JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
KA ʻOIHANA HOʻONAʻAUAO
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

OFFICE OF FACILITIES AND OPERATIONS

March 31, 2023

TO: Mary Alice Evans
Director, Office of Planning and Sustainable Development
Environmental Review Program

FROM: Edward S. Ige
Facilities Director, Facilities Development Branch

SUBJECT: **Chapter 343, Hawaii Revised Statutes, Final Environmental Assessment and Finding of No Significant Impact**
James Campbell High School – Athletic Complex Facilities and Master Plan
Ewa Beach, Oahu, Hawaii
Tax Map Key: (1) 9-9-001:002

The Hawaii State Department of Education has reviewed the Final Environmental Assessment for the James Campbell High School Athletic Complex Facilities and Master Plan and comments received during the 30-day comment period and has issued a Finding of No Significant Impact (DEA-AFONSI) determination. Please publish this determination in the next edition of the Environmental Notice.

Attached is a completed OEQC Publication Form, one electronic copy in Adobe Acrobat PDF file format of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Should you have any questions, please contact Karynn Yoneshige, Project Coordinator of the Facilities Development Branch, Project Management Section, at (808) 784-5053 or via email at Karynn.yoneshige@k12.hi.us, or contact our authorized agent of this project, Taeyong Kim, of Environmental Communications, Inc. at (808) 528-4661

ESI:ky

c: Facilities Development Branch

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Monday, April 3, 2023 9:11:30 AM

Action Name

James Campbell High School Athletic Complex & Master Plan

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

ʻEwa, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 9-1-001-002

Action type

Agency

Other required permits and approvals

NPDES, Community Noise, Building Permits

Proposing/determining agency

Department of Education

Agency contact name

Karynn Yoneshige

Agency contact email (for info about the action)

karynn.yoneshige@k12.hi.us

Email address or URL for receiving comments

karynn.yoneshige@k12.hi.us

Agency contact phone

(808) 784-5127

Agency address

P.O. Box 2360
Honolulu, Hawaii 96804
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Environmental Communications, Inc.

Consultant contact name

Taeyong Kim

Consultant contact email

tkim@environcom.com

Consultant contact phone

(808) 528-4661

Consultant address

P.O. Box 236097
Honolulu, HI 96823
United States
Map It

Action summary

The proposed project is a programmatic document for future improvements on the James Campbell High School campus as well as an environmental assessment that specifically address improvements for the athletic facilities for the campus. Presently funded is new athletic complex that will consist of new bleachers, girls and boys locker rooms, fitness and trainer rooms, broadcast booth, weight training rooms, a new ticket booth, concession stand and public toilets and other support services.

Other future master plan components include renovated fields, new parking areas, relocation of portable buildings to facility a new internal circulation road, new covered play courts to replace Ilima Intermediate's outdoor courts, a new parking garage, a new multipurpose building, additional play courts, replacement of visitor's bleachers and other modernization improvements.

The proposed project cost is $18,000,000.

Reasons supporting determination

Based on an evaluation of project significance criteria, the proposed James Campbell High School Athletic Facilities Improvements project is not expected to have a significant effect on the environment beyond those associated with a master planned campus community that is limited to already improved areas. As such, a Finding of No Significant Impact (FONSI) has been determined for the project by the Department of Education.

Attached documents (signed agency letter & EA/EIS)

- KY-Evans-FEA-ALFONSI-letter-Campbell-HS-Athletic-Complex-Facilities-and-Master-Plan-signed.pdf
- Campbell-FEA-consolidated.pdf

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- Campbell-High-School-Athletic-Facilities-1.kml.zip

Authorized individual

Taeyong Kim

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

FINAL ENVIRONMENTAL ASSESSMENT

JAMES CAMPBELL HIGH SCHOOL
ATHLETIC COMPLEX FACILITIES & MASTER PLAN

TMK 9-1-001: 002

91-980 NORTH ROAD

EWA BEACH, O'AHU, HAWAI'I

THIS DOCUMENT IS PREPARED PURSUANT TO CHAPTER 343, HAWAI□I REVISED STATUTES

APPROVING AGENCY:
STATE OF HAWAII
DEPARTMENT OF EDUCATION

APRIL 2023

FINAL ENVIRONMENTAL ASSESSMENT
JAMES CAMPBELL HIGH SCHOOL
ATHLETIC COMPLEX FACILITIES & MASTER PLAN
TMK 9-1-001: 002
91-980 NORTH ROAD
EWA BEACH, O'AHU, HAWAI'I

THIS DOCUMENT IS PREPARED PURSUANT TO CHAPTER 343, HAWAI'I REVISED STATUTES

APPROVING AGENCY:
STATE OF HAWAII
DEPARTMENT OF EDUCATION

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

343	Environmental Lawa Hawaii Revised Statutes (343 HRS)
AAQS	Ambient Air Quality Standards
AGL	Above Ground Level
ANSI	American National Standards Institute
BLNR	Board of Land and Natural Resources
BMPs	Best Management Practices
BWS	Board of Water Supply
CDUP	Conservation District Use Permit
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Clean Islands Council
City	City and County of Honolulu
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
CT	Census Tract
CWA	Clean Water Act of 1977
CZMA	Coastal Zone Management Act
DA	Department of the Army
dB	Decibel
dBA	Decibels A-Weighted Scale
DBEDT	Dept. of Business, Economic Development and Tourism
DHS	U.S. Department of Homeland Security
DLM	Department of Land Management (City and County of Honolulu)
DLNR	Department of Land and Natural Resources
DNL	Day-night sound level
DOA	Department of Agriculture (State of Hawaii)
DOD	U.S. Department of Defense
DOE	Department of Education (State of Hawaii)
DOH	Department of Health (State of Hawaii)
DOT-A	Department of Transportation, Airports Division (State of Hawaii)
DOT-H	Department of Transportation, Harbors Division (State of Hawaii)
DPP	Department of Planning and Permitting (City and County of Honolulu)
DU	Decision Units
EA	Environmental Assessment
EFH	Essential Fish Habitats
EHE	Environmental Health Evaluation
EHMP	Environmental Hazard Management Plan
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
EMS	Emergency Medical Services (City and County of Honolulu)
EO	Executive Order(s)

EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
ESA	Environmental Site Assessment
F	Fahrenheit
FAA	Federal Aviation Administration
FAQ	Frequently Asked Questions
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
FHA	Federal Housing Administration
FIRM	Flood Insurance Rate Map(s)
FONSI	Finding of No Significant Impact
FR	Federal Register
FWCA	Fish and Wildlife Coordination Act
GHG	Greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GWP	Global warming potential
H_2S	Hydrogen Sulfide
HAR	Hawai‘i Administrative Rules
HART	Honolulu Authority for Rapid Transit
HCDA	Hawaii Community Development Authority (State of Hawaii)
HCM	Highway Capacity Manual
HECO	Hawaiian Electric Company
HEER	Hazard Evaluation and Emergency Response Office (State of Hawaii)
HEPA	Hawaii Environmental Policy Act
HFD	Honolulu Fire Department (City and County of Honolulu)
HHFDC	Hawaii Housing Finance and Development Corporation (State of Hawaii)
HIA	Honolulu International Airport
HISC	Hawaii Invasive Species Council
HPD	Honolulu Police Department (City and County of Honolulu)
HRS	Hawaii Revised Statutes
HTCO	Hawaiian Telcom
HUD	U.S. Department of Housing and Urban Development
IBC	International Building Code
IPCC	Intergovernmental Panel on Climate Change
JBPHH	Joint Base Pearl Harbor-Hickam
kV	Kilovolt
LED	Light emitting diode
Leq	Equivalent sound level
LIHTC	State Low Income Housing Tax Credits
LOS	Level of Service
LUC	Land Use Commission (State of Hawaii)
LUO	Land Use Ordinance
MHHW	Mean higher high water
MLLW	Mean lower low water
MS4	Municipal Separate Storm Sewer System
MSL	Mean sea level

MUS	Management Unit Species
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NEC	Network Enterprise Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service (National Oceanic and Atmospheric Administration)
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
OCCL	Office of Conservation and Coastal Lands (State of Hawaii)
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs (State of Hawaii)
OMPO	Oahu Metropolitan Planning Organization
ORMP	Ocean Resources Management Plan (State of Hawaii)
OU1C	Operating Unit 1C
Pb	Lead
PCB	Polychlorinated biphenyl
PET	Polyethylene terephthalate
PUC	Public Utilities Commission
PVC	Polyvinyl chloride
RFP	Request for Proposals
RHRF	Rental Housing Revolving Fund
ROI	Region of influence
ROW	Right of way
SB	Senate Bill
SHPD	State Historic Preservation Division
SLUC	State Land Use Commission
SMA	Special Management Area
SOEST	School of Ocean and Earth Science and Technology (University of Hawaii)
SO_2	Sulfur dioxide
SPS	Sewage Pump Station
State	State of Hawaii
SVOC	Semi-volatile organic compounds
SWMP	Storm Water Management Plan
TMDL	Total Maximum Daily Load(s)
TMK	Tax Map Key
UH	University of Hawaii
US	United States
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard

USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground storage tanks
VA	U.S. Department of Veterans Affairs
VOC	Volatile organic compound
VPH	Vehicles per hour
WQC	Water Quality Certification

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SECTION ONE
PROJECT SUMMARY

PROPOSING/ ACCEPTING AGENCY:	Department of Education Office of Facilities and Operations 3633 Waialae Avenue, Room B-201 Honolulu, Hawai‘i 96816
AGENT:	Environmental Communications, Inc. P.O. Box 236097 Honolulu, Hawai‘i 96823
PROJECT NAME:	James Campbell High School Master Plan and Athletic Facilities
PROJECT LOCATION:	91-750 Fort Weaver Road Ewa Beach, Oahu, Hawai‘i The project site is located on a large block containing James Campbell High School, Ilima Intermediate School, and Pohakea Elementary School
TAX MAP KEY:	9-1-001: 002
OWNERSHIP:	City and County of Honolulu
LOT AREA:	5.071 Acres
ZONING:	The project area is designated as R-5 Residential under the City and County of Honolulu Zoning Maps.
SPECIAL DISTRICT:	The project is not located in a Special District
STATE LAND USE:	Urban
EXISTING LAND USE:	The proposed project is presently in use as the James Campbell High School, a public facility. The proposed action will improve and continue the current use as an educational facility.
NATURE OF DEVELOPMENT:	The proposed action consists of the implementation of a portion of a new master plan for the James Campbell High School.

	This document encompasses the proposed master plan for the campus and specifically addresses the athletic complex improvements which have been funded. This Environmental Assessment (EA) is intended to serve as a programmatic for the Master Plan components which will be developed as funding is available and to provide specific details for the athletic complex improvements which have received funding.
TOTAL PROJECT COST:	Approximately $18,000,000
PROJECT SCHEDULE:	The athletic complex portion project is anticipated to commence in the Spring of 2025 and is anticipated to be completed in Summer of 2026.
PERMITS REQUIRED:	City and County of Honolulu Building Permits
NEED FOR ASSESSMENT:	Chapter 343, Hawaii Revised Statutes Use of State funds and County Lands
ACTION DETERMINATION:	Anticipated Finding of No Significant Impact

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SECTION TWO
PROPOSED PROJECT AND STATEMENT OF OBJECTIVES

2.1 PROJECT LOCATION

The proposed project entails a new campus master plan for the exiting James Campbell High School which is located on a single large block that also includes Ilima Intermediate School, Pohakea Elementary School and Kaimiloa Elementary School. The block also includes the Ewa Beach Library and the private Our Lady of Perpetual Help school. Other uses on this block include the Hale Pono Boys and Girls Club, a few commercial uses and townhouse and single family residential dwellings. This large block is bounded by Fort Weaver Road to the south, North Road to the west, Kehue Street to the north, and Kuhina Street to the West. The James Campbell High School is located on a portion of Tax Map Key: 9-1-001: 002 which includes the project site and Ilima Intermediate School and Pohakea Elementary School. The site is owned by the City and County of Honolulu.

The project area can be considered the center point of the Ewa Beach community. A mix of older single-family and low-density town homes surround the project area, while newer planned developments including Ocean Point and Ewa by Gentry lie to the west. These new developments have significantly increased the population of the district. Beyond the project block, notable uses include the Ewa Beach Community Park located directly across the project site on North Road, commercial uses and the US Postal Service located to the southwest, and the Ewa Beach Elementary School. It should be noted that three public elementary schools and one private elementary school are located less than a quarter mile from the project site and are indicative of the high demand for schools within this district.

In general, the Ewa Beach district has been transitioned from an agricultural and bedroom community to an area of mixed residential and commercial uses. This is enabled by the State and County models of urban development which promote mixed use growth in west Oahu. The proposed improvements will incrementally provide for the changing needs for high school education and supporting facilities as this dynamic community evolves.

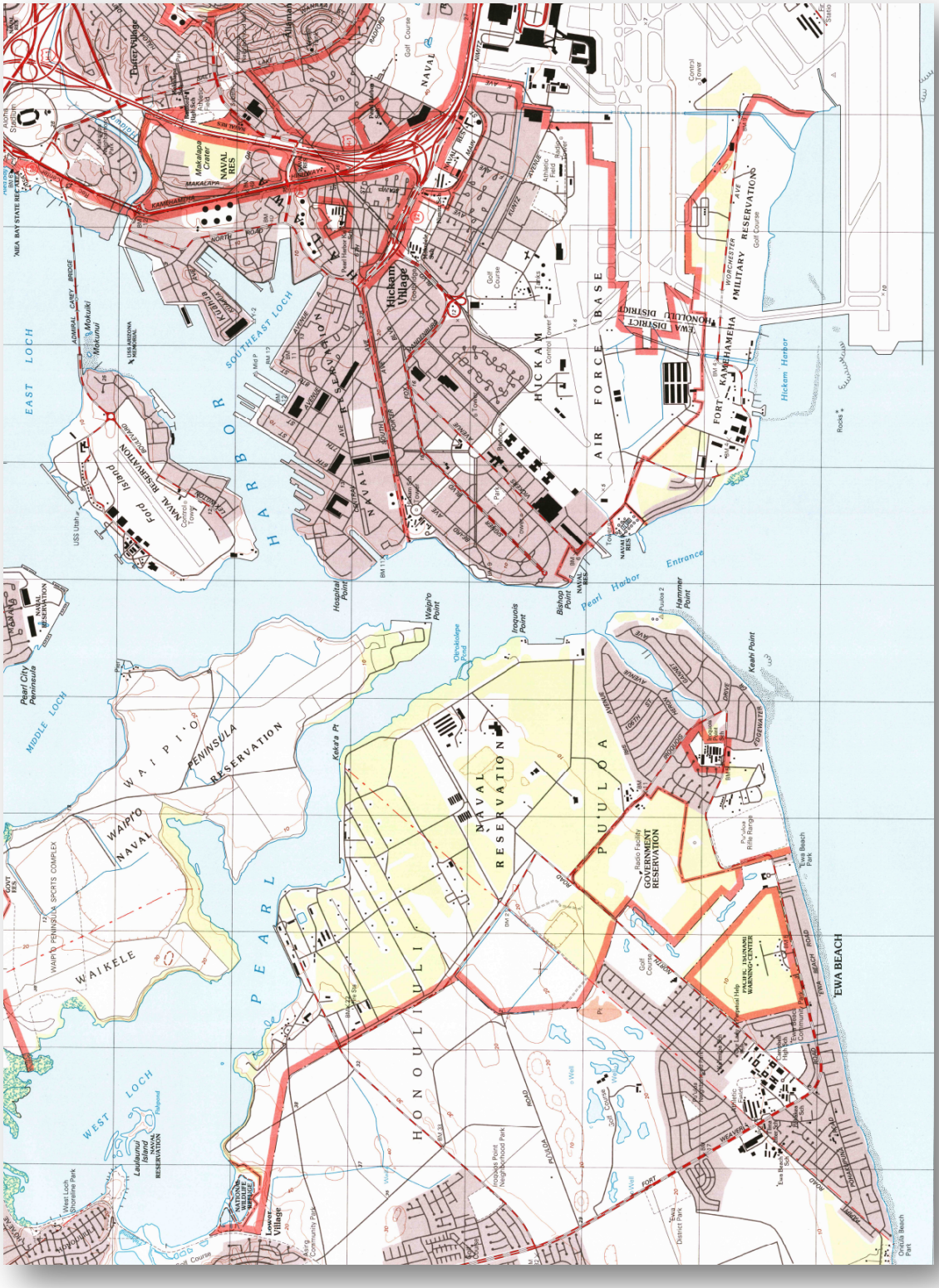


Figure 1: Project Location Map Source: US Geological Service

Figure 2: Aerial View Source: Google Earth

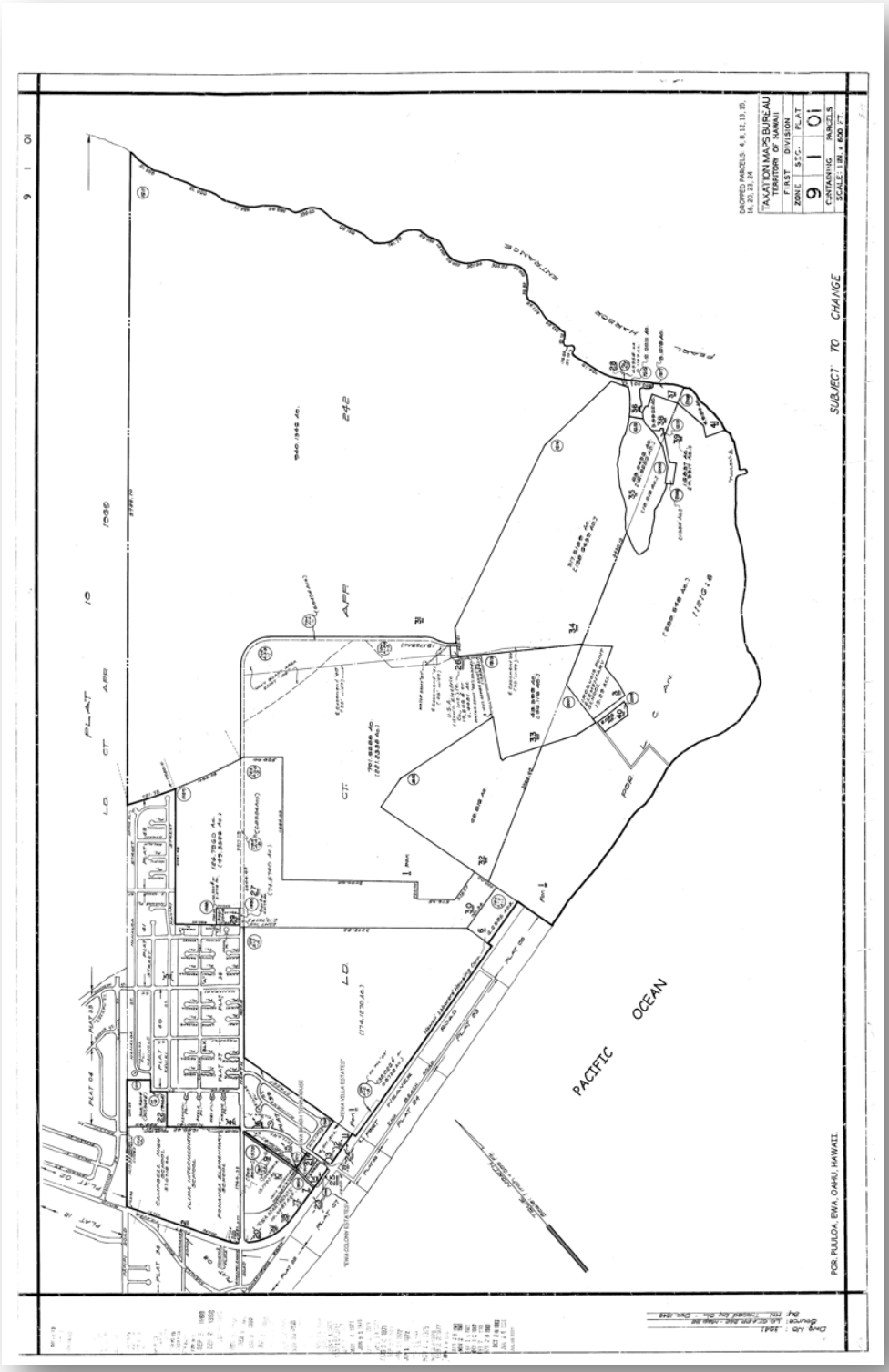


Figure 3: Tax Map Plat Source: City and County of Honolulu

2.2 PROJECT DESCRIPTION

2.2.1 PROJECT NEED AND PURPOSE OF THIS DOCUMENT

The project subject of this document is two-fold. This Environmental Assessment serves as a programmatic document for future improvements on the James Campbell High School campus which are described in gross area descriptions, and this document provides specific details regarding athletic complex improvements which have been programmatically funded and are in the design phase. Collectively, impacts associated with this master plan are regulated to a single site and are anticipated to be addressed by this document within a ten year period. Should the programming for specific components of the master plan substantially change, environmental site conditions change, or should the improvements occur beyond a 10-year period, the proposing agency shall evaluate the need for supplemental planning and environmental documentation.

The proposed master plan and athletic complex improvements are subject to Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules. The proposed action is triggered by the use of State funds and County lands.

2.2.2 EXISTING CAMPUS PLAN

The existing facilities of the James Campbell High School campus are depicted in the following plan graphic. Areas not included in the master plan scope are depicted as hatched areas. A programmatic table of the individual use spaces within the plan are listed in the adjacent table. This plan graphic is immediately followed with the proposed master plan to facilitate easy comparisons.

2.2.3 PROPOSED MASTER PLAN COMPONENTS

The proposed master plan provides a graphic showing all master plan improvements and the project phasing in the accompanying table. This schedule provides general phase related improvements which are addressed as follows.

<u>Current Ongoing Improvements</u>

- As new classroom complex consisting of six classroom buildings totaling 39,900 square feet was recently completed. This complex of buildings is located immediately north of the main campus parking lot.
- A new plaza entry and unmarked parking area will be located adjacent to, and northwest of the administration building.
- These improvements are not subject of this document and were addressed under separate planning processes.

<u>Phase One Improvements</u>

- The baseball/ softball field will be renovated for improved turf conditions.

- A new small parking area will be added adjacent to the baseball/ softball field via an entrance off Kuhina Street.
- The multi-purpose field will be demolished and replaced with new turf and track surfaces.
- A new track and field throwing pit will be constructed at the north end of the field.

Phase Two Improvements

- Two portable buildings identified as 3 and 4, located southeast of the athletic field will be relocated to allow for improved movement of the internal circulation road that will be constructed.
- The new internal circulation road will provide restricted access for buses and authorized vehicles to the athletic complex. This service/ bus road will enter from Fort Weaver Road and will exit onto North Road northeast of the Ewa Beach Library.
- The existing outdoor courts serving Ilima Intermediate School will be demolished and replaced by new covered courts.
- The existing field building located west of the track and field will be demolished and will be replaced by homefield bleachers accommodating approximately 3,000 people and a press box with a locker room building located beneath the bleachers. This 9,230 square foot building will include athletic lockers, laundry room, Trainer's room, fitness room, first aid room & storage. Upgrades will be made to the existing fencing.
- A new ticket both, concession stand and toilet building will be added at the south end of the track and field area.
- A new storage and bathroom building will be added at the southeastern side of the track and field area.

Phase Three Improvements

- A new three story parking garage will be constructed between Ilima Intermediate School and the James Campbell High School. This parking building will be located in the location of the existing Building N.
- A new multipurpose building will be constructed south of the new interior access road immediately south of the track and field complex. This building will house athletic programs offices, physical education classrooms and general classroom spaces.
- Additional play courts and landscaping will be located adjacent to the existing play courts located at the east end of the campus.
- Visitors bleachers located on the east side of the track and field will be replace in this phase. The new bleachers will accommodate approximately 650 people.

Future Phases

- Demolition of Building A
- Construction of a new 2 story administration building and parking lot on the Building A site.
- Demolition of portable buildings 5 through 12, and 17 through 19.
- Construction of a new 3 story classroom building where the portable building was located.
- Demolition of Building N.
- Construction of a new 2 story STEM Academy Building.
- Expansion of the existing parking lot.
- Additional site work and landscaping.

The project has received funding for the new bleacher and athletic locker rooms building. The program for this building is provided in the following table.

CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX	NEW WORK	UNIT AREA	ED SPEC AREA	TOTAL AREA
ATHLETIC LOCKER ROOMS				
GIRLS LOCKER ROOM				
COACH'S OFFICE	1	160	160	160
LOCKER SHOWER TOILET	1	110	110	110
LOCKER ROOM AND MEETING AREA	1	1,100	1,100	1,100
TOILET AREA	1	200	200	200
DRYING ROOM	1	300	300	300
SHOWER ROOM	5	100	500	500
EQUIPMENT STORAGE AREA	1	300	300	300
SHOWER BOOTH ROOM	3	40	120	120
SHOWER BOOTH ROOM (ADA)	1	80	80	80
TRANSGENDER ROOM	1	150	150	150
TOWEL AND SUPPLY STORAGE	1	200	200	200
JANITOR CLOSET	1	80	80	80
TOTAL				3,300
BOYS LOCKER ROOM				
COACH'S OFFICE	1	160	160	160
LOCKER SHOWER TOILET	1	110	110	110
LOCKER ROOM AND MEETING AREA	1	1,100	1,100	1,100
TOILET AREA	1	200	200	200
DRYING ROOM	1	300	300	300
SHOWER ROOM	5	100	500	500
EQUIPMENT STORAGE AREA	1	300	300	300
SHOWER BOOTH ROOM	3	40	120	120

SHOWER BOOTH ROOM (ADA)	1	80	80	80
TRANSGENDER ROOM	1	150	150	150
TOWEL AND SUPPLY STORAGE	1	200	200	200
JANITOR CLOSET	1	80	80	80
TOTAL				3,300
COMMON AREAS				
LAUNDRY ROOM	1	160	160	160
ELECT, MECH, TELECOM RMS	3	100	300	300
FITNESS ROOM	1	1,800	1,800	1,800
TRAINER'S ROOM	1	1,300	1,300	1,300
HEAVY EQUIPMENT ROOM	1	500	500	500
BROADCAST BOOTH	1	690	690	690
MEN'S PUBLIC TOILET	1	600	600	600
WOMEN'S PUBLIC TOILET	1	660	660	660
TOTAL				6,010
WEIGHT TRAINING ROOM				
MULTI-USE MACHINE AREA	1	800	800	800
SQUAT RACK AREA	3	100	300	300
POWER BENCH AREA	1	200	200	200
FREE STANDING RACK AREA	1	235	235	235
REHAB MACHINE AREA	1	625	625	625
TOTAL				2,160
TOTAL BUILDING AREA			TOTAL	14,770

ACCESSORY SPACES

OUTDOOR FACILITIES	**NEW WORK**	**UNIT AREA**	**ED SPEC AREA**	**TOTAL AREA**
TICKET BOOTH	1	100	100	100
CONCESSION	1	300	300	300
MEN'S PUBLIC TOILET	1	600	600	600
WOMEN'S PUBLIC TOILET	1	660	660	660
JANITOR'S CLOSET	1	80	80	200
STORAGE	1	800	800	800
TOTAL OUTDOOR FACILITIES			TOTAL	2,660

Figure 4: Existing Site Plan Source: Design Partners, Inc.

