFFICE SVCS	
TECH ASST	
Return to:	
No. Copies	
Copies to:	
Due Date:	

GH

April 23, 2009

MEMORANDUM

TO: ~~DLNR Agencies:~~
x Div. of Aquatic Resources
~~Div. of Boating & Ocean Recreation~~
x Engineering Division
Div. of Forestry & Wildlife
Div. of State Parks
Commission on Water Resource Management
Office of Conservation & Coastal Lands
x Land Division –Oahu District

RECEIVED
APR 24 2009
AQUATIC RESOURCES

FROM: Morris M. Atta
SUBJECT: Pre-Consultation for the Proposed Education and Inovation Instructional Facility at Leeward Community College
LOCATION: Ewa, Oahu, TMK: (1) 9-6-3:48
APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 10, 2009.

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 my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(x) We have no comments.
( ) Comments are attached.

Signed: _____
Date: 5/26/09

PBR HAWAII
& ASSOCIATES, INC.

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May 10, 2010

Mr. Morris M. Atta, Administrator
State of Hawai'i
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai'i 96809

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Atta:

Thank you for your letter dated May 29, 2009. We have reviewed your letter and it is our understanding that the Division of Aquatic Resources has no comments to offer at this time.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
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

May 7, 2009

Mr. Vincent Shigekuni
PBR Hawai'i & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813-3484

LOG NO: 2009.1953
DOC NO: 0905WT30
Archaeology

Dear Mr. Shigekuni:

SUBJECT: Chapter 6E-8 Historic Preservation Review--
Pre-consultation for DRAFT Environmental Assessment--
For the Proposed Education and Innovation Instructional Facility at Leeward Community College
Hono'uli'uli Ahupua 'a, 'Ewa District, O'ahu, Hawai'i
TMK: (1) 9-6-003: 048

Thank you for providing the opportunity to comment on this pre-consultation for the development of a DRAFT Environmental Assessment (DEA) which we received on April 23, 2009

This current project area is on the immediate campus in an area near the parking lot. Though there have been studies that revealed historic properties (human burials) these discoveries occurred on the bottom lands below the bluff where a large population of Chinese was located in the early historic period. This project is on the other side of the college in an area already heavily disturbed by construction related to the college. Therefore we will likely concur with any finding of **"no historic properties affected"** when the DEA is developed.

In the event that historic resources, including human skeletal remains, are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance and the State Historic Preservation Division contacted at (808) 692-8015.

Please contact Wendy Tolleson at (808) 692-8024 if you have any questions or concerns regarding this letter.

Aloha,

Nancy A. McMahon

Nancy A. McMahon (Deputy SHPO)
Archaeology and Historic Preservation Manager

PBR HAWAII
& ASSOCIATES, INC.

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May 10, 2010

Ms. Nancy A. McMahon, Archaeology and Historic Preservation Manager
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, Hawai'i 96707

Attn: Ms. Wendy Tolleson

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Ms. McMahon:

Thank you for your letter dated May 7, 2009. We acknowledge your assessment that SHPD will likely concur with any finding of "no historic properties affected" when the DEA (Draft EA) is developed. Also, in the event that historic resources are discovered, including human skeletal remains, during project construction, all work will cease in the immediate vicinity of the find, the find will be protected from additional disturbance and the State Historic Preservation Division will be contacted.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.3267

May 27, 2009

Mr. Vincent Shigekuni
Vice President
PBR HAWAII & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Leeward Community College (LCC), Education and Innovation Instructional Facility Pre-Consultation for Draft Environmental Assessment (DEA)

Thank you for providing the subject project for the State Department of Transportation's (DOT) review and comments.

DOT understands that the subject project proposes to construct a three-story structure consisting of classrooms, conference rooms and offices. The project is located adjacent to the Theater Plaza on the LCC campus.

The DOT Highways Division Planning Branch, telephone number (808) 587-1830, submits the following comments. The DEA should discuss and evaluate project impacts to State highway facilities, specifically Ala Ike Street, Kamehameha Highway and Farrington Highway, such as but not limited to:

1. The additional traffic generated by the expansion of LCC must be assessed. The applicant shall provide a Traffic Impact Analysis Report (TIAR) for review and acceptance that addresses/identifies measures to mitigate all project-generated traffic and that also appropriately addresses traffic issues typically associated with school operations.

2. The applicant is required to submit construction plans for all work done within the State highway right-of-way.

3. The construction vehicles and types of equipment that will be used at the job site must be identified. Please note that a DOT Highways Division permit is required to transport any oversized equipment/overweight loads on State highway facilities.

4. The inconvenience to the motoring public, bicyclists, students, visitors, college staff, etc. during construction should also be addressed.

5. The hours that construction activity will be occurring should be noted and included in any impact assessment.

Four copies of the DEA should be provided to DOT to facilitate review by the Highways Division. If there are any other questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at (808) 587-2356.

Very truly yours,

BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

c: Katherine Kealoha, Office of Environmental Quality Control

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& ASSOCIATES, INC.

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May 10, 2010

Mr. Brennon T. Morioka, Ph.D., P.E.
Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

Attn: Mr. David Shimokawa

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Morioka,

Thank you for your letter dated May 27, 2009. We greatly appreciate your recommendations and will address them in the Draft EA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD09/4412

May 20, 2009

Vincent Shigekuni, Vice President
PBR Hawaii & Associates Inc.
1001 Bishop St.
ASB Tower, Suite 650
Honolulu, HI 96813-3484

RE: Pre-Consultation for the proposed Education and Innovation Instructional Facility at Leeward Community College Draft Environmental Assessment, TMK: (1) 9-6-003:048.

Aloha e Vincent Shigekuni,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned request for comments, dated April 22, 2009. The proposed Education and Innovation Instructional Facility of Leeward Community College would be located next to the Theatre Plaza. The three story structure would include classrooms, conference rooms, and offices.

Thank you for the opportunity to comment, but OHA has no comments at this time. We look forward to reviewing the forthcoming Draft Environmental Assessment, however, and providing a more thorough review at that time. If you have further questions, please contact Heidi Guth by phone at (808) 594-1962, or e-mail her at heidig@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

PBR HAWAII
& ASSOCIATES, INC.

PRINCIPALS

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Fax: (808) 535-3163

May 10, 2010

Mr. Clyde W. Nāmuʻo, Administrator
State of Hawaiʻi
Office of Hawaiian Affairs
711 Kapiʻolani Boulevard, Suite 500
Honolulu, Hawaiʻi 96813

Attn: Ms. Heidi Guth

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF OʻAHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Nāmuʻo,

Thank you for your letter dated May 20, 2009. We acknowledge that your department has no comments to offer at this time.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawaiʻi at Mānoa

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DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
715 SOUTH KING STREET, SUITE 311 • HONOLULU, HAWAII 96813 • AREA CODE 808 • PHONE: 768-7762 • FAX: 768-7792

MUFI HANNEMANN
MAYOR

DEBORAH KIM MORIKAWA
DIRECTOR

ERNEST Y. MARTIN
DEPUTY DIRECTOR

May 4, 2009

Mr. Vincent Shigekuni, Vice President
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3481

Dear Mr. Shigekuni:

Subject: Environmental Assessment Pre-Consultation
Leeward Community College Innovate Instruction Facility

The Department of Community Services appreciates being consulted on the subject environmental assessment. Based on the materials you provided, we have determined that the proposed project will have no impact on any project, program, or facility of the Department of Community Services. The proposed project will be consistent of our policy of promoting projects which enhance and expand educational opportunities for the people of the City and County of Honolulu.

We would appreciate the opportunity to review the environmental assessment when it is completed. Questions regarding this matter may be directed to Keith Ishida at 768-7750.

Sincerely,

Deborah Kim Morikawa

Deborah Kim Morikawa
Director

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

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Executive Vice-President

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Executive Vice-President

VINCENT SHIGEKUNI
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Fax: (808) 535-3163

Ms. Deborah Kim Morikawa, Director
Department of Community Services
City and County of Honolulu
715 South King Street
Honolulu, Hawaii 96813

Attn: Mr. Keith Ishida

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Ms. Morikawa:

Thank you for your letter dated May 4, 2009. We acknowledge your assessment that the project should have no impact on any project, program or facility of the Department of Community Services.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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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) 523-4567
Web site: www.honolulu.gov

MUFI HANNEMANN
MAYOR

CRAIG I. NISHIMURA, P.E.
DIRECTOR

COLLINS D. LAM, P.E.
DEPUTY DIRECTOR

May 4, 2009

Mr. Vincent Shigekuni, Vice President
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Pre-Consultation for the Proposed Education and Innovation Instructional Facility at Leeward Community College Draft Environment Assessment

Thank you for giving us the opportunity to comment on the above Draft Environmental Assessment.

The Department of Design and Construction has the following comments:

- A sewer connection application should be filed with the Department of Planning and Permitting.

Should you have any questions, please call Jay Hamai, Assistant Chief, Wastewater Division, at 768-8799.

Very truly yours,

Craig I. Nishimura, P.E.
Director

CIN:lt (310431)

c: DDC Wastewater Division

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

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Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
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DACHENG DONG, LEED® AP
Associate

Mr. Criag I. Nishimura, Director
Department of Design and Construction
650 South King Street
Honolulu, Hawai'i 96813

Attn: Mr. Jay Hamai

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Nishimura:

Thank you for your letter dated May 4, 2009. We greatly appreciate the information provided and will incorporate it into the Draft Environmental Assessment.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

MUFI HANNEMANN
MAYOR

JEOFFREY S. CUDIAMAT, P.E.
DIRECTOR AND CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 09-369

May 7, 2009

Mr. Vincent Shigekuni
PBR Hawaii & Associates
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Pre-Consultation for the Proposed
Education and Innovation Instructional Facility
At Leeward Community College
Draft Environmental Assessment

Thank you for the opportunity to review and comment on the pre-consultation for the subject proposed Education and Innovation Instructional Facility project.

We have no comments to offer as the proposed facility will be within University of Hawaii property and will have negligible impact on our facilities and operations.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 768-3697.

Sincerely,

Jeoffrey Cudiamat

Jeoffrey S. Cudiamat, P.E.
Director and Chief Engineer

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

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SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Mr. Jeoffrey S. Cudiamat, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Attn: Mr. Charles Pignataro

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Cudiamat:

Thank you for your letter dated May 7, 2009. We acknowledge your assessment that the project should have negligible impact on your facilities and operations.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

KAPOLEI HALE • 1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3003 • FAX: (808) 768-7053 • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LESTER K.C. CHANG
DIRECTOR

GAIL Y. HARAGUCHI
DEPUTY DIRECTOR

April 30, 2009

Mr. Vincent Shigekuni, Vice President
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Shigekuni:

Subject: Pre-Consultation-Education and Innovation Instructional Facility at Leeward Community College

Thank you for the opportunity to review and comment at the Pre-Consultation State of the Draft Environmental Assessment for the proposed education and innovation instructional facility at Leeward Community College.

The Department of Parks and Recreation has no comment as the proposed project will not impact any program or facility of the department. You may remove us as a consulted party to the balance of the EIS process.

Should you have any questions, please contact Mr. John Reid, Planner, at 768-3017.

Sincerely,

LESTER K. C. CHANG
Director

LKCC:jr
(310451)

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

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Fax: (808) 535-3163

Mr. Lester K.C. Chang, Director
Department of Parks and Recreation
City and County of Honolulu
Kapolei Hale
1000 Uluohia Street, Suite 309
Kapolei, Hawai'i 96707

Attn: Mr. John Reid

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Chang:

Thank you for your letter dated April 30, 2009. We acknowledge your assessment that the project should not impact any program or facility of the Department.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. As requested, we will not be sending the Department of Parks and Recreation a copy of the Draft Environmental Assessment to review and comment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-8041
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MUFI HANNEMANN
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

May 11, 2009

2009/ELOG-989(lk)

Mr. Vincent Shigekuni
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Pre-Assessment Consultation
Leeward Community College
94-045 Ala Ike Street – Waiawa
Tax Map Key 9-6-3: 48

This is in response to your April 22, 2009 letter, requesting comments on the proposed Education and Innovation Instructional Facility at Leeward Community College (LCC). Preliminary plans include a three-story structure consisting of classrooms, conference rooms and offices. The building will be located adjacent to the Theater Plaza on the eastern portion of the campus.

We offer the following preliminary comments:

1. LCC is currently operating under Plan Review Permit (PRU) No. 1999/PRU-1 (Resolution No. 99-359, CD1), approved on March 15, 2000 for the 30-Year Master Plan for the expansion of the college. The applicant should include a discussion on how the proposal is consistent with the Long Range Development Plan (LRDP) for LCC approved under Resolution No. 99-359, CD1.

2. The PRU report indicates that new instructional buildings will be limited to two (2) stories plus basement levels. Therefore, the applicant should also provide a detailed description of the proposed project, including the consistency with the design standards of the LRDP, and plans of the proposed work. Whether the proposal requires a modification of the PRU permit will be determined when the additional information is submitted for review.

3. The proposed building appears to be located within an existing parking area. Therefore, the number of existing parking spaces to be removed, and the number and location of the replacement stalls should be provided.

If you have any questions, please contact Lynne Kauer of our staff at 768-8016.

Very truly yours,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:cs

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PBR HAWAII
& ASSOCIATES, INC.

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Fax: (808) 535-3163

May 10, 2010

Mr. David K. Tanoue, Director
Departemnt of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawai'i 96813

Attn: Ms. Lynne Kauer

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Tanoue:

Thank you for your letter dated May 11, 2009 [your File No. 2009/ELOG-989(lk)]. We greatly appreciate your recommendations and will address them in the Draft EA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 523-4730 • Internet: www.honolulu.gov

MUFI HANNEMANN
MAYOR

WAYNE Y. YOSHIOKA
DIRECTOR

SHARON ANN THOM
DEPUTY DIRECTOR

TP4/09-310573R

May 5, 2009

PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Vincent Shigekuni

Dear Mr. Shigekuni:

Subject: Pre-consultation: Draft Environmental Assessment (DEA) for Proposed Instructional Facility at Leeward Community College

This is in response to your letter requesting our review and comments on the pre-consultation for a Draft Environmental Assessment (DEA) for the subject project. We offer the following comments:

The construction of the project will impact City transit operations, bus stop, and para-transit operations that serve the Leeward Community College (LCC). Please have the Contractor notify the Department of Transportation Services (DTS) and Oahu Transit Services, Inc. (OTS), at least 30 days prior to construction. The notification should include the scope of work, location, proposed temporary closure of any traffic lane(s), sidewalk, or bus stop and duration of the project. The contact numbers are: DTS (Public Transit Division) at 768-8396; OTS at 848-4578 or 848-6016; and Para-transit operations at 454-5041 or 454-5020.

In addition, we wish to withhold any comments related to other traffic impacts on surrounding roadway facilities pending the preparation of a traffic assessment study as part of the DEA. We request that this assessment be forwarded to the department upon completion of the study.

Should you have any questions on the matter, please contact Mr. Brian Suzuki at 768-8349.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

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Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Mr. Wayne Y. Yoshioka, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Attn: Mr. Brian Suzuki

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Yoshioka:

Thank you for your letter dated May 5, 2009 (your reference number TP4/09-310573R). We greatly appreciate the information provided and will incorporate it into the Draft Environmental Assessment (EA). As requested, a traffic impact assessment report will be included in the Draft EA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

MUFI HANNEMANN
MAYOR

BOISSE P. CORREA
CHIEF

PAUL D. PUTZULU
KARL A. GODSEY
DEPUTY CHIEFS

OUR REFERENCE BS-DK

April 24, 2009

Mr. Vincent Shigekuni
Vice President
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

This is in response to your letter of April 22, 2009, requesting comments on a Pre-Consultation, Draft Environmental Assessment, for the proposed Education and Innovation Instructional Facility at Leeward Community College.

This project should have no significant impact on the facilities or operations of the Honolulu Police Department.

If there are any questions, please call Major Dave Kajihiro of District 3 at 723-8803 or Mr. Brandon Stone of the Executive Bureau at 529-3644.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
DEBORA A. TANDAL
Assistant Chief of Police
Support Services Bureau

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

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Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED® AP
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Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO, LEED® AP
Associate

SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Mr. Boisse P. Correa, Chief of Police
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawai'i 96813

Attn: Assistant Chief of Police Tandal

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Chief Correa:

Thank you for your letter dated April 24, 2009 (your reference number: BS-DK). We acknowledge your assessment that the project should have no significant impact on the facilities or operations of the Honolulu Police Department.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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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

MUFI HANNEMANN
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

May 11, 2009

Mr. Vincent Shigekuni
Vice President
PBR Hawaii & Associates, Inc.
Suite 650, ASB Tower
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Preconsultation for the Proposed Education and Innovation Instructional Facility at Leeward Community College
Pearl City, Oahu, Hawaii

In response to your letter dated April 22, 2009, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and requires that the following be complied with:

1. Provide a fire apparatus access road for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45 720 mm) from a fire apparatus access as measured by an approved route around the exterior of the building or facility. (1997 Uniform Fire Code, Section 902.2.1.)

2. Provide a water supply, approved by the county, capable of supplying the required fire flow for fire protection to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed or moved into or within the county.

   On-site fire hydrants and mains capable of supplying the required fire flow shall be provided 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. (1997 Uniform Fire Code, Section 903.2, as amended.)

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

Should you have any questions, please call Battalion Chief Socrates Bratakos of our Fire Prevention Bureau at 723-7151.

Sincerely,

KENNETH G. SILVA
Fire Chief

KGS/KT:bh

PBR HAWAII
& ASSOCIATES, INC.

PRINCIPALS

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Executive Vice-President

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May 10, 2010

Mr. Kenneth G. Silva, Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawai'i 96813-5007

Attn: Battalion Chief Socrates Bratakos

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Chief Silva:

Thank you for your letter dated May 11, 2009. We greatly appreciate your recommendations and will address them in the Draft EA.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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HONOLULU, HI 96843

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BRENNON T. MORIOKA, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager and Chief Engineer

April 27, 2009

Mr. Vincent Shigekuni
Vice President
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Shigekuni:

Subject: Your Letter Dated April 22, 2009 on the Draft Environmental Assessment Pre-Consultation for the Proposed Education and Innovation Instructional Facility at Leeward Community College, TMK: 9-6-003:048

Thank you for your letter on the proposed education center.

The existing water system is presently 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 your building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

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

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

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

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

K. Shida

KEITH S. SHIDA
Program Administrator
Customer Care Division

PBR HAWAII
& ASSOCIATES, INC.

May 10, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA
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Executive Vice-President

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Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

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SCOTT MURAKAMI, ASLA, LEED® AP
Associate

DACHENG DONG, LEED® AP
Associate

Mr. Keith S. Shida, Program Administrator
Customer Care Division
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawai'i 96843

Attn: Mr. Robert Chun

SUBJECT: PRE-CONSULTATION FOR THE PROPOSED EDUCATION AND INNOVATION INSTRUCTIONAL FACILITY AT LEEWARD COMMUNITY COLLEGE, HONOLULU, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Shida:

Thank you for your letter dated April 27, 2009. We greatly appreciate the information provided and will incorporate it into the Draft Environmental Assessment.

Thank you again for your participation in the preparation of the upcoming Environmental Assessment. If you have any questions regarding this project, please do not hesitate to contact me at 521-5631.

Sincerely,

Michael Shibata
Project Manager/Planner

cc: Bruce Teramoto, University of Hawai'i at Mānoa

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

KAPOLEI OFFICE
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Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
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Fax: (808) 535-3163

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Appendix B

RESOLUTION 99-359, CD-1

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

'00 MAR 21 AM 8 26

No. 99-359, CD1

RESOLUTION

APPROVING A PLAN REVIEW USE APPLICATION SUBMITTED BY THE UNIVERSITY OF HAWAII FACILITIES PLANNING OFFICE FOR COMMUNITY COLLEGES, FOR THE LEEWARD COMMUNITY COLLEGE FACILITY, THIRTY-YEAR MASTER PLAN TO ALLOW THE CONSTRUCTION OF NEW SCHOOL FACILITIES, EXPANSION AND INTERIOR RENOVATIONS TO EXISTING BUILDINGS, AND UPGRADING OF INFRASTRUCTURE IMPROVEMENTS.

WHEREAS, in accordance with the Land Use Ordinance, Sections 21-2.40-2 and 21-2.120, Revised Ordinances of Honolulu 1990, the University of Hawaii Facilities Planning Office for Community Colleges, herein referred to as the Applicant, has applied for a Plan Review Use to allow the construction of new school facilities, expansion and interior renovations to existing buildings, and upgrading of infrastructure improvements for the Leeward Community College facility in the AG-2 General Agricultural District located in Waiawa, Oahu, Hawaii, also identified as Tax Map Key 9-6-003: 048 (1999/PRU-1); and

WHEREAS, the City Council held a public hearing on February 16, 2000, to consider said application for a Plan Review Use; and

WHEREAS, on March 15, 2000, the City Council, having duly considered all of the evidence and reports offered at said public hearing, recommended approval of the subject application for a Plan Review Use with certain conditions enumerated below; now, therefore,

BE IT RESOLVED by the Council of the City and County of Honolulu that a Plan Review Use be issued to the Applicant under the following conditions:

1. This Plan Review Use pertains to the land area described on the map attached hereto as Exhibit 1.

2. Development of the site shall be in general conformance with the attached exhibits and the plans on file with the Department of Planning and Permitting labeled "Leeward Community College Long-Range Development Plan" dated December 1995 and spanning a 30-year period, and as described in the Director's Report (Departmental Communication No. 1097, dated November 23, 1999), and as

RESOLUTION

conditioned herein. Deviations from these plans, other than those of minor impact, shall require Council approval. The Director of Planning and Permitting may approve minor deviations.

3. Prior to the issuance of grading or building permits, the Applicant shall submit to the Director of the Department of Planning and Permitting, for review and approval, revised site plans showing the dimensions and location of the 10 required loading spaces.

4. Prior to the year 2017, the Applicant shall submit to the Department of Planning and Permitting documentation that at least one of the following projects to mitigate traffic congestion near the Leeward Community College campus has been funded by the State and the State has entered into a binding contract for the construction thereof:

   a) A secondary vehicle access road to Leeward Community College; and/or

   b) Widening and other improvements to Ala Ike Road, Waiawa Road, and the Waiawa Road bridge over the H-1 Freeway.

   In the event this condition is not met, no further expansion of the Leeward Community College will be permitted after the year 2016, notwithstanding the 30-year master plan otherwise approved hereunder.

5. The Applicant shall obtain all other governmental approvals or permits which may be required for the proposed project.

6. As may be required by the Director of Planning and Permitting for the review of grading and/or building permits, the Applicant shall submit reports updating the Applicant's status in complying with applicable conditions of this PRU.

7. All exterior area lighting shall be low pressure sodium lighting with full cut-off fixtures and shall be shielded and directed away from any adjoining lots and rights-of-way.

RESOLUTION

8. The Applicant shall use reclaimed water for irrigation purposes when such reclaimed water becomes available and shall install dual lines to accommodate the use of non-potable water for irrigation.

9. The Applicant shall develop an energy conservation retrofit plan for the Leeward Community College campus within two years of the date of adoption of this resolution.

RESOLUTION

BE IT FINALLY RESOLVED by the Council of the City and County of Honolulu that the Clerk is hereby directed to transmit copies of this resolution to the Director of the Department of Planning and Permitting; the Director of the Department of Transportation Services; the Director of the Department of Design and Construction; the Director of the State Department of Transportation; the University of Hawaii Facilities Planning Office for Community Colleges; and George I. Atta, Group 70 International, Inc., 925 Bethel Street, 5th Floor, Honolulu, Hawaii 96813.

INTRODUCED BY:

Rene Mansho (BR)

DATE OF INTRODUCTION:

November 24, 1999
Honolulu, Hawaii

Councilmembers

(OCS/022400/ct)

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

I hereby certify that the foregoing RESOLUTION was adopted by the COUNCIL OF THE CITY AND COUNTY OF HONOLULU on the date and by the vote indicated to the right.