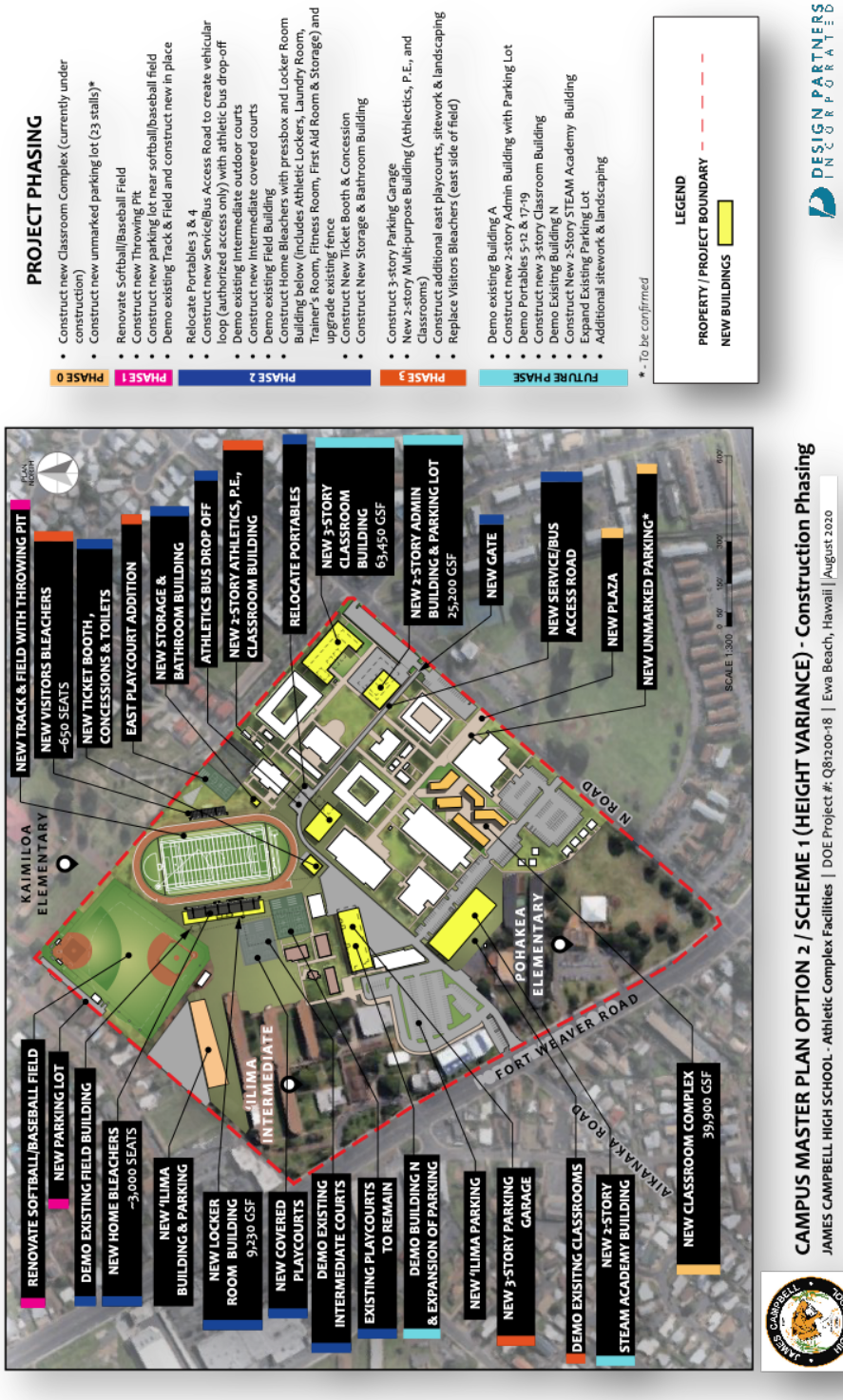


Figure 5: Site Master Plan Source: Design Partners, Inc.

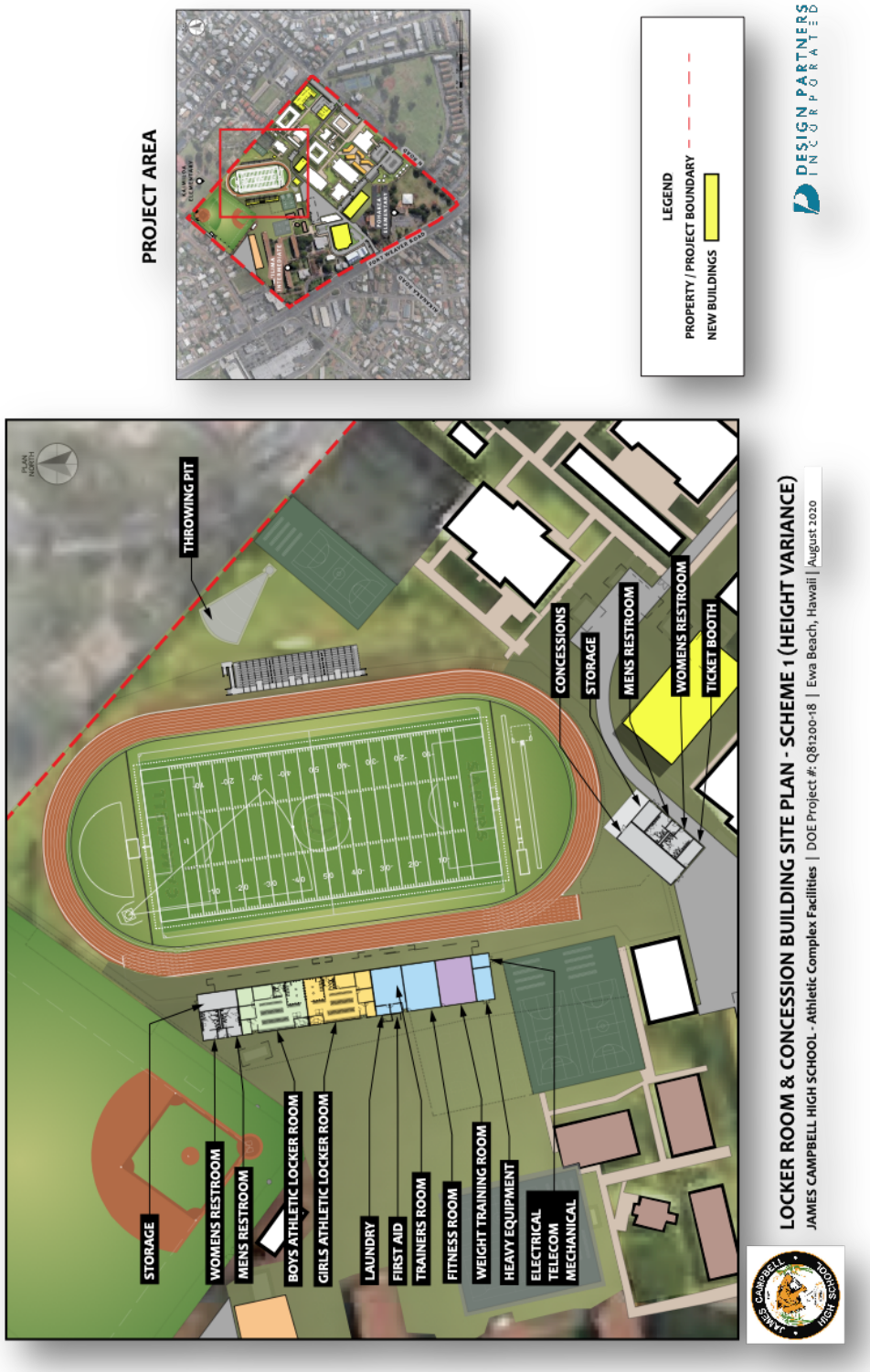


Figure 6: Athletic Facility Site Plan Source: Design Partners, Inc.

Figure 7: Locker Room and Bleacher Floor Plan Source: Design Partners, Inc.

2.3 ALTERNATIVE GYMNASIUM LOCATIONS

Alternative locations for the proposed gymnasium were considered

2.3 PROJECT OBJECTIVE

The objective of the proposed project master plan is to create a path that strategically meets the needs of the largest public high school in Hawaii. The demand for educational services and facilities in this fast growing community is significant and compels the State of Hawaii Department of Education accommodate these needs within the limited area of this multi-school complex. Piecemeal, incremental improvements are not suitable for the significant needs of this school therefore a prioritized and phased approach is required. The subject master plan addresses both current and projected needs and also creates a sequence of improvements that allow for the maximization of this size limited campus.

Improvements to accommodate the growing student population have already begun with the addition of the new class room complex. It has been determined by the Department of Education that suitable athletic facilities are a priority item as well as to meet the requirements of Title IX directives regarding gender equitable facilities.

2.4 FUNDING AND SCHEDULE

The project master plan has been funded and current funding will allow for the construction of the athletic field complex improvements. The project total development cost is approximately $18,000,000.

Upon completion of the Environmental Assessment process, the project will be required to obtain standard construction related permits from the State of Hawaii and the City and County of Honolulu. The anticipated construction start date is during the Spring of 2025. The project is anticipated to be completed in the Summer of 2026.

SECTION THREE
DESCRIPTION OF ENVIRONMENT, ANTICIPATED IMPACTS AND MITIGATION MEASURES

3.1 ENVIRONMENTAL SETTING

The project site represents an entire city block that is located within a highly urbanized area located within the Ewa District. Originally a Hawaiian settlement area, the area was known as a plantation and subsequently became associated with the former Ewa Sugar Mill. Since the closure of the mill, Ewa Beach became a bedroom community that consists primarily of low-density residential uses and some supporting commercial areas. More recently, the Ewa district has become an area of rapid growth through planned developments and new sub-communities such as Ocean Point and Ewa by Gentry.

The project site and educational uses predate the newer communities that arose in the Ewa district. Located in what is essentially the core of the Ewa Beach community, new uses developed around the complex of schools leaving the schools no additional areas for expansion. Limited land area requires that capital improvements be planned and developed to accommodate the grown district population.

The project site is notable as a complex or cluster of schools including the Pohakea Elementary School, Ilima Intermediate School and the subject James Campbell High School. Adjacent to or within easy walking distance are Kaimiloa Elementary School, Ewa Beach Elementary School, and the private Our Lady of Perpetual Help School. Collectively, this is the single largest complex of schools in the State of Hawaii.

3.2 SURROUNDING USES

Adjacent uses are predominately low-density housing in single-family or low-density apartments to the north, east and south, and the planned development communities of Ocean Point to the west and Ewa by Gentry further north. Commercial uses are located primarily along Fort Weaver Road. The Ewa Beach Community Park is located across North Road from the project site.

3.3 MASTER PLAN

The actions subject of this environmental assessment are two-fold. The first component consists of an overall campus master plan that includes current, short-term and long-term improvements that address the most pressing needs on this campus. The second component which is addressed in greater detail are the athletic facilities improvements which have been funded and are identified as near-term improvements. This priority action is addressed within the context of the campus master plan because the sequencing

of improvement actions are difficult to treat discretely and are best served when viewed holistically.

3.4 ENVIRONMENTAL CONSIDERATIONS

3.4.1 GEOLOGICAL CHARACTERISTICS

Topography

The project site consists of flat urban land that this is in use as an existing high school campus. Previously, the site was extensively disturbed when the site was used for cane cultivation. The majority of the block is paved, is in occupied by structures, or is in maintained landscape and athletic field use. The surrounding blocks consist of both single-family dwellings and low-rise residential and commercial buildings. The site is located within a highly urbanized environment and the site is essential devoid of any undeveloped areas except in the vicinity of the Pacific Tsunami Warning Center.

Climate

The geography of the Ewa District is typically warm and dry in climate. Prevailing trade winds arrive from the northeast. According to the National Weather Service Honolulu Office, over a period of 30 years, normal monthly high temperatures range from 80 degrees in January to a high of 89 degrees in August for an average of 84 degrees. Normal month low temperatures range from a low of 63 degrees in February and a high of 72 degrees in August for a monthly average of 67 degrees. Precipitation typically ranges from 0.40 inches in August to a high of 3.3 inches in December. The annual average rainfall in Ewa is 19 inches per year.

USDA Soil Survey Report and Detailed Land Classification – Island of O‘ahu

The project site is located on soils classified Coral Outcrop (CR), according to Panel 55 of the Soil Survey of Islands of Kauai, O‘ahu, Maui, Molokai, and Lanai, State of Hawai‘i by the U.S. Department of Agriculture Soil Conservation Service. This land type consists of coral or cemented calcareous sand.
The project site is classified as “U” Urban on Map No. 248 of the Detailed Land Classification – Island of O‘ahu by the University of Hawai‘i Land Study Bureau.

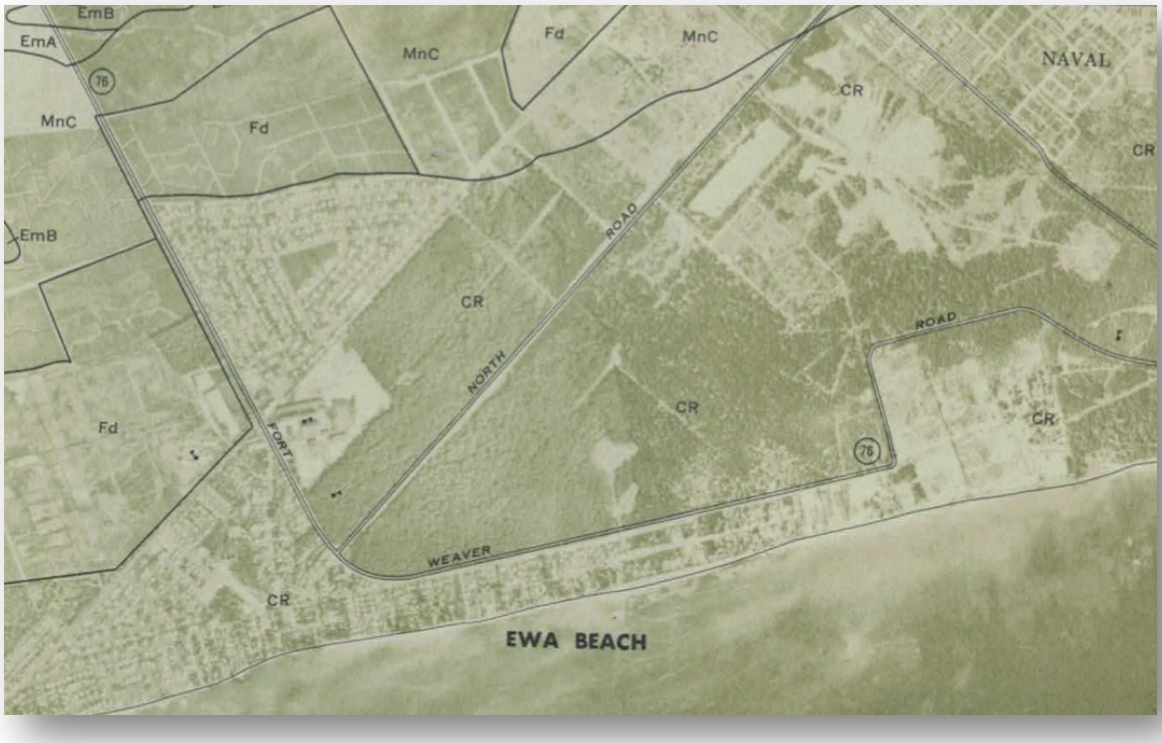


Figure 8: Soils Map Source: USDA Soil Conservation Service

3.4.2 WATER RESOURCES

Hydrologic Hazards and Resources

According to Panel 150003 C 0328 G of the Federal Emergency Management Agency Flood Insurance Rate Map, the project site is located in Zone D, an unstudied area where flood hazards are undetermined, but flood is possible.

The project site lies at an elevation of approximately 13.5 feet above mean sea level.

Using the Hawai'i Sea Level Rose Vulnerability and Adaption Report, dated December 2017, and its companion tool, the Hawai'i Sea Level Rise Viewer, one is able to identify areas vulnerable to variations in sea level rise based upon three hazards – passive flooding, annual high wave flooding and coastal erosion. The Report projects sea level rise for four time periods as shown in the table below. Changes in global climate conditions can also influence the projections.

The Sea Level Rise Viewer depicts areas susceptible to sea level rise caused by the aforementioned three hazards and notes these areas as "Sea Level Rise Exposure Area." Campbell High School is not located in a Sea Level Rise Exposure Area

Global Sea Level Rise Projection		
Year	**Feet**	**Meters**
2030	0.5	0.16601
2050	1.1	0.3224
2075	2	0.5991
2100	3.2	0.9767

Source: Hawai'i Sea Level Rise Vulnerability and Adaptation Report, December 2017

Tsunami Inundation

According to the National Ocean and Atmospheric Administration (NOAA), the project site is located in the extreme evacuation area of the Tsunami Hazard Map.

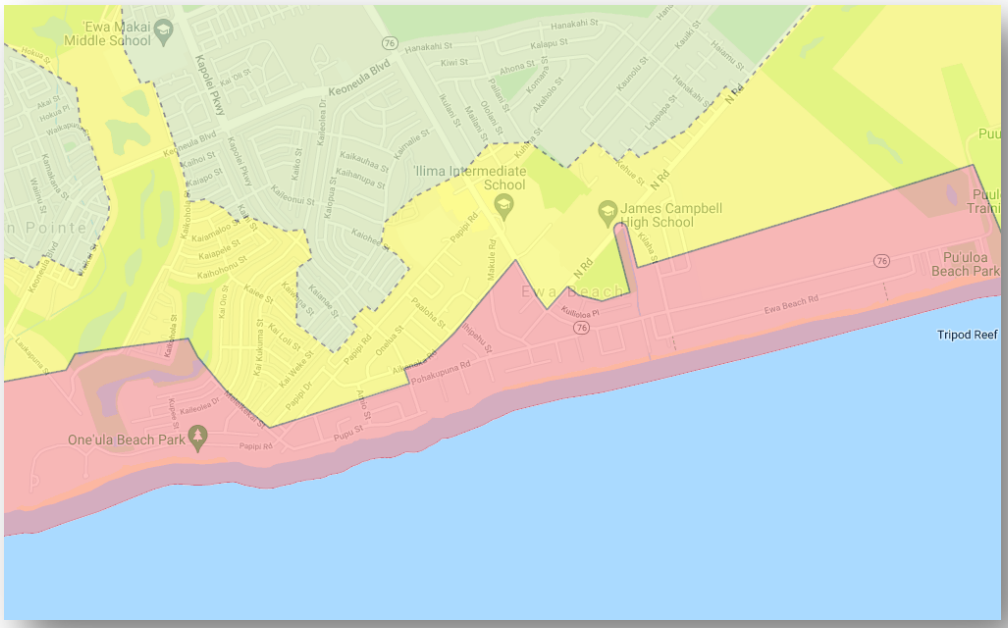
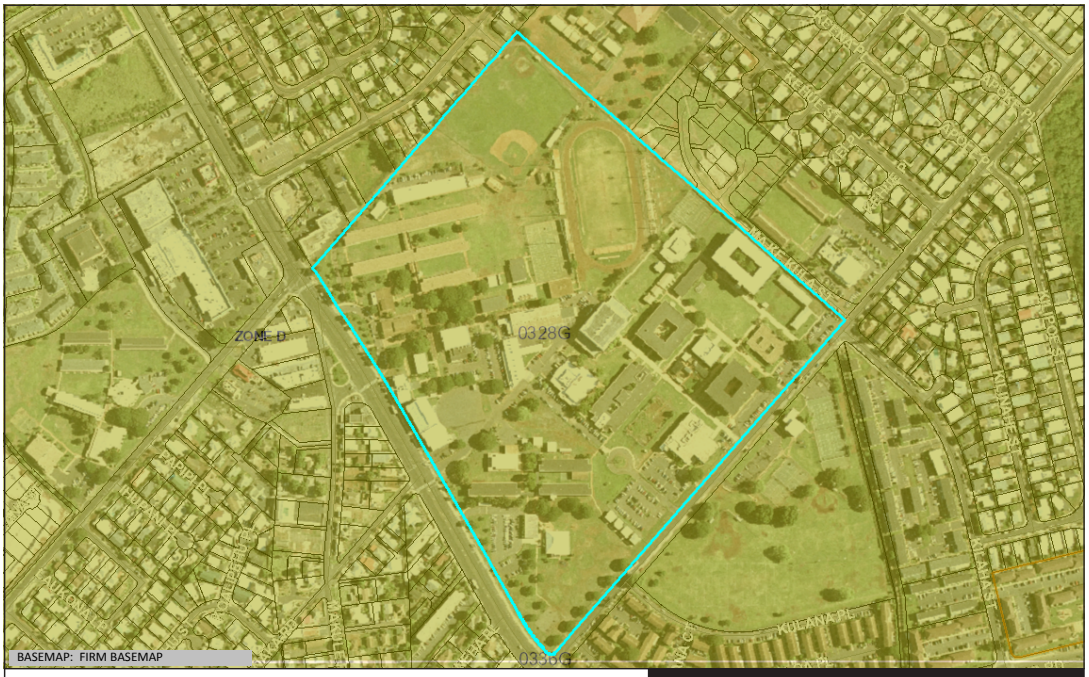


Figure 8: Tsunami Hazard Map Source: NOAA

Special Management Area

The project site is not located within the boundaries of the Special Management Area (SMA) Map.



Flood Hazard Assessment Report

www.hawaiinfip.org

James Campbell H.S.

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 9-1-001:002
WATERSHED:	KALOI
PARCEL ADDRESS:	91-980 NORTH ROAD EWA BEACH, HI 96706

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0328G
PANEL EFFECTIVE DATE:	JANUARY 19, 2011

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 400 800 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(*Note: legend does not correspond with NFHL)*

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A**: No BFE determined.
- **Zone AE**: BFE determined.
- **Zone AH**: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V**: Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE**: Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF**: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded)**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X**: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D**: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

Figure 9 – Flood Insurance Rate Map

Source: Department of Land and Natural Resources

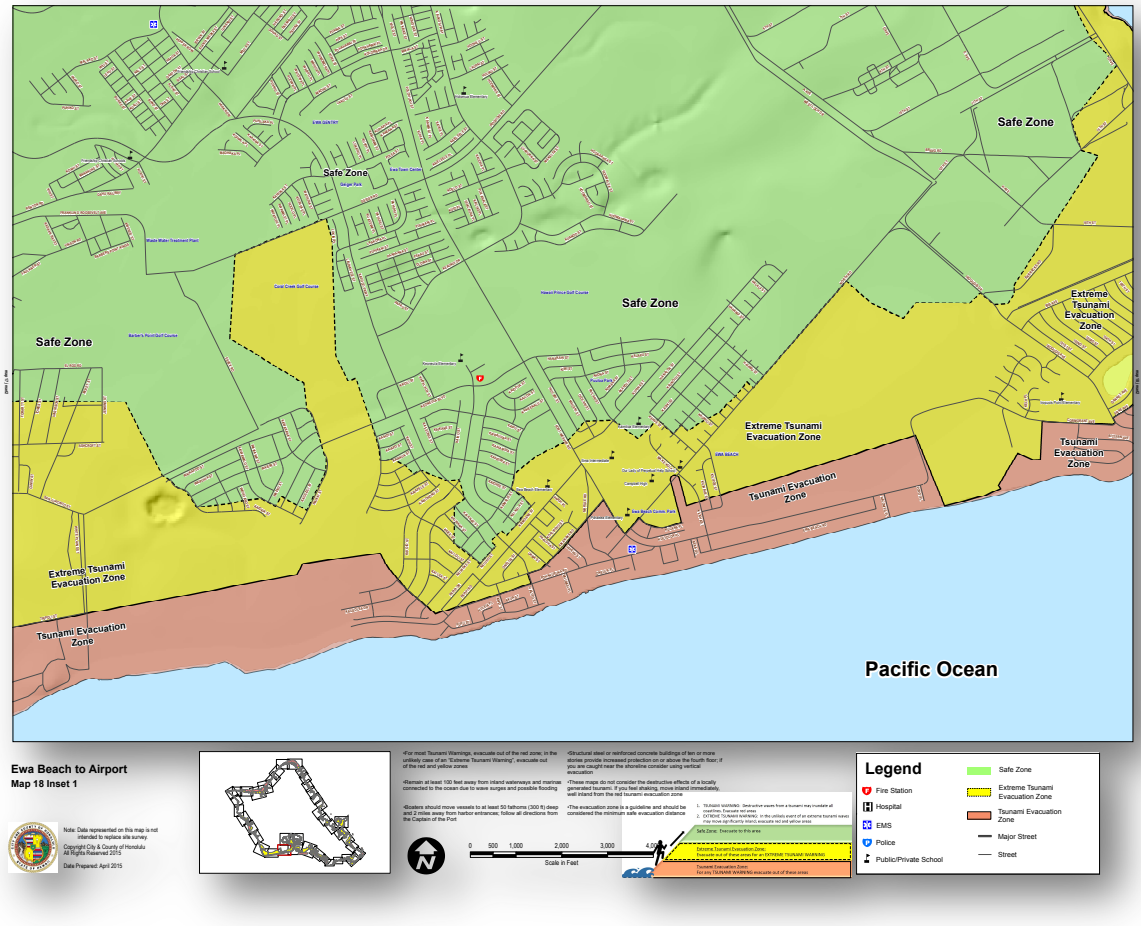


Figure 10 – Tsunami Hazard Map Source: City and County of Honolulu

3.4.3 HISTORICAL AND ARCHAEOLOGICAL ASSESSMENT

The proposed project site is located on an area that has been heavily altered during the construction of the existing field area. The proposed improvements will occur entirely on areas that were previously altered and not impacts to any area of historic significance or archaeological importance are anticipated. The area was formerly in sugarcane cultivation and but was urbanized over the years and no longer retains any character of its former uses.

In October 2014, Cultural Surveys Hawai‘i, Inc. (CSH) conducted an archaeological assessment investigation of the adjacent Ewa Elementary School. The study was designed to identify, document, and perform significance assessment of any historic properties in the project area, as well as to comply with the State’s historic preservation review under Hawai‘i Revised Statutes (HRS) §6E-8, Hawai‘i Administrative Rules (HAR) §13-13-275, and the project’s

environmental review under HRS §343. An archaeological inventory survey plan was accepted by the State Historic Preservation Division (SHPD) in a letter, dated June 14, 2014, to set the format for the above assessment.

The study titled *Archaeological Assessment Report for the Ewa Elementary School Building E Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu, TMK: (1) 9-1-017:002 (por.)* was prepared by Cultural Surveys Hawaii, Inc.. The study, which did not find any archaeological artifacts, is included in its entirety as Appendix A.

In the unlikely event that any artifacts or remains are uncovered during the construction process, all work will cease and the appropriate agencies will be contacted for further instruction.

3.4.4 CULTURAL IMPACT ASSESSMENT

A study titled *Cultural Impact Assessment for the 'Ewa Elementary School Eight (8) Classroom Building Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island TMK: [1] 9-1-017:002* was prepared by Cultural Surveys Hawai'i in December 2013. The study, which assesses the project area, is included in its entirety as Appendix B.

As stated in the Environmental Assessment prepared for the adjacent elementary school site, no significant findings resulted from the assessment however it was recommended that should historic, cultural, or burial sites or artifacts be identified during construction ground disturbance activity, personnel involved with the construction work should cease all work in the immediate area of the find and the appropriate agencies notified pursuant to applicable laws. In the event of discoveries of burials during construction, recognized cultural authorities and lineal descendants should be notified and consulted on matters of burial treatment. Additionally, it is recommended that cultural and lineal descendants be granted access rights to iwi kupuna to conduct customary and traditional burial practices on-site.

3.4.5 TRAFFIC CONDITIONS

~~The proposed athletic complex improvements that have been funded and scheduled for construction will not have any adverse impact on traffic conditions as the improvements will not generate any additional traffic over the current use of the field and supporting facilities. The project may possibly improve traffic flow immediately around the project site by the creation of a new internal service/ bus access road which will allow service vehicles and buses to enter into the site near the athletic facilities. This may improve traffic conditions during sporting~~

~~events by allowing buses to store and que within the site rather than outside of the campus~~.

A Traffic Impact Assessment and a Traffic Management Plan have been prepared for the proposed project by Austin, Tsutsumi & Associates, Inc. These reports are included in the Appendicies. A summary of the findings of these studies is presented below.

Accessibility Description

The Project proposes to construct improvements on the JCHS campus, including athletic facilities improvements, a new 3-story parking garage and new multipurpose, administration and classroom buildings to replace existing portables. Completion of the proposed master plan improvements is anticipated by 2032.