ATTEST:

GENEVIEVE G. WONG
City Clerk

JON C. YOSHIMURA
CHAIR AND PRESIDING OFFICER

Dated 3/15/00

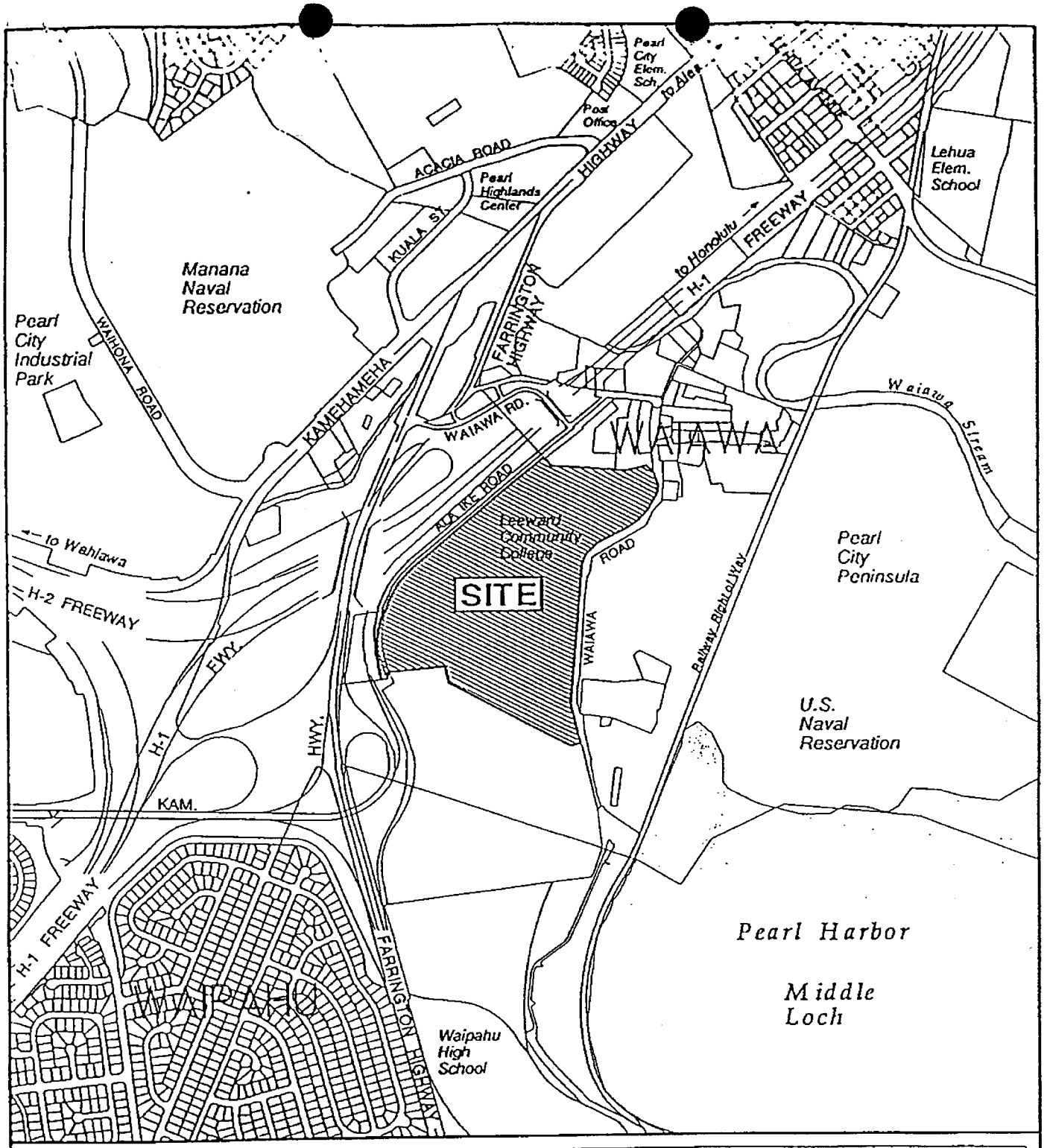
ADOPTED MEETING HELD 3/15/00			
	AYE	NO	A/E
BAINUM	X		
DaSOTO	X		
FELIX	X		
HANNEMANN	X		
HOLMES	X		
KIM	X		
MANSHO	X		
MIRIKITANI	X		
YOSHIMURA	X		
	9	0	0

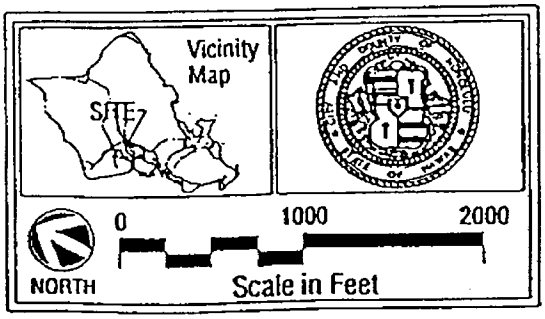
Reference:

Report No. Z-73

Resolution No.

99-359, CD1





LOCATION MAP

LEEWARD COMMUNITY COLLEGE

TAX MAP KEY(S): 9-6-003: 048

FOLDER NO.: 1999/PRU-1

Exhibit 1

Prepared By: Department of Planning & Permitting
City & County of Honolulu

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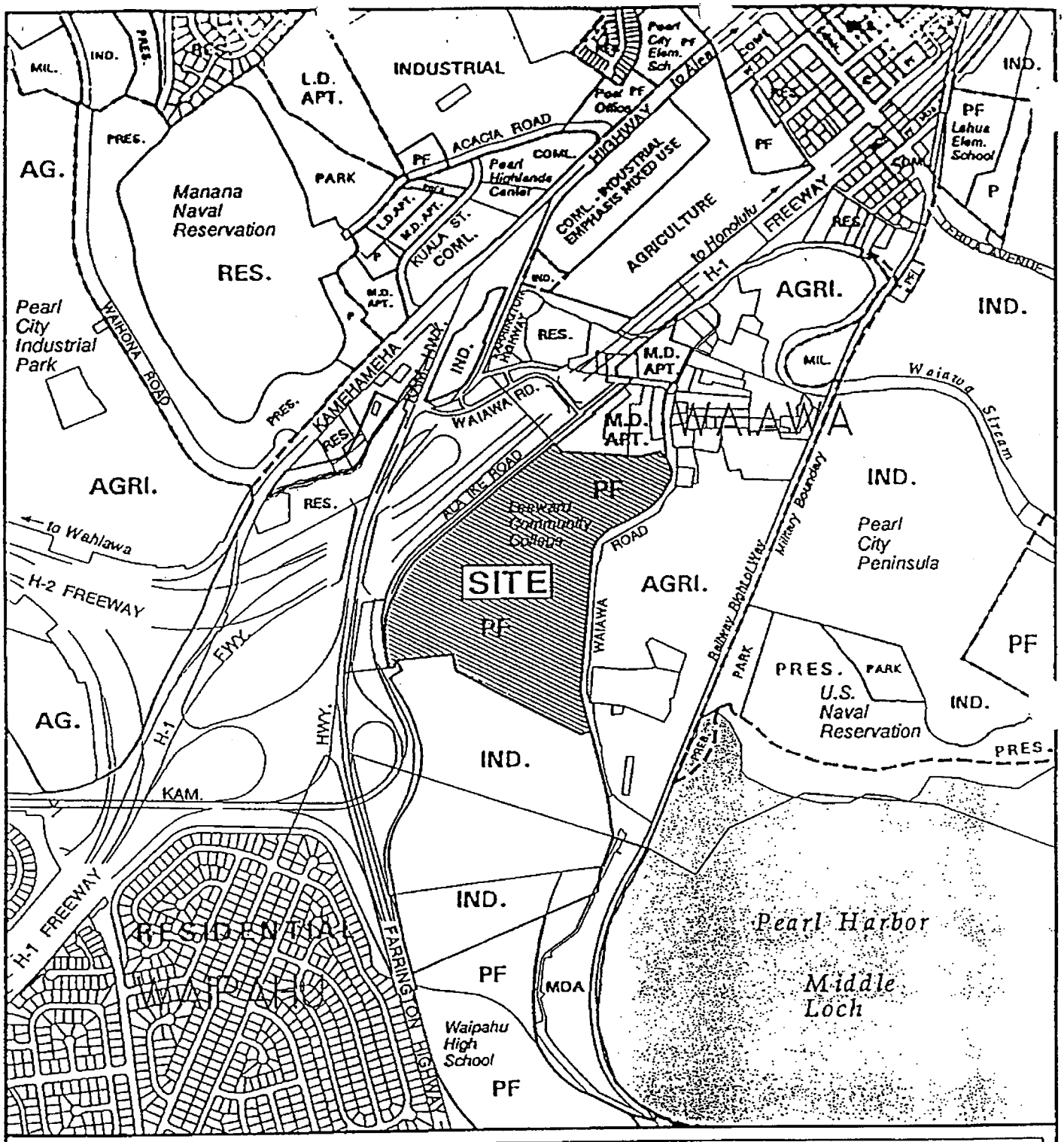
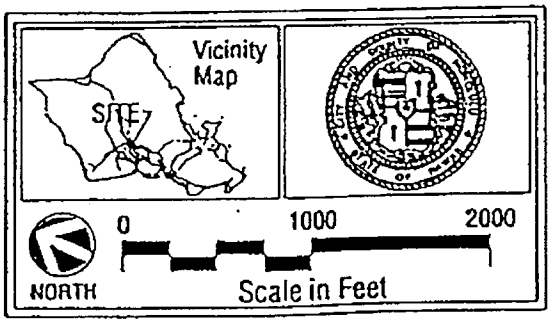
Date Prepared: August 1999





PORTION OF CENTRAL OAHU DEVELOPMENT PLAN LAND USE MAP

TAX MAP KEY(S): 9-6-003: 048

FOLDER NO.: 1999/PRU-1

Exhibit 2

Prepared By: Department of Planning & Permitting
City & County of Honolulu

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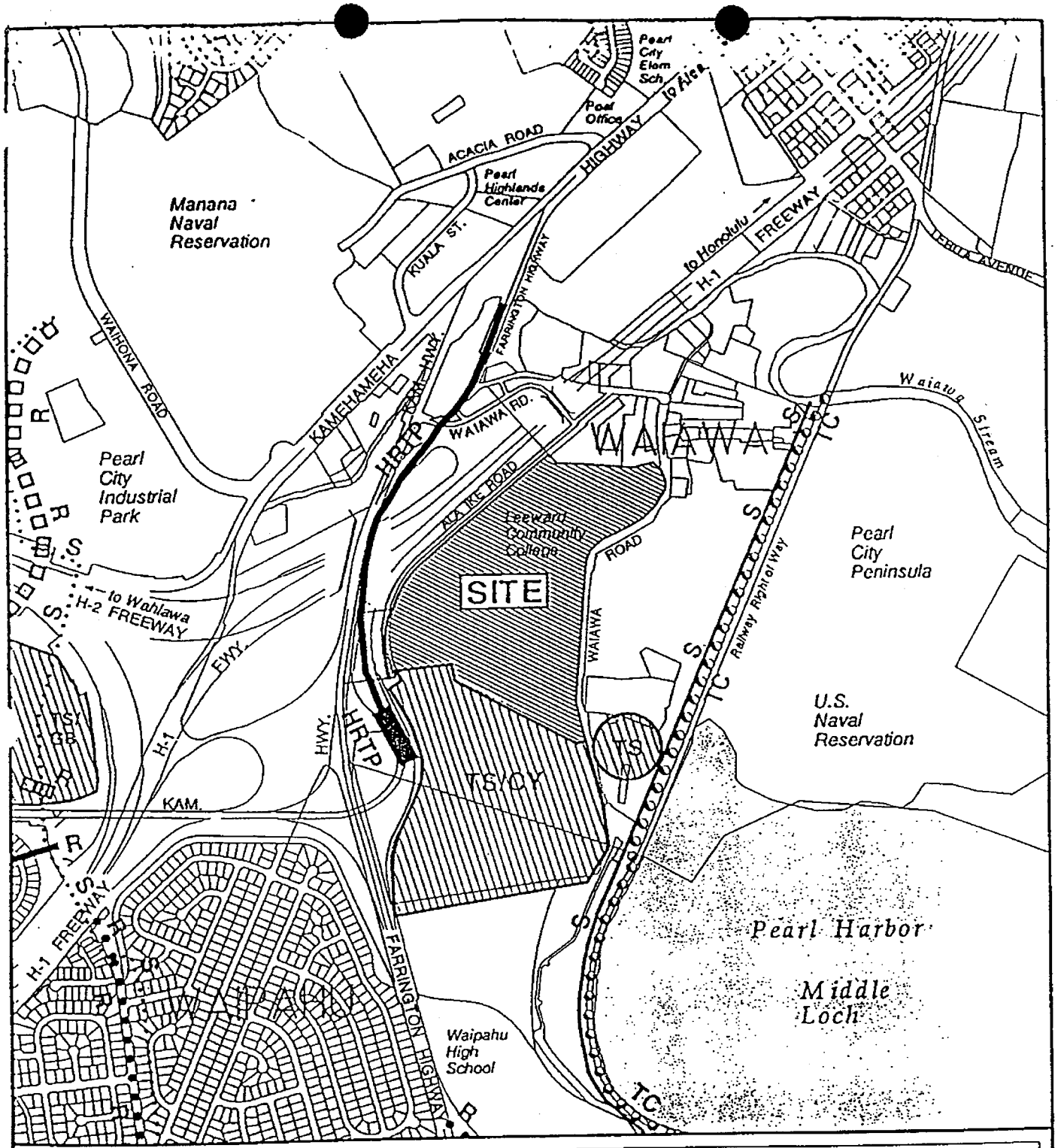
Date Prepared: August 1999



PORTION OF CENTRAL OAHU DEVELOPMENT PLAN PUBLIC FACILITIES MAP

TAX MAP KEY(S): 9-6-003: 048

FOLDER NO.: 1999/PRU-1

Exhibit 3

Prepared By: Department of Planning & Permitting
City & County of Honolulu

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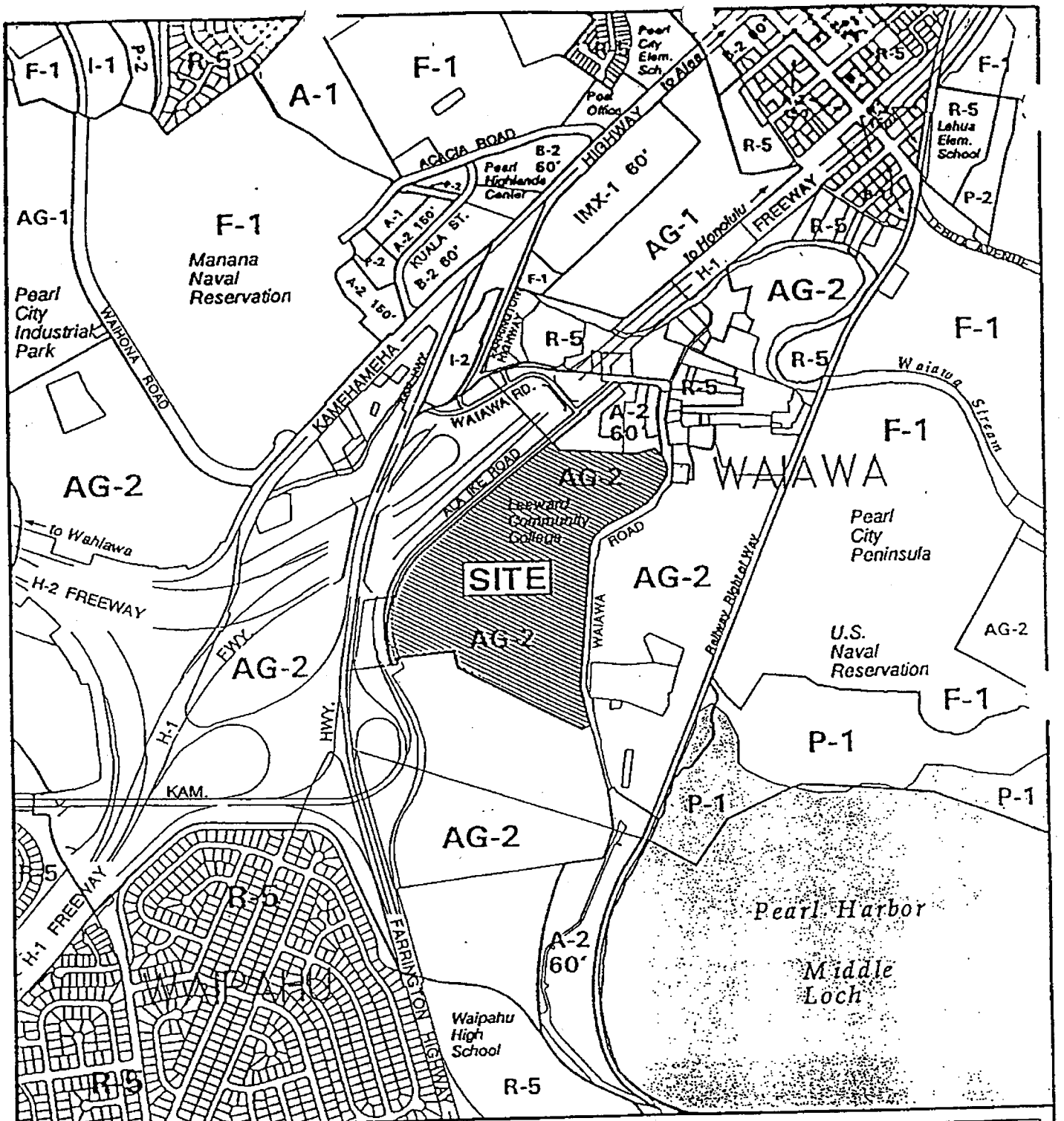
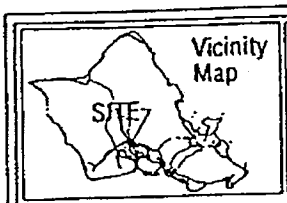
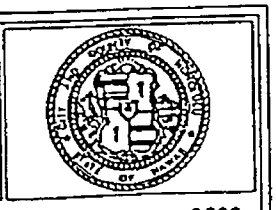
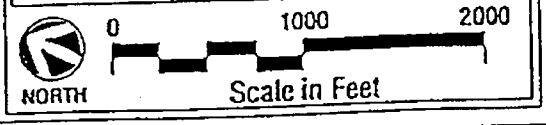
Date Prepared: August 1999









PORTION OF WAIPAHU-PEARL CITY
EXISTING ZONING MAP

TAX MAP KEY(S): 9-6-003: 048

Exhibit 4

FOLDER NO.: 1999/PRU-1

Prepared By: Department of Planning & Permitting
City & County of Honolulu

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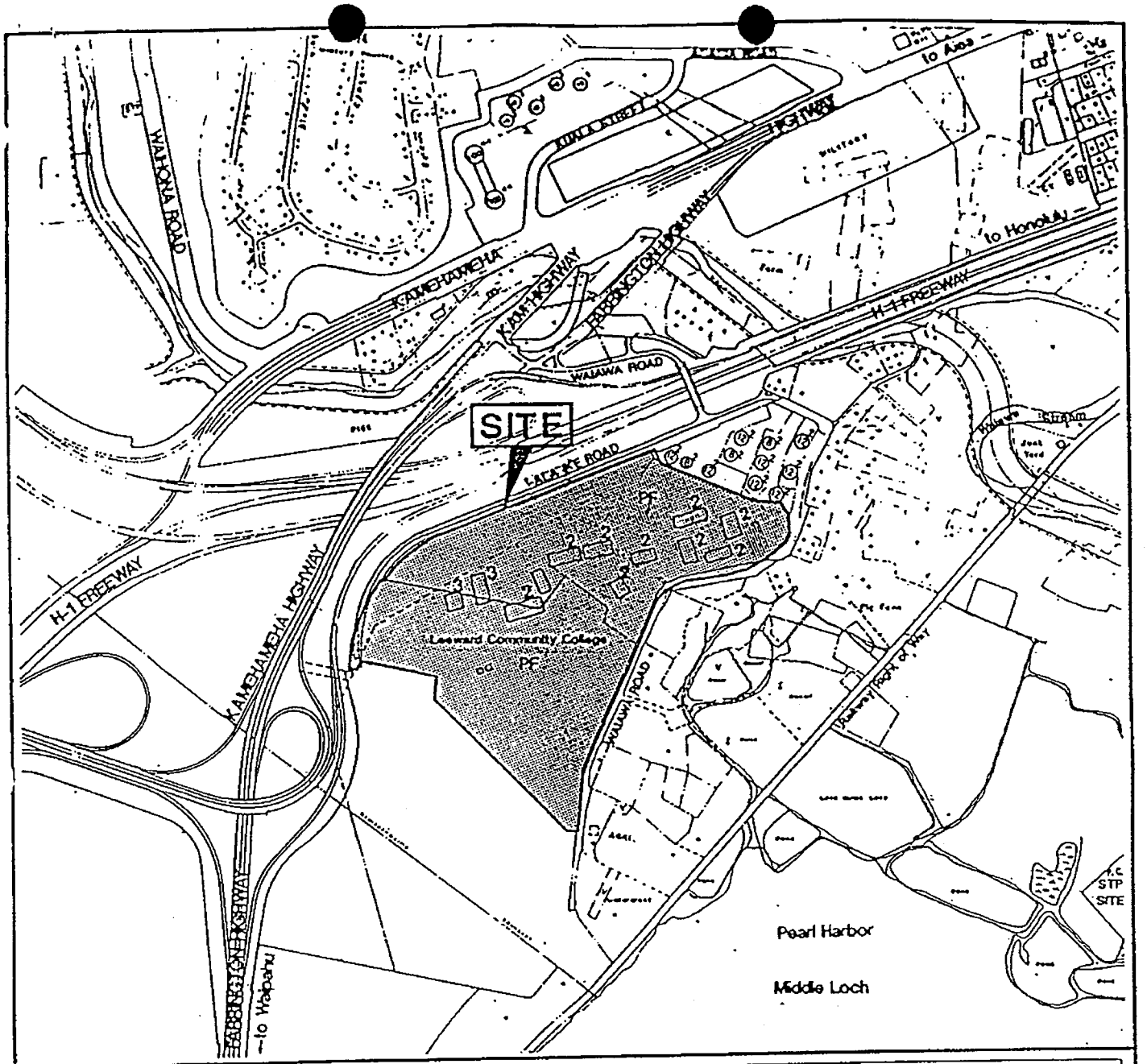
Date Prepared: August 1999



LEGEND

•	RESIDENTIAL SINGLE-FAMILY	QP	QUASI-PUBLIC FACILITIES
✓	TWO-FAMILY	P	PARKS & RECREATION
5	MULTI-FAMILY	+ CEM.	CEMETERY
52	MOTEL & HOTEL		TRANSPORTATION
C	COMMERCIAL		UTILITIES
I	INDUSTRIAL		MILITARY
	AGRICULTURAL	V	VACANT
PF	PUBLIC FACILITIES	UC	UNDER CONSTRUCTION

PORTION OF WAIAWA - PEARL CITY

EXISTING LAND USE MAP

TAX MAP KEY(S): 9-6-003: 048

FOLDER NO.: 1999/PRU-1

NORTH

0 800 1600

Scale in Feet

Prepared By: Department of Planning & Permitting
City & County of Honolulu

Date of Data: June 1994
Date Prepared: August 1999

Exhibit 5

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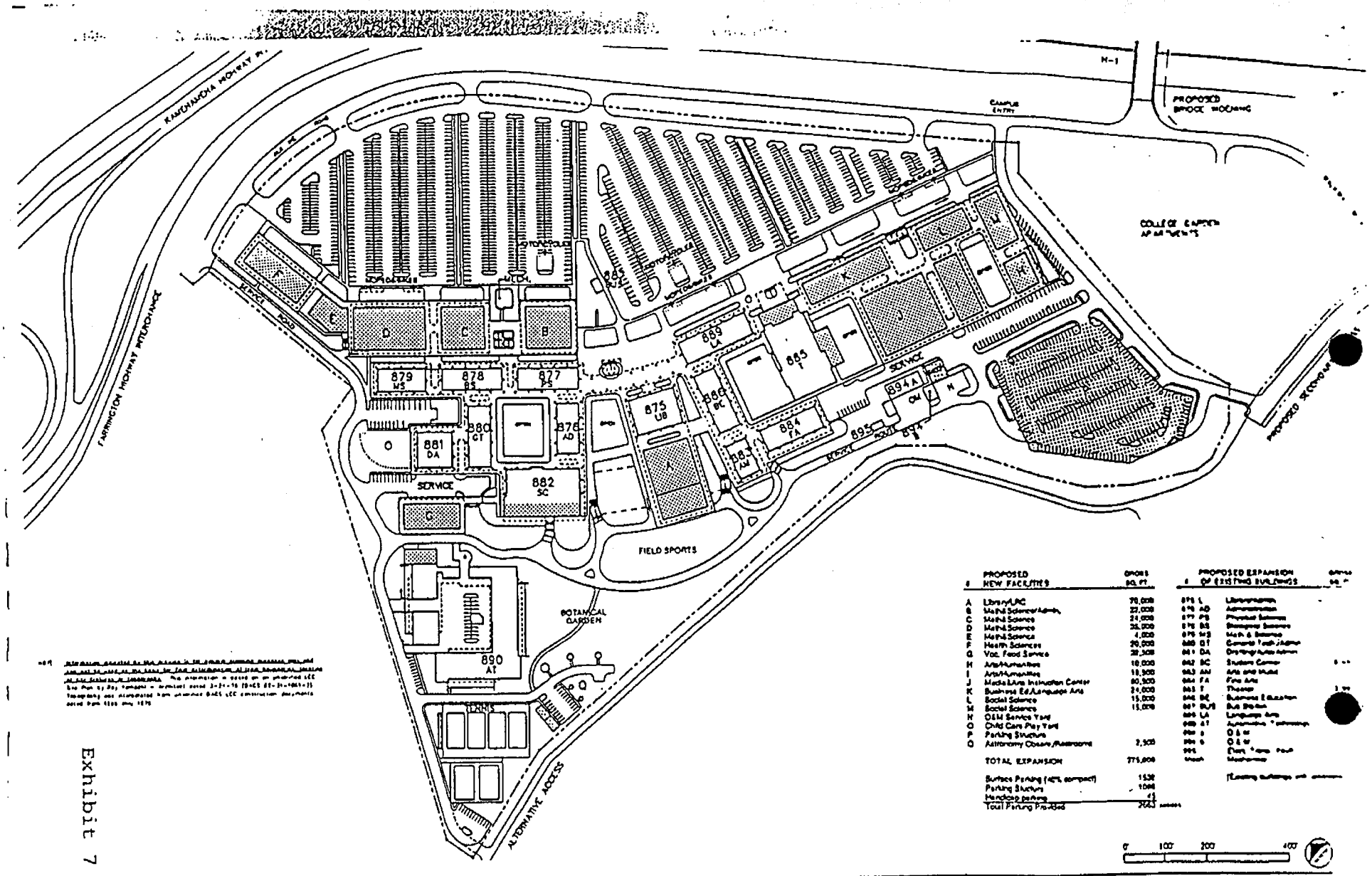
Table 3-2
COMPARATIVE SUMMARY OF EXISTING AND FUTURE SPACE REQUIREMENTS

Programs at 5,000 FTE	TOTAL ASF	%	Existing Sq.ft. util.	Additional Sq. Ft. Needed	%	% Increase Over Exist. Sq. Ft.
1.0 INSTRUCTIONAL	286,659	61%	153,258	133,401	59%	87%
1.1 PASS	4,602		4,106	494		12%
1.2 Arts and Humanities	58,617		20,753	37,864		182%
1.2. *Art-Visual*	*14,640*					
1.2. *Dance*	*5,250*					
1.2. *Drama*	*3,600*					
1.2. *Music*	*19,870*					
1.2. *Division*	*15,257*					
1.3 Business Education	21,570		14,603	6,967		48%
1.4 Language Arts	22,718		13,349	9,369		70%
1.5 Math and Sciences	82,698		34,263	48,435		141%
1.5. *Physics/Eng.*	*6,956*					
1.5. *Bio Science*	*20,442*					
1.5. *Info & Computer Sci.*	*15,020*					
1.5. *Chemistry*	*10,650*					
1.5. *Math*	*15,518*					
1.5. *Earth Sci.*	*9,344*					
1.5. *Division*	*4,768*					
1.6 Social Sciences Division	17,894		7,499	10,395		139%
1.7 Vocational-Technical	66,552		58,683	7,869		13%
1.7. *Food Services*	*19,572*		*9,936*	*9,636*		
1.7. *Automotive Tech.*	*34,871*		*33,384*	*1,487*		
1.7. *Drafting Tech.*	*7,527*		*7,598*	*-71*		
1.7. *TV Production*	*2,250*		*1,250*	*1,000*		
1.7. *Div.*	*2,332*		*1,918*	*414*		
Graphic Arts	*0*		*4,597*	*-4,597*		*out*
1.8 Health Sciences	12,008		0	12,008		*new*
2.0 COMMUNITY SERVICES	41,799	9%	20,080	18,810	8%	94%
2.1 Dir of Community Svcs.	3,492		1,324	2,168		164%
2.2 Theatre ***	29,407		18,756			41%
House operations	*19,775*		*16,866*			
*Adm., lobby, misc.****	*9,632*		*1,890*	*7,742*		
2.3 Media&Arts Instruct. Ctr.	8,900		0	8,900		*new*
3.0 ACADEMIC SUPPORT	76,240	16%	31,370	44,870	20%	143%
3.1 Educational Media Ctr.	11,798		7,841	3,957		50%
3.1.- *Divison*	*5,698*					
3.1. *TV Facility*	*6,100*					
3.2 Library	45,840		18,345	27,495		150%
3.3 Learning Resource Center	12,546		3,565	8,981		252%
3.4 Student Assessment	2,190		226	1,964		869%
3.5 Curriculum Resource Ctr	1,232		375	857		229%
3.6 Dean of Instructional Svcs	2,634		1,018	1,616		159%
4.0 STUDENT SERVICES	30,091	6%	15,330	14,761	7%	96%
4.1 Enrollment Services	7,692		1,951	5,741		294%
4.2 Counseling	6,776		3,230	3,546		110%
4.3 Student Life	10,719		8,381	2,338		28%
4.4 Campus Health Center	896		326	570		175%
4.5 Child Care	2,724		1,200	1,524		127%
4.6 Dean of Student Services	1,284		242	1,042		431%
5.0 INSTITUTIONAL SUPPORT	34,685	7%	19,238	15,447	7%	80%
5.1 Office of the Provost	2,460		1,480	980		66%
5.2 Administrative Services	32,225		17,758	14,467		81%
5.2. *Dir. of Adm./Personnel*	*984*		*804*	*180*		
5.2. *Business Office*	*2,616*		*2,222*	*394*		
5.2. *Aux. Serv. (OM)*	*7,140*		*6,813*	*327*		
5.2. *Computer Center*	*2,428*		*875*	*1,553*		
5.2. *Bookstore*	*6,257*		*3,560*	*2,697*		
5.2. *Cafeteria*	*12,800*		*3,484*	*9,316*		
UHWO	0		2,820	-2,820	-1%	out
TOTALS (ASF) 60%	469,474	100%	242,096	224,469	100%	93%
Total (Estimated NA) 40%	312,983		165,743	150,149		
Total (Estimated Gross)	782,457		407,839	374,618		

Note:
1) ASF = Assigned Square Feet
2) ***This space is the only portion of the Theater with exterior expansion area.

Exhibit 6



#	PROPOSED NEW FACILITIES	GROSS SQ. FT.
A	Library/LRC	78,000
B	Math & Science/Admin.	22,000
C	Math & Science	24,000
D	Math & Science	26,000
E	Math & Science	4,000
F	Health Sciences	20,000
G	Voc. Food Service	28,300
H	Arts/Humanities	18,000
I	Arts/Humanities	18,900
J	Media Live Instruction Center	60,500
K	Business Ed./Language Arts	24,000
L	Social Science	15,000
M	Social Science	15,000
N	O&M Service Yard	
O	Child Care Play Yard	
P	Parking Structure	
Q	Astronomy Observ./Restrooms	2,500
	TOTAL EXPANSION	275,000
	Surface Parking (40% compact)	1530
	Parking Structure	1066
	Handicap parking	45
	Total Parking Provided	2641

#	PROPOSED EXPANSION OF EXISTING BUILDINGS	GROSS SQ. FT.
875	L	Library/Media
876	AD	Administration
877	PS	Physical Sciences
878	BS	Biological Sciences
879	MS	Math & Sciences
880	CT	Cosmetology/Barber
881	DA	Drafting/Auto Mechanics
882	SC	Student Center
883	AM	Arts and Music
884	FA	Fine Arts
885	T	Theater
886	BC	Business Education
887	BUS	Bus Station
888	LA	Language Arts
889	AT	Automotive Technology
890	1	Old W
890	2	Old W
891		Dent. Hygiene Food
		Mechanics

(Existing buildings with additions)

Exhibit 7

Figure 5

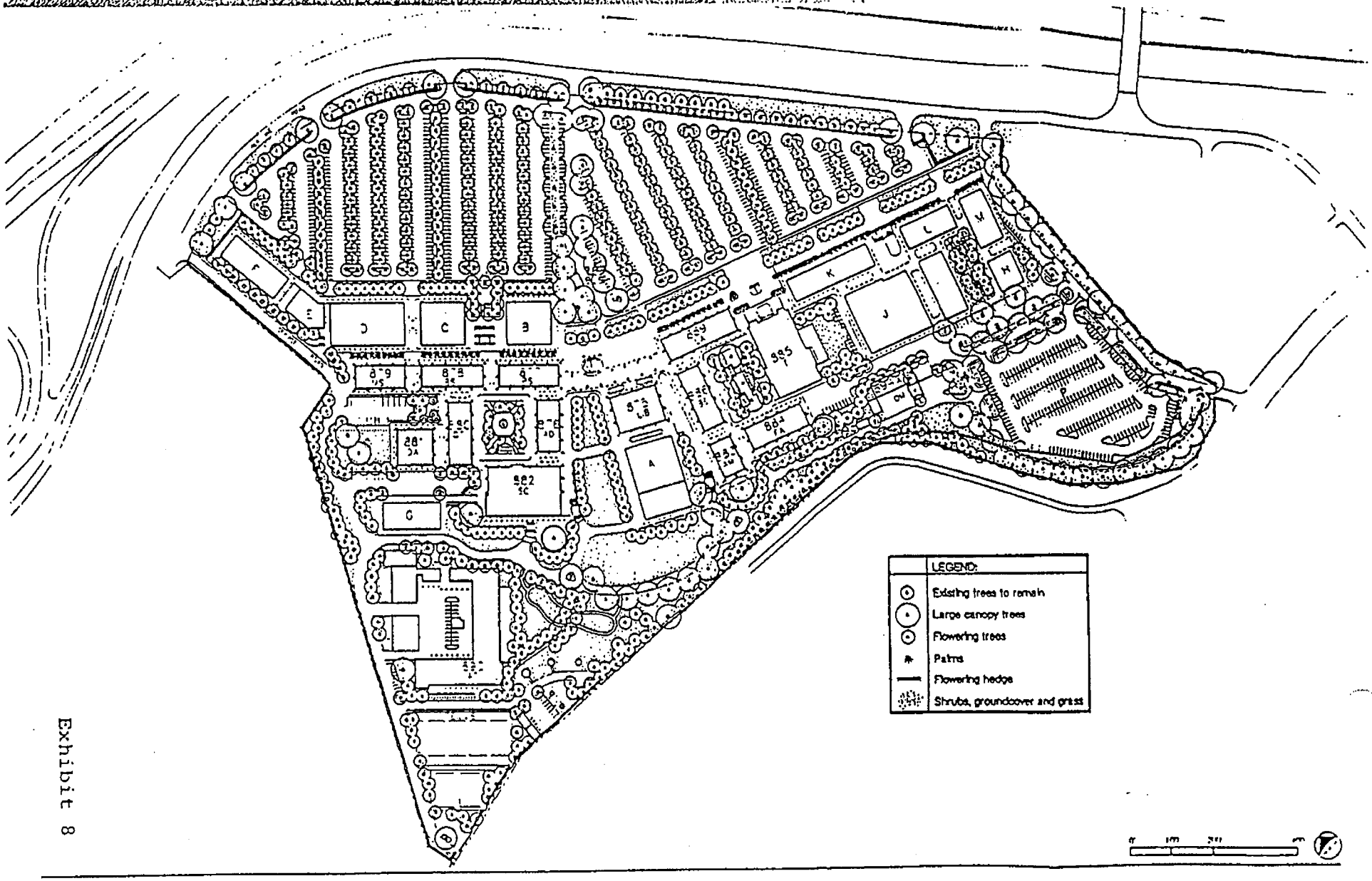


Exhibit 8

Leeward Community College Master Plan

Ultimate Landscape Plan

GROUP 70

REPORT OF THE COMMITTEE ON ZONING

John DeSoto, Chair; Andy Mirikitani, Vice-Chair
Duke Bainum, John Henry Felix, Rene Mansho, Members

00 FEB -7 PM 12:45

DEPT OF PLANNING and PERMITTING CITY & COUNTY OF HONOLULU

Committee Meeting Held
January 11, 2000

Honorable Jon C. Yoshimura
Chair, City Council
City and County of Honolulu

Mr. Chair:

Your Committee on Zoning, to which was referred Resolution 99-359 entitled:

"RESOLUTION APPROVING A PLAN REVIEW USE APPLICATION SUBMITTED BY THE UNIVERSITY OF HAWAII FACILITIES PLANNING OFFICE FOR COMMUNITY COLLEGES, FOR THE LEEWARD COMMUNITY COLLEGE FACILITY, THIRTY-YEAR MASTER PLAN TO ALLOW THE CONSTRUCTION OF NEW SCHOOL FACILITIES, EXPANSION AND INTERIOR RENOVATIONS TO EXISTING BUILDINGS, AND UPGRADING OF INFRASTRUCTURE IMPROVEMENTS,"

as transmitted by Departmental Communication No. 1097 from the Department of Planning and Permitting (DPP), dated November 23, 1999, reports as follows:

The purpose of Resolution 99-359 is to grant to the University of Hawaii Facilities Planning Office for Community Colleges approval of a Plan Review Use (PRU) for construction of new school facilities, expansion and interior renovations to existing buildings and upgrading of infrastructure improvements for the Leeward Community College (LCC) in Pearl City.

Your Committee finds that the proposed use is subject to the PRU provisions of the City's Land Use Ordinance, ROH Section 21-2.120 et seq.

Your Committee notes that the DPP recommends approval of the PRU subject to the following conditions contained in the resolution:

1. Prior to the issuance of grading or building permits, the Applicant shall submit to the Director of the Department of Planning and Permitting, for review and approval, revised site plans showing the dimensions and location of the 10 required loading spaces.

   Upon approval, development of the site shall be in general conformance with said plans, and the plans on file with the Department of Planning and Permitting labeled "Leeward Community College Long-Range Development Plan" dated December 1995, and as described in the Director's Report (Departmental Communication No. ___. The Director of Planning and Permitting may approve minor or non-substantive deviations.

2. Prior to the Year 2017, the Applicant shall submit to the DPP documentation that a secondary vehicle access to the Leeward Community College campus has been selected and funded by the State. In the event a secondary vehicle access is not funded by the Year 2017, no further expansion of the Leeward Community College will be permitted.

3. Standard condition concerning governmental approvals.

4. As may be required by the Director of Planning and Permitting for the review of grading and/or building permits, the Applicant shall submit reports updating the Applicant's status in complying with applicable conditions of this PRU.

On January 12, 2000, representatives of the Applicant provided the following information about the project to your Committee.

1. Overview. The LCC has been operating since 1968, and most construction on the LCC was finished in 1979. In 1996, the University of Hawaii approved an update to the LCC's Master Plan. The purpose of that plan is to accommodate a maximum student body of 5,000 full-time students; the LCC now has approximately 4,000 full-time and 1,800 part-time students. Accessibility for persons with disabilities is also a major purpose of the project. New construction will be done in the style of the existing buildings in order to implement the architectural style of the campus. The project will be constructed in phases over a 30-year period due to the financial condition of the State.

2. Parking and landscaping. Parking will be increased to meet the demand generated by the larger number of students the project will bring to the LCC. Further, existing stalls will be restriped to increase the amount of parking available. The project will include more intensive parking lot landscaping.

3. Traffic. The only access to the LCC now is by Waiawa Road, a two-lane, two-way State road that crosses the H-1 Freeway. Waiawa Road intersects with Ala Ike Road, which is a two-lane, two-way State road that runs parallel to the H-1 Freeway along the LCC's northern boundary. Waiawa Road is congested during end-of-class periods when many students leave the campus. In Departmental Communication No. 1097 (1999), the DPP reported the project can be accommodated through the Year 2017 with improvements and widening to Ala Ike and Waiawa Roads. But a secondary access road will be needed after 2017 (see the DPP's proposed Condition 2).

A representative of the Applicant stated the Applicant conducted a study that recommended expanding Waiawa and Ala Ike Roads to four lanes and widening the Waiawa Bridge. The State Legislature has not yet appropriated funds for these roadway improvements. The Applicant's representative stated that the Applicant will commit to working with the State Department of Transportation to ensure the improvements to Waiawa and Ala Ike Roads are made a priority.

4. Water and lighting. A Councilmember reported the City is constructing a line for recycled water close to the LCC's property line, and asked if it would be possible for the LCC to use reclaimed water if it were available. A representative of the Applicant stated the project will include upgrades to the LCC's irrigation system, but that that system has not yet been designed. The representative said it is possible the Applicant may use recycled water to irrigate the LCC. Your Committee will consider amending Resolution 99-359 before its adoption by the Council to require the LCC to use reclaimed water in its irrigation system.

   To help protect surrounding uses from any negative lighting impacts generated by the project, your Committee will also consider amending the resolution before its adoption to require the project to use low-pressure sodium lighting with full-cut off fixtures.

Based upon the recommendations of the Director of Planning and Permitting and upon information received to date, the Zoning Committee finds that the Thirty-Year Master Plan proposed by the Applicant appears to be consistent with the General Plan and Development Plan of the City and in the best interests of the people of the City and County of Honolulu. Your Committee further finds that the siting of structures and the landscaping, screening and buffering of the proposed use would

mitigate objectionable aspects of the use and potential incompatibility of the use with surrounding uses. Your Committee expects to obtain further public input at the Public Hearing to be held on this resolution in accordance with law.

Your Committee on Zoning recommends that Resolution 99-359 be scheduled for public hearing as required by ROH Section 21-2.70(a), and be referred back to Committee. (Ayes: DeSoto, Felix, Mansho, Mirikitani - 4; Noes: None; Excused: Bainum - 1.)

Respectfully submitted,

Committee Chair

99 NOV 30 PM 2:25

OCS/MARIEBEL

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

DEPT. OF PLANNING & PERMITTING C & C OF HONOLULU

No. 99-359

RESOLUTION

APPROVING A PLAN REVIEW USE APPLICATION SUBMITTED BY THE UNIVERSITY OF HAWAII FACILITIES PLANNING OFFICE FOR COMMUNITY COLLEGES, FOR THE LEEWARD COMMUNITY COLLEGE FACILITY, THIRTY-YEAR MASTER PLAN TO ALLOW THE CONSTRUCTION OF NEW SCHOOL FACILITIES, EXPANSION AND INTERIOR RENOVATIONS TO EXISTING BUILDINGS, AND UPGRADING OF INFRASTRUCTURE IMPROVEMENTS.

WHEREAS, in accordance with the Land Use Ordinance, Sections 21-2.40-2 and 21-2.120, the University of Hawaii Facilities Planning Office for Community Colleges, herein referred to as the Applicant, has applied for a Plan Review Use to allow the construction of new school facilities, expansion and interior renovations to existing buildings, and upgrading of infrastructure improvements for the Leeward Community College facility in the A-2 General Agricultural District located in Waiawa, Oahu, Hawaii, also identified as Tax Map Key 9-6-003: 048.

WHEREAS, the City Council held a public hearing on _____, to consider said application for a Plan Review Use; and

WHEREAS, on _____, the City Council, having duly considered all of the evidence and reports offered at said public hearing, recommended approval of the subject application for a Plan Review Use with certain conditions enumerated below; now therefore,

BE IT RESOLVED by the Council of the City and County of Honolulu that a Plan Review Use be issued to the Applicant under the following conditions:

1. Prior to the issuance of grading or building permits, the applicant shall submit to the Director of the Department of Planning and Permitting, for review and approval, revised site plans showing the dimensions and location of the 10 required loading spaces.

   Upon approval, development of the site shall be in general conformance with said plans, and the plans on file with the Department of Planning and Permitting labeled "Leeward Community College Long Range Development Plan" dated December 1995, and as described in the Director's Report (Departmental Communication No. ____. The Director of Planning and Permitting may approve minor or non-substantive deviations.

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2

RESOLUTION

2. Prior to the Year 2017, the applicant shall submit to the DPP documentation that a secondary vehicle access to the Leeward Community College campus has been selected and funded by the State. In the event a secondary vehicle access is not funded by the Year 2017, no further expansion of the Leeward Community College will be permitted.

3. The Applicant shall obtain all other governmental approvals or permits which may be required for the proposed project.

4. As may be required by the Director of Planning and Permitting for the review of grading and/or building permits, the Applicant shall submit reports updating the Applicant's status in complying with applicable conditions of this PRU.

RESOLUTION

BE IT FINALLY RESOLVED by the Council of the City and County of Honolulu that the Clerk be, and he is, hereby directed to transmit copies of this resolution to the Director of the Department of Planning and Permitting; the Director of the Department of Transportation Services; the Director of Department of Design and Construction; the Director of the State Department of Transportation; the University of Hawaii Facilities Planning Office for Community Colleges; George I. Atta, Group 70 International, Inc., 925 Bethel Street, 5th Floor, Honolulu, Hawaii 96813.

INTRODUCED BY:

Rene Mansho (BR)

DATE OF INTRODUCTION:

November 24, 1999
Honolulu, Hawaii

Councilmembers

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

I hereby certify that the foregoing RESOLUTION was adopted by the COUNCIL OF THE CITY AND COUNTY OF HONOLULU on the date and by the vote indicated to the right.

ATTEST:

GENEVIEVE G. WONG
City Clerk

JON C. YOSHIMURA
CHAIR AND PRESIDING OFFICER

Dated _____

ADOPTED MEETING HELD			
	AYE	NO	A/E
BAINUM			
DeSOTO			
FELIX			
HANNEMANN			
HOLMES			
KIM			
MANSHO			
MIRIKITANI			
YOSHIMURA			

Reference: D 1097

Report No.

Resolution No.

99-359

APPENDIX C

TRAFFIC IMPACT ASSESSMENT REPORT

TRAFFIC EVALUATION

Leeward Community College Educational and Innovation Instructional Facility: A Learning Community

Pearl City, Oahu, Hawaii

December 2009

Revised March 2010

Over a Century of Engineering Excellence

TRAFFIC EVALUATION

Leeward Community College

Educational and Innovation Instructional Facility:

A Learning Community

Pearl City, Oahu, Hawaii

December 2009

Revised March 2010

Prepared for:

Urban Works
831 Pohukaina Street, Suite E1
Honolulu, Hawaii 96813

Prepared by:

PB Americas, Inc.
American Savings Bank Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813
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PBQD Reference Number:
16503A

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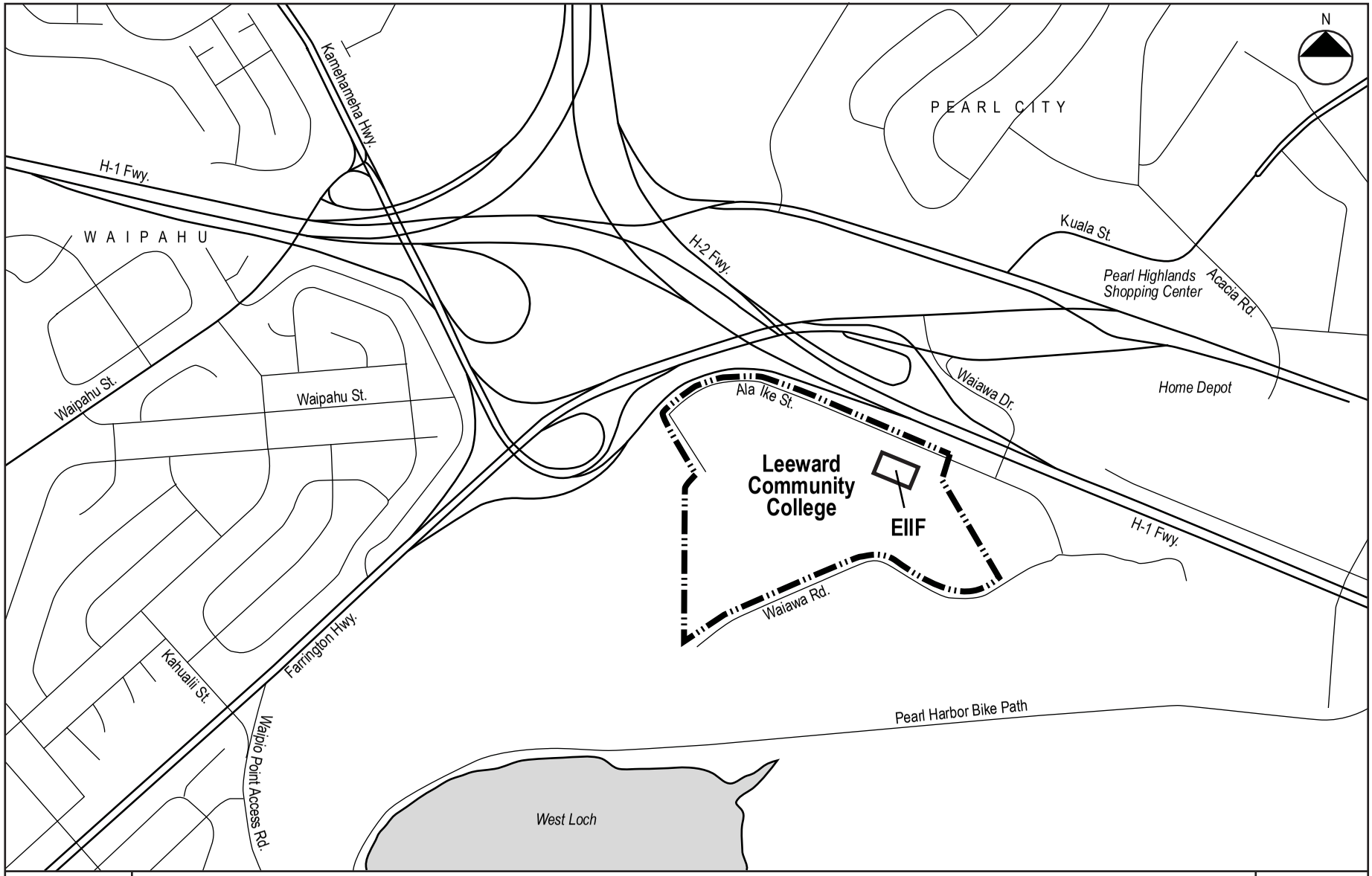
I. INTRODUCTION

The Leeward Community College "Educational and Innovation Instructional Facility (LCC EIIF): A Learning Community" is planned to be constructed on the eastern end of the current Leeward Community College campus by the year 2015 as shown in Figure 1. The LCC EIIF will be located where currently the University of Hawaii, West Oahu (UHWO) campus has its portable facilities. These facilities are scheduled to be removed by the groundbreaking for the LCC EIIF as UHWO will move to its new location in East Kapolei.