Access to/from the Project site will continue to be provided via driveways along North Road and via Aikanaka Road from Fort Weaver Road. The majority of JCHS driveways along North Road provide one-way access in or out of three (3) individual parking lots along the North Road frontage. With the Project, the two (2) easternmost parking lots will be consolidated and provided with a single ingress driveway and single egress driveway. The third parking lot and its accesses will be maintained. The westernmost JCHS driveway along North Road provides access to another JCHS parking lot and the Ewa Beach Public Library parking lot as well as a drive aisle that provides additional parking and connects through the campus to Aikanaka Road. The Aikanaka Road access provides access to the main shared JCHS and Ilima Intermediate School parking lot and additional parking areas. No changes are proposed to the westernmost JCHS driveway or Aikanaka Road access with the Project.

The Project site will also continue to provide access for pedestrians, bicyclists, and transit users as well. A new plaza is proposed along North Road to provide a central access for pedestrians and bicyclists. An additional sidewalk entrance will also be provided at the easternmost JCHS driveway across Kilaha Street to allow pedestrians entering from the opposite end of the campus to enter without having to cross heavy vehicle traffic entering and exiting the JCHS driveways.

Currently, the JCHS campus provides a total of 329 parking stalls for students, faculty/staff and visitors. 66 of the parking stalls are publicly available stalls within the Ilima Intermediate School parking lot that are open to JCHS students and visitors. With the Project, the number of parking stalls is proposed to increase to at least 459 stalls with the addition of the 3-story parking garage and expansion of existing parking areas. The minimum m 459 stalls is based on requirements from the Land Use Ordinance (LUO). However, the number of new stalls may exceed the minimum stalls recommended by the LUO in order to provide enough

event parking and limit parking overflow impacts to the surrounding neighborhood.

In addition to providing parking, the three (3) JCHS parking lots along North Road nearest to Kilaha Street are also utilized for pick-up and drop-off operations for parents and school buses. The middle lot was observed to be used exclusively for school buses during school start/end times, with access to the parking lot monitored by a security guard. The Ilima Intermediate School parking lot is also utilized for pick-up and drop-off operations by both Ilima Intermediate School and JCHS. With the Project, the two (2) easternmost JCHS parking lots along North Road are proposed to be consolidated with one (1) ingress driveway and one (1) egress driveway. The new consolidated parking lot is proposed to serve as a parent pick-up/drop-off area. In order to minimize queuing and delays during pick-ups and drop-offs, it is recommended to maintain separate loading areas for school buses and parents, and school bus pick-up/drop-off is proposed to occur within the lot directly to the west of the consolidated parking lot.

The Project also proposes to construct a new roadway through campus, connecting the existing access from Aikanaka Road to North Road via an existing fire lane. This internal roadway will generally be used outside of normal school hours during athletic events to provide a designated area for school buses from visiting teams to pick-up and drop-off players. A small, paved parking area is also proposed along the internal roadway which will be utilized by auto shop maintenance vehicles and emergency vehicles only during school hours. When not in use, the connections to the internal roadway will be gated to prevent unauthorized vehicles from entering. Due to limited access to the internal roadway during school hours, no significant conflict is anticipated between vehicles and students walking between buildings on campus.

Project Trip Generation

Existing JCHS vehicle, pedestrian and bicycle trips were determined based on data collected at the Aikanaka Road and the JCHS driveways along North Road. Note that transit users are counted as pedestrians (City bus riders who walk to/from nearby bus stops) and vehicles utilizing on-street parking are also counted as pedestrians. The trip data also includes trips to/from Ilima Intermediate School and the Hale Pono Boys and Girls Club via Aikanaka Road and therefore is assumed to provide a conservative estimate of JCHS trip generation.

The Project is ultimately expected to provide approximately 341,000 square feet of academic classroom space, an increase of approximately 18.7% over the existing 287,000 square feet of classroom space. While this increase in classroom space will primarily be the result of replacing current portables with permanent buildings, it was conservatively assumed that the increase could potentially support an increase in JCHS enrollment if the need were to arise in the future. Ultimately, the need for additional high school facilities to accommodate a

growing population in West Oahu is expected to be fulfilled by the proposed East Kapolei High School rather than increasing enrollment at existing schools such as JCHS. The proposed near-term athletic facilities are not expected to impact typical day-to-day operations of JCHS.

The Project proposes to ultimately increase academic classroom space by approximately 18.7% at full build-out. Currently, JCHS enrollment is approximately 3,100 students, the highest enrollment of all high schools in the state. Enrollment has remained steady in recent years, primarily due to JCHS operating at maximum capacity. Given current operations, enrollment is not expected to grow proportionally with the increase in classroom space. However, for the purposes of this study, it was assumed that Project trips would increase by 18.7% consistent with the increase in academic facilities to determine the full potential impacts of the Project.

With the consolidation of the two (2) easternmost North Road parking lots, the majority of vehicle traffic entering JCHS from North Road is expected to enter from the JCHS driveway across Kilaha Street.

The peak hour and second highest peak hour vehicle trip generation for the Project are shown in Tables 1 and 2, respectively. The Project is expected to add a total of 299(64)[142] new trips during the AM(PM)[School PM] peak hours and 82(35)[68] new trips during the AM 2nd Peak(PM 2nd Peak)[School PM 2nd Peak] hours at full build-out.

Table 1: Project Peak Hour Vehicle Trip Generation

Land Use	Variable	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Existing JCHS	3,075 Students	915	679	1594	135	207	342	308	453	761
Proposed JCHS	3,651 Students	1086	807	1893	160	246	406	365	538	903
Total Net New Trips		**171**	**128**	**299**	**25**	**39**	**64**	**57**	**85**	**142**

Table 2: Project Second Highest Peak Hour Vehicle Trip Generation

Land Use	Variable	AM 2nd Highest Peak Hour			PM 2nd Highest Peak Hour			School PM 2nd Highest Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Existing JCHS	3,075 Students	200	235	435	94	101	195	126	239	365
Proposed JCHS	3,651 Students	239	278	517	111	119	230	149	284	433
Total Net New Trips		**39**	**43**	**82**	**17**	**18**	**35**	**23**	**45**	**68**

Multimodal Trips

Multimodal trips were assumed to include all trips not occurring by private vehicle and include pedestrian, bicycle (or other non-motorized vehicle used for transportation) and transit trips. Multimodal trips and existing mode splits were determined based on data collected at Fort Weaver Road/Aikanaka Road and the JCHS driveways along North Road. As noted previously, transit riders using the City bus were counted as pedestrians and not transit users because they travel between bus stops and the JCHS campus on foot and cannot be distinguished from pedestrians. In addition, because school bus loading occurs on campus, the school bus is counted as a single vehicle trip, and riders are not counted as transit users.

In order to estimate the percent of pedestrians walking to/from transit, the existing mode split for the study parcel was determined based on the ORTP 2040 TDFM. According to the TDFM, approximately 25% of pedestrian trips are to/from transit versus 75% of pedestrian trips remaining as pedestrians for the full trip from origin to destination. The pedestrian count data was modified to reflect the assumed 25% of pedestrian trips as transit trips.

Pedestrian, bicycle and transit trips were assumed to grow similar to vehicle trips, with the potential to increase by approximately 18.7% by full build-out of the Project. The peak hour and second highest peak hour multimodal trip generation for the Project are shown in Tables 3 and 4, respectively.

Because pedestrian, bicycle and transit trips at the study intersections are not differentiated as a JCHS trip or other trip, the 18.7% growth rate for JCHS was applied to all bicycle and pedestrian crossing volumes at the study intersections. This growth rate is considered conservative since the rate exceeds the ORTP 2040 TDFM growth rates for vehicles and is expected to cover all Project-related or ambient growth in the study area.

Based on the collected data for the peak hours and second highest peak hours of traffic, the following average mode splits were observed for JCHS. These mode splits are expected to remain for Future Year 2032.

- Vehicle: 64%
- Pedestrian: 23%
- Bicycle: 5%
- Transit: 8%

Table 3: Project Peak Hour Multimodal Trip Generation

Mode	Land Use	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Pedestrian	Existing JCHS	531	30	561	11	52	64	72	898	970
	Proposed JCHS	631	36	667	13	62	75	85	1066	1151
	Net New Trips	100	6	106	2	10	11	13	168	181
Bicycle	Existing JCHS	89	0	89	6	16	22	11	127	138
	Proposed JCHS	106	0	106	7	19	26	13	151	164
	Net New Trips	17	0	17	1	3	4	2	24	26
Transit	Existing JCHS	177	10	187	4	18	21	24	300	324
	Proposed JCHS	210	12	222	5	21	26	28	356	384
	Net New Trips	33	2	35	1	3	5	4	56	60

Table 4: Project Second Highest Peak Hour Multimodal Trip Generation

Mode	Land Use	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Pedestrian	Existing JCHS	145	10	155	14	28	42	31	61	93
	Proposed JCHS	172	12	184	17	33	50	37	72	109
	Net New Trips	27	2	29	3	5	8	6	11	16
Bicycle	Existing JCHS	26	0	26	4	7	11	5	16	21
	Proposed JCHS	31	0	31	5	8	13	6	19	25
	Net New Trips	5	0	5	1	1	2	1	3	4
Transit	Existing JCHS	49	3	52	5	9	14	11	21	31
	Proposed JCHS	58	4	62	6	11	17	13	25	38
	Net New Trips	9	1	10	1	2	3	2	4	7

Complete Streets Modal Priority Analysis

The Multimodal Radar Diagram was developed by the City and County of Honolulu in order to further illustrate the Complete Street Modal Priority Analysis. Based on the performance evaluation methods summarized in the previous sections, each street segment receives a score (1-4) for each mode, where

one (1) represents a high comfort level and four (4) represents a low comfort level. The scores generate a visual diagram which compares the target performance to the actual or design performance.

The Existing and Future Year 2032 with Project modal priority scores for the studied Fort Weaver Road and North Road segments are summarized in Table 5 below. Multimodal performance of the segments, as well as multimodal radar diagrams are included in the following sections.

Table 5: Summary Table of Multimodal Radar Diagram Results

Segment	Street Type	Mode	Existing Score	Target Score	FY 2032 Score
Fort Weaver Rd North Rd/ Kimopelekane Rd to Papipi Rd (Northbound)	Main Street	Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	1	1	1
		Auto	2	2	2
		Parking	1	3	4
Fort Weaver Rd Papipi Rd to North Rd/ Kimopelekane Rd (Southbound)		Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	3	1	3
		Auto	2	1	2
		Parking	4	3	4
North Rd Fort Weaver Rd to Kilaha St (Eastbound)	Street	Pedestrian	3	1	2
		Bicycle	3	3	1
		Transit	-	3	-
		Auto	2	2	2
		Parking	4	3	-
North Rd Kilaha St to Fort Weaver Rd (Westbound)		Pedestrian	2	1	1
		Bicycle	3	3	1
		Transit	1	3	1
		Auto	2	2	2
		Parking	-	3	-

Score at or better than target
Score 1 or worse than target
Score 2 or more worse than target

Project Mitigation

The Project will consider the implementation of various Transportation Demand Management (TDM) strategies and Transportation Improvement strategies based on feasibility. A comprehensive list of TDM and Transportation Improvement strategies that are proposed or will be considered with the Project include the following:

- Reduce the number of JCHS driveways along North Road to reduce opportunities for vehicle and pedestrian/bicyclist conflicts.

- Provide a new plaza entrance to JCHS along North Road to facilitate a central location for pedestrian and bicyclist access to the school, further reducing opportunities for vehicle and pedestrian/bicyclist conflicts.

- Provide a new sidewalk along the easternmost JCHS driveway to provide an additional pedestrian entrance to JCHS for students entering from the east or via Kilaha Street in order to reduce pedestrian crossings and vehicle conflicts at the JCHS driveways.

- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.

- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program, and encourage carpooling.

- Provide additional on-site bicycle parking for faculty/staff and students.

- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.

- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.

- Encourage volunteer efforts from JCHS service organizations to clean and maintain existing City and County of Honolulu bus stops along the Project frontage in order to maintain a comfortable environment for transit users.

- Consider shifting JCHS start and end times to avoid overlap with Ilima Intermediate School and Pohakea Elementary School. It should be noted that any changes to the bell schedule would require a faculty vote of approval.

Conclusions and Recommendations of the Traffic Impact Analysis

Existing Traffic Conditions

Vehicular, pedestrian and bicycle traffic along Fort Weaver Road and North Road is largely impacted by the nearby JCHS, Ilima Intermediate School and Pohakea Elementary School campuses. Heavy volumes of all modes were observed during the AM and School PM peak hours as a result, with peak volumes occurring in an approximately 15 to 30-minute peak surrounding the school start and end times.

Outside of the peak AM and School PM periods, volumes of all modes were significantly lighter.

Along the study segment of Fort Weaver Road, the majority of modes operate with a modal priority score at or better than the target score, with the exception of transit in the southbound direction and parking in both directions. Transit service is limited in the southbound direction due to the limited area serviced to the south of the Project area and is not expected to have major impacts on transit ridership. On-street parking was observed to be unevenly utilized with heavy utilization on the southbound side of the roadway fronting the residential area and light utilization on the northbound side of the roadway fronting Pohakea Elementary School.

Along the study segment of North Road, the lack of sidewalks on the eastbound side of the roadway and at-grade sidewalks for the majority of the segment on the westbound side of the roadway contributes to pedestrian modal priority scores lower than the target scores. In the eastbound direction, on-street parking also scores lower than the target score as a result of heavily utilized parking by JCHS students and nearby residents. The remaining modes currently score at or better than the target scores.

Project Specific Traffic Conditions

The Project is projected to generate 299(64)[142] net new vehicular trips and 158(20)[267] net new multimodal trips (pedestrian, bicycle, transit) during the AM(PM)[School MD] peak hours of traffic. During the second highest peak hours of traffic, the Project is projected to generate 82(35)[68] net new vehicular trips and 44(13)[27] net new multimodal trips during the AM 2nd Peak(PM 2nd Peak)[School PM 2nd Peak] periods. The Complete Streets Modal Priority Analysis for Existing conditions and Future Year 2032 with Project conditions is shown in Table 6 below.

Identified walkway and bicycle facility improvement projects are anticipated to be completed by Future Year 2032 and were included in the multimodal analysis based on an assumed design in lieu of completed plans. With the improvements, all pedestrian and bicycle segment scores along North Road are expected to improve, with only eastbound North Road expected to operate with a pedestrian score one (1) below the target score. Parking and transit are expected to continue not meeting target scores along Fort Weaver Road. However, as mentioned under existing conditions, transit along southbound Fort Weaver Road serves limited areas and an increase in service is not expected to be required. Parking along Fort Weaver Road is expected to be more evenly utilized in the future as a result of parking removal along North Road to accommodate new sidewalks and bicycle lanes.

As part of the Project, the Developer will consider implementing the following Transportation Demand Management (TDM) and Transportation Improvement strategies to promote the use of multimodal transportation alternatives in the Project area, if feasible:

- Reduce the number of JCHS driveways along North Road to reduce opportunities for vehicle and pedestrian/bicyclist conflicts.

- Provide a new plaza entrance to JCHS along North Road to facilitate a central location for pedestrian and bicyclist access to the school, further reducing opportunities for vehicle and pedestrian/bicyclist conflicts.

- Provide a new sidewalk along the easternmost JCHS driveway to provide an additional pedestrian entrance to JCHS for students entering from the east or via Kilaha Street in order to reduce pedestrian crossings and vehicle conflicts at the JCHS driveways.

- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.

- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program and encourage carpooling.

- Provide additional on-site bicycle parking for faculty/staff and students.

- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.

- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.

Table 6: Future Year 2032 Complete Streets Modal Priority Analysis

Segment	Street Type	Mode	Existing Score	Target Score	FY 2032 Score
Fort Weaver Rd North Rd/ Kimopelekane Rd to Papipi Rd (Northbound)	Main Street	Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	1	1	1
		Auto	2	2	2
		Parking	1	3	4
Fort Weaver Rd Papipi Rd to North Rd/ Kimopelekane Rd (Southbound)		Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	3	1	3
		Auto	2	1	2
		Parking	4	3	4
North Rd Fort Weaver Rd to Kilaha St (Eastbound)	Street	Pedestrian	3	1	2
		Bicycle	3	3	1
		Transit	-	3	-
		Auto	2	2	2
		Parking	4	3	-
North Rd Kilaha St to Fort Weaver Rd (Westbound)		Pedestrian	2	1	1
		Bicycle	3	3	1
		Transit	1	3	1
		Auto	2	2	2
		Parking	-	3	-

Score at or better than target
Score 1 or worse than target
Score 2 or more worse than target

3.4.6 NOISE ENVIRONMENT

Development of the project areas will involve excavation, grading, and other typical construction activities during construction. The use of impact equipment is not anticipated, as the foundation will be pre-drilled to avoid any need for pile driving. The actual noise levels produced during construction will be a function of the methods employed during each stage of the construction process. Earthmoving equipment, e.g., bulldozers and diesel-powered trucks, will probably be the loudest equipment used during construction. In cases where construction noise is expected to exceed the HDOH "maximum permissible" property line noise levels, a permit must be obtained to allow the operation of construction equipment.

In cases where construction noise exceeds, or is expected to exceed the State's "maximum permissible" property line noise levels, a permit must be obtained from HDOH to allow the operation of vehicles, cranes, construction equipment,

power tools, etc., which emit noise levels in excess of the "maximum permissible" levels.

In order for HDOH to issue a construction noise permit, the contractor must submit a noise permit application to HDOH, which describes the construction activities for the project. Prior to issuing the noise permit, HDOH may require action by the contractor to incorporate noise mitigation into the construction plan. HDOH may also require the contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. However, HDOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities.

Use of the proposed improvements are not anticipated to have any negative affect on the noise environment above those presently experienced over the previous and current uses as an athletic facility.

3.4.7 AIR QUALITY AND HAZARDOUS MATERIALS

The proposed project will have short-term and long-term effect on ambient air quality. During demolition and excavation, dust will be generated however fugitive dust is generally controlled by frequent watering and perimeter screening. Best management practices will be used to ensure that dust control during demolition of the existing paving and during construction of the new building are kept to a minimum. These impacts are typical of any new construction project.

3.4.8 BIOLOGICAL CHARACTERISTICS

Flora

The project area is presently covered with an aluminum bleacher structure, concrete sidewalks and grass. The project site is essentially devoid of any plant material except for a single monkeypod tree that is located adjacent to the improvement area.

Fauna

The site does not serve as a wildlife habitat although avifauna, feral cats, and rodents may be found on-site although none were observed during site inspections.

3.4.9 INFRASTRUCTURE AND UTILITIES

The proposed improvements are readily serviced by existing utilities presently serving the campus. All existing utilities are located underground and any improvements to utility lines will remain underground. No significant impacts on infrastructure and utilities are expected from the proposed improvements.

Water

The project will continue to be serviced by the existing water system. The proposed athletic will result in an increase in water with the addition of locker rooms and additional restrooms. The new domestic water and fire protection water meters to serve the project are expected to be upgraded as part of the development. Water conservation efforts are likely to be implemented where practicable. This may include water efficient fixtures and the use of xeriscape or low water requirement landscaping.

Stormwater

The site is presently naturally drained with runoff entering a stormwater box drain in the project area. The proposed project will be required to control drainage according to prevailing drainage regulations. All storm water runoff from the proposed improvements will be reviewed for conformance with City and County of Honolulu Ordinance 96-34 regarding peak runoff.

Best Management Practices (BMPs) will be put in to place prior to the start of any construction to ensure that runoff in the storm drain system are treated for minimal impact into State receiving waters. Additionally, Low Impact Design feature will be considered for the project.

Wastewater

Approval from City and County of Honolulu Department of Planning and Permitting for municipal sewer system connection to accommodate the proposed project will be required. Sewer mains are located along each street frontage and an appropriate sewage connection system will be designed in consideration of the most effective connection points.

Solid Waste

It is expected that private refuse collection service will be used to service the project location. The project operator may implement recycling programs upon project completion.

Telephone and Electrical Services

Telephone and electrical services are available to the site. Coordination with the local electric and telephone service providers will be expected during the design and construction phases.

3.4.10 PUBLIC FACILITIES

The East Kapolei Fire Station No. 43 provides fire protection service to the project area. The station is located at 91-1211 Kinoiki Street. Response time to the site is less than 5 minutes.

Police service is provided by the Honolulu Police Department (HPD) District 8, which is administratively based in Kapolei. This station is located at 1100 Kamokila Boulevard, Police services are provided by patrolling officers and response time to the site is less than 5 minutes.

The nearest hospital providing full medical services is the Queens Medical Center – West Oahu which is located approximately 2.5 mile from the project site. The address of this facility, which also serves as the base for Emergency Medical Response is 91-2139 Fort Weaver Road, Ewa Beach.

Public and private Schools located near or adjacent to the project site include Pohakea Elementary School, Kaimiloa Elementary Schools, Ewa Beach Elementary School, Ilima Intermediate School, and the private Our Lady of Perpetual Help School. The proposed improvements will not have any impact on these schools but will be an important improvement for athletic activities at the James Campbell High School.

SECTION FOUR
RELATIONSHIP TO PLANS, CODES AND ORDINANCES

4.1 STATE OF HAWAII PLANS

State Land Use Boundary

The State Land Use Commission Boundary Maps identify the project site as being within the Urban area. This is consistent with the surrounding uses that include commercial uses and medium to low-density residential developments.

Coastal Zone Management Act

Hawai‘i Revised Statutes (HRS) § 205A-1 states that the entire State is located within the coastal zone management area. The proposed athletic complex project is generally consistent with all objectives of the CZM. The project does not directly affect coastal recreational, historic, costal ecosystems. The project will minimally decrease open space but will significantly increase the benefit the school and users of the facility. Overall, the project should be considered an important improvement both from a policy perspective as well as in terms of function and efficiency.

Hawaii State Plan

The project is also consistent with the Hawai‘i State Plan, HRS Chapter 226. While the project does affect the physical environment, the project will not affect the natural beauty and historic resource of Hawai‘i (12(b)(5) and 12(b)(7)) as the site is and has been within a highly urban environment designated for urban development. The project does provide significant educational and socio-cultural advancement by providing a fully integrated multi-function complex that is supportive of Department of Education policies.

HRS 226-21 elaborates on the State’s plan for socio-cultural advancement as it relates to education. In this regard the Plan specifically states the following:

(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.

(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

(3) Provide appropriate educational opportunities for groups with special needs.

(4) Promote educational programs which enhance understanding of Hawaii's cultural heritage.

(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.

(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.

(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.

(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.

(9) Support research programs and activities that enhance the education programs of the State.

The proposed improvements are consistent and further promote each object or has no conflict with any objective within the State Plan.

4.2 CITY AND COUNTY OF HONOLULU PLANS

City and County of Honolulu General Plan

The City and County of Honolulu General Plan provides the overall vision for the island of O‘ahu and broadly outlines the objectives and policies shaping future growth. While the proposed action is consistent with Chapter IX, Health and Education: Objective B: To provide a wide range of educational opportunities for the people of O‘ahu. Policy 4: Encourage the construction of school facilities that are designed for flexibility and high levels of use. Policy 5: Facilitate the appropriate location of learning institutions from the preschool through the university levels.

City and County of Honolulu Ewa Development Plan

The City’s Ewa Development Plan 2013 development plan guides development in the Ewa District of O‘ahu. While the project is generally consistent with all aspects of the Ewa DP, particularly relevant to the proposed project is Section 4.7 School Facilities. The Plan states that the Ewa district has an enormous shortfall in meeting educational facilities for this district. In this regard, the proposed improvements fully align with objectives and policies by provided sorely needed athletic facilities which are part of the basic programs of the Department of Education.

SECTION FIVE
IMPACTS, ALTERNATIVES AND MITIGATION MEASURES

5.1 PROBABLE IMPACT ON THE ENVIRONMENT

The proposed project represents no change in use but provides significant improvements to the athletic facilities for the James Campbell High School. The project is consistent with surrounding land uses and the intent of the prevailing Department of Education plans for the Campbell Area Complex. Impacts associated with the proposed project have generally been determined to be negligible. Upon completion, the new facility will greatly benefit the students, faculty and the public by providing improved seating and passive participation in sporting events, will provide significantly improved locker rooms for both male and female athletes, and new training areas.

When viewed in the cumulative with the other components proposed for the campus, impacts to the environment will be more significant. In addition to significantly improving the campus for the campus for both academic and sporting activities, the campus plant will be significantly improved over the no-action alternative.

Positive environmental impacts are expected as a result of the proposed short and long-term improvements. Students will directly benefit by the proposed improvements and public participants will also benefit from the proposed bleachers and appurtenant concessions, restrooms and overall grounds improvements.

5.2 ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

Adverse impacts that cannot be avoided are generally related to short-term construction impacts. These impacts can be minimized by sound construction practices, Best Management Practices (BMPs) adherence to applicable construction regulations as prescribed by the Department of Health, and coordination with applicable County agencies. Primary construction related impacts are discussed in greater detail in the air quality and nose impact sections of this document.

5.3 ALTERNATIVES TO THE PROPOSED ACTION

No other use alternatives beyond the non-action alternative were considered for this project. Non-action was considered and rejected due to the need for appropriate gender equitable facilities and due to the extremely high student enrollment at James Campbell High School. The project is consistent with the State of Hawaii and City and County of Honolulu policies and objectives.

Within the scope of proposed improvements, alternative density configurations were considered however the proposed improvements are considered the most minimally invasive and will allow for continued use of the campus with minimal disruption. Alternative locations were not considered.

5.4 MITIGATION MEASURES

Long-term impacts resulting from the proposed improvements are expected to be minimal or non-existent based upon the subject environmental assessment. Long-term traffic, air and noise impacts are not expected to change significantly after improvements are completed. Short-term construction related noise and air quality impact mitigation measures include general good housekeeping practices and scheduled maintenance to avoid a prolonged construction period. The contractor will be directed to use best management practices (BMP) wherever applicable. Construction materials and equipment will be transported to the project site during non-peak traffic hours. In the event that existing roadways or sidewalks are damaged during construction activities, the roadways and sidewalks will be restored to original or better condition.

5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the proposed project will result in the irreversible and irretrievable commitment of resources in the use of non-recyclable energy expenditure and labor. Materials used for new construction may have salvage value; however, it is unlikely that such efforts will be cost-effective. The expenditure of these resources is offset by gains in construction-related wages, increased tax base and tertiary spending.

6.0 NECESSARY PERMITS AND APPROVALS

Permits and approvals that may be required are contingent upon the actual design of the proposed project. All permits and approvals are generally ministerial in nature. Permits listed below represent a general list that represents permits and approvals that will be required for the project.

State Agencies

Permit or Approval	Approving Agency
National Pollutant Discharge Elimination System (NPDES) Permit	Dept. of Health
Community Noise Permit / Variance	Dept. of Health

County Agencies

Permit or Approval	Approving Agency
Building Permits	Dept. of Planning and Permitting
Certificate of Occupancy	Dept. of Planning and Permitting
Construction Dewatering Permit	Dept. of Planning and Permitting
Grading and Stockpiling Permits	Dept. of Planning and Permitting
Sewer Connection Permit	Dept. of Environmental Services
Trenching Permit	Dept. of Planning and Permitting

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7.0. FINDNGS AND REASONS SUPPORTING ~~ANTICIPATED~~ DETERMINATION OF FINDING OF NO SIGNIFICANT IMPACT

As stated in Section 11-200-13, EIS Rules, Significance Criteria: in determining whether an action may have a significant effort on the environment, every phase of a proposed action shall be considered. The expected consequences of an action, both primary and secondary, and the cumulative as well as the short-term and long-term effects must be assessed in determining if an action shall have significant effect on the environment. Each of the significance criteria is listed below and is followed by the means of compliance or conflict (if extant).

- Involves an irrevocable commitment to the loss or destruction of any natural or cultural resource.

The proposed action will occur on an existing developed site and will not impact any topographical resources other than the removal or relocation of some existing trees. Subsurface archaeological artifacts are an unlikely possibility; therefore, in the event that any archaeological remains are uncovered during the course of construction, all work will stop and the State Historic Preservation Office will be contacted for appropriate action.

- Curtails the range of beneficial uses of the environment.

The proposed improvements will not result in a change from its existing uses but represents a significant upgrade in athletic facilities to the school. The proposed project will not curtail beneficial uses of the environment. The proposed project will provide needed facilities and is considered a highest and best use in the public interest.

- Conflicts with the State's long-term environmental policies or guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed action is consistent with the goals and guidelines expressed in Chapter 344, Hawai‘i Revised Statutes and NEPA. The proposed action is triggered by the use of State lands and funds. The subject Environmental Assessment has been developed in compliance with the Chapter 343.

- Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.

The proposed action will make a positive contribution to the welfare and economy of the State and City by providing desirable and needed athletic and educational facilities to the State of Hawai‘i. The proposed use will provide gender equitable accommodations for all student athletes. The facility will also contribute positively to the community through the use of goods and services in the area, through construction related employment, and through secondary and tertiary spending and taxes. The proposed action will not have any impact on any native cultural practices as the site has been in urban use for over 60 years.

A historic and cultural resource plan for the Mauka Area Plan is assessed in the programmatic *Kaka‘ako Community Development District Final Supplemental Environmental Impact Statement* prepared for the Hawai‘i Community Development Authority in May 2009. Section 2.8.1 Historic and Cultural Resources lists eight (8) sites that are considered important and selected for protection for their historic and cultural value. None of the properties is within or near the Block C project site. The document also states that other sites of historic and cultural significance with the Mauka Area may be identified and added to HCDA’s preservation list. None in the project vicinity have been subsequently no historic or cultural practices will be impacted by the proposed action.

- Substantially affects public health.

The proposed improvements are not expected to have any direct impact on public health but will provide significantly improved health related facilities to students and visitors of the school. No recreational resources for the public will be impacted by the project, nor will the project increase any undesirable environmental impacts.

- Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed action will not increase the population within the community. The project as proposed will significantly improve public educational and athletic facilities for this rapidly growing area.

- Involves a substantial degradation of environmental quality.

The proposed action will not degrade environmental quality. Impacts associated with the project, such as traffic impact and noise quality have been assessed to be minimal. The project is located in a highly urban environment that is expected to be heavily developed in the future. In that respect, the project is consistent with the overall land use of the district.

- Is individually limited but cumulatively has a considerable effect upon the environment or involves a commitment for larger actions.

The proposed athletic facilities improvements represent a portion of the physical master plan for the campus and are an important component of campus improvements necessary for this high growth school. The site is appropriately zoned for the proposed activities and does not serve as a component of a larger development, but rather, fulfills the intent of the James Campbell High School Master Plan.

- Substantially affects a rare, threatened or endangered species, or its habitat.

The proposed action will not affect any rare, threatened or endangered species of flora or fauna, nor is it known to be near or adjacent to any known wildlife sanctuaries.

- Detrimentally affects air or water quality or ambient noise levels.

The proposed action will not impact air or water quality. The change in noise level is expected to be negligible and will not significantly affect surrounding properties beyond its existing levels.

Minimal impacts on air quality and noise are anticipated during construction, but will be limited by normal construction practices and Department of Health construction mitigation standards.

- 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 will not have any impact on an environmentally sensitive area.

- Substantially affects scenic vistas and view planes identified in County or State plans or studies.

The proposed action will not affect any scenic vistas or view planes.

- Requires substantial energy consumption.

The project will require a small increase in electrical energy consumption over the existing use due to the size of the improvement over the existing facilities This increase is expected to be partially offset through energy conservation measures such as energy efficient light fixtures. General conservation goals include: meeting State energy conservation goals, using energy saving design practices and technologies, and recycling and using recycled-content products.

Based on the above stated criteria, the proposed James Campbell High School Athletic Facilities Improvements project is not expected to have a significant effect on the environment beyond those associated with a master planned community. As such, a Finding of No Significant Impact (FONSI) is ~~anticipated~~ has been determined for the project by Department of Education.

8.0 PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT

State Agencies

Department of Education

Department of Land and Natural Resources
Historic Preservation Division

City and County Agencies

Department of Planning and Permitting

Honolulu Fire Department

Honolulu Police Department

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9.0 LIST OF PARTIES TO BE CONSULTED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT REVIEW PROCESS

Agencies with ministerial or specific interests regarding the proposed project were contacted for their comments regarding the proposed project. Parties contacted are listed and the date of their comments are listed below.

	Comment Date
Federal Agencies	
US Environmental Protection Agency Region IX Administrator	
State Agencies	
Department of Accounting and General Services	
Department of Business Economic Development & Tourism Energy, Resources & Technology Division	
Department of Defense	
Department of Education	
Department of Health	Feb. 8, 2022
Department of Health Clean Water Branch	
Department of Land and Natural Resources	
Department of Land and Natural Resources State Historic Preservation Officer	
Department of Transportation	
Disability and Communication Access Board	
Hawai‘i Community Development Authority	
Office of Environmental Quality Control	
Office of Hawaiian Affairs	
Office of Planning	
University of Hawai‘i at Manoa Environmental Center	
County Agencies	
Board of Water Supply	
Department of Community and Social Services	
Department of Design and Construction	
Department of Environmental Services	
Department of Facilities Maintenance	
Department of Planning and Permitting	
Department of Parks and Recreation	
Department of Transportation Services	Feb. 7, 2022
Fire Department	
Police Department	

Officials and Organizations

Neighborhood Board

Gmail Taeyong Kim <environcom1@gmail.com>

James Campbell High School Athletic Complex Facilities and Master Plan--Draft EA (AFNSI)

1 message

Cab General <Cab.General@doh.hawaii.gov> Tue, Feb 8, 2022 at 3:26 PM
To: "karynn.yoneshige@k12.hi.us" <karynn.yoneshige@k12.hi.us>, "tkim@environcom.com" <tkim@environcom.com>

Aloha

Thank you for the opportunity to provide comments on the subject project. I apologize for sending this past the deadline.

Please see our standard comments at:

https://health.hawaii.gov/cab/files/2019/08/Standard-Comments-Clean-Air-Branch-2019.pdf

Please let me know if you have any Questions

Lisa M.M. Wallace

EHS QA Officer

Clean Air Branch

Environmental Health Office

Hilo, Hawaii 96720

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

April 1, 2019

March 30, 2023

Lisa M.M. Wallace, EHS QA Officer
Clean Air Branch
Department of Health
Via Email

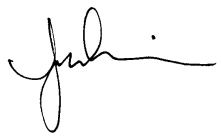
Re: James Campbell H.S. Athletic Complex and Master Plan
Draft Environmental Assessment

Dear Ms. Wallace:

Thank you for your comments of February 8, 2023 on the Draft Environmental Assessment for the subject project. We have reviewed your email and thank you for providing us with the Clean Air Branch's standard comments. We have reviewed the standard comments and understand and agree to all items regarding air quality. Best management practices will be implemented to ensure that air quality due to construction activities will be addressed and mitigated.

Thank you for participating in the environmental review process. Your comments are appreciated and will be included in the Final Environmental Assessment.

Sincerely,



Taeyong Kim
Principal Planner
Environmental Communications, Inc.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • web: www.honolulu.gov

RICK BLANGIARDI
MAYOR

J. ROGER MORTON
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

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DEPT OF EDUCATION
FACILITIES DEV BRANCH

TP1/22-872610

February 7, 2022

Mr. Edward S. Ige, Facilities Director
Facilities Development Branch
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

Attention: Ms. Karynn Yoneshige
Project Coordinator, Facilities Development Branch,
Project Management Section

Dear Mr. Ige:

Thank you for the opportunity to provide written comments regarding the Draft Environmental Assessment and Anticipated Finding of No Significant Impact; James Campbell High School Athletic Complex Facilities and Master Plan; Ewa Beach, Oahu, Hawaii; Job Number: Q81200-18; Tax Map Key: (1) 9-1-001:002. We have the following comments.

1. Transportation Impact Assessment (TIA). The applicant shall perform a TIA to examine the vehicle, pedestrian, bicycle, and public transit stress and comfort levels at the nearby intersections and driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles. The applicant shall discuss the future year growth rate, trip distribution, mode split, and route assignment assumptions used in the TIA.

   The TIA should identify an appropriate speed limit for the streets adjacent to the project by analyzing conflict density and activity level, among other contextual factors, to determine the speed limit that will best minimize the risk of a person being killed or seriously injured. The National Association of City Transportation Officials Safe Speed Study methodology is recommended. A

Safe Speed Study should be conducted for the longest relevant segment of a street corridor affected by the project.

The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch at dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723.

2. Traffic Management Plan.

    i. The Draft Environmental Assessment shall include a Traffic Management Plan, which discusses traffic impacts the project may have on any surrounding City roadways, including short-term impacts during construction and long-term impacts after construction with corresponding measures to mitigate these impacts by applying Complete Streets principles.

    ii. Construction materials and equipment shall be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.), but not during school dismissal periods for the safety of the students and to minimize any possible disruption to the local streets.

3. Parking.

    i. A discussion regarding off-street parking and site generated parking demand should be added to this report. We recommend the applicant provide the minimum parking ratio, given that the Project is adjacent to Fort Weaver Road, which already experiences heavy vehicle congestion; and is served by several high quality bus stops.

    ii. Page 27 of the City and County of Honolulu's TIA Guide requires that when proposed parking for the project exceeds the trip generation estimate, the parking generation estimate should be used after adjusting for the time of day distribution for parking demand. This conclusion is supported by research: (Millard-Ball A, West J, Rezaei N, Desai G. What do residential lotteries show us about transportation choices? Urban Studies. March 2021. doi:10.1177/0042098021995139), which concludes that parking supply is positively correlated with car ownership and negatively correlated with transit usage.

iii. Electric Vehicle Parking. Places of accommodation with at least 100 parking spaces available for use by the general public shall have at least one parking space exclusively for electric vehicles and equipped with an electric vehicle charging system located anywhere in the parking structure, as per Hawaii Revised Statutes §291-71.

4. Complete Streets. The TIA shall include a discussion of the following:

   i. Include a description of how the project will promote, encourage, and monitor transit use by its employees and students.

   ii. The management entity shall inform employees and parents of the City's vanpool, car share, and bikeshare programs to promote alternate modes of transportation.

   iii. Investigate the feasibility of providing employees with subsidized transit passes.

   iv. The management entity should adopt (i.e., be responsible for litter removal, cleaning and maintenance of bus stop shelter, benches and floor area) existing and any anticipated future bus stops fronting the project site at no cost to the City.

   v. The applicant shall make a contribution for complete streets improvements as recommended by the forthcoming TIA.

   vi. Bicycle Parking. The project shall quantify the number of secure on-site bicycle parking that will be provided. Refer to Section No. 21-6.150 Bicycle Parking in the City and County of Honolulu Land Use Ordinance for minimum requirements.

   vii. A proposed Priority 1 Shared Use Path project (Project ID 1-27 in the 2019 Oahu Bike Plan) is located on Fort Weaver Road fronting the project site. Any proposed driveway/roadway improvements to the project shall be designed to minimize conflicts between bicyclists/pedestrians and turning vehicles.

   viii. A proposed Priority 2 Bike Lane project (Project ID 2-54 in the 2019 Oahu Bike Plan) is located on North Road fronting the project site. Any proposed driveway/roadway improvements to the project shall be designed to minimize conflicts between bicyclists and turning vehicles.

ix. A proposed Tier 2 Walkway project (Project ID 2-77 in the 2021 Oahu Pedestrian Plan) is located on North Road fronting the project site. Any proposed driveway/roadway improvements to the project shall be designed to minimize conflicts between pedestrians and turning vehicles

x. A proposed Walkway Upgrade project (Project ID U-24 in the 2021 Oahu Pedestrian Plan) is located on North Road fronting the project site. Any proposed driveway/roadway improvements to the project shall be designed to incorporate with the upgraded walkway and minimize conflicts between pedestrians and turning vehicles

5. Street Usage Permit. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane or pedestrian mall on a City street.

6. Neighborhood Impacts. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

7. Bus Stops. The project site is in the immediate vicinity of bus stops. Please coordinate roadway improvements with DTS – Transportation Mobility Division (TMD). Contact DTS-TMD at TheBusStop@honolulu.gov

8. Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act requirements.

Should you have any questions, please contact Greg Tsugawa, of my staff, at (808) 768-6683.

Very truly yours,

J. Roger Morton
Director

March 30, 2023

J. Roger Morton,Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Re: James Campbell H.S. Athletic Complex and Master Plan Environmental Assessment

Dear Mr. Morton:

Thank you for your comments of February 7, 2023 on the Draft Environmental Assessment for the subject project. We have reviewed your comments and understand that the project requires a Traffic Impact Assessment (TIA) and Traffic Management Plan (TMP). These studies have been completed and are now summarized and included in total in the Final Environmental Assessment. These reports fully address your comments Number 1 through 4.

Item 5. Street Usage Permit
We understand that any construction activities requiring the closure of any traffic lane will require a permit from your department.

Item 6. Neighborhood Impacts
Thank you for this advisement. All impacted parties that will be affected by construction related activities impacting local traffic will be notified to the best of the development teams abilities.

Item 7. Bus Stops
Thank you for your referral to the Transportation Mobility Division (TMD). Coordination with this Division will be conducted to ensure that Bus riders will not be adversely affected.

Item 8. Disability and Communications Access Board (DCAB)
DCAB will be forwarded a copy of the project plans for review and compliance confirmation.

Thank you for participating in the environmental review process. Your comments are appreciated and will be included in the Final Environmental Assessment.

Sincerely,

Taeyong Kim
Principal Planner
Environmental Communications, Inc.

TRANSPORTATION IMPACT ASSESSMENT
JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX FACILITIES AND MASTER PLAN

EWA BEACH, OAHU, HAWAII

DRAFT FINAL

February 22, 2023

Prepared for:

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TRANSPORTAION IMPACT ASSESSMENT
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February 22, 2023

TABLE OF CONTENTS

TABLE OF CONTENTS
Cont'd

TABLE OF CONTENTS
Cont'd

TABLES

TABLE OF CONTENTS
Cont'd

TABLE OF CONTENTS
Cont'd

FIGURES

TABLE OF CONTENTS
Cont'd

TABLE OF CONTENTS
Cont'd

APPENDICES

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

TERRANCE S. ARASHIRO, P.E.
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TRANSPORTATION IMPACT ASSESSMENT

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX FACILITIES AND MASTER PLAN

Ewa Beach, Oahu, Hawaii

This report documents the findings of a transportation study conducted by Austin, Tsutsumi, and Associates, Inc. (ATA) to evaluate the transportation impacts resulting from the proposed James Campbell High School Athletic Complex Facilities and Master Plan project (hereinafter referred to as the "Project") located in Ewa Beach, Oahu, Hawaii.

1. PROJECT BACKGROUND, DESCRIPTION AND STUDY AREA

1.1 Project Background

The Project site is located in Ewa Beach, within the James Campbell High School (JCHS) campus. The following master plan improvements are proposed with the Project:

- Phase 1 – Baseball/softball field renovations with construction of a new small parking area (access via Kuhina Street), multi-purpose field replacement, and construction of a new track and field throwing pit.

- Phase 2 – Relocation of portable buildings 3 and 4, construction of new internal bus circulation road (entry via existing Fort Weaver Road driveway and exit via existing parking lot driveways along North Road), Ilima Intermediate School play court replacement, demolition of the existing field building, construction of new 3,000-seat homefield bleachers with press box and locker room facilities located beneath bleachers, construction of a new ticket booth/concession stand building, and construction of a new storage and bathroom building.

- Phase 3 – Construction of a new 3-story parking garage, multipurpose building, additional play courts, and 650-seat visitors' bleachers.

- Future Phases – Demolition of Building A and N and portable buildings 5-12 and 17-19, construction of new 2-story administration building, 3-story classroom building, and 2-story STEM Academy Building, and expansion of the existing parking lot.

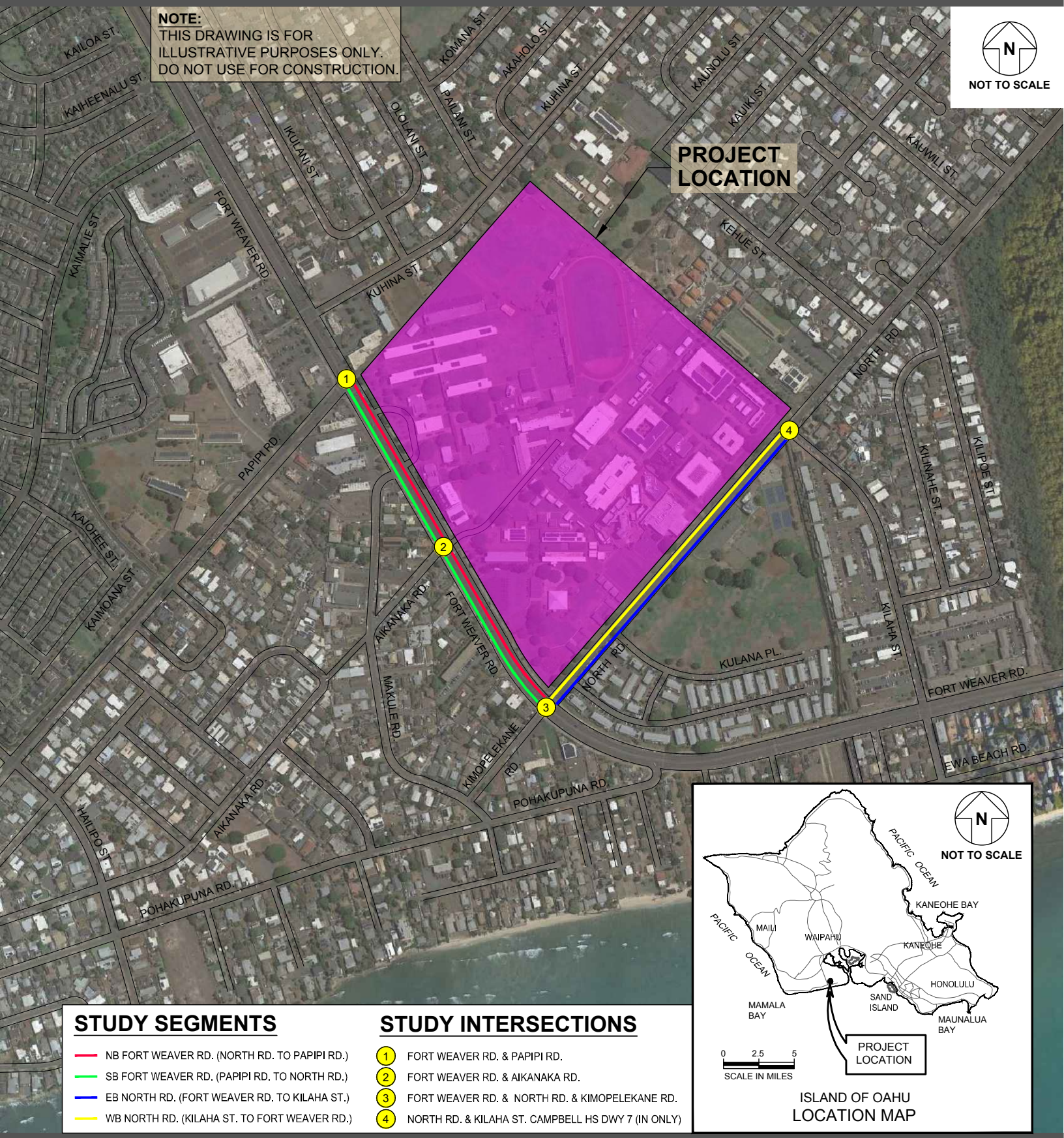
It is our understanding that funding has been secured for the Phase 1 master plan improvements as well as select improvements in Phase 2, including the homefield bleachers with athletic facilities located below, the ticket booth/concession stand building, and the storage and bathroom building. Construction of these facilities is anticipated to begin in Spring 2025 and commence in Summer 2026. The remaining master plan improvements are anticipated to occur over a 10-year period with full build-out of the master plan to occur by 2032.

Access to the site will continue to be provided by existing driveways along North Road and by Aikanaka Road from Fort Weaver Road. Access to the proposed parking area adjacent to the baseball/softball field is expected to occur via the Kuhina Street/Pailani Street intersection.

See Figure 1.1 for the Location Map.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors



STUDY SEGMENTS

- NB FORT WEAVER RD. (NORTH RD. TO PAPIPI RD.)
- SB FORT WEAVER RD. (PAPIPI RD. TO NORTH RD.)
- EB NORTH RD. (FORT WEAVER RD. TO KILAHA ST.)
- WB NORTH RD. (KILAHA ST. TO FORT WEAVER RD.)

STUDY INTERSECTIONS

1. FORT WEAVER RD. & PAPIPI RD.
2. FORT WEAVER RD. & AIKANAKA RD.
3. FORT WEAVER RD. & NORTH RD. & KIMOPELEKANE RD.
4. NORTH RD. & KILAHA ST. CAMPBELL HS DWY 7 (IN ONLY)

FIGURE 1.1

LOCATION MAP

1.2 Project Description

The Project will be located at the existing JCHS campus at 91-980 North Road on the northeast corner of Fort Weaver Road and North Road/Kimopelekane Road. The JCHS campus is located on an approximately 57-acre lot, identified as TMK (1) 9-1-001:002, which is shared with Ilima Intermediate School, Pohakea Elementary School, the Hale Pono Boys and Girls Club and the Ewa Beach Public Library.

The Project proposes to construct improvements on the JCHS campus, including athletic facilities improvements, a new 3-story parking garage and new multipurpose, administration and classroom buildings to replace existing portables. Completion of the proposed master plan improvements is anticipated by 2032. See Figure 1.2 for the Site Plan.

Access to/from the Project site will continue to be provided via driveways along North Road and via Aikanaka Road from Fort Weaver Road. The majority of JCHS driveways along North Road provide one-way access in or out of three (3) individual parking lots along the North Road frontage. With the Project, the two (2) easternmost parking lots will be consolidated and provided with a single ingress driveway and single egress driveway. The third parking lot and its accesses will be maintained. The westernmost JCHS driveway along North Road provides access to another JCHS parking lot and the Ewa Beach Public Library parking lot as well as a drive aisle that provides additional parking and connects through the campus to Aikanaka Road. The Aikanaka Road access provides access to the main shared JCHS and Ilima Intermediate School parking lot and additional parking areas. No changes are proposed to the westernmost JCHS driveway or Aikanaka Road access with the Project. See Figure 1.3 for the Vehicle Access & Circulation Plan.

The Project site will also continue to provide access for pedestrians, bicyclists, and transit users as well. A new plaza is proposed along North Road to provide a central access for pedestrians and bicyclists. An additional sidewalk entrance will also be provided at the easternmost JCHS driveway across Kilaha Street to allow pedestrians entering from the opposite end of the campus to enter without having to cross heavy vehicle traffic entering and exiting the JCHS driveways. See Figure 1.4 for the Pedestrian and Bicycle Access and Circulation Plan, which shows routes to/from the Project, nearby commercial and residential areas and transit.

Currently, the JCHS campus provides a total of 329 parking stalls for students, faculty/staff and visitors. 66 of the parking stalls are publicly available stalls within the Ilima Intermediate School parking lot that are open to JCHS students and visitors. With the Project, the number of parking stalls is proposed to increase to at least 459 stalls with the addition of the 3-story parking garage and expansion of existing parking areas. The minimum m 459 stalls is based on requirements from the Land Use Ordinance (LUO). However, the number of new stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood. The proposed parking areas and parking garage are shown in Figure 1.5.

In addition to providing parking, the three (3) JCHS parking lots along North Road nearest to Kilaha Street are also utilized for pick-up and drop-off operations for parents and school buses. The middle lot was observed to be used exclusively for school buses during school start/end times, with access to the parking lot monitored by a security guard. The Ilima Intermediate School parking lot is also utilized for pick-up and drop-off operations by both Ilima Intermediate School and JCHS. With the Project, the two (2) easternmost JCHS parking lots along North Road are proposed to be consolidated with one (1) ingress driveway and one (1) egress driveway. The new

consolidated parking lot is proposed to serve as a parent pick-up/drop-off area. In order to minimize queuing and delays during pick-ups and drop-offs, it is recommended to maintain separate loading areas for school buses and parents, and school bus pick-up/drop-off is proposed to occur within the lot directly to the west of the consolidated parking lot.

The Project also proposes to construct a new roadway through campus, connecting the existing access from Aikanaka Road to North Road via an existing fire lane. This internal roadway will generally be used outside of normal school hours during athletic events to provide a designated area for school buses from visiting teams to pick-up and drop-off players. A small, paved parking area is also proposed along the internal roadway which will be utilized by auto shop maintenance vehicles and emergency vehicles only during school hours. When not in use, the connections to the internal roadway will be gated to prevent unauthorized vehicles from entering. Due to limited access to the internal roadway during school hours, no significant conflict is anticipated between vehicles and students walking between buildings on campus.