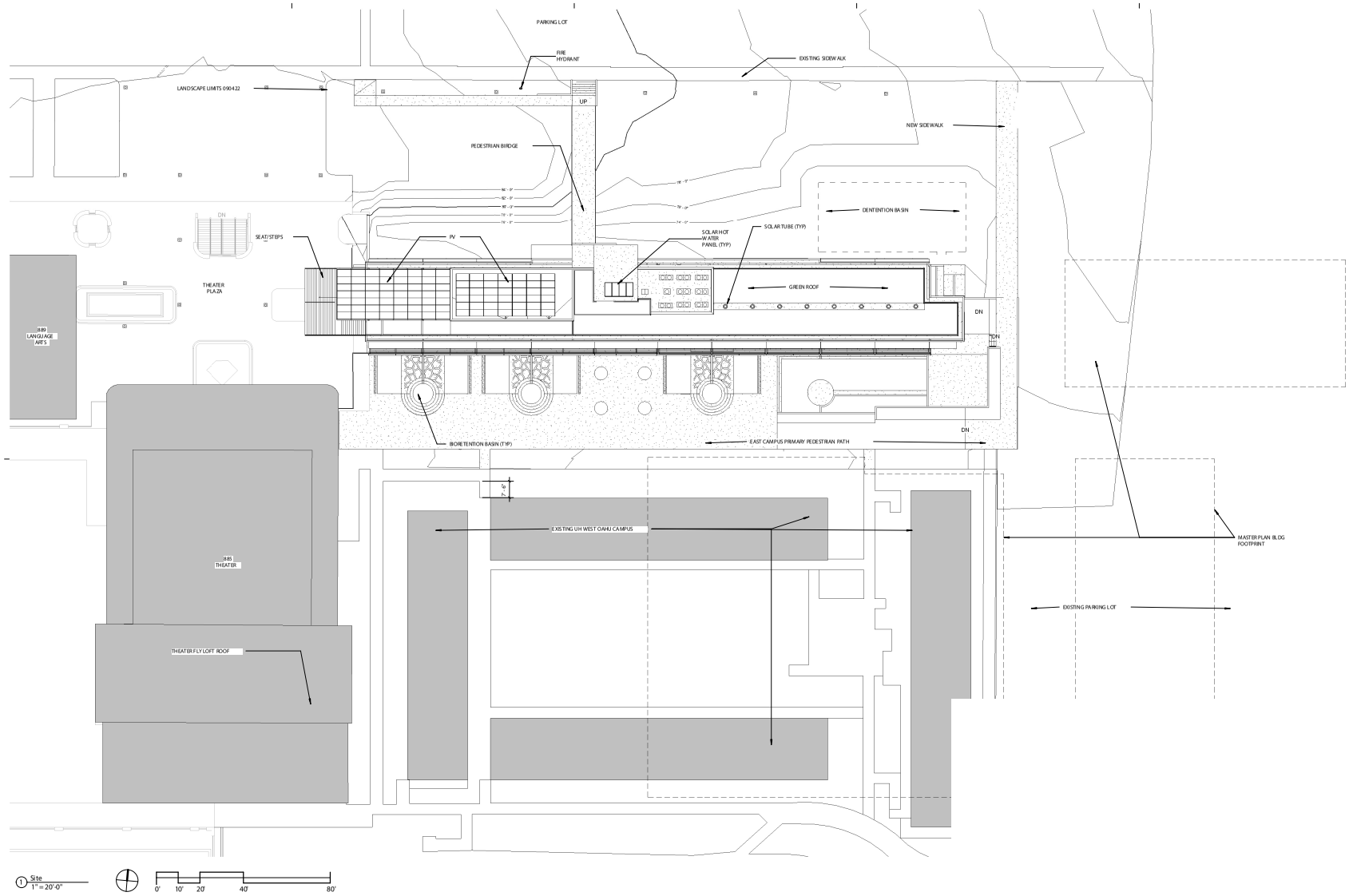
Figure 2 shows the site plan. The new educational facility will be connected to LCC's Theater Plaza via a newly constructed staircase. The new facility will also be connected to the eastern portion of LCC's parking lot via a pedestrian bridge. A pedestrian path, running west-to-east, will connect to the rest of the campus. Along this pathway, bioretention basins will be utilized. A green roof is also planned as part of an environmentally-conscious design strategy.

The LCC EIIF will host over 18,328 square feet of space: 2,042 square feet will be dedicated to a Teacher Education Office Suite; 2,094 square feet to a Teacher Education/Home Away from Home space, including a case study/seminar room and a classroom; 9,925 square feet to Common and Shared Spaces, including a conference room, student resource center, and approximately nine classrooms; and 4,265 square feet to non-assignable spaces, including: restrooms, stairwells, lobby areas, janitorial maintenance rooms, etc.



AREA MAP

Figure 1



SITE PLAN

Figure 2

II. EXISTING CONDITIONS

A. Existing Land Use

Leeward Community College currently sits on a parcel of land just makai of the Waiawa Freeway Interchange which accommodates the H-1 Freeway, H-2 Freeway, Farrington Highway and Kamehameha Highway. Much of the surrounding land is State of Hawaii Department of Transportation Right-of-Way and is designated by the City as an AG-2 Agriculture – General use.

There is a small cluster of homes in-between Farrington Highway and Kamehameha Highway known as the "banana patch" and this area is designated as R-5 (Residential) use.

Adjacent to Waiawa Drive (to the east), in-between Farrington Highway west-bound (WB) and Farrington Highway is the Benjamin "Ben" Saguibo Laborers' Apprenticeship & Training Center. This facility is on an I-2 Industrial intensive use-designated parcel.

East of Leeward Community College, on Kamehameha Highway, business uses begin to abound along the Kamehameha Highway corridor in Pearl City. The Pearl Highlands Shopping Center, just West of Acacia Road, is in a B-2 (Business – Community) land use district. Home Depot, just mauka of the shopping center, is in an IMX-1 (Industrial-Commercial Mixed Use) land use district. The Wal-Mart and additional shopping center areas mauka of the Pearl Highlands Shopping Center are also in an IMX-1 district.

B. Existing Roadway Network

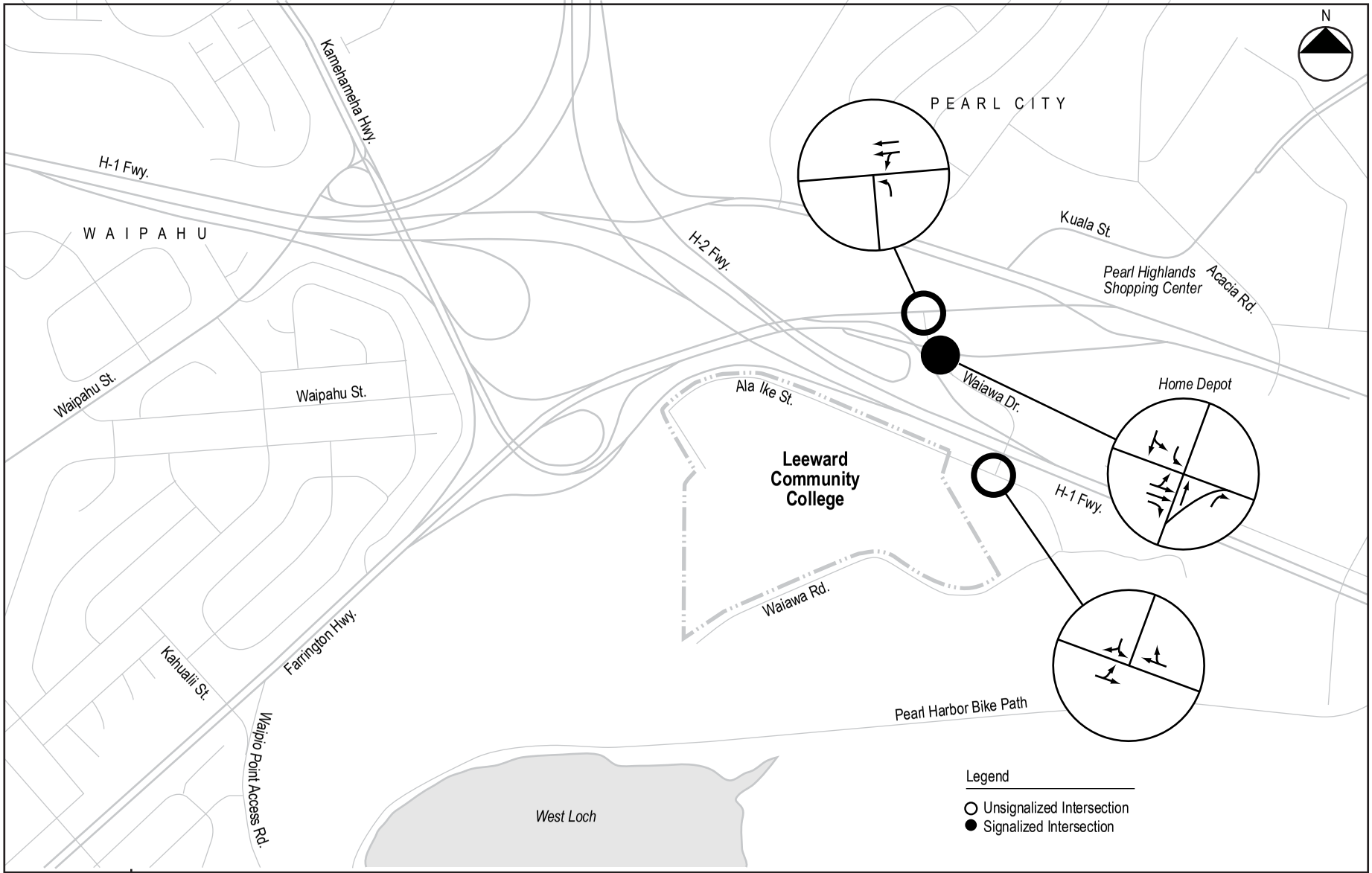
LCC has no direct access to H-1 Freeway, H-2 Freeway, or Kamehameha Highway. The following is a breakdown of the roadways most pertinent to the project site:

Farrington Highway is a State Principal Arterial Highway that connects Central Oahu to West Oahu. The division and grade separation of the divided highway is quite pronounced in the vicinity of LCC. Farrington Highway connects to Kamehameha Highway in the vicinity of Pearl Highlands Shopping Center. The posted speed limit on the WB side is 35 mph and 30 mph on the east-bound (EB) side in the vicinity of LCC. Farrington Highway (WB) and Waiawa Drive form a stop-controlled intersection and Farrington Highway (EB) and Waiawa Drive form a signalized intersection.

Ala Ike Street is the two-lane local road that provides the sole access to the LCC campus. Ala Ike Street acts as a spine that collects vehicles from LCC's parking lot. Ala Ike Street runs in an west-east orientation, running parallel with the H-1 Freeway and then connecting the residential neighborhood east and makai of LCC to the Waiawa Drive Overpass. Ala Ike Street has curb and gutter and sidewalk improvements on its western and curb and gutter for half of its length on the eastern side. It ends in a cul-de-sac roughly 720 feet makai of the Waiawa Drive Overpass. Two AC pavement, unstriped, single lane roads radiate off of the cul-de-sac and lead to further residential areas. The western leg that projects from the cul-de-sac carries west-bound and defines the makai border of LCC. However, there does not appear to be any connectivity to LCC via this makai portion of roadway. No speed limit signs are posted on Ala Ike Street.

Waiawa Drive is a two-lane collector road that provides access over the H-1 Freeway via the Waiawa Drive Overpass which emanates from a T-intersection with Ala Ike Street and heads mauka of the LCC campus. The EB and WB approaches of Ala Ike Street are stop-controlled at this T-intersection. At its mauka terminus, Waiawa Drive forms two separate intersections with Farrington Highway (approximately 220 feet apart). The makai-most intersection provides access to Farrington Highway EB and is signalized. The mauka-most intersection provides access to Farrington Highway WB with the NB Waiawa Drive approach being stop-controlled. The posted speed limit on Waiawa Drive is 25 mph.

Figure 3 illustrates the lane configurations and control types of the three intersections in the vicinity of LCC.



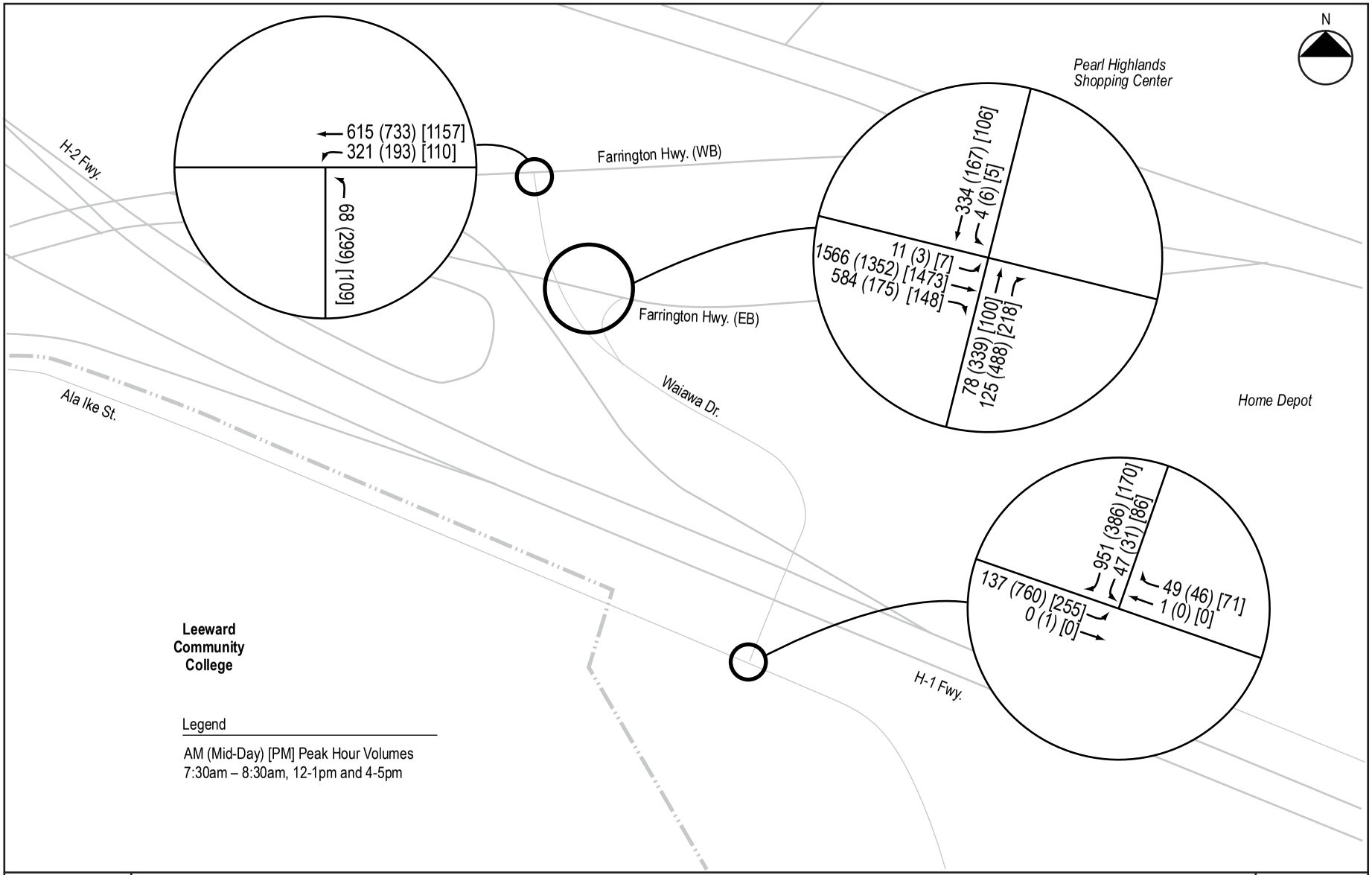
EXISTING INTERSECTIONS

Figure 3

C. Existing Traffic Volumes

Turning movement counts were recorded at the three intersections in the vicinity of LCC on October 28, 2009 and supplemented with counts taken in November 2007. These intersections were: Ala Ike Street and Waiawa Drive, Waiawa Drive and Farrington Highway (EB), and Waiawa Drive and Farrington Highway (WB). Data was collected from 7 a.m. to 9 a.m. and 11:30 a.m. to 1:30 p.m. The two-hour periods were selected after discussions with the LCC administrative staff and a review of the LCC schedule of classes revealed that traffic into and out of the campus would be heaviest at these times. Data from 3 p.m. to 6 p.m. was collected from November 2007. The peak hours were found to be: 7:30 a.m. to 8:30 a.m. in the morning, 12:00 p.m. to 1:00 p.m. in the afternoon, and 4:00 p.m. to 5:00 p.m. in the evening. Figure 4 illustrates the counts taken and collected and the peak hours for each time period. Appendix A includes all of the raw count data.

The EB traffic on Farrington Highway is heaviest in the AM peak period when townbound commuters use it as an alternative to the H-1 Freeway and students and faculty access it to attend morning classes at LCC. During the mid-day peak period, the EB traffic is still rather heavy, but the ingress movements to the campus are much lighter, creating fewer conflicting movements. However, the egress movements are very heavy as the students and faculty exit the campus after their classes. The EB vehicles queuing at the Ala Ike Street and Waiawa Drive intersection extend approximately 0.36 miles (to the westernmost LCC parking lot driveway), as vehicles leave en masse from the LCC parking lot at the end of mid-day classes. This situation occurs approximately three times during the normal weekday, at the end of the 10 a.m., 11 a.m., and noon classes. The noon time congestion was observed to be the worst.



EXISTING TRAFFIC VOLUMES

Figure
4

D. Existing Traffic Operations

The intersection Level of Service definitions are provided in Appendix B.

The three intersections of: Ala Ike Street and Waiawa Drive, Farrington Highway (EB) and Waiawa Drive, and Farrington Highway (WB) and Waiawa Drive were analyzed in regards to their peak hour control delay. The results can be found below in Table 1 and the complete Capacity Analysis Worksheets are available in Appendix C.

Table 1 Existing LOS and Delay

EXISTING	AM		Midday		PM	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Ike St and Waiawa Dr	**Unsignalized**					
EB Ala Ike Through-Left	D	25.4	F	250.3	C	20.9
WB Ala Ike Through-Right	A	9.1	A	9.1	A	9.2
SB Waiawa Left-Right	A	1.0	A	0.8	A	2.9
Farrington Hwy (EB) and Waiawa Dr	**B**	**18.8**	**C**	**28.7**	**B**	**14.3**
EB Farrington Left	B	15.9	A	19.0	B	12.0
EB Farrington Double Through	B	15.9	B	19.0	B	12.0
EB Farrington Right	B	11.7	B	10.6	A	6.2
NB Waiawa Through	C	26.7	C	24.9	C	22.7
NB Waiawa Right	C	28.0	E	67.2	C	27.6
SB Waiawa Left	C	25.4	B	19.2	C	21.2
SB Waiawa Through-Left	D	40.0	C	21.4	C	23.0
Farrington Hwy (WB) and Waiawa Dr	**Unsignalized**					
WB Farrington Through-Left	A	3.1	A	1.9	A	2.2
WB Farrington Through	A	3.1	A	3.1	A	2.2
NB Waiawa Left	E	38.4	F	154.2	D	28.3

Delay is expressed in seconds per vehicle

At the Ala Ike Street and Waiawa Drive intersection, the EB Ala Ike Through-Left Turn movement operates poorly during the mid-day peak hour (LOS F, 250.3 seconds of delay per vehicle). It reflects the queuing of vehicles leaving the LCC parking lot after mid-day classes are finished. The synchronization of class dismissals at LCC in the mid-day leads to the release of hundreds of outbound vehicles onto Ala Ike Street during short periods of time. Upon observation, it was determined that similar congested conditions occur around 11 a.m. and 1 p.m., as well.

This Farrington Highway (EB) and Waiawa Drive intersection operates at LOS B during the AM peak hour, LOS C during the Mid-day peak hour, and LOS B during the PM peak hour.

During the Mid-day peak hour, the NB Waiawa Drive left turn at the Farrington Highway (WB) and Waiawa Drive intersection experiences excessive delay (LOS F, 154.2 seconds of delay per vehicle) due to the lack of sufficient gaps in the Farrington Highway WB traffic and the increase in vehicles from LCC seeking these gaps. The WB Farrington Highway movements run free and therefore experience minimal control delay.

III. PROJECTED YEAR 2015 CONDITIONS WITHOUT PROJECT

By the year 2015, UHWO is anticipated to be relocated to East Kapolei. LCC's enrollment is projected to be 9,077, up 19% from the combined enrollment of LCC and UHWO in 2009.

The LCC community will be impacted by the construction of Segments C and D of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) in the Year 2015. Three new structures are also projected to be constructed near the rail line which will follow the median of Farrington Highway in the vicinity of LCC. The Transit Maintenance Facility is slated to be constructed on the parcel of land west of Leeward Community College on what is also currently designated as AG-2 land. The LCC transit station is slated to be constructed on the western end of the LCC campus, straddling Ala Ike Street. The Pearl Highlands transit station is projected to be constructed just mauka of the Farrington Highway (WB) and Waiawa Drive intersection. The bus pull-out that is currently on the makai side of Farrington Highway (WB) will be moved to the mauka side and will form the fourth leg of the Farrington Highway (WB) and Waiawa Drive intersection. This intersection will be signalized via the HHCTCP by the year 2015.

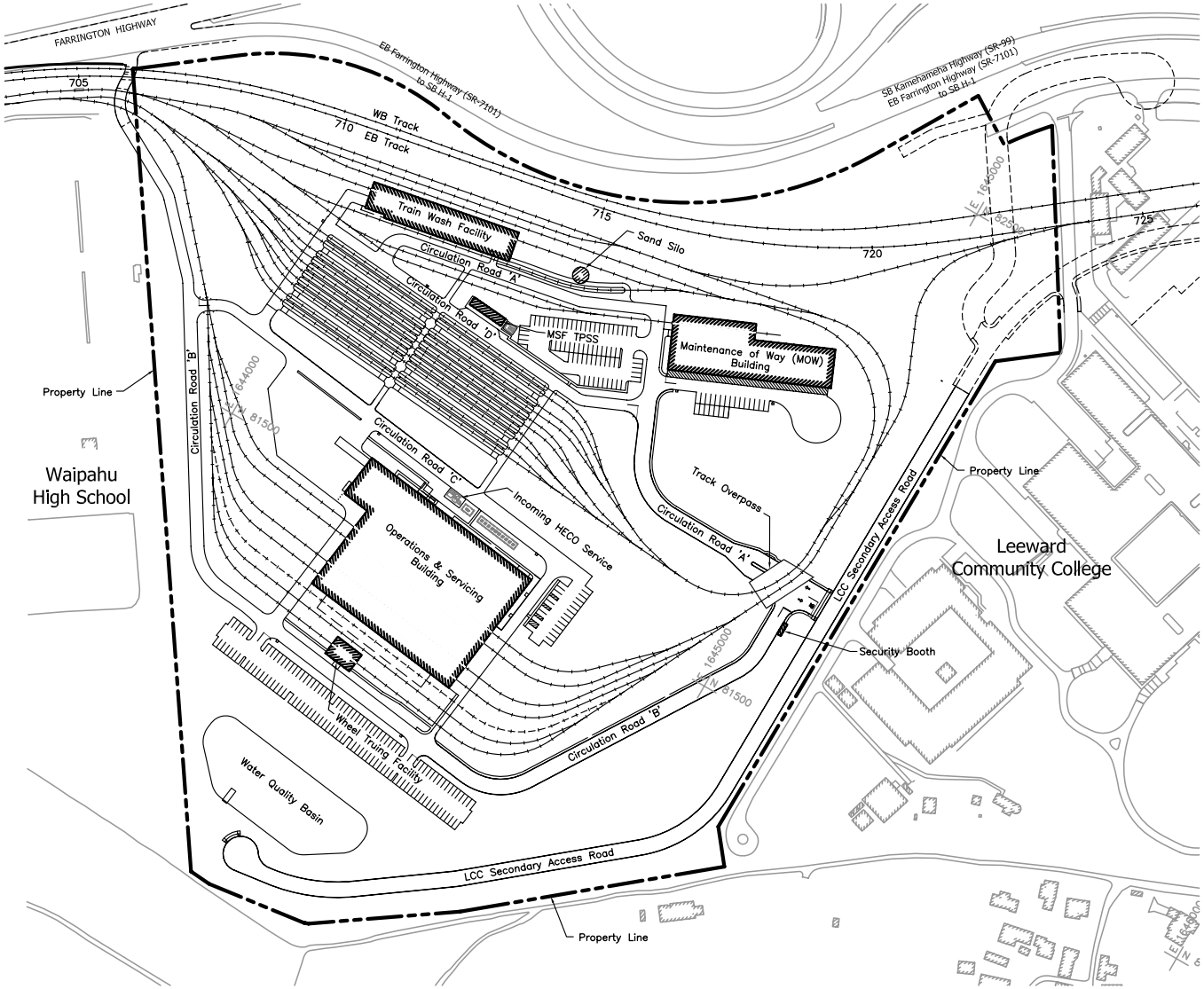
Figures 5A, 5B, and 5C show the three transit facilities discussed above.

A. Projected Year 2015 Traffic without Project

Although UHWO will leave the LCC campus by the year 2015, the anticipated increase in enrollment at LCC will create an overall increase in traffic volumes at the three intersections nearest the campus.

In addition, the background traffic along Farrington Highway (both in the EB and WB directions) and Ala Ike Street, east of the Waiawa Drive Overpass, is projected to grow at an annualized rate of 0.9% according to the 2030 Oahu Travel Demand Forecasting Model (OTDFM).

Generally, the increase in traffic volumes up through the year 2015 will impact many of the individual movements at the three intersections nearest the LCC campus. These volumes can be found in Figure 6.