Proposed parent and school bus loading areas and circulation patterns with the Project are shown in Figures 1.6 to 1.8.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TIAR

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

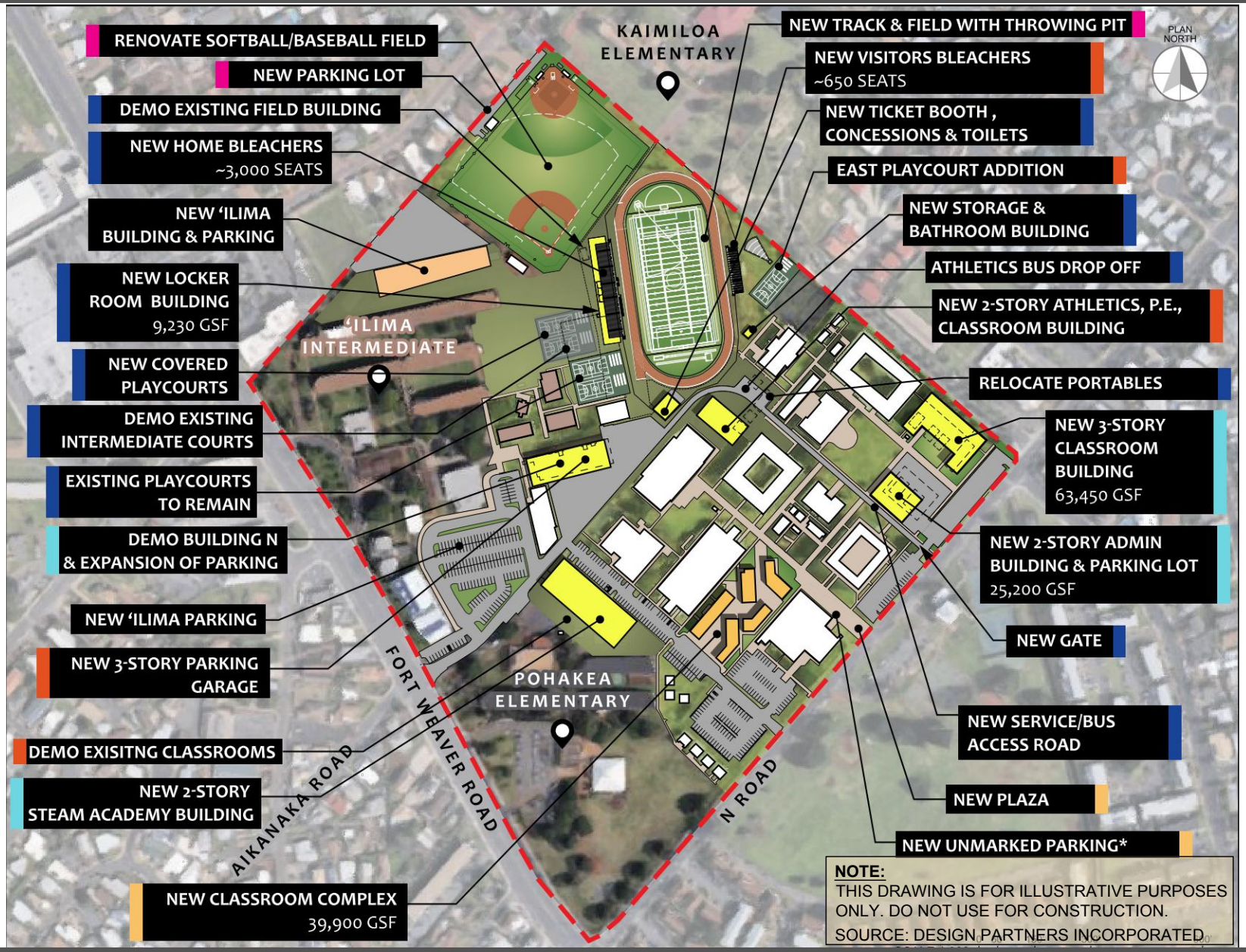


FIGURE 1.2

SITE PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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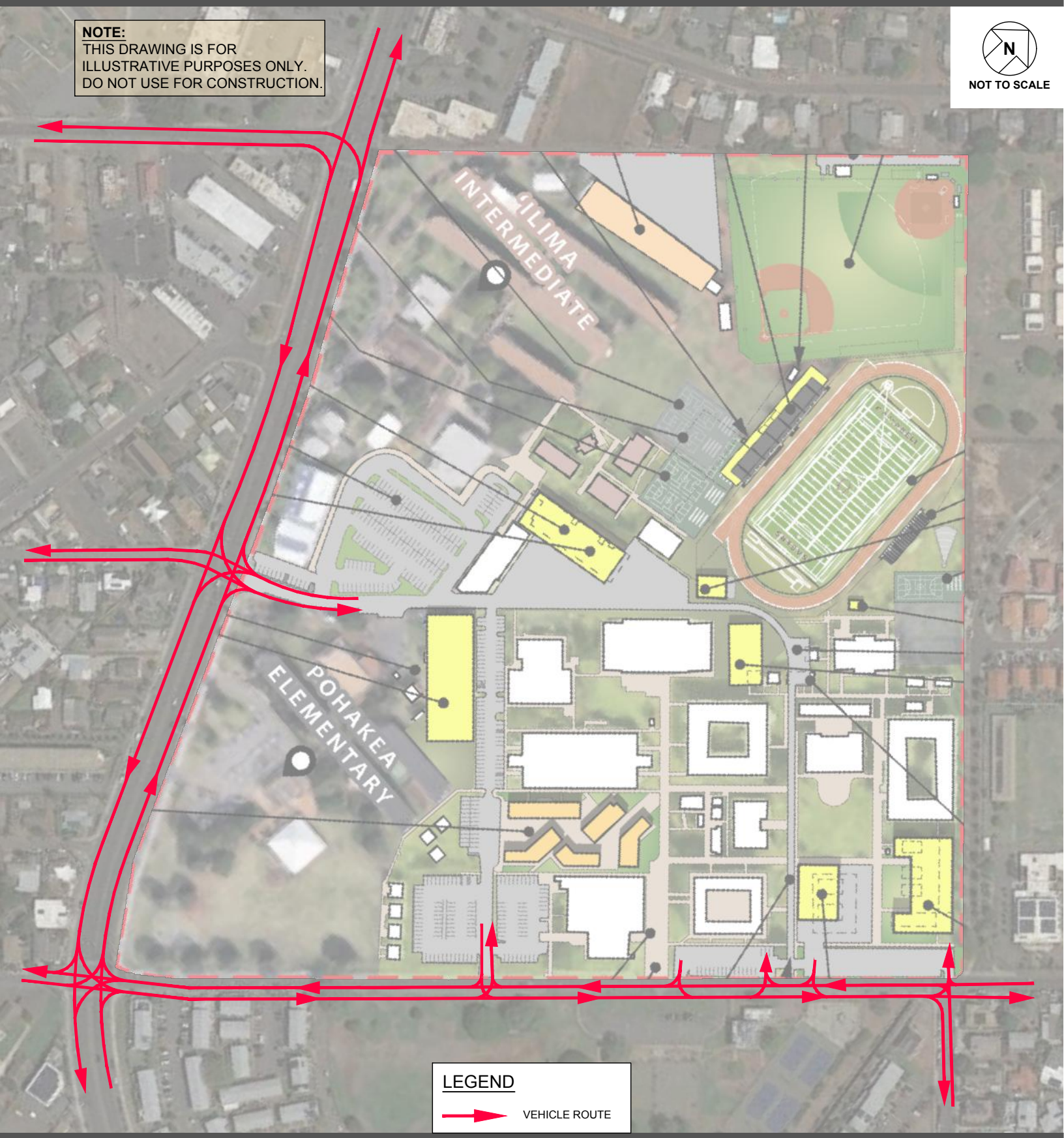

FIGURE 1.3

VEHICLE ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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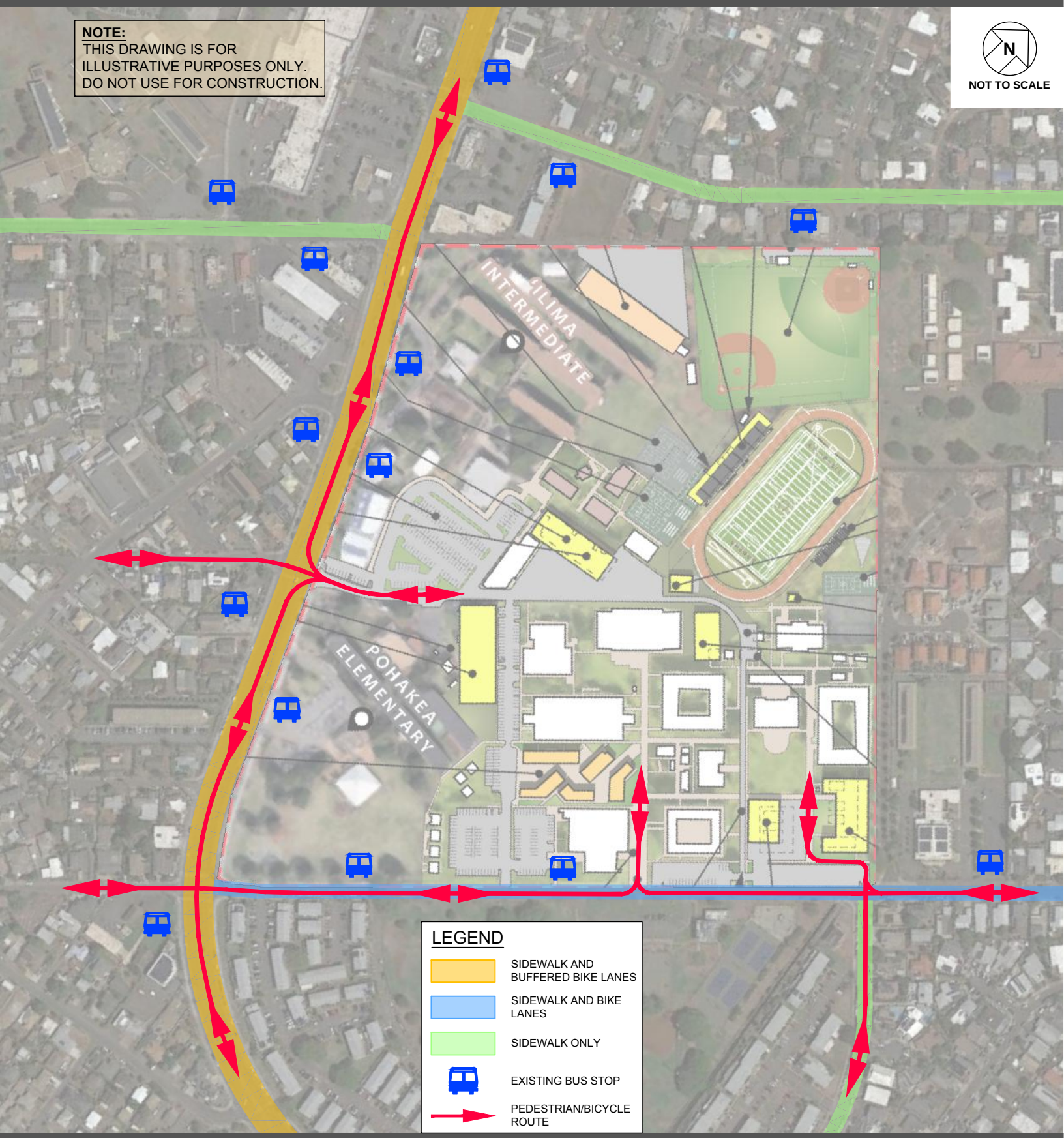

FIGURE 1.4

PEDESTRIAN AND BICYCLE ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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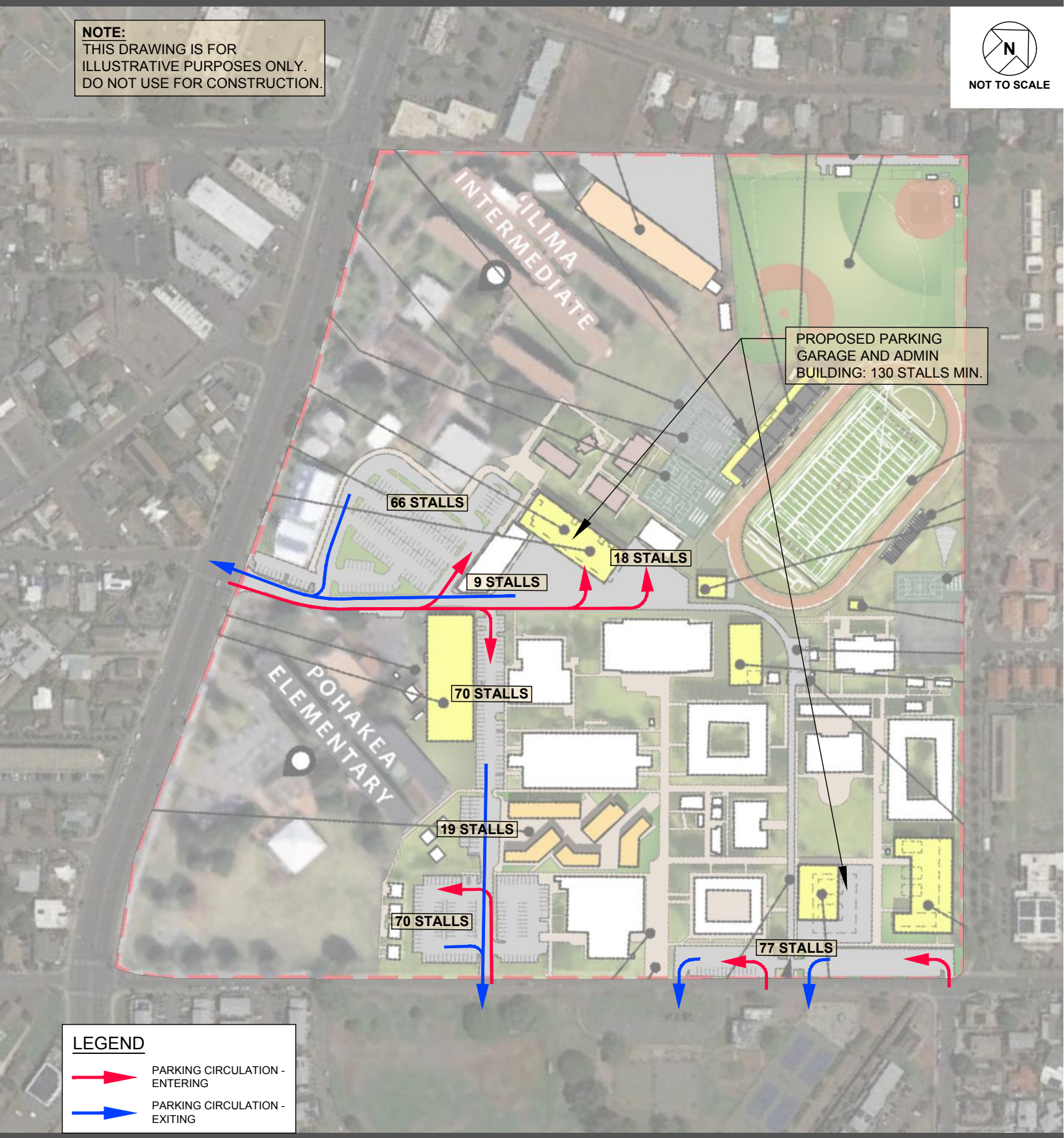

FIGURE 1.5

PROJECT PARKING PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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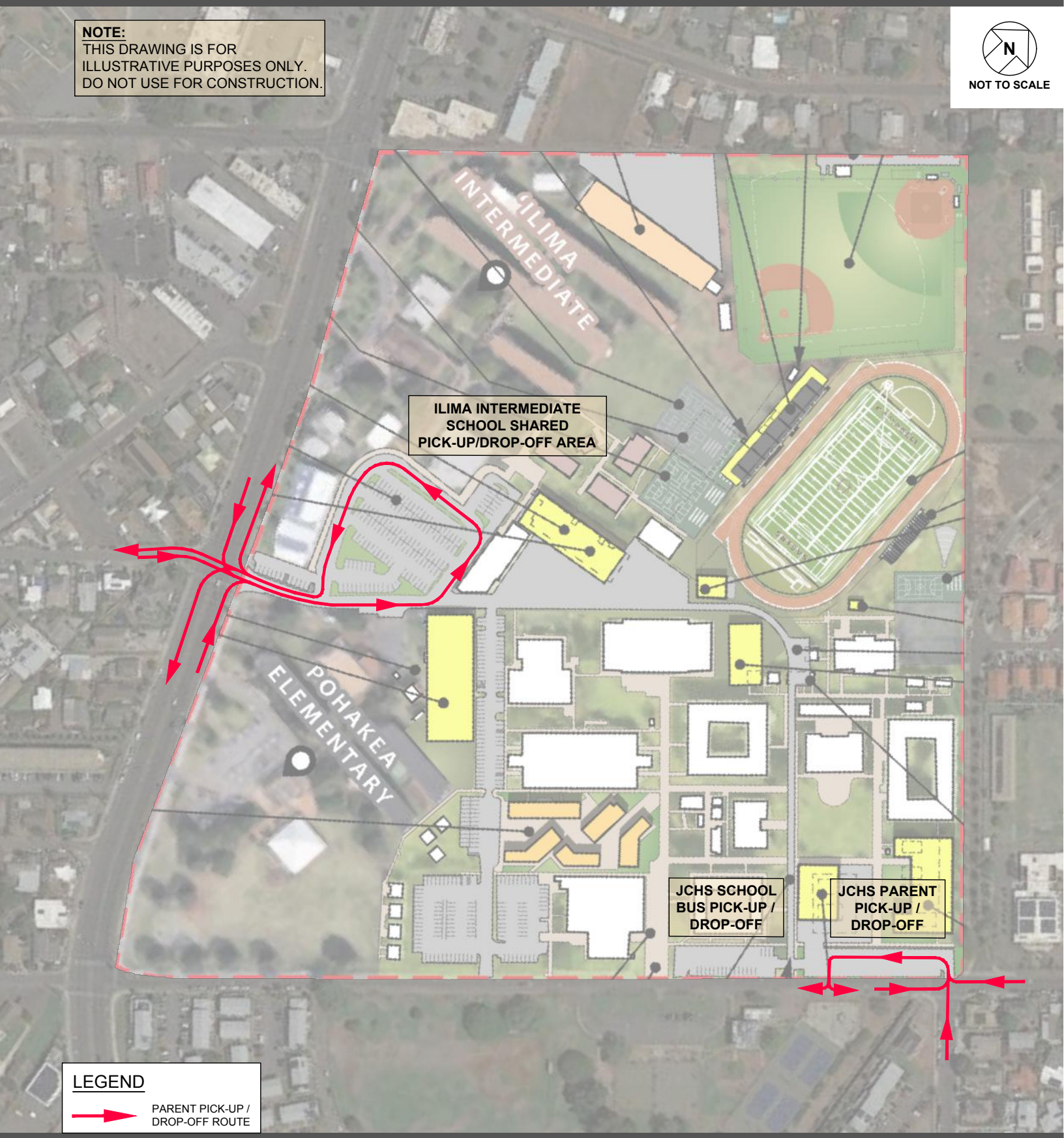

FIGURE 1.6

PARENT PICK-UP AND DROP-OFF AREAS
ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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LEGEND

SCHOOL BUS PICK-UP / DROP-OFF ROUTE

FIGURE 1.7

SCHOOL BUS PICK-UP AND DROP-OFF AREAS ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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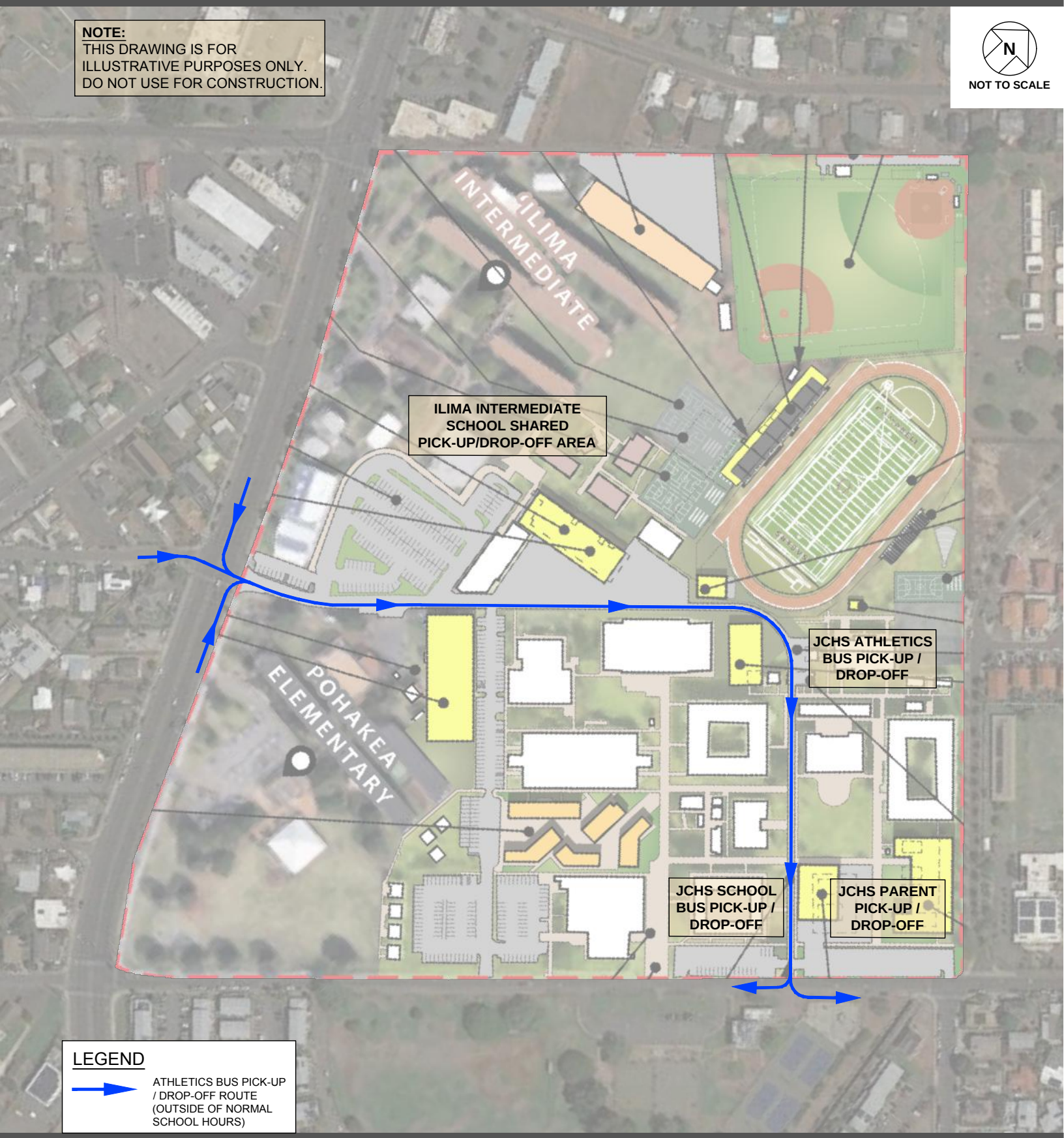

LEGEND

ATHLETICS BUS PICK-UP / DROP-OFF ROUTE (OUTSIDE OF NORMAL SCHOOL HOURS)

FIGURE 1.8

ATHLETICS BUS PICK-UP AND DROP-OFF AREAS ACCESS AND CIRCULATION PLAN

1.3 Plan Conformity

The improvements considered in this study are consistent with the following policies and plans:

- City and County of Honolulu, Complete Streets Design Manual, September 2016.
- City and County of Honolulu, Oahu Bike Plan 2019 Update, December 2019.
- City and County of Honolulu, Oahu Pedestrian Plan Draft, June 2021.
- City and County of Honolulu, Right-of-Way Widths for Planned Street Improvements, November 2021.
- State of Hawaii Department of Transportation, Statewide Pedestrian Master Plan, May 2013.

1.4 Project Study Area

The Project Study Area includes the roadways along the Project frontage including Fort Weaver Road, between North Road/Kimopelekane Road and Papipi Road, and North Road, between Fort Weaver Road and Kilaha Street. The segments listed above and the following intersections were evaluated as part of the study:

- Fort Weaver Road & Papipi Road (signalized)
- Fort Weaver Road & Aikanaka Road (signalized)
- Fort Weaver Road & North Road/Kimopelekane Road (signalized)
- North Road & Kilaha Street (unsignalized)

1.4.1 Existing Priority Networks

Pedestrian and bicycle priority networks are networks of roadways that provide important pedestrian and bicycle connections to transit and major destinations. Roadways that are identified as part of a priority network do not necessarily provide existing facilities and may be included as locations for proposed facilities. The pedestrian priority network for the study area is shown in Figure 1.9, and the bicycle priority network for the study area is shown in Figure 1.10.

1.4.2 Existing Street Access

Access to and from the Project is provided via Fort Weaver Road and North Road. Fort Weaver Road serves as a major arterial through Ewa and Ewa Beach, connecting residential, recreational, commercial and medical uses to Farrington Highway and the H-1 Freeway. Fort Weaver Road serves as the main commuter route for residents living in Ewa region.

Fort Weaver Road has bike lanes on both sides of the roadway between Keoneula Boulevard and Ewa Beach Road/Kilaha Street. North Road does not have existing bicycle facilities and is categorized as a moderate stress shared roadway on the Oahu Bike Map. Additional bicycle facilities providing access between the project site and surrounding land uses include:

- Papipi Road Shared Roadway – Shared roadway from Fort Weaver Road to end of Papipi Road.
- Keoneula Boulevard Multi-Use Path – Multi-Use Path from Fort Weaver Road to end of Keoneula Boulevard.

1.4.3 Existing Public Transit

1.4.3.1 School Bus Service

Students in grades 6-12 residing 1.5 miles or more from their home school qualify for regular school bus service. Regular school bus service is limited to transportation from the residential address of record to school and back home again. Bus riders can choose to pay quarterly – $36 one way per quarter (AM only or PM only) or $72 round trip – or via bus coupons – $10.00 per sheet of 10 coupons at one (1) coupon per ride (AM or PM). Students may also receive a free annual bus pass based on certain qualifications.

Currently, five (5) school buses serve JCHS covering the following school bus routes:

- Iroquois Point (2 routes)
- Summer Hill
- West Loch Estates, Fairways, and Honuliuli Road
- Kapolei Parkway, Hoakalei, Kekaiholo, and Kaileolea

1.4.3.2 City Bus Transit

Oahu Transit Services (OTS) operates TheBus with a fleet of 540 fixed-route buses servicing the most populated areas of the island. TheBus is the primary form of public transit on Oahu. The cost of service for adults is $3.00 for each one-way ride, $7.50 for a one-day pass, $80 for a monthly pass and $880 for an annual pass[1]. Effective June 20, 2021, paper bus pass sales were discontinued and replaced with the Holo Card. Currently the Holo Card is only available to use on TheBus; however, in the future, the Holo Card will be available to use on TheHandi-Van and the Honolulu Rail Transit System as well.

TheHandi-Van serves as an extension to TheBus, designed to serve riders that require additional assistance. Passengers pre-arrange drop-off and pick-up with TheHandi-Van and share the vans with other riders. Daily service is generally available island wide between 4:00 AM and 1:00 AM while 24-hour service is available in areas located within ¾ miles of Routes 2 and 40. The fare is $2.25 per one-way trip. TheHandi-Van stops at the nearest curbside for both pick-ups and drop-offs.

The State of Hawaii Department of Education (HIDOE) is currently offering free city bus passes for students during the 2022-2023 school year as a part of the Expanding Ridership to Educate Students in Schools (EXPRESS) County Bus Pass pilot program. It is unknown whether this program will continue in the future.

As shown in Table 1.1, there are seven (7) bus stops along the study segments of Fort Weaver Road and North Road, including the Ewa Beach Transit Center, which is located adjacent to the Hale Pono Boys & Girls Club along Fort Weaver Road.

Figure 1.11 identifies the bus stops that serve each bus route and identifies the bus stops with amenities (shelter and/or bench).

[1] According to TheBus (www.thebus.org). Date Accessed: July 1, 2022.