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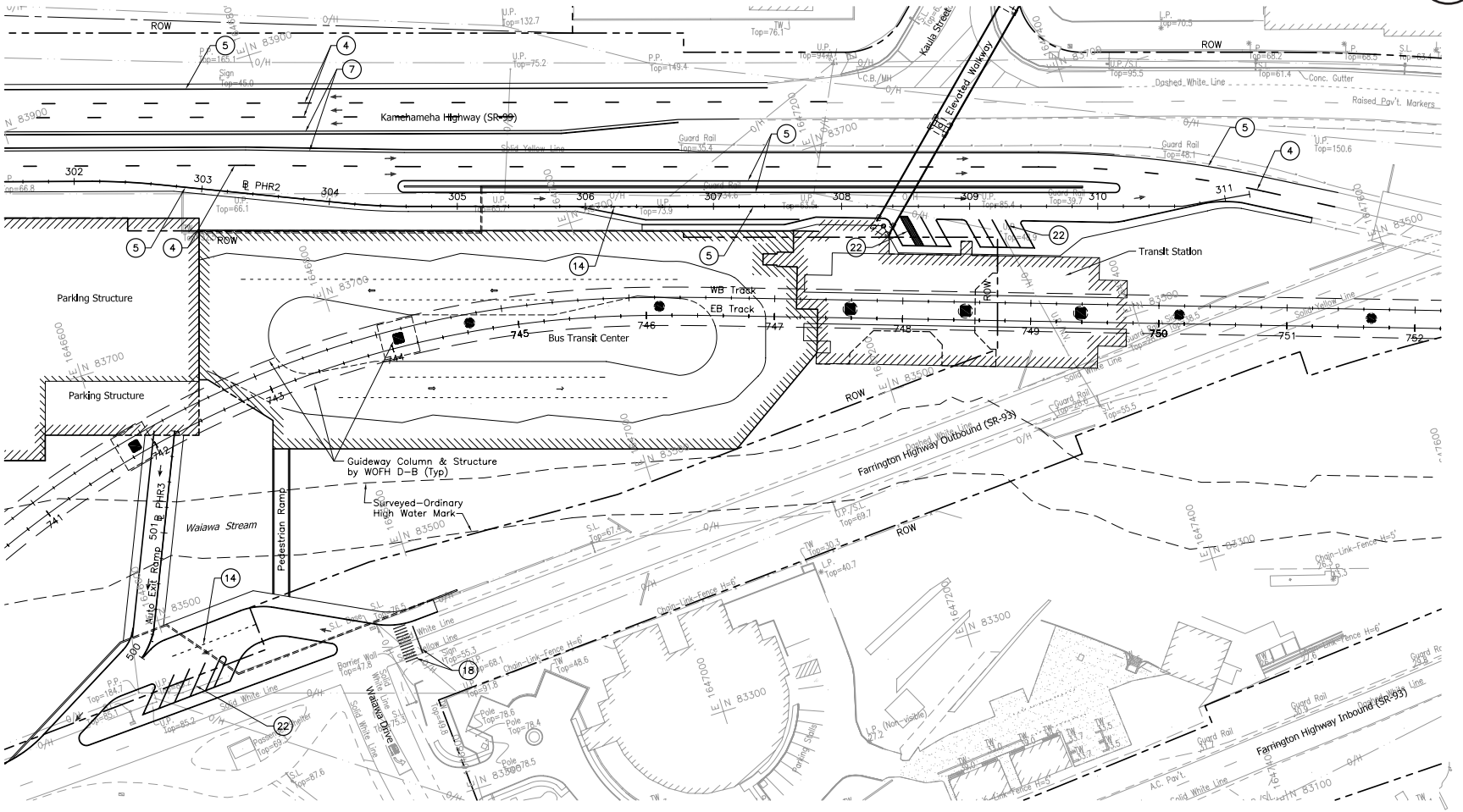
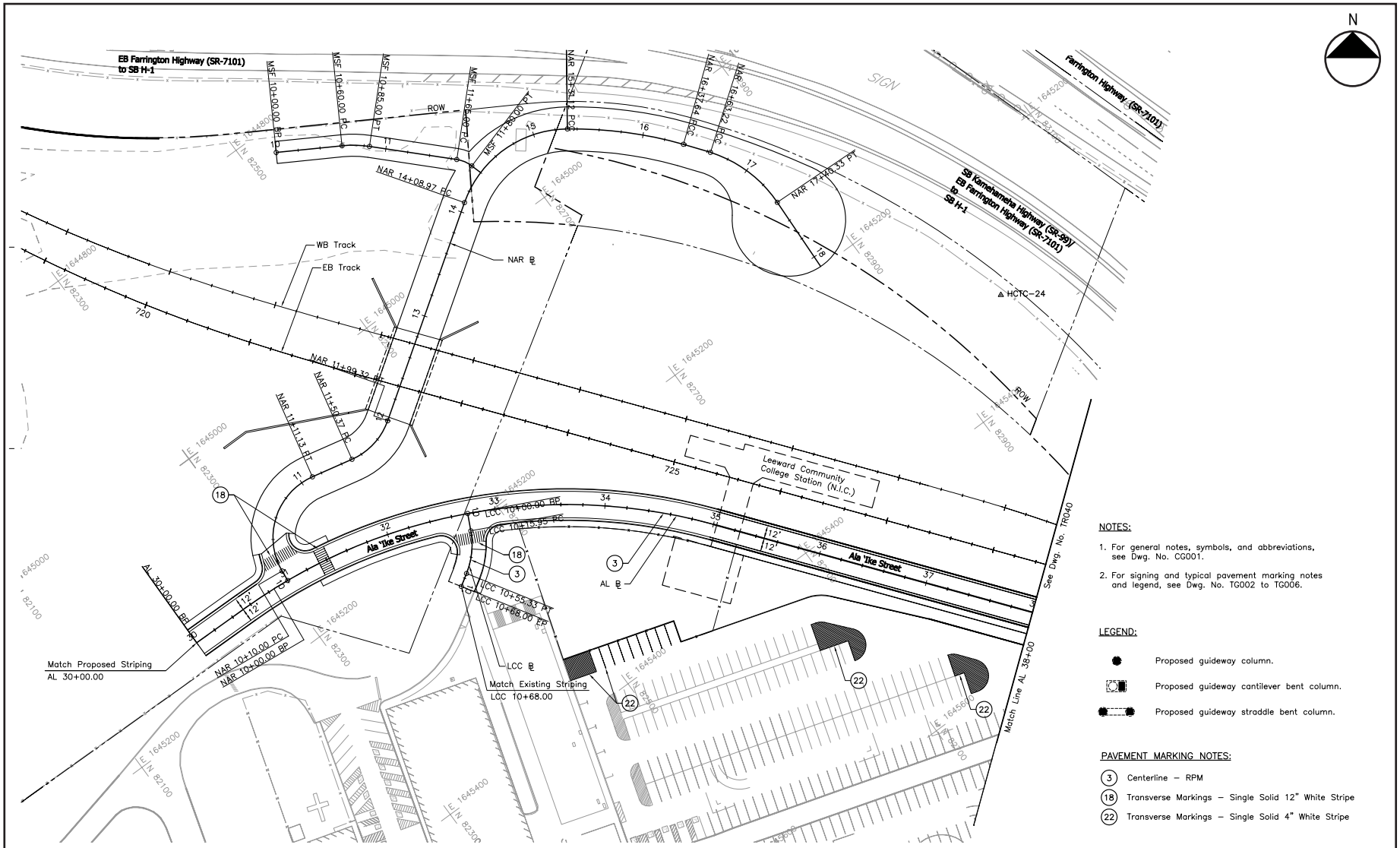
FUTURE TRANSIT MAINTENANCE FACILITY DEVELOPMENT

Figure 5A



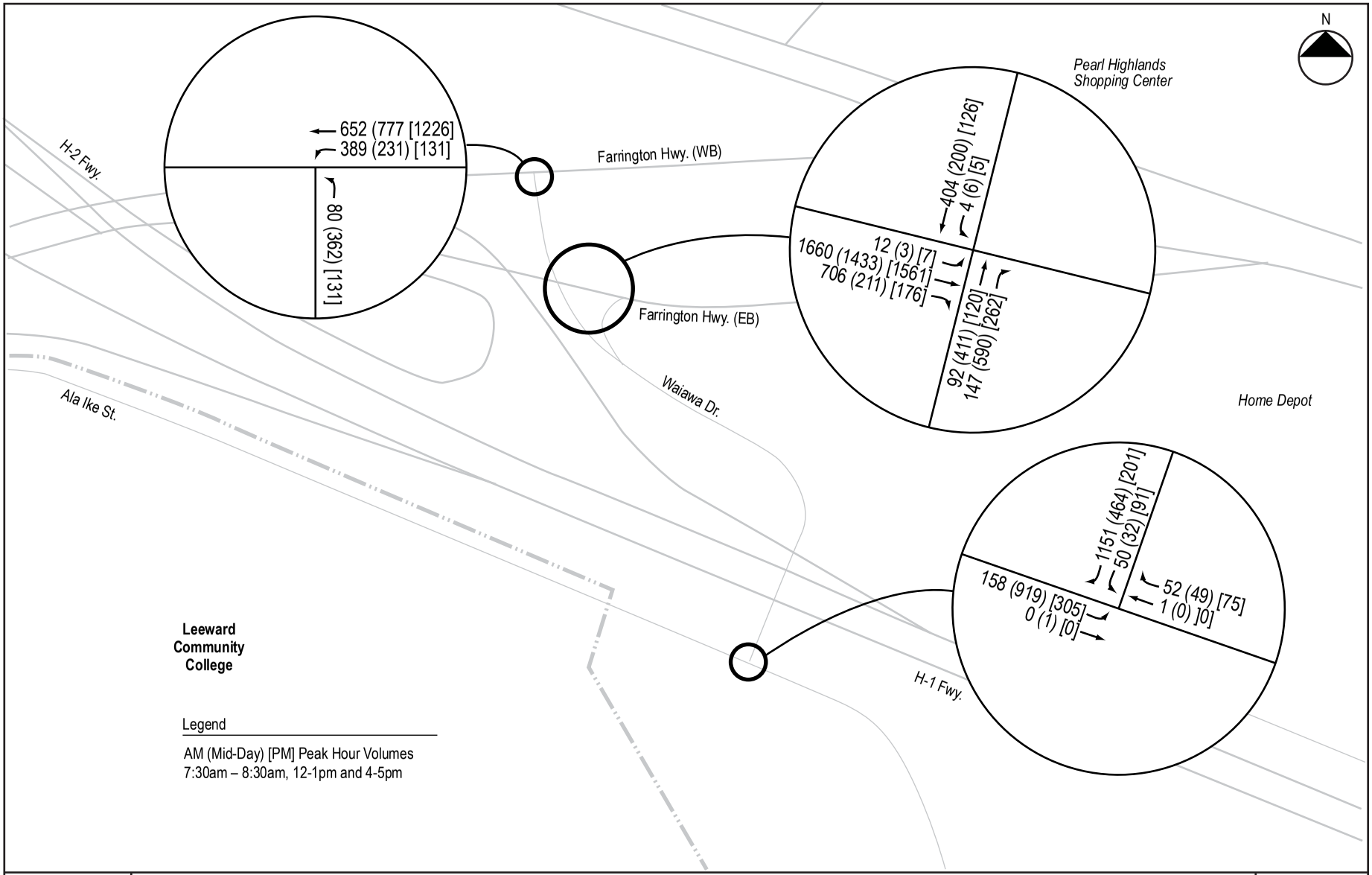
FUTURE PEARL HIGHLANDS TRANSIT STATION DEVELOPMENT

Figure
5B



FUTURE LCC TRANSIT STATION DEVELOPMENT

Figure 5C



YEAR 2015 TRAFFIC VOLUMES WITHOUT PROJECT

Figure 6

B. Projected Year 2015 Traffic Operations without Project

Table 2 shows the Year 2015 LOS at each intersection. The two movements that will be impacted most are the EB Ala Ike through-left movement at the Ala Ike Street and Waiawa Drive intersection and the NB Ala Ike right turn at the Farrington Highway (EB) and Ala Ike Street intersection. The EB through-left at Ala Ike and Waiawa is projected to continue to operate at LOS F during the mid-day, but control delay will increase from 250.3 seconds per vehicle to 451.4 seconds per vehicle. The NB right at Farrington Highway (EB) and Ala Ike will operate at LOS F (172.1 seconds per vehicle), an increase from LOS E (67.2 seconds per vehicle) in the existing condition.

The signalization at Farrington Highway (WB) and Waiawa Drive is anticipated to greatly improve the operation of that intersection, particularly for the NB left turns from Waiawa Drive.

Table 2 Projected Year 2015 LOS without Project

Year 2015 without Project	AM		Midday		PM	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Ike St and Waiawa Dr	**Unsignalized**					
EB Ala Ike Through-Left	E	39.9	F	451.4	D	28.9
WB Ala Ike Through-Right	A	9.1	A	9.1	A	9.2
SB Waiawa Left-Right	A	1.3	A	0.7	A	2.8
Farrington Hwy (EB) and Waiawa Dr	**C**	**24.5**	**D**	**52.3**	**B**	**17.2**
EB Farrington Left	C	20.6	B	19.2	B	14.5
EB Farrington Double Through	C	20.6	B	19.2	B	14.5
EB Farrington Right	B	17.9	B	10.3	A	7.1
NB Waiawa Through	C	27.7	C	31.7	C	24.4
NB Waiawa Right	C	29.5	F	172.1	C	33.2
SB Waiawa Left	C	26.2	C	21.0	C	22.5
SB Waiawa Through-Left	D	49.3	C	24.0	C	24.8
Farrington Hwy (WB) and Waiawa Dr	**A**	**6.7**	**B**	**11.0**	**A**	**7.9**
WB Farrington Through-Left	A	6.5	B	10.7	A	7.3
WB Farrington Through	A	6.5	B	10.7	A	7.3
NB Waiawa Left	A	9.6	B	11.6	B	13.9

Delay is expressed in seconds per vehicle

IV. PROJECTED YEAR 2015 CONDITIONS WITH PROJECT

By the year 2015, UHWO is anticipated to be relocated to East Kapolei. LCC's enrollment is projected to be 9,077, up 19% from the combined enrollment of LCC and UHWO in 2009. The HHCTCP rail line and structures including the Transit Maintenance Facility, Pearl Highlands transit station, and LCC transit station are projected to be in-place by the year 2015.

A. Project-Related Traffic Volumes

Figure 7 shows the Project-Related Traffic Volumes generated by the LCC EIIF development. The LCC EIIF adds only minimal additional traffic volumes to the roadway network in the year 2015.

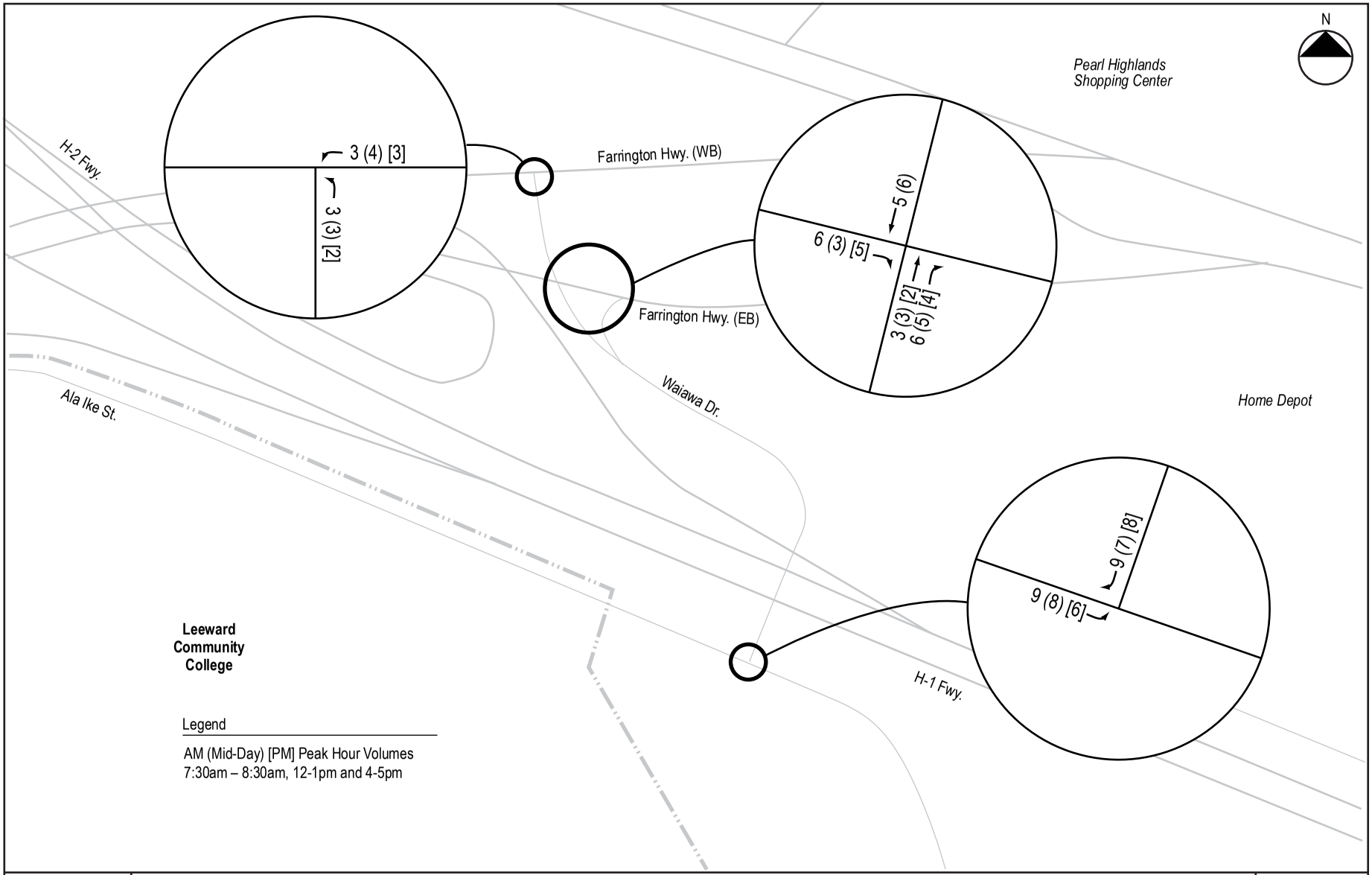
The LCC EIIF development is labeled as a Community College (ITE Code 540) land use according to the Institute of Transportation Engineers' Trip Generation manual, 8th Edition. During the AM peak hour a total of 58 trips (29 inbound and 29 outbound) are generated by the development. During the Mid-day peak hour a total of 49 trips (22 inbound and 27 outbound) are generated by the development. In the PM peak hour, 47 trips (27 inbound and 20 outbound) are projected to be generated. Table 3 shows the projected trip generation for the development.

The Trip Generation Handbook (ITE, 2nd Edition) doesn't publish pass-by percentages for a Community College land use (540), or any related land uses. But, based upon informal discussions with a forum of transportation engineers, it is projected that most of the trips generated by the development will come from vehicle trips that were already attracted to the site, e.g., a student who drives to the LCC campus to take a class at a pre-existing structure and then walks to the new LCC EIIF to take an additional class. A pass-by rate of 70% was utilized to determine how many of the trips generated would be new trips. This is considered to be a conservative estimate.

Table 3 LCC EIIF Trip Generation: New Trips

				AM Peak			MD Peak			PM Peak		
Land Uses	Units		ITE Code	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Community College	18519	SF	540	29	29	58	22	27	49	27	20	47
Pass-By Traffic	70%			20	20	41	15	19	34	19	14	33
Project Total				**9**	**9**	**17**	**7**	**8**	**15**	**8**	**6**	**14**

Volumes expressed in vehicles per hour



PROJECT-RELATED TRAFFIC VOLUMES

Figure
7

The new trips generated by the LCC EIIF development are minimal. Figure 8 details the minimal increase in total traffic volumes in the year 2015.

Since ingress and egress to and from the LCC campus is limited to Ala Ike Street, Waiawa Drive, and then to WB and EB onto Farrington Highway, trip distribution and assignment were projected based upon existing travel patterns.

B. Projected Year 2015 Traffic Operations with Project

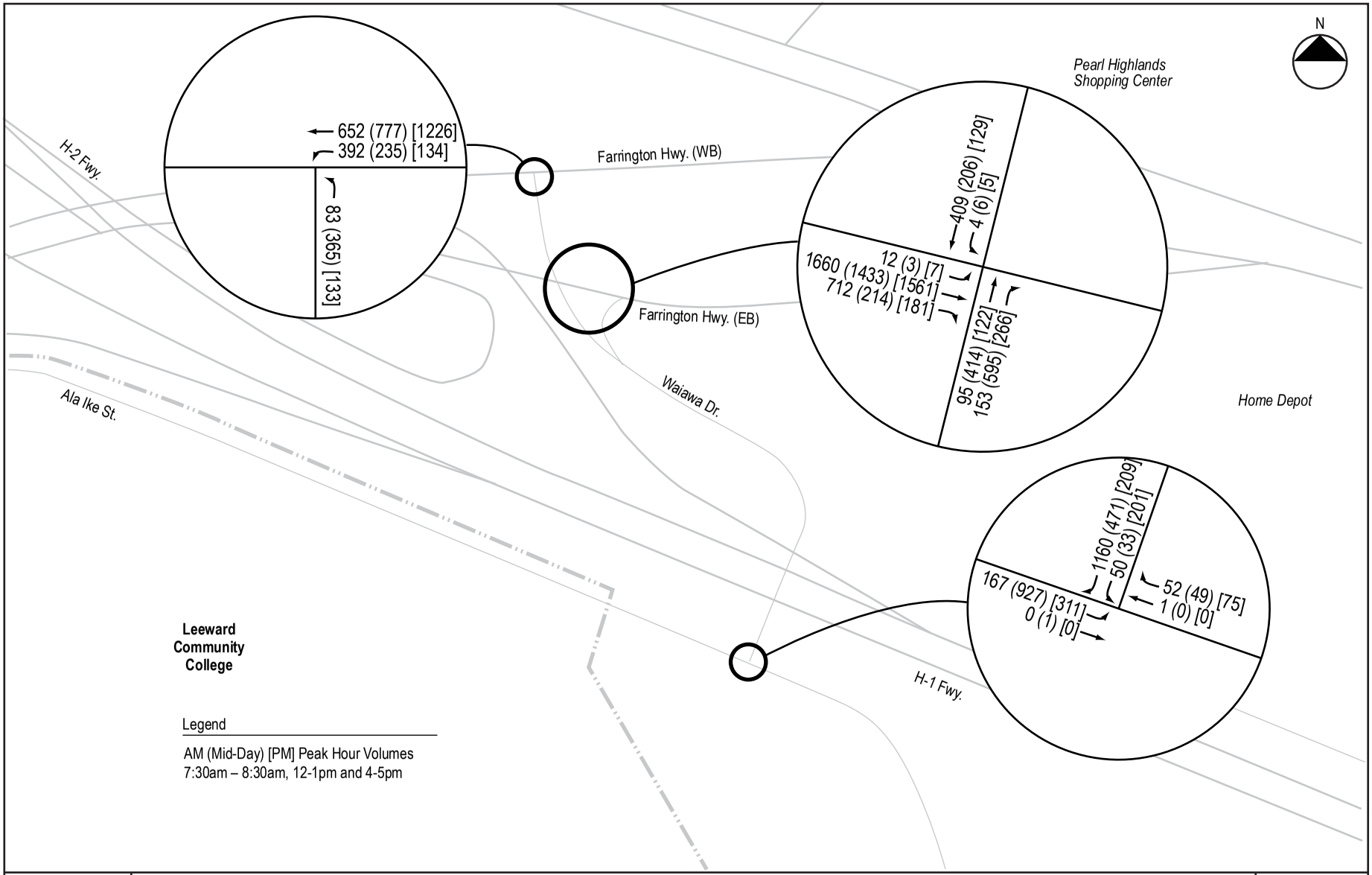
Traffic operations are not significantly impacted by the LCC EIIF development.

The Ala Ike Street and Waiawa Drive intersection will operate similarly to the year 2015 without Project scenario. The EB Ala Ike through-left movement will continue to operate at excessive delay in the mid-day peak hour (LOS F, 466.7 seconds of delay per vehicle).

The Farrington Highway (EB) and Waiawa Drive intersection will operate similarly as the year 2015 without Project scenario. The LOS in the AM peak hour is anticipated to remain at C, the mid-day peak hour is expected to be unchanged at LOS D, and the PM peak hour LOS is expected to be unchanged at LOS B.

The Farrington Highway (WB) and Waiawa Drive intersection is also anticipated to operate similarly as the year 2015 without Project scenario. The AM peak hour is anticipated to operate at LOS A, the mid-day peak hour is anticipated to operate at LOS B, and the PM peak hour is expected to operate at LOS A.

Table 4 details the Projected Year 2015 LOS with Project.



YEAR 2015 TRAFFIC VOLUMES WITH PROJECT

Figure 8

Table 4 Projected Year 2015 LOS with Project

Year 2015 with Project	AM		Midday		PM	
	LOS	Delay	LOS	Delay	LOS	Delay
Ala Ike St and Waiawa Dr	**Unsignalized**					
EB Ala Ike Through-Left	E	43.6	F	466.7	D	30.3
WB Ala Ike Through-Right	A	9.1	A	9.1	A	9.2
SB Waiawa Left-Right	A	1.4	A	0.7	A	2.8
Farrington Hwy (EB) and Waiawa Dr	**C**	**24.8**	**D**	**53.5**	**B**	**17.4**
EB Farrington Left	C	20.9	B	19.2	B	14.7
EB Farrington Double Through	C	20.9	B	19.2	B	14.7
EB Farrington Right	B	18.4	B	10.3	A	7.1
NB Waiawa Through	C	27.7	C	32.0	C	24.5
NB Waiawa Right	C	29.5	F	177.3	C	33.5
SB Waiawa Left	C	26.1	C	21.0	C	22.5
SB Waiawa Through-Left	D	49.8	C	24.0	C	24.8
Farrington Hwy (WB) and Waiawa Dr	**A**	**6.8**	**B**	**10.9**	**A**	**8.1**
WB Farrington Through-Left	A	6.6	B	10.3	A	7.5
WB Farrington Through	A	6.6	B	10.3	A	7.5
NB Waiawa Left	A	9.5	B	12.7	B	13.9

Delay is expressed in seconds per vehicle

V. CONCLUSION AND RECOMMENDATIONS

The Leeward Community College Educational and Innovation Instructional Facility is anticipated to have minimal impact to the roadway network in the vicinity of the existing LCC campus in the horizon year of 2015. The number of new trips generated by LCC EIIF are 17 during AM peak hour, 15 during midday peak hour, and 14 during PM peak hour.

It is anticipated that by the year 2015 UHWO will be relocated to its new campus in East Kapolei and LCC enrollment will continue to grow. The City, as part of its HHCTCP, will construct Pearl Highlands transit station, LCC transit station, and Transit Maintenance Facility. The HHCTCP will signalize the Farrington Highway (WB) and Waiawa Drive intersection as part of the Pearl Highlands transit station construction.

Overall operation at the two intersections of Farrington Highway and Waiawa Drive will run at the acceptable LOS. The Ala Ike Street and Waiawa Drive intersection will experience longer delay due to overall student enrollment growth at the LCC.

Appendix A

Existing Traffic Data

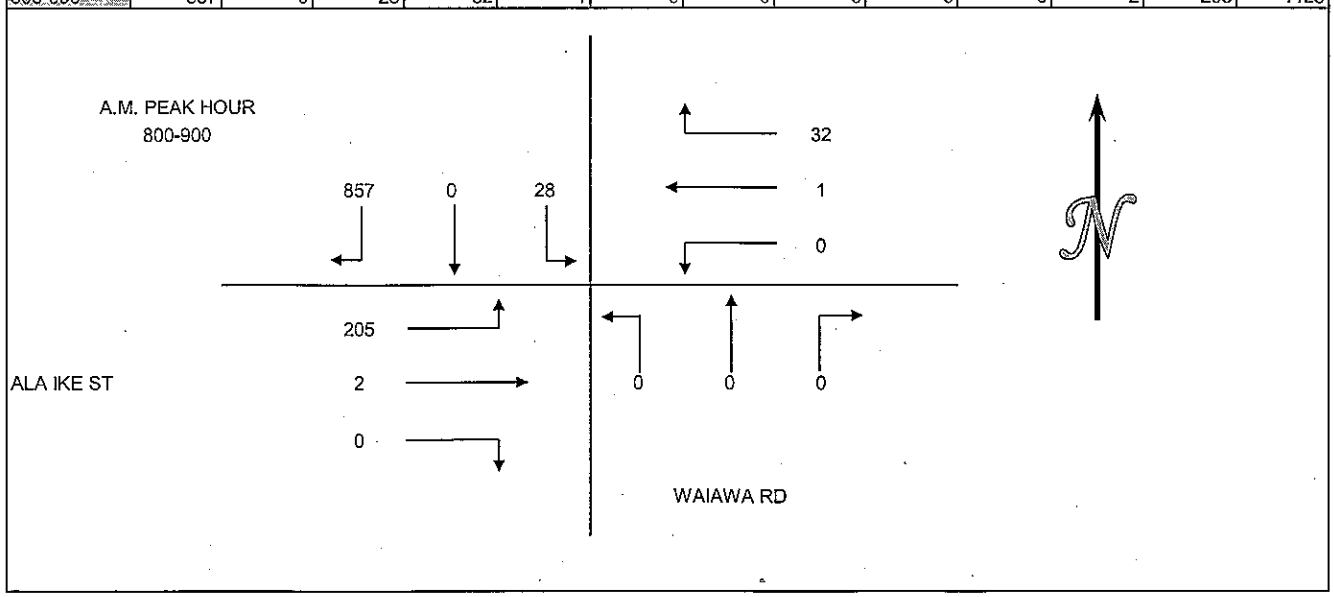
WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969 info@wiltecusa.com

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR AND PEERS
PROJECT: HAWAII - HONOLULU TRANSIT PROJECT
DATE: THURSDAY NOVEMBER 1, 2007
PERIOD: 6:00 AM TO 9:00 AM
INTERSECTION: N/S WAIAWA RD
E/W ALA IKE ST

15 MIN COUNTS													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-615	24	0	2	35	1	0	0	0	0	0	0	5	67
615-630	11	0	1	12	0	0	0	0	0	0	0	7	31
630-645	27	0	3	18	2	0	0	0	0	0	0	1	51
645-700	7	0	3	6	0	0	0	0	0	0	0	2	18
700-715	20	0	1	9	0	0	0	0	0	0	0	3	33
715-730	55	0	9	23	0	0	0	0	0	0	0	14	101
730-745	79	0	6	21	0	0	0	0	0	0	0	13	119
745-800	300	0	11	26	0	0	0	0	0	0	2	40	379
800-815	266	0	8	4	0	0	0	0	0	0	1	43	322
815-830	111	0	11	9	0	0	0	0	0	0	0	29	160
830-845	194	0	5	17	1	0	0	0	0	0	1	37	255
845-900	286	0	4	2	0	0	0	0	0	0	0	96	388
HOUR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-700	69	0	9	71	3	0	0	0	0	0	0	15	167
615-715	65	0	8	45	2	0	0	0	0	0	0	13	133
630-730	109	0	16	56	2	0	0	0	0	0	0	20	203
645-745	161	0	19	59	0	0	0	0	0	0	0	32	271
700-800	454	0	27	79	0	0	0	0	0	0	2	70	632
715-815	700	0	34	74	0	0	0	0	0	0	3	110	921
730-830	756	0	36	60	0	0	0	0	0	0	3	125	980
745-845	871	0	35	56	1	0	0	0	0	0	4	149	1116
800-900	857	0	28	32	1	0	0	0	0	0	2	205	1125



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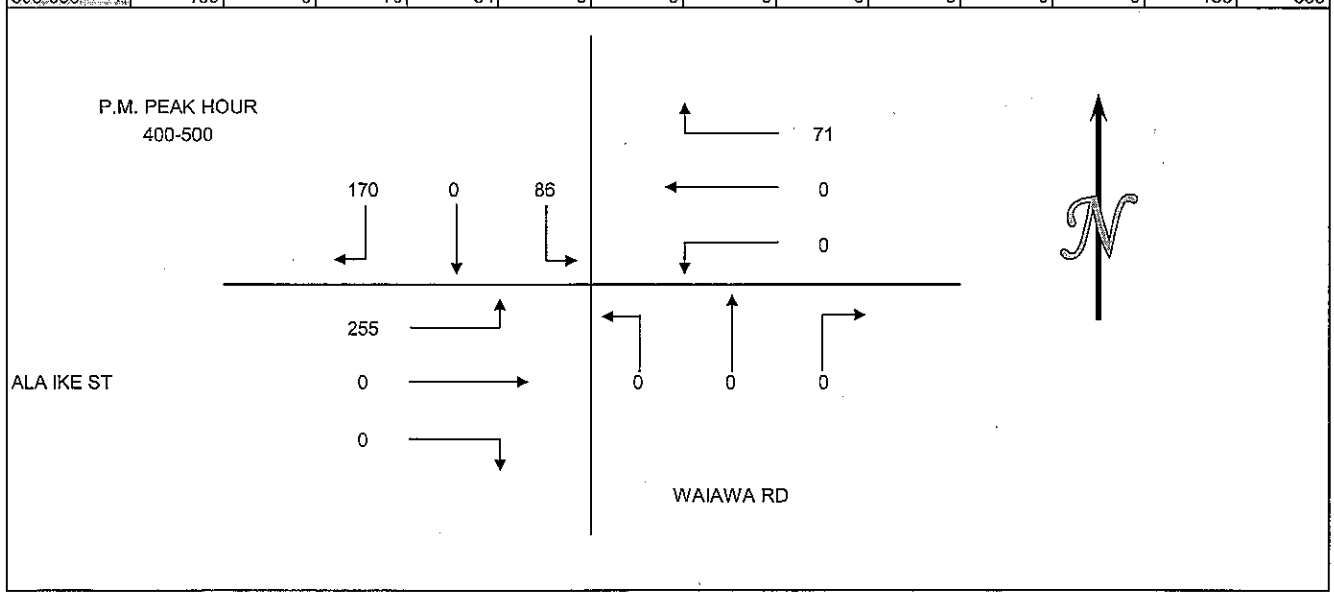
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR AND PEERS
PROJECT: HAWAII - HONOLULU TRANSIT PROJECT
DATE: THURSDAY NOVEMBER 1, 2007
PERIOD: 3:00 PM TO 6:00 PM
INTERSECTION: N/S WAIAWA RD
E/W ALA IKE ST

15 MIN COUNTS													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	34	0	12	20	0	0	0	0	0	0	1	77	144
315-330	28	0	12	9	0	0	0	0	0	0	0	73	122
330-345	38	0	11	8	0	0	0	0	0	0	0	56	113
345-400	32	0	19	13	0	0	0	0	0	0	0	46	110
400-415	45	0	30	22	0	0	0	0	0	0	0	73	170
415-430	52	0	23	10	0	0	0	0	0	0	0	57	142
430-445	44	0	15	20	0	0	0	0	0	0	0	77	156
445-500	29	0	18	19	0	0	0	0	0	0	0	48	114
500-515	18	0	14	33	0	0	0	0	0	0	0	43	108
515-530	24	0	15	15	0	0	0	0	0	0	0	36	90
530-545	40	0	18	11	0	0	0	0	0	0	0	49	118
545-600	27	0	23	5	0	0	0	0	0	0	0	28	83
HOUR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	132	0	54	50	0	0	0	0	0	0	1	252	489
315-415	143	0	72	52	0	0	0	0	0	0	0	248	515
330-430	167	0	83	53	0	0	0	0	0	0	0	232	535
345-445	173	0	87	65	0	0	0	0	0	0	0	253	578
400-500	170	0	86	71	0	0	0	0	0	0	0	255	582
415-515	143	0	70	82	0	0	0	0	0	0	0	225	520
430-530	115	0	62	87	0	0	0	0	0	0	0	204	468
445-545	111	0	65	78	0	0	0	0	0	0	0	176	430
500-600	109	0	70	64	0	0	0	0	0	0	0	156	399



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

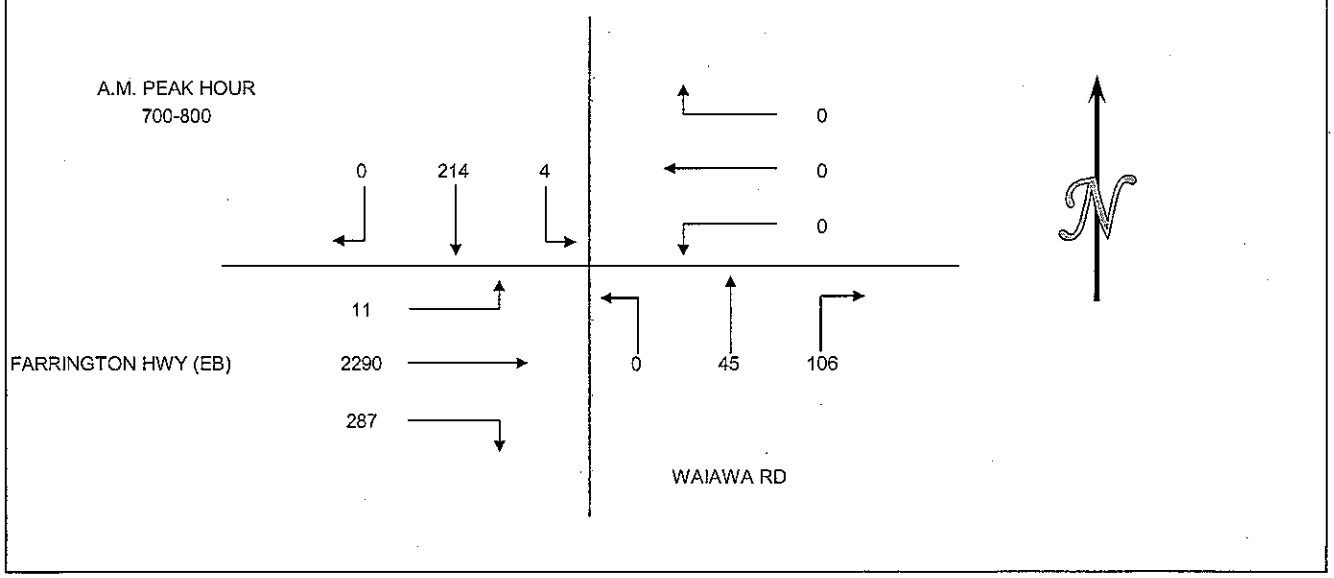
CLIENT: FEHR AND PEERS
PROJECT: HAWAII - HONOLULU TRANSIT PROJECT
DATE: THURSDAY NOVEMBER 1, 2007
PERIOD: 6:00 AM TO 9:00 AM
INTERSECTION: N/S WAIAWA RD
E/W FARRINGTON HWY (EB)

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-615	0	2	0	0	0	0	17	1	0	8	629	6	663
615-630	0	9	0	0	0	0	20	1	0	7	732	4	773
630-645	0	14	0	0	0	0	21	2	0	15	652	3	707
645-700	0	15	1	0	0	0	24	2	0	14	581	1	638
700-715	0	25	0	0	0	0	37	13	0	26	612	0	713
715-730	0	37	1	0	0	0	13	5	0	29	653	2	740
730-745	0	57	2	0	0	0	34	15	0	108	571	3	790
745-800	0	95	1	0	0	0	22	12	0	124	454	6	714
800-815	0	75	1	0	0	0	15	24	0	90	499	3	707
815-830	0	64	0	0	0	0	30	9	0	71	321	1	496
830-845	0	62	0	0	0	0	38	12	0	184	306	0	602
845-900	0	67	0	0	0	0	80	26	0	259	269	0	701

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-700	0	40	1	0	0	0	82	6	0	44	2594	14	2781
615-715	0	63	1	0	0	0	102	18	0	62	2577	8	2831
630-730	0	91	2	0	0	0	95	22	0	84	2498	6	2798
645-745	0	134	4	0	0	0	108	35	0	177	2417	6	2881
700-800	0	214	4	0	0	0	106	45	0	287	2290	11	2957
715-815	0	264	5	0	0	0	84	56	0	351	2177	14	2951
730-830	0	291	4	0	0	0	101	60	0	393	1845	13	2707
745-845	0	296	2	0	0	0	105	57	0	469	1580	10	2519
800-900	0	268	1	0	0	0	163	71	0	604	1395	4	2506



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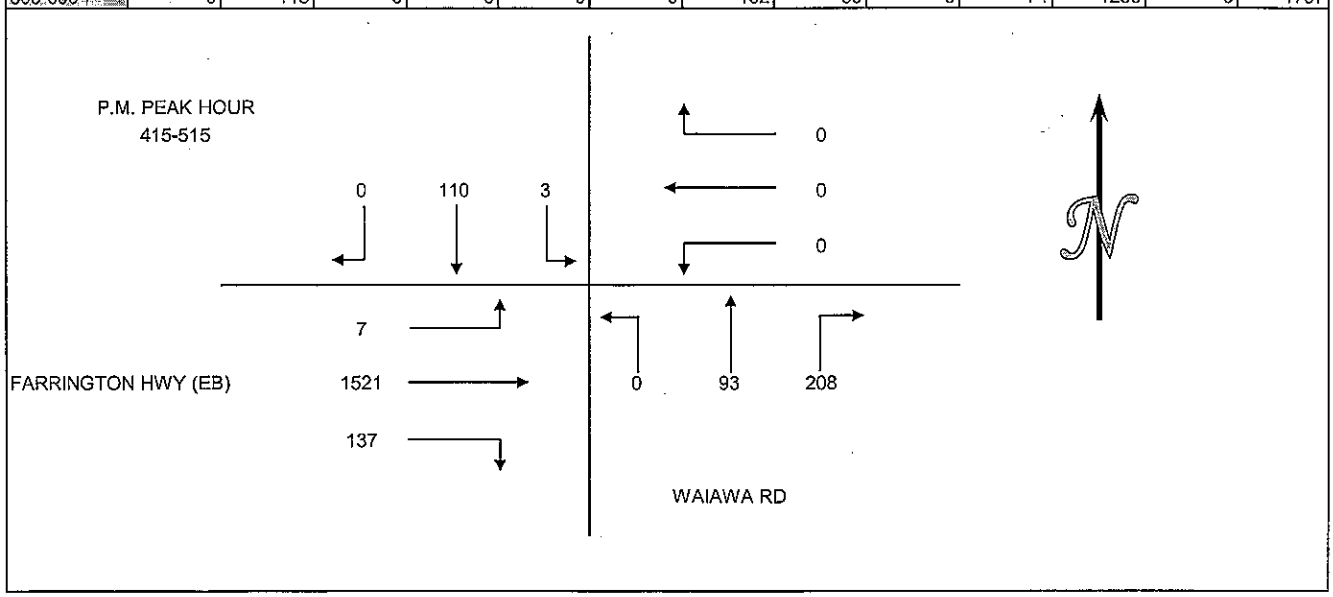
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR AND PEERS
PROJECT: HAWAII - HONOLULU TRANSIT PROJECT
DATE: THURSDAY NOVEMBER 1, 2007
PERIOD: 3:00 PM TO 6:00 PM
INTERSECTION: N/S WAIAWA RD
E/W FARRINGTON HWY (EB)

15 MIN COUNTS													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	0	28	3	0	0	0	60	34	0	11	320	6	462
315-330	0	23	0	0	0	0	64	41	0	25	348	6	507
330-345	0	26	7	0	0	0	48	22	0	28	408	3	542
345-400	0	19	1	0	0	0	29	12	0	20	382	0	463
400-415	0	23	2	0	0	0	47	19	0	27	314	1	433
415-430	0	27	1	0	0	0	46	25	0	48	394	1	542
430-445	0	28	0	0	0	0	57	30	0	36	354	3	508
445-500	0	28	2	0	0	0	68	26	0	37	411	2	574
500-515	0	27	0	0	0	0	37	12	0	16	362	1	455
515-530	0	24	2	0	0	0	26	16	0	21	337	1	427
530-545	0	25	0	0	0	0	26	24	0	18	301	2	396
545-600	0	39	1	0	0	0	43	37	0	19	288	2	429
HOUR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	0	96	11	0	0	0	201	109	0	84	1458	15	1974
315-415	0	91	10	0	0	0	188	94	0	100	1452	10	1945
330-430	0	95	11	0	0	0	170	78	0	123	1498	5	1980
345-445	0	97	4	0	0	0	179	86	0	131	1444	5	1946
400-500	0	106	5	0	0	0	218	100	0	148	1473	7	2057
415-515	0	110	3	0	0	0	208	93	0	137	1521	7	2079
430-530	0	107	4	0	0	0	188	84	0	110	1464	7	1964
445-545	0	104	4	0	0	0	157	78	0	92	1411	6	1852
500-600	0	115	3	0	0	0	132	89	0	74	1288	6	1707



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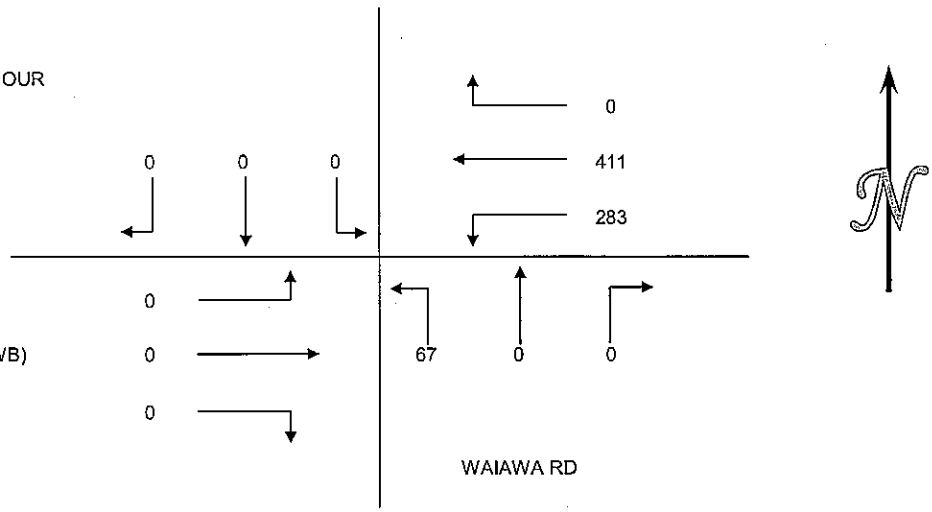
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR AND PEERS
PROJECT: HAWAII - HONOLULU TRANSIT PROJECT
DATE: THURSDAY NOVEMBER 1, 2007
PERIOD: 6:00 AM TO 9:00 AM
INTERSECTION: N/S WAIAWA RD
E/W FARRINGTON HWY (WB)

15 MIN COUNTS													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-615	0	0	0	0	63	3	0	0	5	0	0	0	71
615-630	0	0	0	0	83	10	0	0	2	0	0	0	95
630-645	0	0	0	0	98	16	0	0	4	0	0	0	118
645-700	0	0	0	0	67	11	0	0	9	0	0	0	87
700-715	0	0	0	0	96	21	0	0	14	0	0	0	131
715-730	0	0	0	0	85	33	0	0	7	0	0	0	125
730-745	0	0	0	0	101	75	0	0	16	0	0	0	192
745-800	0	0	0	0	96	88	0	0	19	0	0	0	203
800-815	0	0	0	0	123	55	0	0	23	0	0	0	201
815-830	0	0	0	0	91	65	0	0	9	0	0	0	165
830-845	0	0	0	0	82	60	0	0	23	0	0	0	165
845-900	0	0	0	0	106	90	0	0	24	0	0	0	220
HOUR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
600-700	0	0	0	0	311	40	0	0	20	0	0	0	371
615-715	0	0	0	0	344	58	0	0	29	0	0	0	431
630-730	0	0	0	0	346	81	0	0	34	0	0	0	461
645-745	0	0	0	0	349	140	0	0	46	0	0	0	535
700-800	0	0	0	0	378	217	0	0	56	0	0	0	651
715-815	0	0	0	0	405	251	0	0	65	0	0	0	721
730-830	0	0	0	0	411	283	0	0	67	0	0	0	761
745-845	0	0	0	0	392	268	0	0	74	0	0	0	734
800-900	0	0	0	0	402	270	0	0	79	0	0	0	751

A.M. PEAK HOUR
730-830



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INTERSECTION TURNING MOVEMENT COUNT SUMMARY

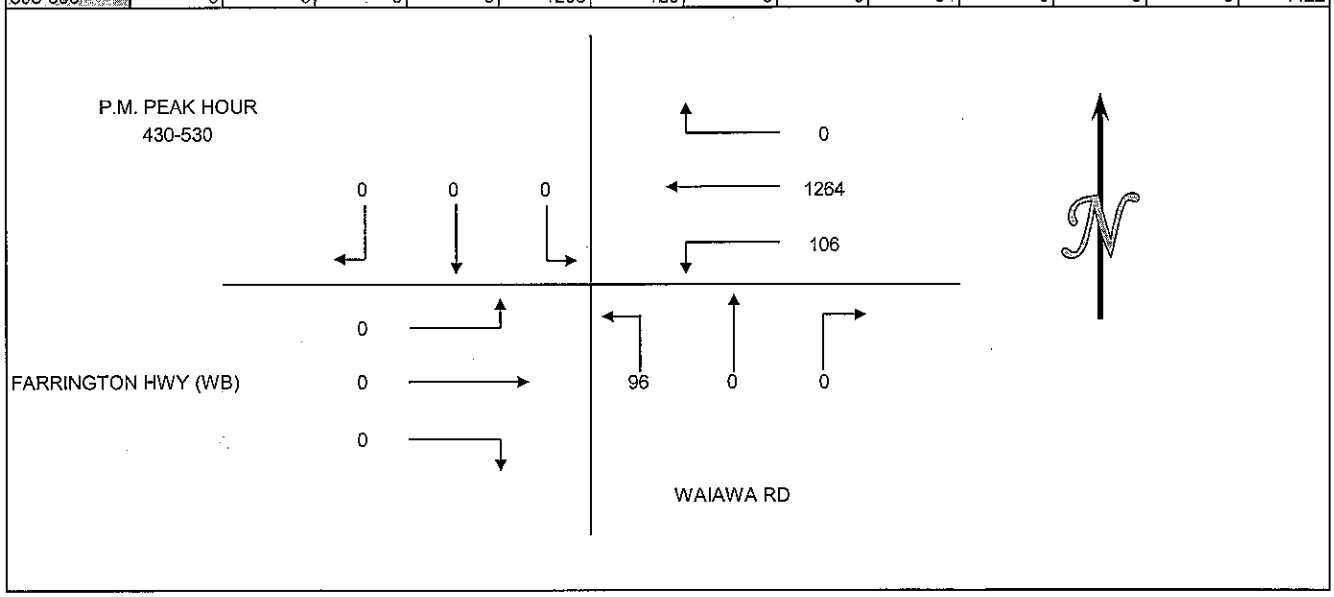
CLIENT:		FEHR AND PEERS
PROJECT:		HAWAII - HONOLULU TRANSIT PROJECT
DATE:		THURSDAY NOVEMBER 1, 2007
PERIOD:		3:00 PM TO 6:00 PM
INTERSECTION:	N/S	WAIAWA RD
	E/W	FARRINGTON HWY (WB)

15 MIN COUNTS

PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-315	0	0	0	0	245	29	0	0	41	0	0	0	315
315-330	0	0	0	0	235	23	0	0	44	0	0	0	302
330-345	0	0	0	0	257	28	0	0	23	0	0	0	308
345-400	0	0	0	0	309	27	0	0	14	0	0	0	350
400-415	0	0	0	0	238	29	0	0	22	0	0	0	289
415-430	0	0	0	0	260	26	0	0	24	0	0	0	310
430-445	0	0	0	0	308	28	0	0	42	0	0	0	378
445-500	0	0	0	0	351	27	0	0	21	0	0	0	399
500-515	0	0	0	0	280	24	0	0	17	0	0	0	321
515-530	0	0	0	0	325	27	0	0	16	0	0	0	368
530-545	0	0	0	0	280	22	0	0	31	0	0	0	333
545-600	0	0	0	0	323	47	0	0	30	0	0	0	400