Table 1.1: Bus Route Summary

Bus Route	**Bus Stops On** (within the study area)	**Headways** (during the AM and PM commuter peaks)
Route 41 – Kapolei – Ewa Beach	Fort Weaver Road North Road	~60 min
Route 42 – Ewa Beach – Waikiki	Fort Weaver Road North Road	~30 min
Route 44 – Waipahu – Ewa Beach	Fort Weaver Road	~60-75 min
Route 91 – Ewa Beach Express	Fort Weaver Road North Road	~20-40 min
Route E – Country Express! Ewa Beach	Fort Weaver Road	~30 min
Route PH7 – Ewa Beach – Pearl Harbor Express	Fort Weaver Road North Road	1 AM and PM trip
Route W1 – Waipahu Via Farrington Highway Express	Fort Weaver Road North Road	~10-20 min

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

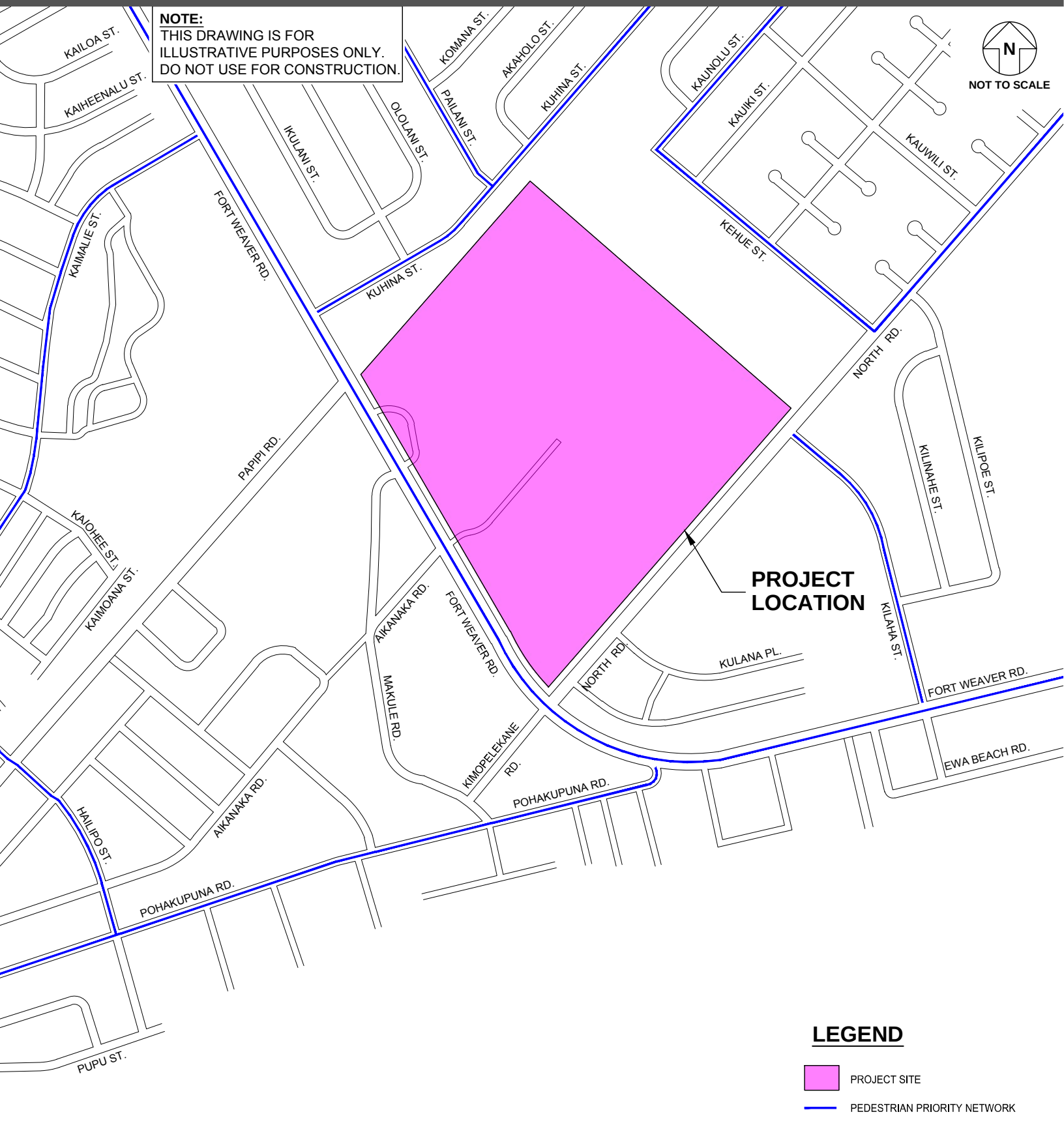

FIGURE 1.9

PEDESTRIAN PRIORITY NETWORK

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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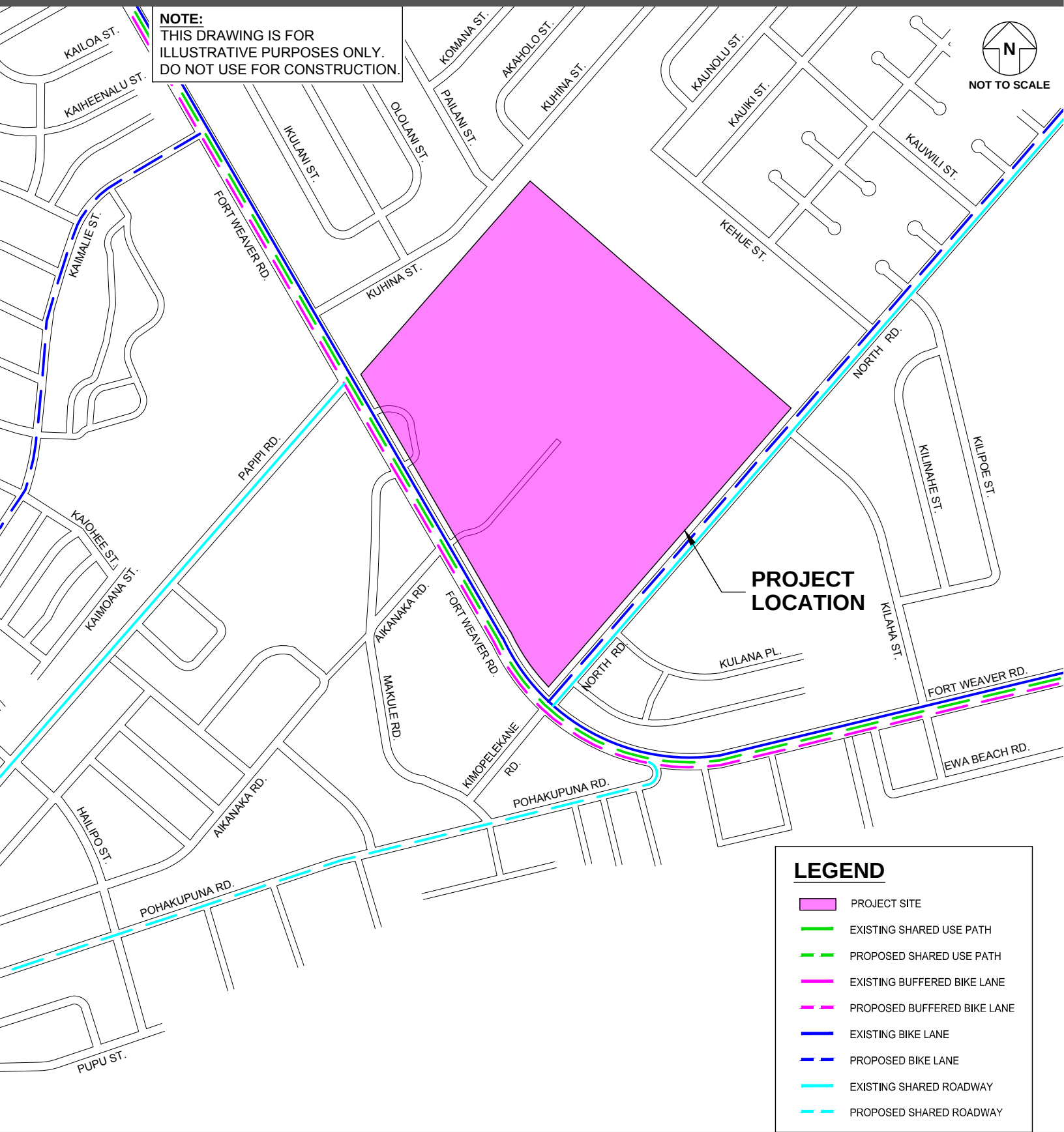

FIGURE 1.10

BICYCLE PRIORITY NETWORK

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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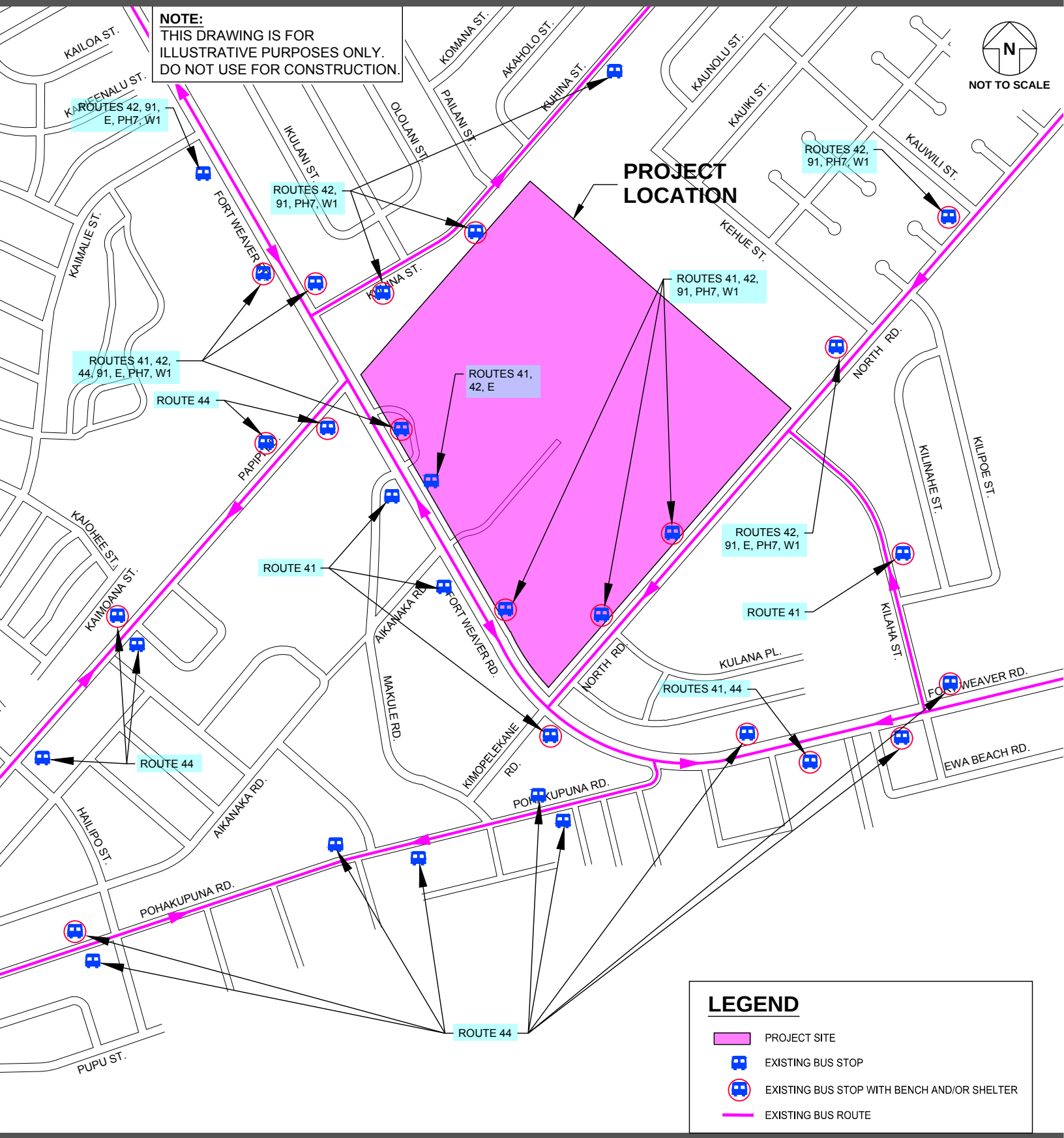

FIGURE 1.11

TRANSIT NETWORK

1.4.4 Existing Street Characteristics

The following are brief descriptions of the existing roadways studied within the Project study area:

Fort Weaver Road is a four (4) to six (6) lane, two-way, north-south, State roadway that transitions from Kunia Road to the north at its intersection with Farrington Highway and terminates to the southeast at its transition to Cormorant Avenue. Fort Weaver Road serves as a major arterial through Ewa and Ewa Beach, connecting various residential, commercial, recreational and medical land uses to Farrington Highway and the H-1 Freeway. Bike lanes and unmarked on-street parking are available along both sides of the roadway in the vicinity of the Project. Along portions of the Project frontage, parking is not allowed and is denoted with pavement markings and signage. Travel lanes are generally 11 – 12 feet wide with an estimated Average Annual Daily Traffic (AADT) of 21,200 vehicles per day in the vicinity of the Project. The posted speed limit is 25 miles per hour (mph) in the vicinity of the Project.

North Road is a two lane, two-way, east-west, local roadway that begins to the west at its intersection with Fort Weaver Road and Kimopelekane Road and terminates to the east at its intersection with West Loch Drive. North Road provides access to James Campbell High School and residential areas within Ewa Beach, as well as the West Loch Annex. Unmarked on-street parking is available along the makai side of the roadway from Fort Weaver Road to Kilaha Street and along both sides of the roadway from Kilaha Street to just past Haiamu Street. Travel lanes are generally 10 – 18 feet wide with an estimated AADT of 6,800 vehicles per day in the vicinity of the Project. The posted speed limit is 25 mph in the vicinity of the Project.

1.4.5 Existing Sidewalk Characteristics

Sidewalks are provided along both sides of Fort Weaver Road. Generally, sidewalks adjacent to the Project along Fort Weaver Road are approximately 10 feet wide with little to no impediments. Sidewalks along the west side of Fort Weaver Road are approximately eight (8) feet wide with large utility poles in the middle of the sidewalk. Curb ramps are provided at all crossing locations to provide an ADA accessible route to/from the Project site.

An at-grade 4-foot-wide asphalt sidewalk, separated from the travel way with an asphalt curb, is present along North Road fronting the Project between Fort Weaver Road and Kilaha Street, with the exception of an approximately 320-foot section fronting the Ewa Beach Public Library which provides a concrete sidewalk. A 4.5-foot-wide concrete sidewalk is present along the makai side of North Road fronting the Ewa Apartments at Kulana complex between Fort Weaver Road and Kulana Place. There is no sidewalk fronting Ewa Beach Community Park between Kulana Place and Kilaha Street.

As previously mentioned in Section 1.4.3 and illustrated in Figure 1.11, a number of transit stops are provided along the study segments, with all stops accessible to the Project site via sidewalks. See Figure 1.12 for the sidewalk widths along the studied roadway segments.

1.4.6 Existing Parking Characteristics

On-street parking is currently provided along the studied segments of Fort Weaver Road and North Road. Between North Road/Kimopelekane Road and Papipi Road, Fort Weaver Road provides approximately 11 unmarked parallel stalls fronting Pohakea Elementary School in the northbound direction and approximately 15 unmarked parallel stalls between intersections and driveways in the southbound direction. In the northbound direction, parking is restricted in several areas with the exception of City buses. Between Fort Weaver Road and Kilaha Street, North Road

provides unmarked on-street parking on the makai side of the roadway. Between Fort Weaver Road and Kulana Place, approximately 9 unmarked parallel stalls are provided. Between Kulana Place and Kilaha Street, a wide shoulder is provided fronting the Ewa Beach Community Park, which allows vehicles to park diagonally. However, a few vehicles were observed to park parallel since parking stalls are not actually marked. Approximately 50 vehicle spaces were observed along this portion of North Road.

On-street parking demand along North Road was observed to peak during JCHS school hours as a result of students and faculty/staff parking along the roadway as well as during early evening sporting events at the Ewa Beach Community Park.

Off-street parking in the study area is provided at JCHS, Ilima Intermediate School, Pohakea Elementary School, the Ewa Beach Public Library and the Ewa Beach Community Park. Parking lots are also provided at nearby apartment complexes and commercial centers. All off-street parking lots are not intended for use by the general public. A total of 329 parking stalls as well as bicycle racks are provided for JCHS students, faculty/staff and visitors.

No publicly available electric vehicle charging stations or bicycle parking are currently provided in the study area.

See Figure 1.13 for the existing on-street parking areas along the studied roadway segments.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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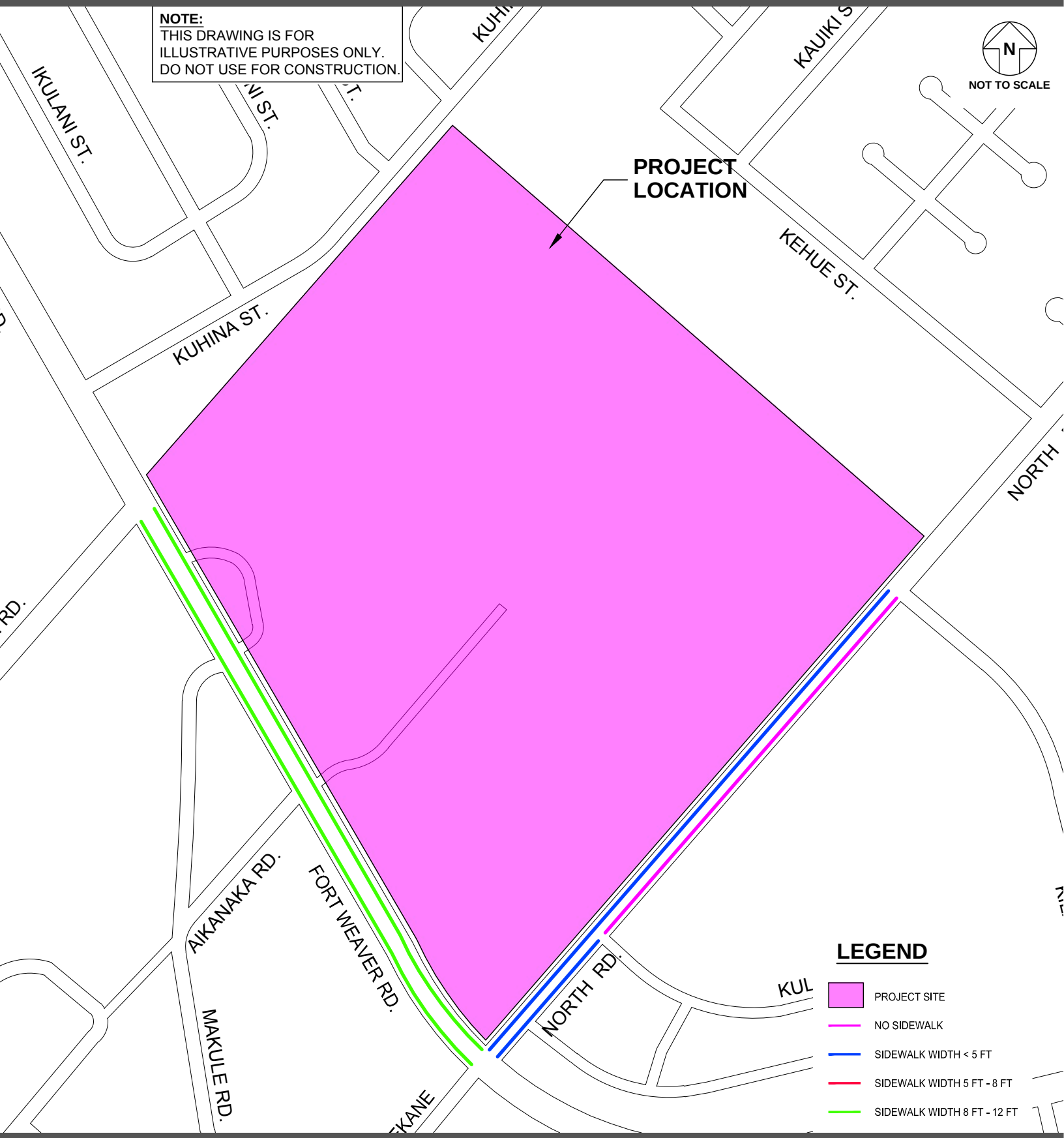

FIGURE 1.12

SIDEWALK WIDTHS

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

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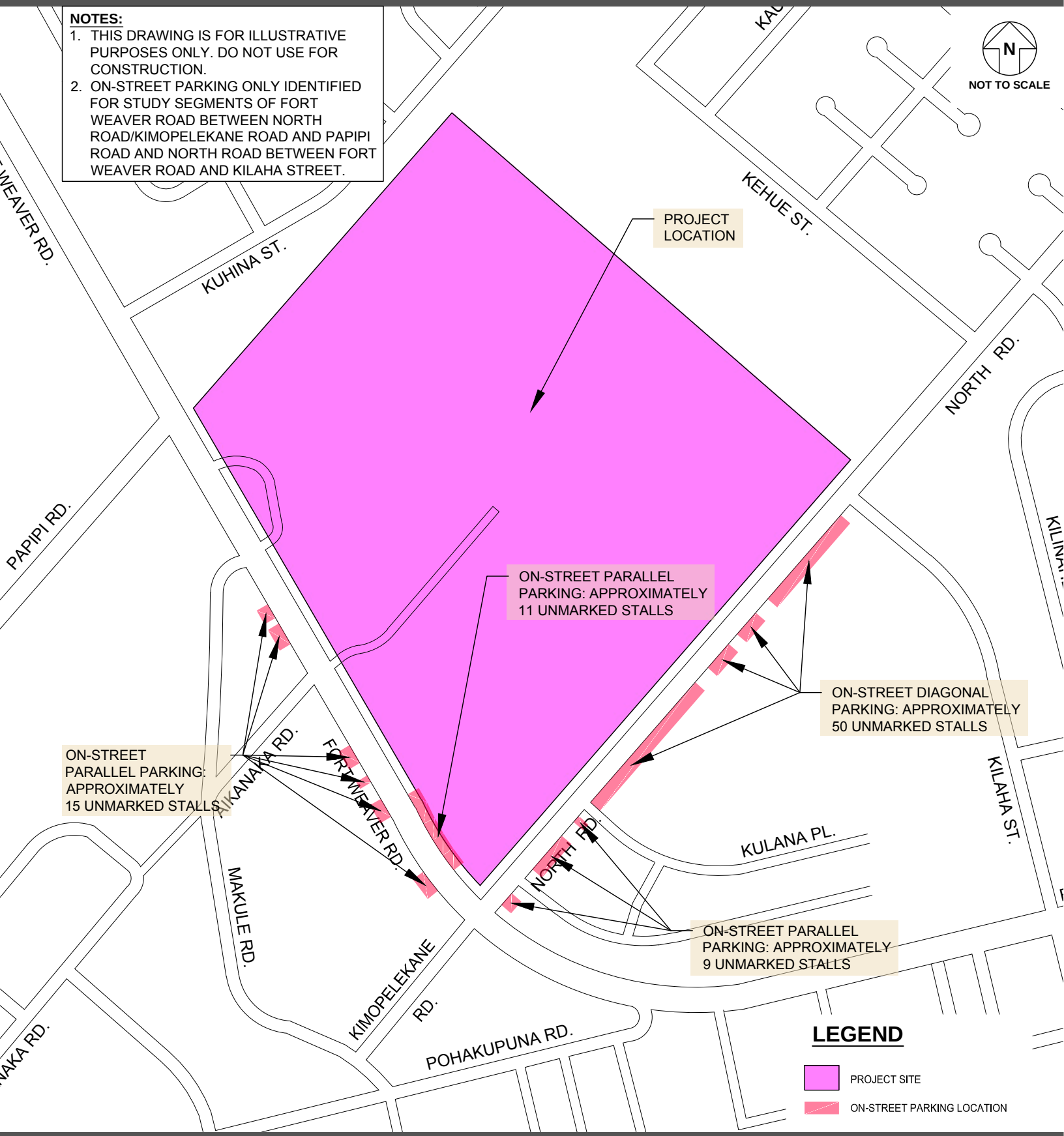

FIGURE 1.13

EXISTING ON-STREET PARKING

2. MULTIMODAL TRANSPORTATION IMPACT ANALYSIS

2.1 Existing Traffic Conditions

2.1.1 Existing Traffic Volumes

12-hour turning movement traffic counts were collected by ATA on Tuesday, April 26, 2022. Based on the count data, the weekday AM, School PM, and PM peak hours of traffic occur between 7:00 AM and 8:00 AM, 2:00 PM and 3:00 PM, and 3:45 PM and 4:45 PM, respectively. The C&C Transportation Impact Assessment (TIA) Guide recommends the use of the second highest peak hour to evaluate vehicle operations in order to allow some vehicle congestion to occur and not prematurely widen roadways for additional vehicle capacity, which can be detrimental to pedestrian and bicycle travel. The second highest peak hours of traffic occur between 8:00 AM and 9:00 AM, 3:00 PM and 4:00 PM and 4:45 PM and 5:45 PM for the AM, School PM and PM periods, respectively. Hereinafter, the second highest peak hours will be referred to as the AM 2nd Peak, School PM 2nd Peak and PM 2nd Peak.

Based on historical traffic count data along Fort Weaver Road and North Road from the State of Hawaii Department of Transportation (HDOT), volumes in the study area were generally observed to have recovered from the COVID-19 pandemic, which caused lower traffic volumes due to various factors such as distance learning and work-from-home policies. As a result, traffic volumes in the study area were assumed to have returned to typical conditions at the time of data collection and observations, and no adjustments to collected data were made.

Existing vehicle volumes for the second highest peak hours of traffic are shown in Figure 2.1. Existing pedestrian and bicycle volumes for the peak hours of traffic are shown in Figure 2.2. Traffic count data utilized in this study is included in Appendix A.

2.1.2 Street Typology Determination

The Honolulu Complete Streets Design Manual provides quality of service targets for each mode of travel based on the street typology. The street typology for a given roadway is generally based on adjacent land uses, transit access, number of travel lanes and speed limits. The appropriate street typology for the studied roadway segments was determined based on the Right-of-Way Widths for Planned Street Improvements report and the National Association of City Transportation Officials (NACTO) City Limits: Setting Safe Speed Limits on Urban Streets Safe Speed Study.

The Right-of-Way Widths for Planned Street Improvements report provides proposed street type assignments to City roadways based on the character, context, function and long-term goals for each roadway in order to accommodate the needs of all roadway users. Based on the Right-of-Way Widths for Planned Street Improvements, North Road is proposed as a Street. The portion of Fort Weaver Road fronting the Project is not assigned a street type in the study. However, the portion of Fort Weaver Road mauka of the Project site from Keoneula Boulevard to Farrington Highway is proposed as a Boulevard.

The NACTO Safe Speed Study recommends speed limits based on conflict density and activity level along the corridor. The resulting speed limit generally correlates to the street typology of the roadway. The results of the NACTO Safe Speed Study are shown in Table 2.1 below. The full NACTO Safe Speed Study is included in Appendix B. Because Fort Weaver Road fronting the

Project site is a State-owned roadway, any modifications to the speed limit will need to be coordinated between the C&C and the State of Hawaii Department of Transportation (HDOT).

Table 2.1: NACTO Safe Speed Study Speed Limit Determination

Segment	Conflict Density	Activity Level	Recommended Speed Limit
Fort Weaver Road – North Road to Papipi Road	High	Moderate	20 MPH
North Road – Fort Weaver Road to Kilaha Street	High	Moderate	20 MPH

Based on the above NACTO Safe Speed Study speed limits, the studied segments of Fort Weaver Road and North Road have speed limits consistent with the street typology for Main Streets and Streets. Consistent with the Right-of-Way Widths for Planned Street Improvements, North Road was evaluated as a Street, which carries moderate volumes at low speed and generally acts as a feeder route to/from residential streets.

Although Fort Weaver Road is proposed as a Boulevard further mauka of the Project site, in the vicinity of the Project, Fort Weaver Road provides direct access to driveways servicing residences, schools, churches and commercial areas. Although the Main Street typology typically represents roadways serving a commercial section of a town center, the high pedestrian and bicycle activity along this segment of Fort Weaver Road due to the schools and commercial areas suggests the need for additional multimodal versus vehicle accommodations. Fort Weaver Road was therefore evaluated as a Main Street between North Road/Kimopelekane Road and Papipi Road.

The street typology for the studied roadway segments and the associated quality of service targets are shown in Table 2.2 below.

Table 2.2 Street Typology

Segment	Type	Target Ped LOS	Target Bike LTS	Target Transit LOS	Target Auto LOS	Target Parking LOS
Fort Weaver Road – North Road to Papipi Road	Main Street	1	3	1	2	3
North Road – Fort Weaver Road to Kilaha Street	Street	1	3	3	2	3

2.1.3 Crosswalk Evaluation

Marked unsignalized crosswalks along North Road provide access between the Ewa Apartments at Kulana complex, Ewa Beach Community Park, Ewa Beach Public Library, JCHS, Kilaha Street residences and bus stops located on the mauka side of the roadway. The Honolulu Complete Streets Design Manual Pedestrian Crossing Treatment Flowchart and Criteria for Crossing Treatments at Uncontrolled Locations table (see Figures 2.3 through 2.9) were used to assess

each of the following existing crosswalks to determine if pedestrian crossing improvements should be considered or if crosswalk removal may be required to meet guidelines:

- North Road/Kulana Place Crosswalk
- North Road Midblock Crosswalk
- North Road/Kilaha Street South Crosswalk
- North Road/Kilaha Street West Crosswalk

Pedestrian volumes at all of the studied crosswalks exceed the minimum of 20 pedestrians in a single hour as a result of heavy pedestrian volumes associated with JCHS, and all studied crosswalks should remain as marked crossings based on the Honolulu Complete Streets Design Manual. Although North Road carries low vehicular volumes and has a two-lane cross-section, the installation of pedestrian crossing signs and advance warning signs is required at midblock crossings and at school crossing locations.