HOUR TOTALS

TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
300-400	0	0	0	0	1046	107	0	0	122	0	0	0	1275
315-415	0	0	0	0	1039	107	0	0	103	0	0	0	1249
330-430	0	0	0	0	1064	110	0	0	83	0	0	0	1257
345-445	0	0	0	0	1115	110	0	0	102	0	0	0	1327
400-500	0	0	0	0	1157	110	0	0	109	0	0	0	1376
415-515	0	0	0	0	1199	105	0	0	104	0	0	0	1408
430-530	0	0	0	0	1264	106	0	0	96	0	0	0	1466
445-545	0	0	0	0	1236	100	0	0	85	0	0	0	1421
500-600	0	0	0	0	1208	120	0	0	94	0	0	0	1422



Parsons Brinckerhoff

1001 Bishop Street #2400
Honolulu, HI 96813

File Name : 16503A - UW - Farrington_Ala Ike - mauka - AM MD 091028RL
Site Code : 00000001
Start Date : 10/28/2009
Page No : 1

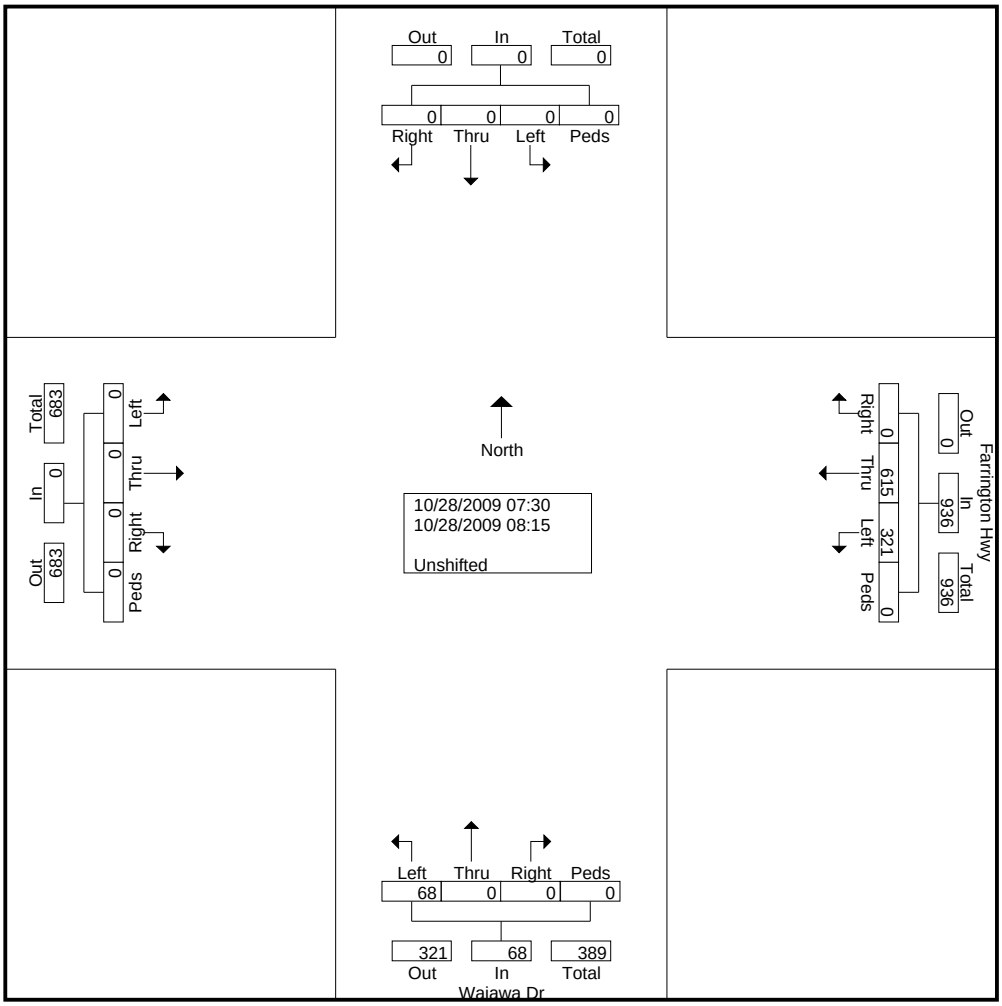
Groups Printed- Unshifted

	Southbound				Farrington Hwy Westbound				Waiawa Dr Northbound				Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
07:30	0	0	0	0	0	68	148	0	0	11	0	0	0	0	0	0	227
07:45	0	0	0	0	0	109	156	0	0	23	0	0	0	0	0	0	288
Total	0	0	0	0	0	177	304	0	0	34	0	0	0	0	0	0	515
08:00	0	0	0	0	0	71	183	0	0	18	0	0	0	0	0	0	272
08:15	0	0	0	0	0	73	128	0	0	16	0	0	0	0	0	0	217
Grand Total	0	0	0	0	0	321	615	0	0	68	0	0	0	0	0	0	1004
Apprch %	0	0	0	0	0	34.3	65.7	0	0	100	0	0	0	0	0	0	
Total %	0	0	0	0	0	32	61.3	0	0	6.8	0	0	0	0	0	0	

Parsons Brinckerhoff

1001 Bishop Street #2400
Honolulu, HI 96813

File Name : 16503A - UW - Farrington_Ala Ike - mauka - AM MD 091028RL
Site Code : 00000001
Start Date : 10/28/2009
Page No : 2



Parsons Brinckerhoff

1001 Bishop Street #2400
Honolulu, HI 96813

File Name : 16503A - UW - Farrington_Ala Ike - mauka - AM MD 091028RL
Site Code : 00000001
Start Date : 10/28/2009
Page No : 1

Groups Printed- Unshifted

	Southbound				Farrington Hwy Westbound				Waiawa Dr Northbound				Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
11:45	0	0	0	0	0	55	182	0	0	74	0	0	0	0	0	0	311
Total	0	0	0	0	0	55	182	0	0	74	0	0	0	0	0	0	311
12:00	0	0	0	0	0	46	181	0	0	91	0	0	0	0	0	0	318
12:15	0	0	0	0	0	41	204	0	0	96	0	0	0	0	0	0	341
12:30	0	0	0	0	1	51	166	0	0	38	0	0	0	0	0	0	256
Grand Total	0	0	0	0	1	193	733	0	0	299	0	0	0	0	0	0	1226
Apprch %	0	0	0	0	0.1	20.8	79.1	0	0	100	0	0	0	0	0	0	
Total %	0	0	0	0	0.1	15.7	59.8	0	0	24.4	0	0	0	0	0	0	

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1001 Bishop Street #2400
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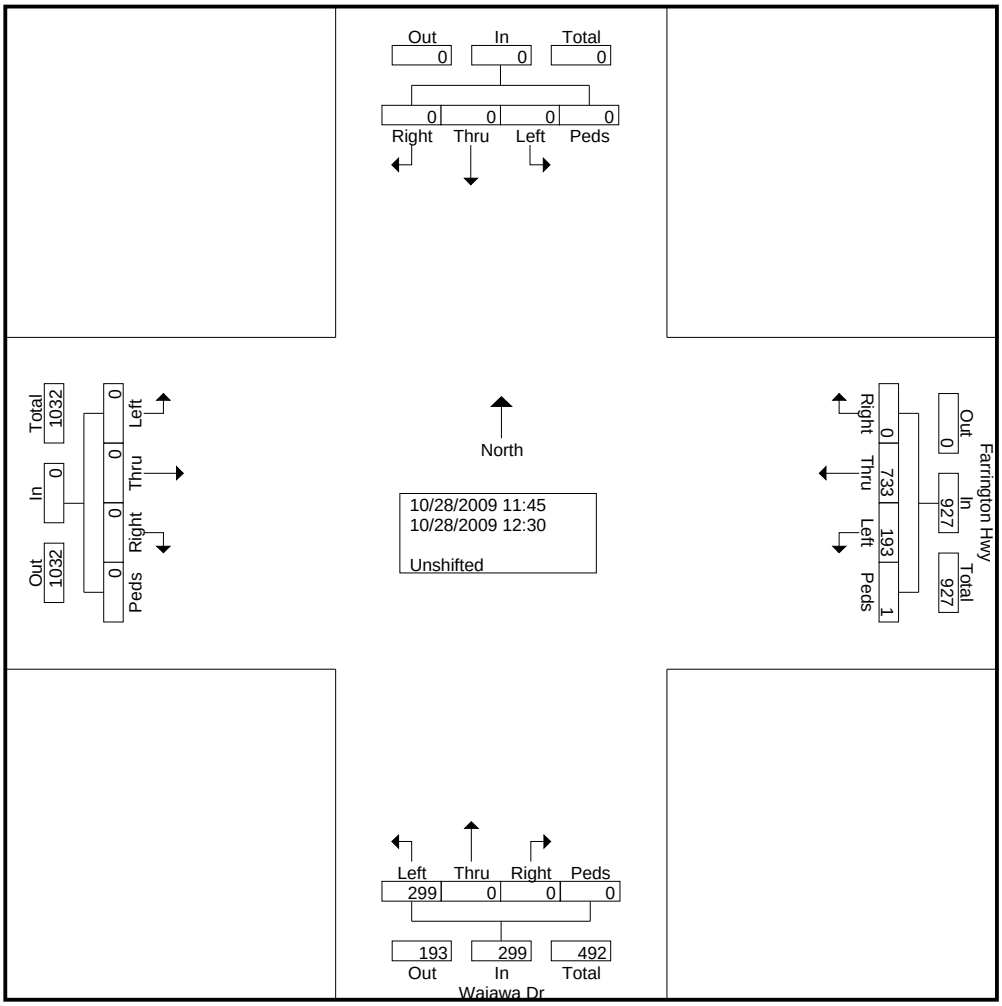
File Name : 16503A - UW - Farrington_Ala Ike - mauka - AM MD 091028RL
Site Code : 00000001
Start Date : 10/28/2009
Page No : 2



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1001 Bishop Street #2400
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Leeward Community College - EHF
Turning Movement Counts
Farrington Hwy makai & Ala Ike St

File Name : 16503A - UW - Farrington_Ala Ike - makai - AM MD 091028DM
Site Code : 00000002
Start Date : 10/28/2009
Page No : 1

Groups Printed- Unshifted

	Ala Ike St Southbound				Westbound				Ala Ike St Northbound				Farrington Hwy Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
07:30	12	1	74	0	12	0	0	0	12	0	11	20	0	3	505	105	755
07:45	10	2	105	0	10	0	0	0	10	0	13	25	0	5	410	193	783
Total	22	3	179	0	22	0	0	0	22	0	24	45	0	8	915	298	1538
08:00	6	1	79	0	6	0	0	0	6	0	28	42	0	0	364	148	680
08:15	4	0	76	0	4	0	0	0	2	0	26	38	0	3	287	138	578
Grand Total	32	4	334	0	32	0	0	0	30	0	78	125	0	11	1566	584	2796
Apprch %	8.6	1.1	90.3	0	100	0	0	0	12.9	0	33.5	53.6	0	0.5	72.5	27	
Total %	1.1	0.1	11.9	0	1.1	0	0	0	1.1	0	2.8	4.5	0	0.4	56	20.9	

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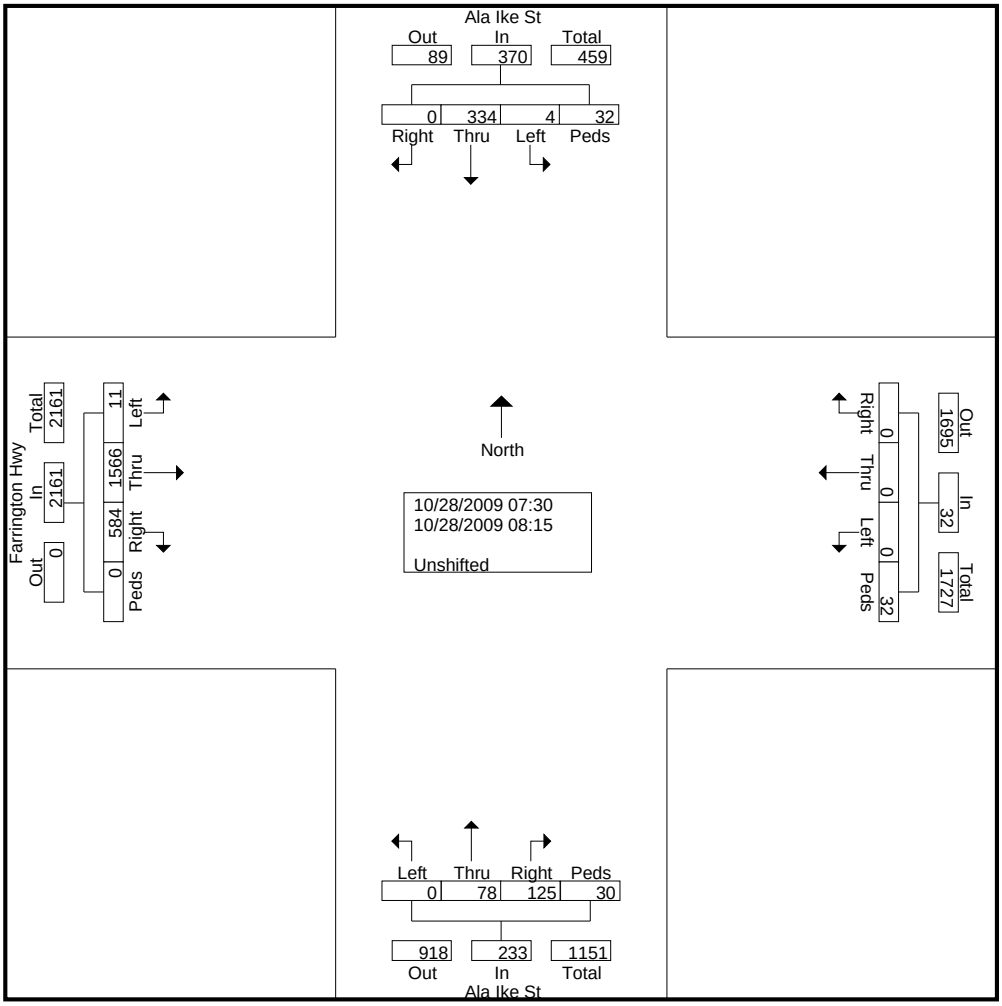
Leeward Community College - Ele
Turning Movement Counts
Farrington Hwy makai & Ala Ike St

File Name : 16503A - UW - Farrington_Ala Ike - makai - AM MD 091028DM
Site Code : 00000002
Start Date : 10/28/2009
Page No : 2



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1001 Bishop Street #2400
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Leeward Community College - EHF
Turning Movement Counts
Farrington Hwy makai & Ala Ike St

File Name : 16503A - UW - Farrington_Ala Ike - makai - AM MD 091028DM
Site Code : 00000002
Start Date : 10/28/2009
Page No : 1

Groups Printed- Unshifted

	Ala Ike St Southbound				Westbound				Ala Ike St Northbound				Farrington Hwy Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
11:45	5	6	53	0	4	0	0	0	5	0	84	138	0	1	336	64	696
Total	5	6	53	0	4	0	0	0	5	0	84	138	0	1	336	64	696
12:00	13	0	26	0	13	0	0	0	13	0	97	149	0	1	323	25	660
12:15	11	0	36	0	7	0	0	0	7	0	116	124	0	0	352	29	682
12:30	9	0	52	0	9	0	0	0	9	0	42	77	0	1	341	57	597
Grand Total	38	6	167	0	33	0	0	0	34	0	339	488	0	3	1352	175	2635
Apprch %	18	2.8	79.1	0	100	0	0	0	3.9	0	39.4	56.7	0	0.2	88.4	11.4	
Total %	1.4	0.2	6.3	0	1.3	0	0	0	1.3	0	12.9	18.5	0	0.1	51.3	6.6	

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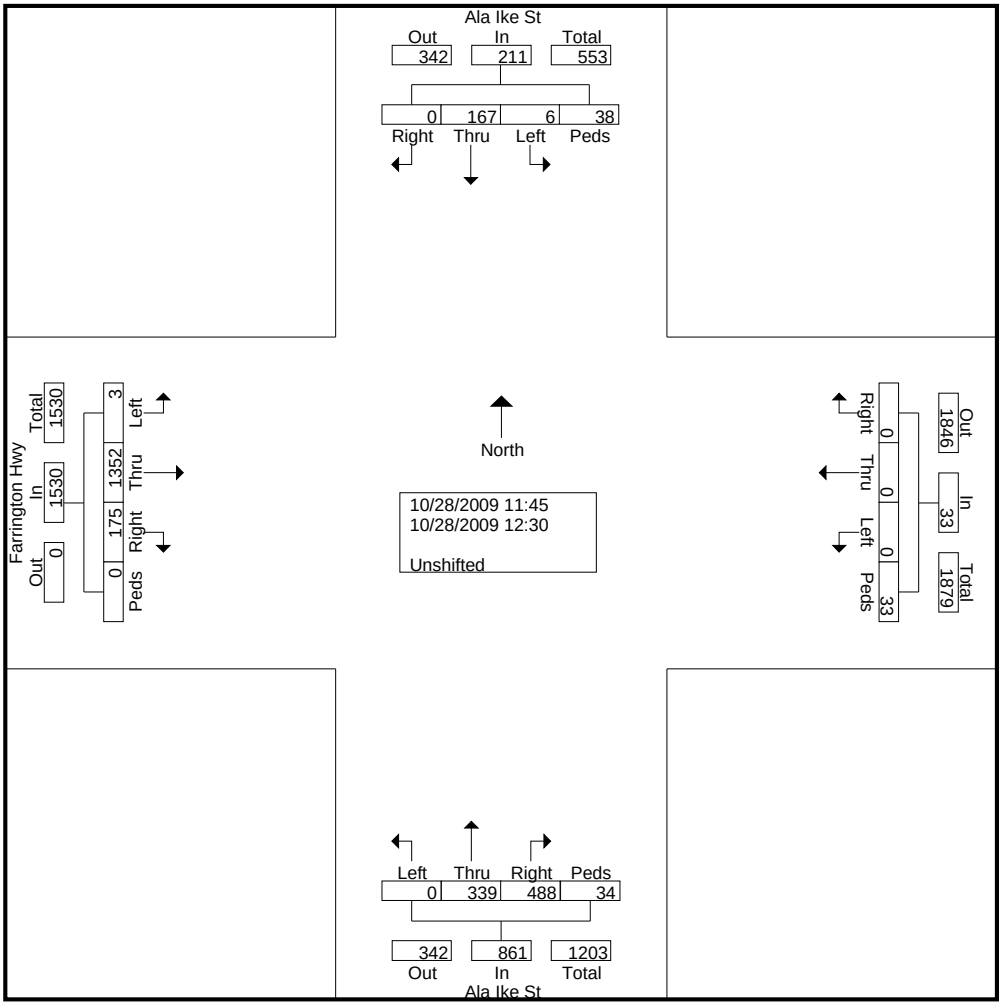
Leeward Community College - EHE File Name : 16503A - UW - Farrington_Ala Ike - makai - AM MD 091028DM
Turning Movement Counts Site Code : 00000002
Farrington Hwy makai & Ala Ike St Start Date : 10/28/2009
Page No : 2



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Leeward Community College - EIIF
Turning Movement Counts
Farrington Hwy & Waiawa Dr
Then Click the Comments Tab

File Name : 16503A - UW - Ala Ike_Waiawa AM MD 091028GK
Site Code : 00000003
Start Date : 10/28/2009
Page No : 1

Groups Printed- Unshifted

	Ala Ike St (N-S) Southbound				Waiawa Dr Westbound				Housing Northbound				Ala Ike St (N-S) Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
07:30	0	8	0	178	0	0	1	15	22	0	0	0	24	26	0	0	274
07:45	0	18	0	301	0	0	0	16	14	0	0	0	14	39	0	0	402
Total	0	26	0	479	0	0	1	31	36	0	0	0	38	65	0	0	676
08:00	1	10	0	247	0	0	0	8	30	0	0	0	29	41	0	0	366
08:15	0	11	0	225	0	0	0	10	2	0	0	0	3	31	0	0	282
Grand Total	1	47	0	951	0	0	1	49	68	0	0	0	70	137	0	0	1324
Apprch %	0.1	4.7	0	95.2	0	0	2	98	100	0	0	0	33.8	66.2	0	0	
Total %	0.1	3.5	0	71.8	0	0	0.1	3.7	5.1	0	0	0	5.3	10.3	0	0	

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Turning Movement Counts
Farrington Hwy & Waiawa Dr
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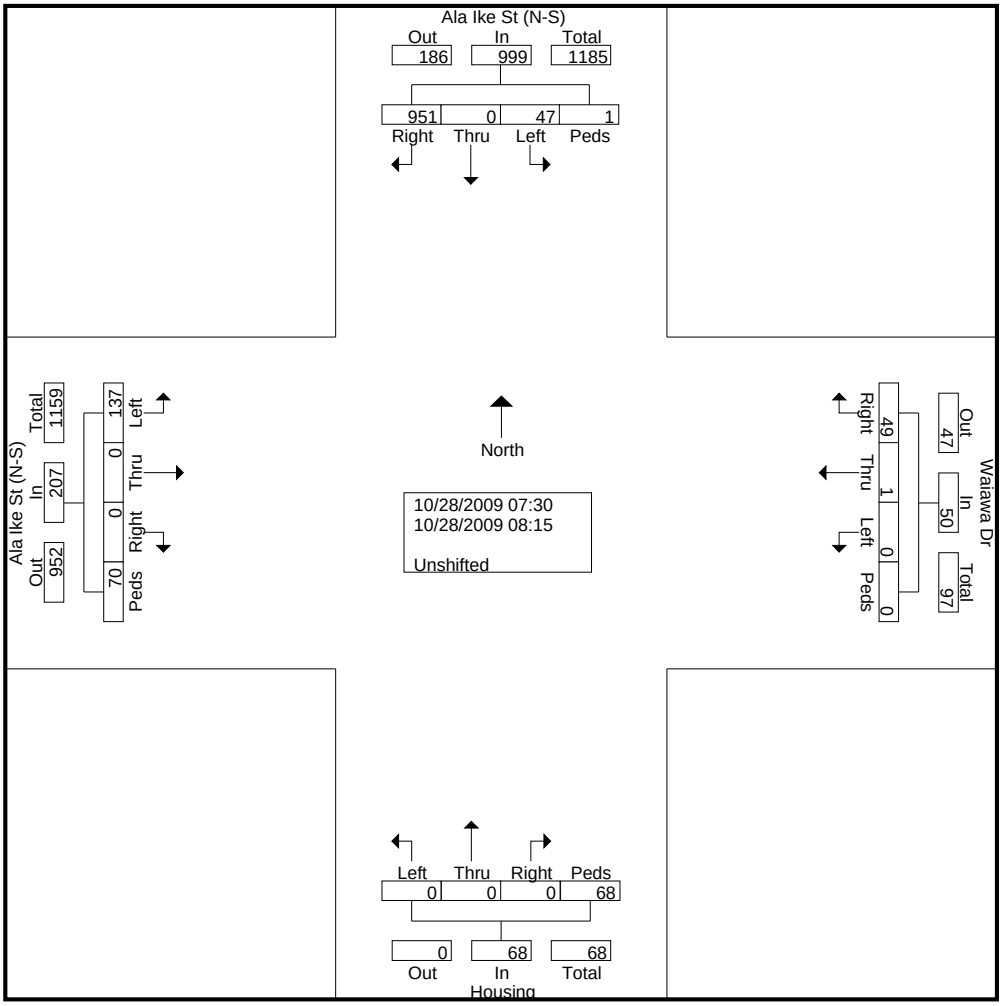
File Name : 16503A - UW - Ala Ike_Waiawa AM MD 091028GK
Site Code : 00000003
Start Date : 10/28/2009
Page No : 2



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Turning Movement Counts
Farrington Hwy & Waiawa Dr
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File Name : 16503A - UW - Ala Ike_Waiawa AM MD 091028GK
Site Code : 00000003
Start Date : 10/28/2009
Page No : 1

Groups Printed- Unshifted

	Ala Ike St (N-S) Southbound				Waiawa Dr Westbound				Housing Northbound				Ala Ike St (N-S) Eastbound				
Start Time	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Int. Total
11:45	1	4	0	127	0	0	0	15	23	0	0	0	23	218	0	0	411
Total	1	4	0	127	0	0	0	15	23	0	0	0	23	218	0	0	411
12:00	0	5	0	86	0	0	0	14	13	0	0	0	12	250	1	0	381
12:15	0	10	0	65	0	0	0	9	10	0	0	0	11	188	0	0	293
12:30	0	12	0	108	0	0	0	8	8	0	0	0	5	104	0	0	245
Grand Total	1	31	0	386	0	0	0	46	54	0	0	0	51	760	1	0	1330
Apprch %	0.2	7.4	0	92.3	0	0	0	100	100	0	0	0	6.3	93.6	0.1	0	
Total %	0.1	2.3	0	29	0	0	0	3.5	4.1	0	0	0	3.8	57.1	0.1	0	

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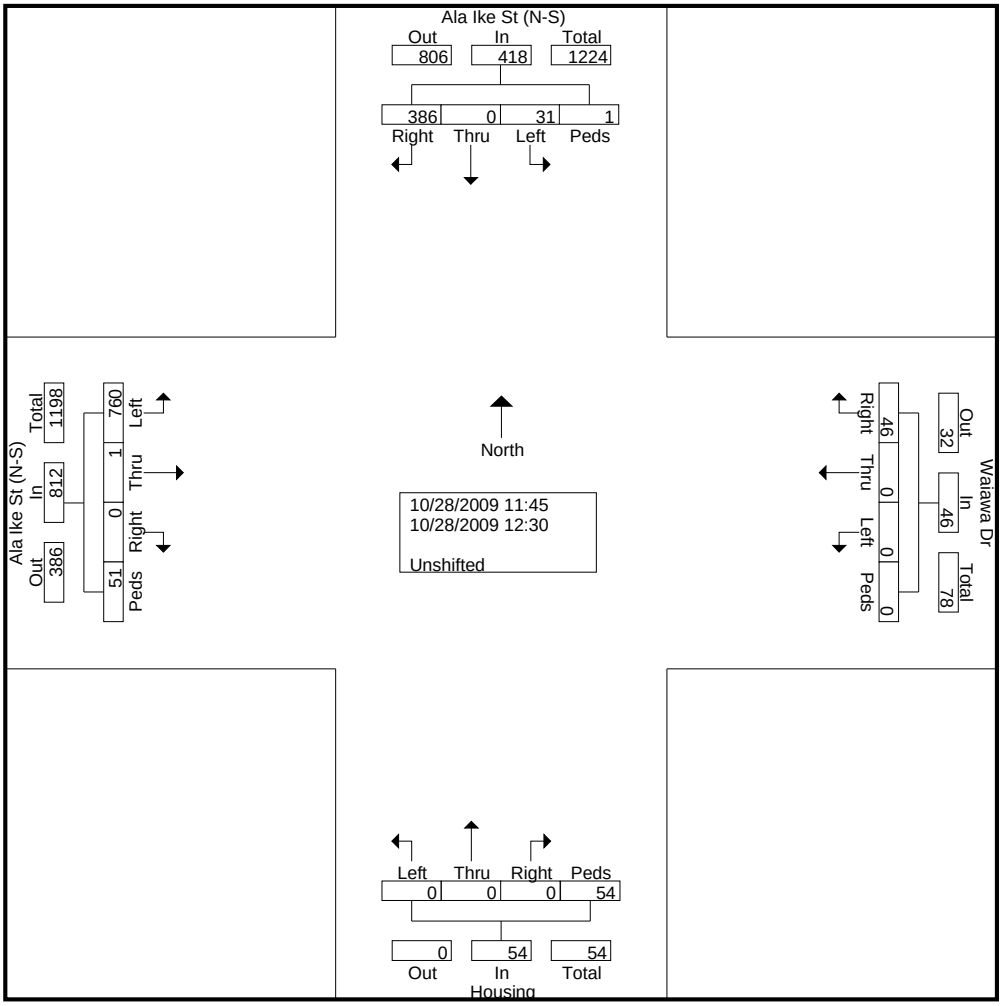
Leeward Community College - EIIF
Turning Movement Counts
Farrington Hwy & Waiawa Dr
Then Click the Comments Tab

File Name : 16503A - UW - Ala Ike_Waiawa AM MD 091028GK
Site Code : 00000003
Start Date : 10/28/2009
Page No : 2



Appendix B

Levels of Service Definitions

The Highway Capacity Manual defines six Levels of Service (LOS), labeled A through F, from best to worst conditions. Levels of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

For unsignalized intersections, the Highway Capacity Manual evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street.

LEVEL-OF-SERVICE A: Little or no delay.

LEVEL-OF-SERVICE B: Short traffic delays.

LEVEL-OF-SERVICE C: Average traffic delays.

LEVEL-OF-SERVICE D: Long traffic delays.

LEVEL-OF-SERVICE E: Very long traffic delays.

LEVEL-OF-SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.

Appendix C

Intersection Capacity Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	1566	584	0	0	0	0	78	125	4	334	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.95	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1490	1581	1752	
Flt Permitted		1.00	1.00					1.00	1.00	0.70	1.00	
Satd. Flow (perm)		3591	1607					1872	1490	1168	1752	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1702	635	0	0	0	0	85	136	4	363	0
RTOR Reduction (vph)	0	0	93	0	0	0	0	0	15	0	0	0
Lane Group Flow (vph)	0	1714	542	0	0	0	0	85	121	4	363	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		57.0	57.0					25.0	25.0	25.0	25.0	
Effective Green, g (s)		57.0	57.0					25.0	25.0	25.0	25.0	
Actuated g/C Ratio		0.61	0.61					0.27	0.27	0.27	0.27	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2178	974					498	396	311	466	
v/s Ratio Prot								0.05				
v/s Ratio Perm		0.48	0.34						0.08	0.00	0.21	
v/c Ratio		0.79	0.56					0.17	0.31	0.01	0.78	
Uniform Delay, d1		13.9	11.0					26.5	27.6	25.4	31.9	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.0	0.7					0.2	0.4	0.0	8.0	
Delay (s)		15.9	11.7					26.7	28.0	25.4	40.0	
Level of Service		B	B					C	C	C	D	
Approach Delay (s)		14.7			0.0			27.5			39.8	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	321	615	68	0
Sign Control	Free			Free	Stop	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	349	668	74	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		1032	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		1032	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		59	100
cM capacity (veh/h)			1622		180	1084

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	572	446	74
Volume Left	349	0	74
Volume Right	0	0	0
cSH	1622	1700	180
Volume to Capacity	0.22	0.26	0.41
Queue Length 95th (ft)	20	0	46
Control Delay (s)	5.5	0.0	38.4
Lane LOS	A		E
Approach Delay (s)	3.1		38.4
Approach LOS			E

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	137	0	1	49	47	951
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	0	1	53	51	1034
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	674	689	172	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674	689	172	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	54	100	100	94	96	
cM capacity (veh/h)	323	335	655	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	149	54	1085
Volume Left	149	0	51
Volume Right	0	53	1034
cSH	323	929	1444
Volume to Capacity	0.46	0.06	0.04
Queue Length 95th (ft)	58	5	3
Control Delay (s)	25.4	9.1	1.0
Lane LOS	D	A	A
Approach Delay (s)	25.4	9.1	1.0
Approach LOS	D	A	

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	1352	175	0	0	0	0	339	488	6	167	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.98	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3592	1607					1872	1496	1627	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.38	1.00	
Satd. Flow (perm)		3592	1607					1872	1496	653	1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1470	190	0	0	0	0	368	530	7	182	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	25	0	0	0
Lane Group Flow (vph)	0	1473	99	0	0	0	0	368	505	6	183	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		45.3	45.3					29.4	29.4	29.4	29.4	
Effective Green, g (s)		45.3	45.3					29.4	29.4	29.4	29.4	
Actuated g/C Ratio		0.52	0.52					0.34	0.34	0.34	0.34	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1877	840					635	507	221	593	
v/s Ratio Prot								0.20				
v/s Ratio Perm		0.41	0.06						c0.34	0.01	0.10	
v/c Ratio		0.78	0.12					0.58	1.00	0.03	0.31	
Uniform Delay, d1		16.8	10.5					23.6	28.6	19.1	21.1	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.2	0.1					1.3	38.6	0.0	0.3	
Delay (s)		19.0	10.6					24.9	67.2	19.2	21.4	
Level of Service		B	B					C	E	B	C	
Approach Delay (s)		18.0			0.0			49.9			21.4	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	193	733	299	0
Sign Control	Free			Free	Stop	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	210	797	325	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		818	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		818	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		0	100
cM capacity (veh/h)			1622		274	1084

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	475	531	325
Volume Left	210	0	325
Volume Right	0	0	0
cSH	1622	1700	274
Volume to Capacity	0.13	0.31	1.19
Queue Length 95th (ft)	11	0	368
Control Delay (s)	4.0	0.0	154.2
Lane LOS	A		F
Approach Delay (s)	1.9		154.2
Approach LOS			F

Intersection Summary			
Average Delay	39.1		
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	760	1	0	46	31	386
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	826	1	0	50	34	420
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	328	347	137	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	328	347	137	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	0	100	100	95	98	
cM capacity (veh/h)	555	530	693	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	827	50	453
Volume Left	826	0	34
Volume Right	0	50	420
cSH	555	937	1444
Volume to Capacity	1.49	0.05	0.02
Queue Length 95th (ft)	1037	4	2
Control Delay (s)	250.3	9.1	0.8
Lane LOS	F	A	A
Approach Delay (s)	250.3	9.1	0.8
Approach LOS	F	A	

Intersection Summary			
Average Delay	156.2		
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	1473	148	0	0	0	0	100	218	5	106	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.95	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.96	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1509	1603	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.69	1.00	
Satd. Flow (perm)		3591	1607					1872	1509	1158	1748	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	1601	161	0	0	0	0	109	237	5	115	0
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	0	1609	96	0	0	0	0	109	216	4	116	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		43.1	43.1					16.9	16.9	16.9	16.9	
Effective Green, g (s)		43.1	43.1					16.9	16.9	16.9	16.9	
Actuated g/C Ratio		0.60	0.60					0.23	0.23	0.23	0.23	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2150	962					439	354	272	410	
v/s Ratio Prot								0.06				
v/s Ratio Perm		0.45	0.06						c0.14	0.00	0.07	
v/c Ratio		0.75	0.10					0.25	0.61	0.01	0.28	
Uniform Delay, d1		10.5	6.2					22.4	24.6	21.2	22.6	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.0					0.3	3.0	0.0	0.4	
Delay (s)		12.0	6.2					22.7	27.6	21.2	23.0	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		11.4			0.0			26.0			22.9	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	110	1157	109	0
Sign Control	Free			Free	Stop	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	120	1258	118	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		868	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		868	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		56	100
cM capacity (veh/h)			1622		270	1084

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	539	838	118
Volume Left	120	0	118
Volume Right	0	0	0
cSH	1622	1700	270
Volume to Capacity	0.07	0.49	0.44
Queue Length 95th (ft)	6	0	53
Control Delay (s)	2.2	0.0	28.3
Lane LOS	A		D
Approach Delay (s)	0.9		28.3
Approach LOS			D

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	255	0	0	71	86	170
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	277	0	0	77	93	185
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	358	349	257	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	358	349	257	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	44	100	100	92	94	
cM capacity (veh/h)	498	506	570	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	277	77	278
Volume Left	277	0	93
Volume Right	0	77	185
cSH	498	937	1444
Volume to Capacity	0.56	0.08	0.06
Queue Length 95th (ft)	84	7	5
Control Delay (s)	20.9	9.2	2.9
Lane LOS	C	A	A
Approach Delay (s)	20.9	9.2	2.9
Approach LOS	C	A	

Intersection Summary			
Average Delay	11.6		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	1660	706	0	0	0	0	92	147	4	404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.93	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.95	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1482	1575	1752	
Flt Permitted		1.00	1.00					1.00	1.00	0.69	1.00	
Satd. Flow (perm)		3591	1607					1872	1482	1148	1752	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	1804	767	0	0	0	0	100	160	4	439	0
RTOR Reduction (vph)	0	0	69	0	0	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	1817	698	0	0	0	0	100	149	4	439	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		61.3	61.3					29.8	29.8	29.8	29.8	
Effective Green, g (s)		61.3	61.3					29.8	29.8	29.8	29.8	
Actuated g/C Ratio		0.59	0.59					0.29	0.29	0.29	0.29	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2135	955					541	428	332	506	
v/s Ratio Prot								0.05				
v/s Ratio Perm		0.51	0.43						0.10	0.00	0.25	
v/c Ratio		0.85	0.73					0.18	0.35	0.01	0.87	
Uniform Delay, d1		17.2	15.0					27.5	29.0	26.1	34.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.5	2.9					0.2	0.5	0.0	14.5	
Delay (s)		20.6	17.9					27.7	29.5	26.2	49.3	
Level of Service		C	B					C	C	C	D	
Approach Delay (s)		19.8			0.0			28.8			49.1	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	389	652	80	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%			3%	-2%	
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				0.98	0.95	
Satd. Flow (prot)				3422	1787	
Flt Permitted				0.98	0.95	
Satd. Flow (perm)				3422	1787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	423	709	87	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1132	87	0
Turn Type			Perm			
Protected Phases				8	2	
Permitted Phases			8			
Actuated Green, G (s)				15.0	6.9	
Effective Green, g (s)				15.0	6.9	
Actuated g/C Ratio				0.50	0.23	
Clearance Time (s)				4.0	4.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				1717	412	
v/s Ratio Prot					c0.05	
v/s Ratio Perm				0.33		
v/c Ratio				0.66	0.21	
Uniform Delay, d1				5.5	9.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.9	0.3	
Delay (s)				6.5	9.6	
Level of Service				A	A	
Approach Delay (s)	0.0			6.5	9.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	29.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	158	0	1	52	50	1151
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	172	0	1	57	54	1251
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	792	804	179	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	792	804	179	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	36	100	100	94	96	
cM capacity (veh/h)	267	287	648	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	172	58	1305
Volume Left	172	0	54
Volume Right	0	57	1251
cSH	267	929	1444
Volume to Capacity	0.64	0.06	0.04
Queue Length 95th (ft)	101	5	3
Control Delay (s)	39.9	9.1	1.4
Lane LOS	E	A	A
Approach Delay (s)	39.9	9.1	1.4
Approach LOS	E	A	

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	1433	211	0	0	0	0	411	590	6	200	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.98	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3592	1607					1872	1493	1637	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)		3592	1607					1872	1493	449	1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1558	229	0	0	0	0	447	641	7	217	0
RTOR Reduction (vph)	0	0	105	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	0	1561	124	0	0	0	0	447	620	6	218	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		49.0	49.0					29.3	29.3	29.3	29.3	
Effective Green, g (s)		49.0	49.0					29.3	29.3	29.3	29.3	
Actuated g/C Ratio		0.54	0.54					0.32	0.32	0.32	0.32	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1949	872					607	484	146	568	
v/s Ratio Prot								0.24				
v/s Ratio Perm		0.43	0.08						c0.42	0.01	0.12	
v/c Ratio		0.80	0.14					0.74	1.28	0.04	0.38	
Uniform Delay, d1		16.7	10.2					27.1	30.5	20.9	23.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.5	0.1					4.6	141.6	0.1	0.4	
Delay (s)		19.2	10.3					31.7	172.1	21.0	24.0	
Level of Service		B	B					C	F	C	C	
Approach Delay (s)		18.0			0.0			114.4			23.9	
Approach LOS		B			A			F			C	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	231	777	362	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%			3%	-2%	
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				0.99	0.95	
Satd. Flow (prot)				3447	1787	
Flt Permitted				0.99	0.95	
Satd. Flow (perm)				3447	1787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	251	845	393	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1096	393	0
Turn Type			Perm			
Protected Phases				8	2	
Permitted Phases			8			
Actuated Green, G (s)				15.1	12.4	
Effective Green, g (s)				15.1	12.4	
Actuated g/C Ratio				0.43	0.35	
Clearance Time (s)				4.0	4.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				1466	624	
v/s Ratio Prot					c0.22	
v/s Ratio Perm				0.32		
v/c Ratio				0.75	0.63	
Uniform Delay, d1				8.6	9.6	
Progression Factor				1.00	1.00	
Incremental Delay, d2				2.1	2.0	
Delay (s)				10.7	11.6	
Level of Service				B	B	
Approach Delay (s)	0.0			10.7	11.6	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	35.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	919	1	0	49	32	464
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	999	1	0	53	35	504
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	376	392	140	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	376	392	140	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	0	100	100	94	98	
cM capacity (veh/h)	514	500	690	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1000	53	539
Volume Left	999	0	35
Volume Right	0	53	504
cSH	514	937	1444
Volume to Capacity	1.95	0.06	0.02
Queue Length 95th (ft)	1660	5	2
Control Delay (s)	451.4	9.1	0.7
Lane LOS	F	A	A
Approach Delay (s)	451.4	9.1	0.7
Approach LOS	F	A	

Intersection Summary			
Average Delay	284.0		
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	1561	176	0	0	0	0	120	262	5	126	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.96	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1502	1597	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.67	1.00	
Satd. Flow (perm)		3591	1607					1872	1502	1133	1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	1697	191	0	0	0	0	130	285	5	137	0
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	16	0	0	0
Lane Group Flow (vph)	0	1705	114	0	0	0	0	130	269	4	138	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		48.1	48.1					20.4	20.4	20.4	20.4	
Effective Green, g (s)		48.1	48.1					20.4	20.4	20.4	20.4	
Actuated g/C Ratio		0.60	0.60					0.25	0.25	0.25	0.25	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2146	960					474	381	287	443	
v/s Ratio Prot								0.07				
v/s Ratio Perm		0.47	0.07						c0.18	0.00	0.08	
v/c Ratio		0.79	0.12					0.27	0.70	0.01	0.31	
Uniform Delay, d1		12.4	7.0					24.1	27.3	22.5	24.4	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1	0.1					0.3	5.8	0.0	0.4	
Delay (s)		14.5	7.1					24.4	33.2	22.5	24.8	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		13.8			0.0			30.4			24.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	131	1226	131	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%			3%	-2%	
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3469	1787	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3469	1787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	142	1333	142	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1475	142	0
Turn Type			Perm			
Protected Phases				8	2	
Permitted Phases			8			
Actuated Green, G (s)				23.3	8.6	
Effective Green, g (s)				23.3	8.6	
Actuated g/C Ratio				0.58	0.22	
Clearance Time (s)				4.0	4.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2026	385	
v/s Ratio Prot					c0.08	
v/s Ratio Perm				0.43		
v/c Ratio				0.73	0.37	
Uniform Delay, d1				6.0	13.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.3	0.6	
Delay (s)				7.3	13.9	
Level of Service				A	B	
Approach Delay (s)	0.0			7.3	13.9	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	305	0	0	75	91	201
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	332	0	0	82	99	218
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	390	377	268	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390	377	268	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	30	100	100	91	93	
cM capacity (veh/h)	471	487	559	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	332	82	317
Volume Left	332	0	99
Volume Right	0	82	218
cSH	471	937	1444
Volume to Capacity	0.70	0.09	0.07
Queue Length 95th (ft)	136	7	6
Control Delay (s)	28.9	9.2	2.8
Lane LOS	D	A	A
Approach Delay (s)	28.9	9.2	2.8
Approach LOS	D	A	

Intersection Summary			
Average Delay	15.4		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	1566	584	0	0	0	0	78	125	4	334	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.93	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.95	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1481	1575	1752	
Flt Permitted		1.00	1.00					1.00	1.00	0.69	1.00	
Satd. Flow (perm)		3591	1607					1872	1481	1145	1751	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	106%	106%	122%	100%	100%	100%	100%	122%	122%	106%	122%	100%
Adj. Flow (vph)	13	1804	774	0	0	0	0	103	166	5	443	0
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	1817	706	0	0	0	0	103	155	4	444	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		61.3	61.3					30.1	30.1	30.1	30.1	
Effective Green, g (s)		61.3	61.3					30.1	30.1	30.1	30.1	
Actuated g/C Ratio		0.59	0.59					0.29	0.29	0.29	0.29	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2129	953					545	431	333	510	
v/s Ratio Prot								0.06				
v/s Ratio Perm		0.51	0.44						0.10	0.00	c0.25	
v/c Ratio		0.85	0.74					0.19	0.36	0.01	0.87	
Uniform Delay, d1		17.3	15.3					27.5	29.0	26.1	34.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.6	3.1					0.2	0.5	0.0	15.0	
Delay (s)		20.9	18.4					27.7	29.5	26.1	49.8	
Level of Service		C	B					C	C	C	D	
Approach Delay (s)		20.2			0.0			28.8			49.6	
Approach LOS		C			A			C			D	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	103.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	321	615	68	0
Sign Control	Free			Free	Stop	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	426	709	90	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		1206	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		1206	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		31	100
cM capacity (veh/h)			1622		130	1084

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	662	472	90
Volume Left	426	0	90
Volume Right	0	0	0
cSH	1622	1700	130
Volume to Capacity	0.26	0.28	0.69
Queue Length 95th (ft)	27	0	96
Control Delay (s)	6.0	0.0	79.3
Lane LOS	A		F
Approach Delay (s)	3.5		79.3
Approach LOS			F

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	137	0	1	49	47	951
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	182	0	1	56	54	1261
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	797	809	178	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	797	809	178	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	32	100	100	94	96	
cM capacity (veh/h)	265	285	648	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	182	58	1315
Volume Left	182	0	54
Volume Right	0	56	1261
cSH	265	929	1444
Volume to Capacity	0.68	0.06	0.04
Queue Length 95th (ft)	114	5	3
Control Delay (s)	43.6	9.1	1.4
Lane LOS	E	A	A
Approach Delay (s)	43.6	9.1	1.4
Approach LOS	E	A	

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	1352	175	0	0	0	0	339	488	6	167	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.98	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3592	1607					1872	1493	1638	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.26	1.00	
Satd. Flow (perm)		3592	1607					1872	1493	443	1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	106%	106%	122%	100%	100%	100%	100%	122%	122%	106%	122%	100%
Adj. Flow (vph)	3	1558	232	0	0	0	0	450	647	7	221	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	0	1561	126	0	0	0	0	450	626	6	222	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		49.0	49.0					29.3	29.3	29.3	29.3	
Effective Green, g (s)		49.0	49.0					29.3	29.3	29.3	29.3	
Actuated g/C Ratio		0.54	0.54					0.32	0.32	0.32	0.32	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1949	872					607	484	144	568	
v/s Ratio Prot								0.24				
v/s Ratio Perm		0.43	0.08						c0.42	0.01	0.13	
v/c Ratio		0.80	0.14					0.74	1.29	0.04	0.39	
Uniform Delay, d1		16.7	10.2					27.1	30.5	20.9	23.6	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.5	0.1					4.9	146.8	0.1	0.4	
Delay (s)		19.2	10.3					32.0	177.3	21.0	24.0	
Level of Service		B	B					C	F	C	C	
Approach Delay (s)		18.0			0.0			117.7			24.0	
Approach LOS		B			A			F			C	

Intersection Summary			
HCM Average Control Delay	53.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	193	733	299	0
Sign Control	Free			Free	Stop	
Grade	-3%			3%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	256	845	396	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		934	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		934	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			84		0	100
cM capacity (veh/h)			1622		223	1084

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	537	563	396
Volume Left	256	0	396
Volume Right	0	0	0
cSH	1622	1700	223
Volume to Capacity	0.16	0.33	1.78
Queue Length 95th (ft)	14	0	679
Control Delay (s)	4.4	0.0	405.2
Lane LOS	A		F
Approach Delay (s)	2.1		405.2
Approach LOS			F

Intersection Summary			
Average Delay	108.9		
Intersection Capacity Utilization	120.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	760	1	0	46	31	386
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1008	1	0	53	36	512
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	381	397	141	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	381	397	141	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	0	100	100	94	98	
cM capacity (veh/h)	510	496	688	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1009	53	548
Volume Left	1008	0	36
Volume Right	0	53	512
cSH	510	937	1444
Volume to Capacity	1.98	0.06	0.02
Queue Length 95th (ft)	1700	4	2
Control Delay (s)	466.7	9.1	0.7
Lane LOS	F	A	A
Approach Delay (s)	466.7	9.1	0.7
Approach LOS	F	A	

Intersection Summary			
Average Delay	293.1		
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	1473	148	0	0	0	0	100	218	5	106	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			3%			-1%			2%	
Total Lost time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00	1.00					1.00	0.94	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	0.96	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3591	1607					1872	1501	1597	1751	
Flt Permitted		1.00	1.00					1.00	1.00	0.67	1.00	
Satd. Flow (perm)		3591	1607					1872	1501	1130	1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	106%	106%	122%	100%	100%	100%	100%	122%	122%	106%	122%	100%
Adj. Flow (vph)	8	1697	196	0	0	0	0	133	289	6	141	0
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	16	0	0	0
Lane Group Flow (vph)	0	1705	117	0	0	0	0	133	273	5	142	0
Confl. Peds. (#/hr)									30	32		
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		48.2	48.2					20.6	20.6	20.6	20.6	
Effective Green, g (s)		48.2	48.2					20.6	20.6	20.6	20.6	
Actuated g/C Ratio		0.60	0.60					0.25	0.25	0.25	0.25	
Clearance Time (s)		6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2142	959					477	383	288	446	
v/s Ratio Prot								0.07				
v/s Ratio Perm		0.47	0.07						c0.18	0.00	0.08	
v/c Ratio		0.80	0.12					0.28	0.71	0.02	0.32	
Uniform Delay, d1		12.5	7.1					24.1	27.4	22.5	24.4	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1	0.1					0.3	6.1	0.0	0.4	
Delay (s)		14.7	7.1					24.5	33.5	22.5	24.8	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		13.9			0.0			30.7			24.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	110	1157	109	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-3%			3%	-2%	
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3469	1787	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3469	1787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	122%	106%	122%	100%
Adj. Flow (vph)	0	0	146	1333	145	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1479	145	0
Turn Type			Perm			
Protected Phases				8	2	
Permitted Phases			8			
Actuated Green, G (s)				23.3	8.7	
Effective Green, g (s)				23.3	8.7	
Actuated g/C Ratio				0.58	0.22	
Clearance Time (s)				4.0	4.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2021	389	
v/s Ratio Prot					c0.08	
v/s Ratio Perm				0.43		
v/c Ratio				0.73	0.37	
Uniform Delay, d1				6.1	13.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.4	0.6	
Delay (s)				7.5	13.9	
Level of Service				A	B	
Approach Delay (s)	0.0			7.5	13.9	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	255	0	0	71	86	170
Sign Control		Stop	Stop		Free	
Grade		-2%	4%		-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	338	0	0	82	99	225
Pedestrians		1	69			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	6			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)					1052	
pX, platoon unblocked						
vC, conflicting volume	394	381	268	69	69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	394	381	268	69	69	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	28	100	100	91	93	
cM capacity (veh/h)	468	484	559	937	1444	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	338	82	325
Volume Left	338	0	99
Volume Right	0	82	225
cSH	468	937	1444
Volume to Capacity	0.72	0.09	0.07
Queue Length 95th (ft)	144	7	6
Control Delay (s)	30.3	9.2	2.8
Lane LOS	D	A	A
Approach Delay (s)	30.3	9.2	2.8
Approach LOS	D	A	

Intersection Summary			
Average Delay	16.0		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		