School crossing signs and advance warning pavement markings were previously provided at the three (3) studied crosswalks crossing North Road. However, several of the school crossing signs were missing during field observations and are recommended to be replaced. Additional advance warning signs and/or in-road signage may be considered.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

DATE OF COUNTS:
TUESDAY, APRIL 26, 2022

AM SECOND PEAK HOUR:
8:00 AM - 9:00 AM

PM SECOND PEAK HOUR:
4:45 PM - 5:45 PM

SCHOOL PM SECOND PEAK HOUR:
3:00 PM - 4:00 PM

LEGEND

##(##)[##] - AM 2ND PEAK(PM 2ND PEAK)[SCHOOL PM 2ND PEAK] VEHICLE VOLUMES

(X) - UNSIGNALIZED INTERSECTION X

(Y) X/X/X - SIGNALIZED INTERSECTION Y, OVERALL AM 2ND PEAK/PM 2ND PEAK/SCHOOL PM 2ND PEAK LOS

X(X)[X] - AM 2ND PEAK(PM 2ND PEAK)[SCHOOL PM 2ND PEAK] LOS

N
NOT TO SCALE

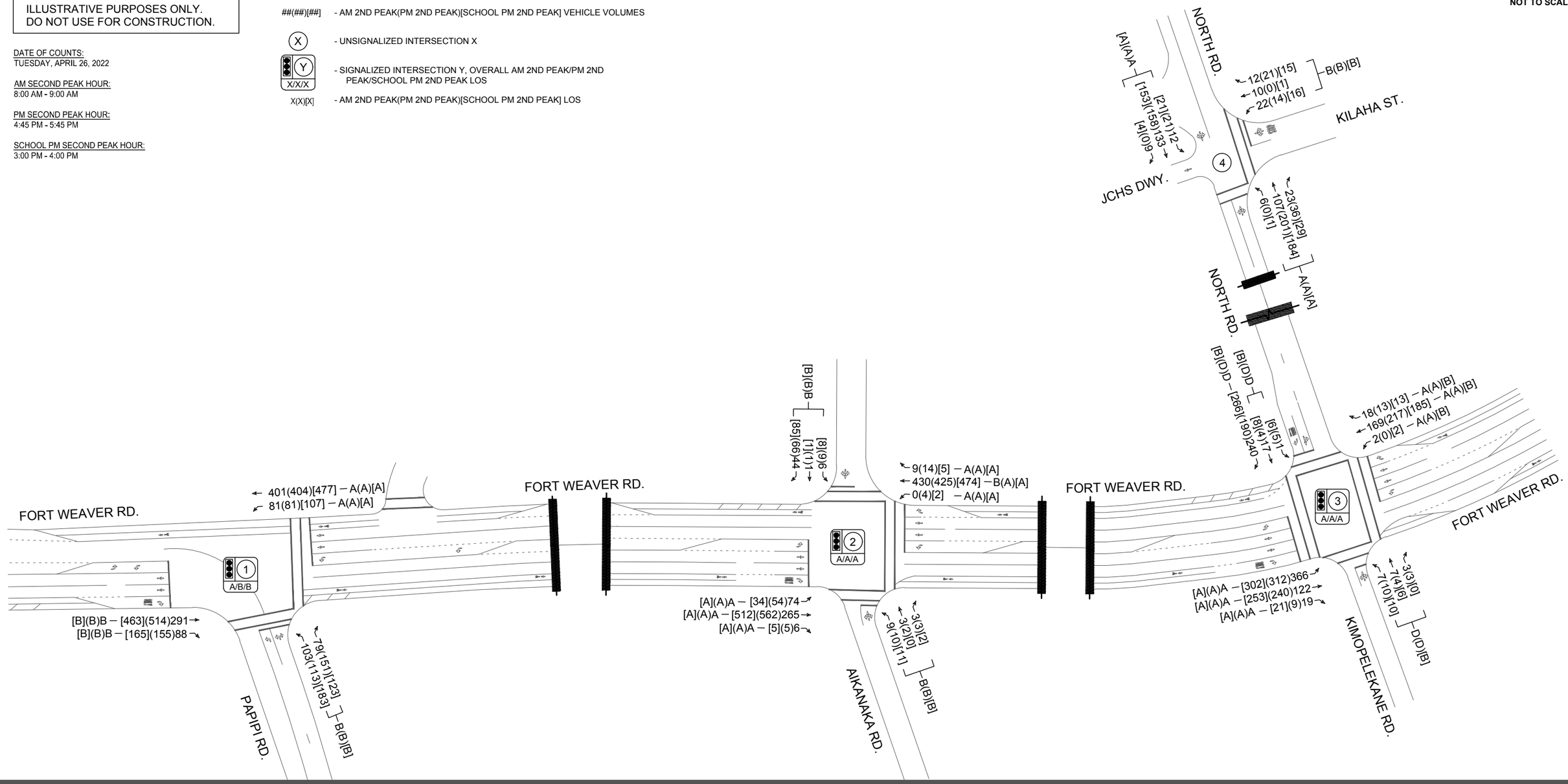

FIGURE 2.1

EXISTING LANE CONFIGURATION, VEHICLE VOLUMES AND MOVEMENT LOS

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors

NOTE:
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DO NOT USE FOR CONSTRUCTION.

DATE OF COUNTS:
TUESDAY, APRIL 26, 2022

AM PEAK HOUR:
7:00 AM - 8:00 AM

PM PEAK HOUR:
3:45 PM - 4:45 PM

SCHOOL PM PEAK HOUR:
2:00 PM - 3:00 PM

LEGEND

X - UNSIGNALIZED INTERSECTION X

Y - SIGNALIZED INTERSECTION Y

##(##)[##] - AM(PM)[SCHOOL PM] BICYCLE VOLUMES

##(##)[##] - AM(PM)[SCHOOL PM] PEDESTRIAN CROSSINGS

N
NOT TO SCALE

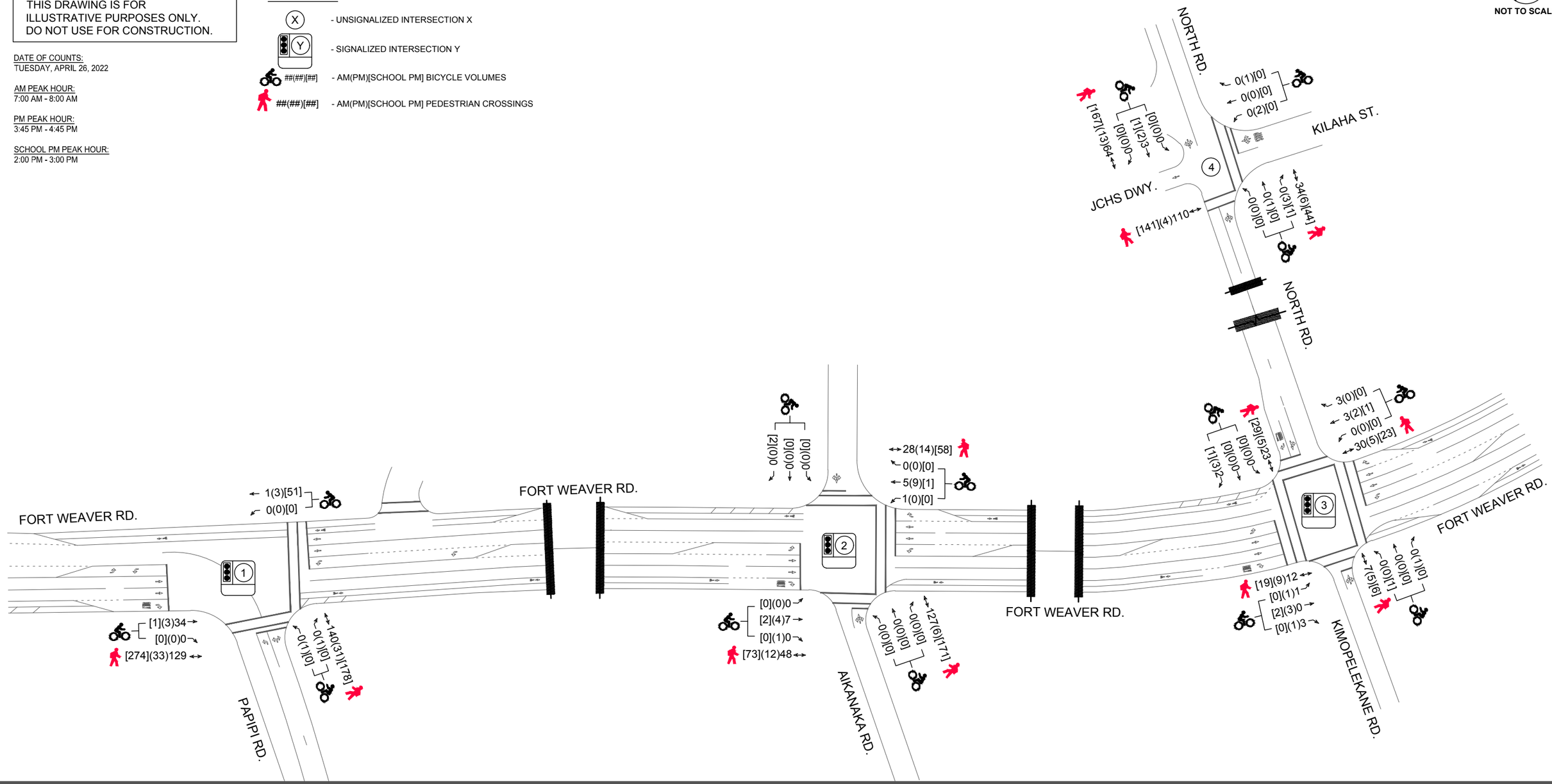


FIGURE 2.2

EXISTING PEDESTRIAN AND BICYCLE VOLUMES

Figure 2.3 - North Road/Kulana Place Crosswalk Flowchart Worksheet

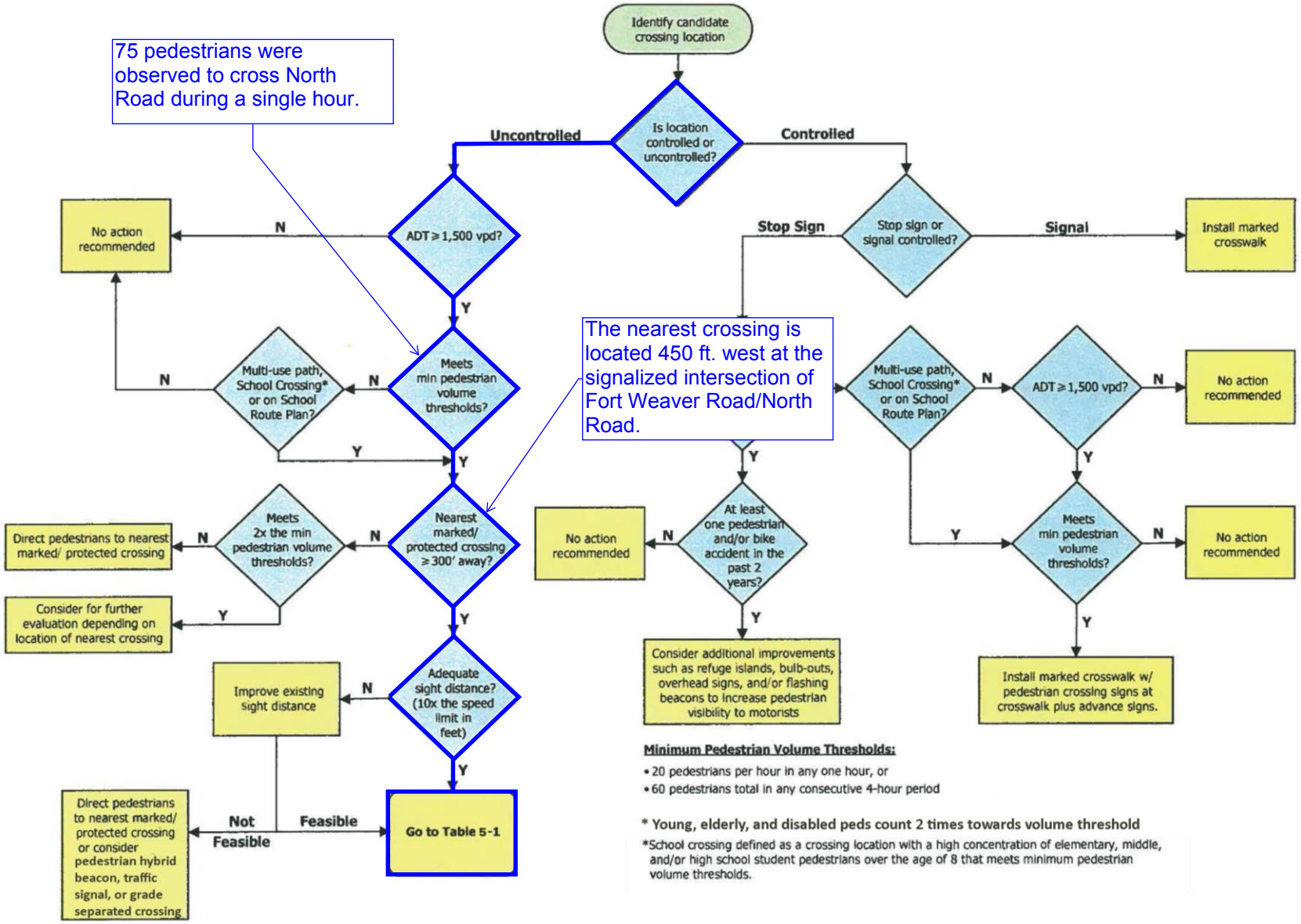


Figure 2.4 - North Road/Kulana Place Crosswalk Table Worksheet

Roadway Configuration	Number of Lanes Crossed to Reach a Refuge	Roadway ADT and Posted Speed															
		1,500-9,000 vpd				9,000-12,000 vpd				12,000-15,000vpd				≥ 15,000 vpd			
		≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph
1 or 2 Lanes (One-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
2 Lanes (Two-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
3 Lanes With Raised Median	1 or 2	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
3 Lanes With Striped Median	3	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
4 Lanes (Two-Way Without Raised	4	A	B	B	C	B	B	C	C	C	C	C	C	C	C	C	C
4 Lanes With Raised Median	2	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
5 Lanes Without Raised Median	5	A	B	C	C	B	B	C	C	C	C	C	C	C	C	C	C
5 lanes With Raised Median	2 or 3	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
6 or More Lanes	3 or 6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

A. Install marked crosswalk with enhanced signs
Specific Guidance: Install marked crosswalk and consider installation of pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) and in-road State Law Stop for Pedestrians sign (R1-6a or similar) on bollard. Signage shall be installed at midblock crossings and at school crossing locations. Use S1-1 signs for School Crossing locations.

B. Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure
Specific Guidance: Install marked crosswalk with pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) . Use S1-1 signs for School Crossing locations. In addition, install overhead signs and/or RRFBs. Where possible, install geometric improvements such as raised crosswalks, refuge islands, and bulb-outs to increase pedestrian visibility to motorists or shorten the pedestrian crossing distance.

C. Do not install marked crosswalk
Specific Guidance: Consider traffic signal, pedestrian hybrid beacon, grade-separated crossing, or other substantial crossing improvement to improve crossing safety for pedestrians.

Figure 2.5 North Road Midblock Crosswalk Flowchart Worksheet

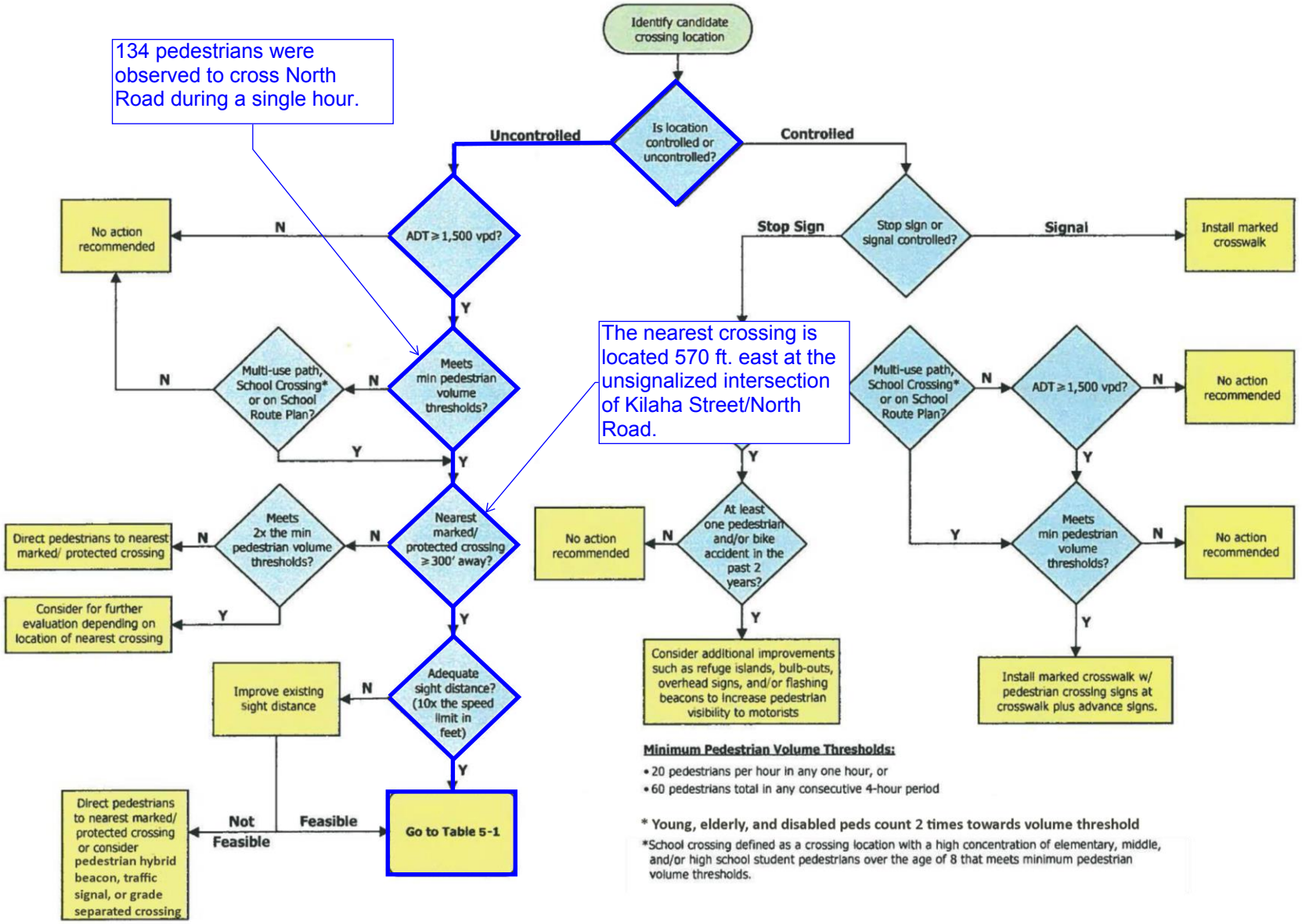


Figure 2.6 North Road Midblock Crosswalk Table Worksheet

Roadway Configuration	Number of Lanes Crossed to Reach a Refuge	Roadway ADT and Posted Speed															
		1,500-9,000 vpd				9,000-12,000 vpd				12,000-15,000vpd				≥ 15,000 vpd			
		≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph
1 or 2 Lanes (One-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
2 Lanes (Two-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
3 Lanes With Raised Median	1 or 2	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
3 Lanes With Striped Median	3	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
4 Lanes (Two-Way Without Raised	4	A	B	B	C	B	B	C	C	C	C	C	C	C	C	C	C
4 Lanes With Raised Median	2	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
5 Lanes Without Raised Median	5	A	B	C	C	B	B	C	C	C	C	C	C	C	C	C	C
5 lanes With Raised Median	2 or 3	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
6 or More Lanes	3 or 6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

A. Install marked crosswalk with enhanced signs
Specific Guidance: Install marked crosswalk and consider installation of pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) and in-road State Law Stop for Pedestrians sign (R1-6a or similar) on bollard. Signage shall be installed at midblock crossings and at school crossing locations. Use S1-1 signs for School Crossing locations.

B. Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure
Specific Guidance: Install marked crosswalk with pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) . Use S1-1 signs for School Crossing locations. In addition, install overhead signs and/or RRFBs. Where possible, install geometric improvements such as raised crosswalks, refuge islands, and bulb-outs to increase pedestrian visibility to motorists or shorten the pedestrian crossing distance.

C. Do not install marked crosswalk
Specific Guidance: Consider traffic signal, pedestrian hybrid beacon, grade-separated crossing, or other substantial crossing improvement to improve crossing safety for pedestrians.

Figure 2.7 North Road/Kilaha Street West Crosswalk Flowchart Worksheet

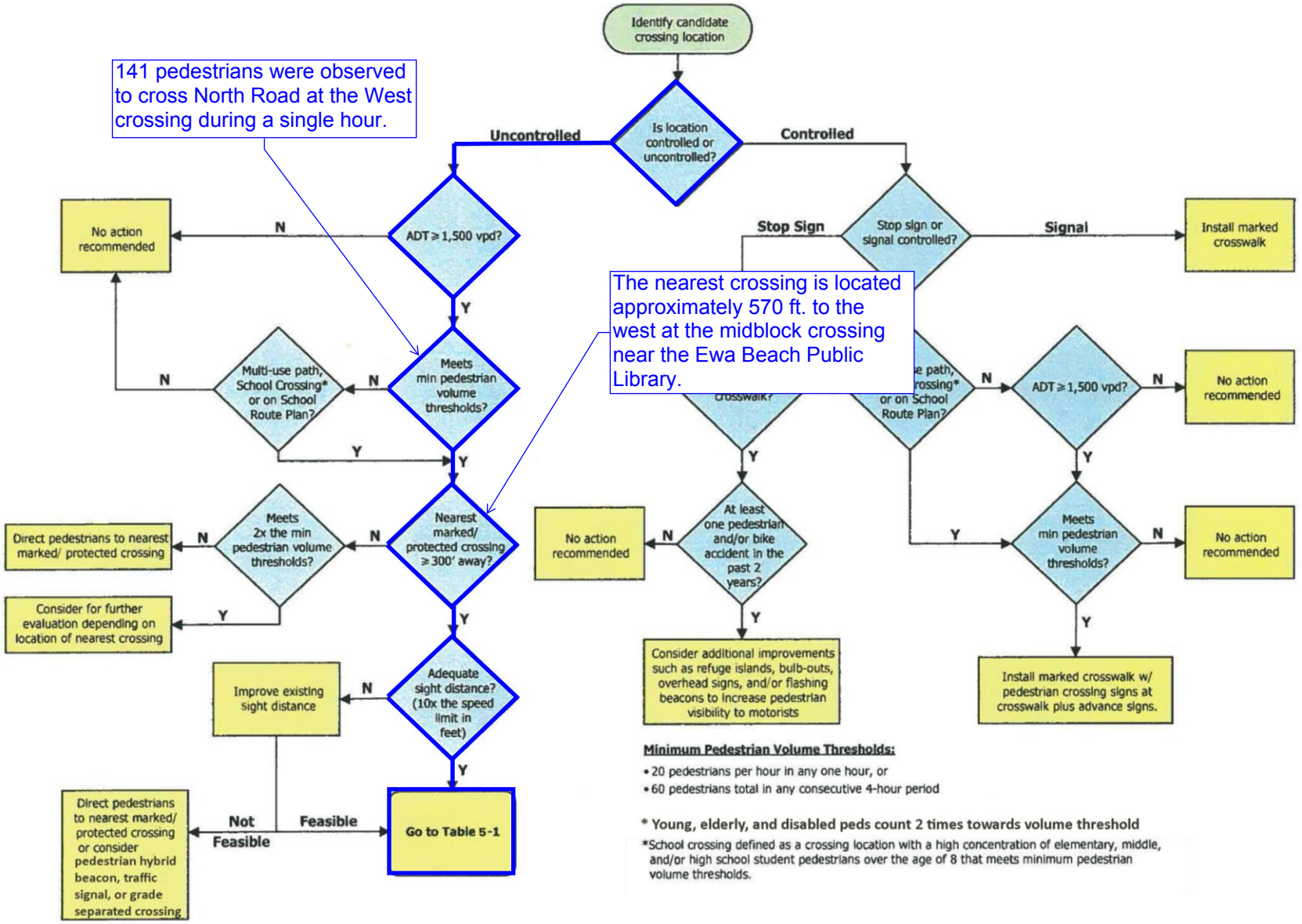


Figure 2.8 North Road/Kilaha Street West Crosswalk Table Worksheet

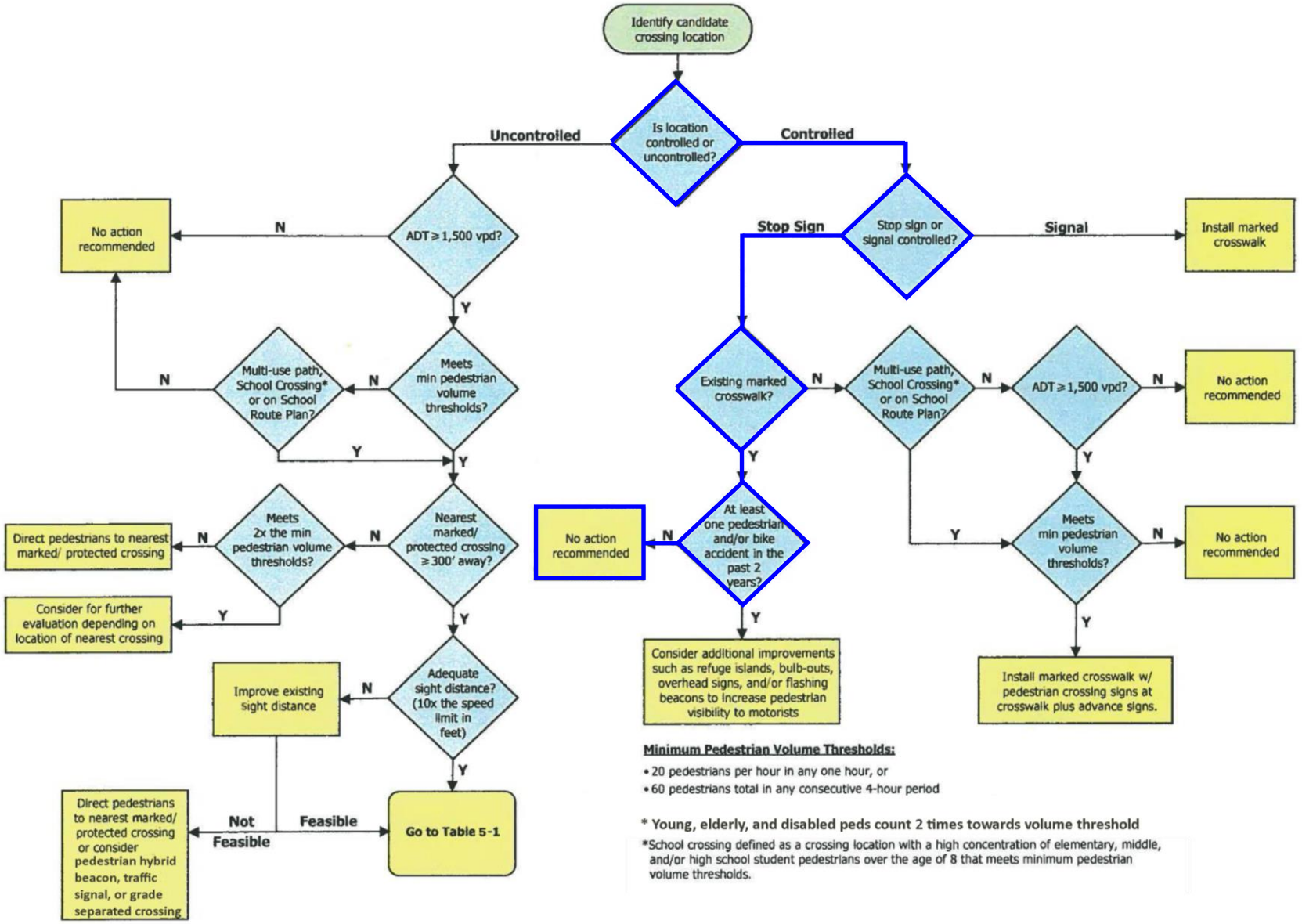
Roadway Configuration	Number of Lanes Crossed to Reach a Refuge	Roadway ADT and Posted Speed															
		1,500-9,000 vpd				9,000-12,000 vpd				12,000-15,000vpd				≥ 15,000 vpd			
		≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph	≤ 30 mph	35 mph	40 mph	> 40 mph
1 or 2 Lanes (One-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
2 Lanes (Two-Way Street)	2	A	A	B	C	A	A	B	C	A	A	B	C	A	B	B	C
3 Lanes With Raised Median	1 or 2	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
3 Lanes With Striped Median	3	A	A	B	C	A	B	B	C	B	B	B	C	B	B	B	C
4 Lanes (Two-Way Without Raised	4	A	B	B	C	B	B	C	C	C	C	C	C	C	C	C	C
4 Lanes With Raised Median	2	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
5 Lanes Without Raised Median	5	A	B	C	C	B	B	C	C	C	C	C	C	C	C	C	C
5 lanes With Raised Median	2 or 3	A	A	B	C	A	B	B	C	B	B	C	C	B	B	C	C
6 or More Lanes	3 or 6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

A. Install marked crosswalk with enhanced signs
Specific Guidance: Install marked crosswalk and consider installation of pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) and in-road State Law Stop for Pedestrians sign (R1-6a or similar) on bollard. Signage shall be installed at midblock crossings and at school crossing locations. Use S1-1 signs for School Crossing locations.

B. Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure
Specific Guidance: Install marked crosswalk with pedestrian crossing sign (W11-2) and down arrow (W16-7p) plus advance warning signs that include a pedestrian crossing sign with ahead plaque (W16-9P) . Use S1-1 signs for School Crossing locations. In addition, install overhead signs and/or RRFBs. Where possible, install geometric improvements such as raised crosswalks, refuge islands, and bulb-outs to increase pedestrian visibility to motorists or shorten the pedestrian crossing distance.

C. Do not install marked crosswalk
Specific Guidance: Consider traffic signal, pedestrian hybrid beacon, grade-separated crossing, or other substantial crossing improvement to improve crossing safety for pedestrians.

Figure 2.9 North Road/Kilaha Street South Crosswalk Flowchart Worksheet



2.1.4 Existing Pedestrian Analysis

Pedestrian performance was evaluated using the Pedestrian Environmental Quality Index (PEQI) spreadsheet tool. The PEQI tool generates a score of the pedestrian environment ranging from 0 to 100 for roadway segments and intersections. Pedestrian environment scores are based on intersection safety, vehicle traffic, sidewalks, land use, perceived safety and perceived walkability. The PEQI score is translated into a multimodal score based on Table 2.3 below for use in the Complete Streets Modal Priority analysis.

Table 2.3: PEQI 2.0 Output Score Range and Scale

Score	Description	Pedestrian Comfort Scale 1-4
100 to 81	Ideal pedestrian conditions exist	1
61 to 80	Reasonable pedestrian conditions exist	
41 to 60	Basic pedestrian conditions exist	2
21 to 40	Poor pedestrian conditions exist	3
0 to 20	Environment not suitable for pedestrians	4

With the exception of the Fort Weaver Road/North Road/Kimopelekane Road intersection, which provides reasonable pedestrian conditions, the rest of the studied intersections provide basic pedestrian conditions. All studied intersections along Fort Weaver Road provide adequate crossing time and additional pedestrian signs. The Fort Weaver Road/North Road/Kimopelekane Road intersection provides a crosswalk in every direction, distinguishing it from the rest of the studied intersections.

The studied segment of Fort Weaver Road provides reasonable pedestrian conditions, scoring well in sidewalks, visual attractiveness, perceived safety, and perceived walkability. The studied eastbound segment of North Road provides poor pedestrian conditions due to the lack of sidewalk. The studied westbound segment of North Road, fronting the Project, provides basic pedestrian conditions due to adequate sidewalk width and the presence of a buffer.

The existing modal priority scores are shown in Tables 2.4 and 2.5 and illustrated in Figure 2.10. Although both intersection scores and segment scores are shown to fully evaluate pedestrian conditions in the study area, only segment scores will be used in the Complete Streets Modal Priority analysis. PEQI worksheets are included in Appendix C.

Table 2.4: Existing Pedestrian Intersection Modal Priority Scores

Intersection Description	PEQI Score	Modal Priority Score	
	Existing	Existing	Target
Fort Weaver Rd & Papipi Rd	56.0 (basic)	2	1
Fort Weaver Rd & Aikanaka Rd	59.7 (basic)	2	1
Fort Weaver Rd & North Rd & Kimopelekane Rd	72.3 (reasonable)	1	1
North Rd & Kilaha St	45.7 (basic)	2	1

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

Table 2.5: Existing Pedestrian Segment Modal Priority Scores

Segment Description	PEQI Score	Modal Priority Score	
	Existing	Existing	Target
Fort Weaver Road North Road/Kimopelekane Road to Papipi Road (Northbound)	67.5	1	1
Fort Weaver Road Papipi Road to North Road/Kimopelekane Road (Southbound)	60.3	1	1
North Road Fort Weaver Road to Kilaha Street (Eastbound)	32.5	3	1
North Road Kilaha Street to Fort Weaver Road (Westbound)	57.1	2	1

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

2.1.5 Existing Bicycle Analysis

Bicycle performance was evaluated using the Level of Traffic Stress (LTS) tool. The LTS tool determines the level of comfort or stress bicyclists experience along street segments. The level of stress is translated into a multimodal score based on Table 2.6 below for use in the Complete Streets Modal Priority analysis.

The Fort Weaver Road segment currently operates with a higher level of traffic stress, Bike LTS 3. While this segment does have bike lanes on both sides of the roadway, the wide cross section and having the bike lanes next to the travel lanes creates a higher level of traffic stress. Since the parking lane was observed to be mostly clear during the AM and School PM peak hours, when the majority of bicyclists were observed, bicyclists were mainly observed to ride in the parking lane, increasing the space between themselves and vehicles. Although the roadway operates with a higher level of traffic stress, based on the street typology, Fort Weaver Road meets the Main Street modal priority score.

The North Road segment also operates with a higher level of traffic stress, Bike LTS 3. While it is categorized as a moderate stress shared roadway and does not have dedicated bicycle facilities, lower vehicle volumes and a narrow cross section allow North Road to have the same level of traffic stress as Fort Weaver Road. North Road meets the Street target modal priority score.

The existing bicycle modal priority scores are shown in Table 2.7 and illustrated in Figure 2.10. Bicycle LTS worksheets are included in Appendix C.

Table 2.6: Bicycle LTS and Scale

Description	Bicycle LTS Scale 1-4
Lowest level of traffic stress. All types of cyclists feel comfortable at this level. Facility types include separated bike lanes.	1
Second lowest level of traffic stress. Families and less experienced cyclists may feel less comfortable on these facilities. Facility types include buffered bike lanes.	2
Higher level of traffic stress. Fewer cyclists are comfortable on this roadway type. Facility examples include narrow bike lanes or a shoulder on a busy street.	3
Highest level of traffic stress. Only the most experienced cyclists are willing to use these roadways. Examples include busy four lane roads with no bike lanes.	4

Table 2.7: Existing Bicycle Modal Priority Score

Segment ID	Segment Description	Bike LTS	Modal Priority Score	
		Existing	Existing	Target
1	Fort Weaver Road North Rd/Kimopelekana Rd to Papipi Rd (Northbound)	LTS 3	3	3
2	Fort Weaver Road Papipi Rd to North Rd/ Kimopelekana Rd (Southbound)	LTS 3	3	3
3	North Road Fort Weaver Rd to Kilaha St (Eastbound)	LTS 3	3	3
4	North Road Kilaha Rd to Fort Weaver Rd (Westbound)	LTS 3	3	3

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

2.1.6 Existing Transit Analysis

Transit performance was evaluated using the Transit Capacity and Quality of Service Manual (TCQSM) model developed by the Transportation Research Board. The TCQSM model assigns a Transit LOS between A and F based on transit operations and amenities as well as the pedestrian environment. The Transit LOS is translated into a multimodal score based on Table 2.8 below for use in the Complete Streets Modal Priority analysis.

Both the Fort Weaver Road northbound and the North Road westbound study segments operate with Transit LOS A since bus stops near the Project frontage along these segments serve a number of local and express routes. The number of buses available during the peak hour in addition to the presence of a sidewalk contribute to good transit accessibility in the Study Area. Fort Weaver Road southbound bus stops only service one transit route, resulting in Transit LOS D.

The existing transit modal priority scores are shown in Table 2.9 and illustrated in Figure 2.10. Scores shown in the table represent the higher vehicle volume of the peak hours, representing the worst conditions for transit users. TCQSM Transit LOS worksheets are included in Appendix C.

Table 2.8: Transit LOS Scoring System and Scale

Transit LOS Letter	Transit LOS Score	Transit Operation/Comfort Scale 1-4
A	< 2	1
B	2 to 2.75	2
C	2.76 to 3.5	3
D	3.6 to 4.25	
E	4.26 to 5	4
F	>5	

Table 2.9: Existing Transit Modal Priority Score

Segment ID	Segment Description	Transit LOS	Modal Priority Score	
		Existing	Existing	Target
1	Fort Weaver Road North Rd/Kimopelekane Rd to Papipi Rd (Northbound)	A	1	1
2	Fort Weaver Road Papipi Rd to North Rd/Kimopelekane Rd (Southbound)	D	3	1
3	North Road Fort Weaver Rd to Kilaha St (Eastbound)	-	-	3
4	North Road Kilaha St to Fort Weaver Rd (Westbound)	A	1	3

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

2.1.7 Existing Vehicle Analysis

Vehicle performance was based on level-of-service (LOS) calculations as defined by the Transportation Research Board Highway Capacity Manual (HCM). Vehicle LOS was evaluated for intersections and roadway segments in the study area for the AM 2nd Peak, School PM 2nd Peak and PM 2nd Peak hours. The Vehicle LOS values are translated into a multimodal score as shown in Tables 2.10 and 2.11 for use in the Complete Streets Modal Priority analysis.

The signalized Fort Weaver Road/Papipi Road, Fort Weaver Road/Aikanaka Road and Fort Weaver Road/North Road/Kimopelekane Road intersections operate with an overall LOS A/B during the AM, School PM and PM 2nd Peak hours of traffic. The unsignalized North Road/Kilaha Street intersection operates with all movements at LOS A/B during all studied time periods.

Based on observations, traffic in the study area is heavily impacted by the start and end times of JCHS, Ilima Intermediate School and Pohakea Elementary School. Although congestion along Fort Weaver Road and North Road was observed as a result of school traffic, the congestion typically only occurs within a peak 15-to-30-minute period during the AM and School PM peak hours. Congestion in the study area was not observed during the second highest peak hours of traffic.

For the roadway segment analysis, the average daily vehicle volume was obtained from the HDOT annual average daily traffic (AADT) counts from 2019, prior to the start of the COVID-19 pandemic. Based on the existing roadway facilities, all segments in the study corridor operate adequately at LOS A or B.

The existing vehicle modal priority scores are shown in Table 2.12 (intersection) and 2.13 (segment) and illustrated in Figure 2.10. Although both intersection scores and segment scores are shown to fully evaluate vehicle conditions in the study area, only segment scores will be used in the Complete Streets Modal Priority analysis. For intersection scores, the poorer score of the AM 2nd Peak, School PM 2nd Peak and PM 2nd Peak hours is shown. Vehicle LOS worksheets are included in Appendix C.

Table 2.10: Vehicle LOS Score Summary and Scale (Intersection)

LOS	V/C Ratio	Intersection Control Delay (seconds/vehicle)		Vehicle Operations Scale 1-4
		Signal Control	Unsignalized Control	
A	0.00 to 0.60	< 10	< 10	1
B	>0.60 to 0.70	> 10 to 20	> 10 to 15	
C	>0.70 to 0.80	> 20 to 35	> 15 to 25	
D	>0.80 to 0.90	> 35 to 55	> 25 to 35	2
E	>0.90 to 1.00	> 55 to 80	> 35 to 50	3
F	>1.00	> 80	> 50	4

Table 2.11: Vehicle LOS Score Summary and Scale (Roadway Segments)

LOS	Average Daily Vehicle Volume			Vehicle Operations Scale 1-4
	2-Lane Road	4-Lane Road	6-Lane Road	
C	0 to 5,900	0 to 11,300	0 to 16,300	1
D	5,901 to 15,400	11,301 to 31,400	16,300 to 46,400	2
E	15,401 to 19,900	31,401 to 37,900	46,401 to 54,300	3
F	>19,900	>37,900	>54,300	4

Table 2.12: Existing Intersection Vehicle Modal Priority Score

Intersection Description	Modal Priority Score	
	Existing	Target
Fort Weaver Road & Papipi Road	1	2
Fort Weaver Road & Aikanaka Road	1	2
Fort Weaver Road & North Road/Kimopelekane Road	1	2
North Road & Kilaha Street	1	2

Score at or better than target
Score 1 worse than target
Score 2 more or worse than target

Table 2.13: Existing Segment Vehicle Modal Priority Score

Segment Description	Existing # of Lanes	Existing AADT	Modal Priority Score	
			Existing	Target
Fort Weaver Road – North Road/Kimopelekane Road to Papipi Road	4	21,200	2	2
North Road – Fort Weaver Road to Kilaha Street	2	6,800	2	2

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

2.1.8 Existing Parking Analysis

Parking occupancy was evaluated for both on-street and off-street parking available to JCHS students, faculty/staff and visitors. Parking occupancy is determined based on the parking demand or total occupied spaces during the peak hours of parking demand compared to the parking supply or total available parking spaces. The parking occupancy values are translated into a multimodal score as shown in Table 2.14 for use in the Complete Streets Modal Priority analysis.

As noted in Section 1.4.6, approximately 26 on-street parking stalls are provided along Fort Weaver Road between North Road and Papipi Road and approximately 59 on-street parking stalls are provided along the makai side of North Road between Fort Weaver Road and Kilaha Street. All on-street parking stalls in the vicinity of the Project are unmarked and are not subject to parking fees or time limits. 329 on-campus parking stalls are provided for JCHS students, faculty/staff and visitors. JCHS parking is not open for use by the general public.

Parking occupancy for JCHS on-campus parking was based on 12-hour traffic count data collected at the Fort Weaver Road/Aikanaka Road intersection and the JCHS driveways along North Road. Because JCHS shares parking stalls within the Ilima Intermediate School lot located along Aikanaka Road, the parking occupancy includes the Ilima Intermediate School parking stalls in the parking demand and supply for JCHS. Only 66 stalls within the Ilima Intermediate School 153-stall lot are available to JCHS students and visitors, with the remaining 87 stalls reserved for Ilima Intermediate School faculty/staff. With the Ilima Intermediate School parking stalls included, the total evaluated parking supply is 416 stalls. Parking occupancy for the JCHS off-street parking is shown in Figure 2.11 for occupancy at 15-minute increments between 6:00 AM and 6:00 PM.

As shown in Figure 2.11, during peak parking demand, parking occupancy for JCHS is approximately 90%. Based on observations, the mauka portion of the Ilima Intermediate School parking lot, which is reserved for Ilima Intermediate School faculty and staff, was largely empty during the morning hours even after school started for the day. The makai portion of the lot, which is open to JCHS students and visitors, was observed to be nearly fully utilized. The JCHS parking lots along North Road were also observed to be fully occupied. Therefore, actual parking occupancy solely for JCHS is likely closer to 100% occupancy when consideration is given to the underutilization of the Ilima Intermediate School parking stalls.

On-street parking along North Road between Fort Weaver Road and Kilaha Street was observed to be fully occupied during the peak parking demand, which was observed to coincide with the start time for JCHS. The nine (9) parallel on-street stalls between Fort Weaver Road and Kulana Place were assumed to be utilized by residents of the Ewa Apartments at Kulana complex makai of the JCHS campus. The majority of diagonal stalls between Kulana Place and Kilaha Street were observed to be utilized by JCHS students and to a lesser extent JCHS faculty/staff. During the afternoon, on-street parking was utilized as overflow parking for the Ewa Beach Community Park during sporting events.

On-street parking along Fort Weaver Road between North Road and Papipi Road was observed to have less demand, primarily because JCHS students were not observed to park along the roadway. Fort Weaver Road on-street parking in the southbound direction was observed to be heavily utilized by adjacent residents with a utilization of approximately 90% throughout the day. Fort Weaver Road on-street parking in the northbound direction was primarily used by parents waiting to pick up students from Pohakea Elementary School. During the pick-up time, all stalls were 100% utilized; however, during less temporary conditions, utilization in the northbound direction was approximately 10%.

Overall, on-street parking in the vicinity of the Project is generally unevenly utilized as a result of a mix of demand by residents and by students. In addition, because Fort Weaver Road is wide and not easily crossed outside of marked crossings, vehicles were observed to only park on one side of the roadway or the other based on their destination.

The existing parking occupancy and modal priority scores are shown in Table 2.15 and illustrated in Figure 2.10. Because modal priority scores are assigned to street segments only, off-street parking occupancy for JCHS is not included in the scores. Existing on-street parking stalls are not marked; therefore, stall counts were approximated based on the curb length available to on-street parking.

Table 2.14: Parking Occupancy Score

Score	Parking Occupancy	Summary	What it Means
1	0% - 50%	Parking may be underutilized.	More than half of the parking spaces are available. Opportunity to rebalance where availability is constrained nearby.
2	51% - 70%	On or below target	Half to ~30% of parking is available. Good availability.
3	71% - 84%	Middle to high range of target	~30% to 15% available – the equivalent of a few parking spaces per block. On target/acceptable availability; actively manage to maintain.
4	≥ 85%	Above target	Less than 1-2 spaces per block. Constrained availability; actively manage to improve availability.

Table 2.15: Existing Parking Modal Priority Score

Segment ID	Segment Description	Existing Stalls	Existing Demand	Existing Occupancy	Modal Priority Score	
					Existing	Target
1	Fort Weaver Road North Rd/Kimopelekane Rd to Papipi Rd (Northbound)	11	1	9%	1	3
2	Fort Weaver Road Papipi Rd to North Rd/Kimopelekane Rd (Southbound)	15	14	93%	4	3
3	North Road Fort Weaver Rd to Kilaha St (Eastbound)	59	59	100%	4	3
4	North Road Kilaha St to Fort Weaver Rd (Westbound)	-	-	-	-	3

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

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LEGEND

- PEDESTRIAN MODAL PRIORITY
- BICYCLE MODAL PRIORITY
- TRANSIT MODAL PRIORITY
- VEHICLE MODAL PRIORITY
- PARKING MODAL PRIORITY
- MODAL PRIORITY SCORE AT OR BETTER THAN TARGET
- MODAL PRIORITY SCORE 1 WORSE THAN TARGET
- MODAL PRIORITY SCORE 2 OR MORE WORSE THAN TARGET

FIGURE 2.10

EXISTING MODAL PRIORITY

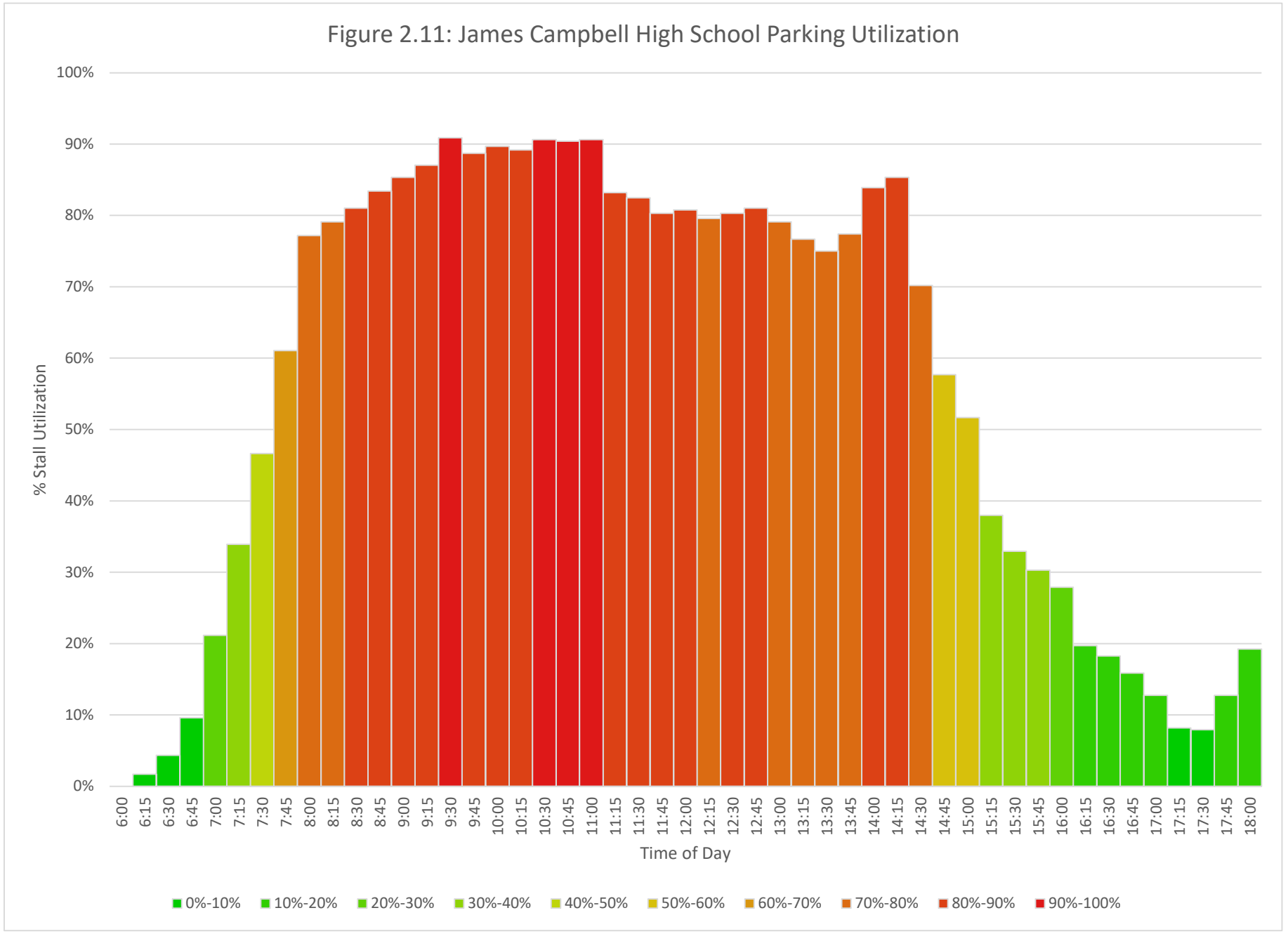
Figure 2.11: James Campbell High School Parking Utilization
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Stall Utilization
6:00
6:15
6:30
6:45
7:00
7:15
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7:45
8:00
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17:00
17:15
17:30
17:45
18:00
Time of Day
0%-10%
10%-20%
20%-30%
30%-40%
40%-50%
50%-60%
60%-70%
70%-80%
80%-90%
90%-100%

2.2 Forecast Future Traffic Conditions

The Future Year 2032 was selected to reflect the Project completion year. The forecasting methodology used to project 2032 volumes is described in the following sections.

2.2.1 Background Growth Rate

The Oahu Regional Transportation Plan 2040 (ORTP) Travel Demand Forecasting Model (TDFM) was used to determine anticipated growth rates along Fort Weaver Road, North Road and Papipi Road. The TDFM provides forecast conditions for the year 2040 based on anticipated socioeconomic changes to the island. Socioeconomic data, such as households and employment, are assigned to Traffic Analysis Zones (TAZs), and trips between the TAZs are generated to assign traffic across the roadway network.

Based on the 2040 TDFM, the following average annual growth rates along Fort Weaver Road, North Road and Papipi Road were applied to the existing condition vehicle through movements:

- Fort Weaver Road: 0.74%
- North Road: 0.11%
- Papipi Road: 0.86%

Growth in pedestrian, bicycle and transit trips in the study area is discussed in Section 2.3.1.2.

2.3 Project Specific Traffic Conditions

2.3.1 Project Trip Generation

Existing JCHS vehicle, pedestrian and bicycle trips were determined based on data collected at the Aikanaka Road and the JCHS driveways along North Road. Note that transit users are counted as pedestrians (City bus riders who walk to/from nearby bus stops) and vehicles utilizing on-street parking are also counted as pedestrians. The trip data also includes trips to/from Ilima Intermediate School and the Hale Pono Boys and Girls Club via Aikanaka Road and therefore is assumed to provide a conservative estimate of JCHS trip generation.

The Project is ultimately expected to provide approximately 341,000 square feet of academic classroom space, an increase of approximately 18.7% over the existing 287,000 square feet of classroom space. While this increase in classroom space will primarily be the result of replacing current portables with permanent buildings, it was conservatively assumed that the increase could potentially support an increase in JCHS enrollment if the need were to arise in the future. Ultimately, the need for additional high school facilities to accommodate a growing population in West Oahu is expected to be fulfilled by the proposed East Kapolei High School rather than increasing enrollment at existing schools such as JCHS. The proposed near-term athletic facilities are not expected to impact typical day-to-day operations of JCHS.

2.3.1.1 Vehicle Trips

Existing vehicle trips to and from JCHS were based on data collected at the Fort Weaver Road/Aikanaka Road intersection and the JCHS driveways along North Road. Based on the data, JCHS currently generates a total of 1,594(342)[761] trips during the AM(PM)[School PM] peak hours of traffic. During the second highest peak hours of traffic, the vehicle trips drop to 435(195)[365] trips during the AM 2nd Peak(PM 2nd Peak)[School PM 2nd Peak].

As noted above, the Project proposes to ultimately increase academic classroom space by approximately 18.7% at full build-out. Currently, JCHS enrollment is approximately 3,100 students, the highest enrollment of all high schools in the state. Enrollment has remained steady in recent years, primarily due to JCHS operating at maximum capacity. Given current operations, enrollment is not expected to grow proportionally with the increase in classroom space. However, for the purposes of this study, it was assumed that Project trips would increase by 18.7% consistent with the increase in academic facilities to determine the full potential impacts of the Project.

With the consolidation of the two (2) easternmost North Road parking lots, the majority of vehicle traffic entering JCHS from North Road is expected to enter from the JCHS driveway across Kilaha Street.

The peak hour and second highest peak hour vehicle trip generation for the Project are shown in Tables 2.16 and 2.17, respectively. The Project is expected to add a total of 299(64)[142] new trips during the AM(PM)[School PM] peak hours and 82(35)[68] new trips during the AM 2nd Peak(PM 2nd Peak)[School PM 2nd Peak] hours at full build-out.

Table 2.16: Project Peak Hour Vehicle Trip Generation

Land Use	Variable	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Existing JCHS	3,075 Students	915	679	1594	135	207	342	308	453	761
Proposed JCHS	3,651 Students	1086	807	1893	160	246	406	365	538	903
Total Net New Trips		**171**	**128**	**299**	**25**	**39**	**64**	**57**	**85**	**142**

Table 2.17: Project Second Highest Peak Hour Vehicle Trip Generation

Land Use	Variable	AM 2nd Highest Peak Hour			PM 2nd Highest Peak Hour			School PM 2nd Highest Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Existing JCHS	3,075 Students	200	235	435	94	101	195	126	239	365
Proposed JCHS	3,651 Students	239	278	517	111	119	230	149	284	433
Total Net New Trips		**39**	**43**	**82**	**17**	**18**	**35**	**23**	**45**	**68**

2.3.1.2 Multimodal Trips

Multimodal trips were assumed to include all trips not occurring by private vehicle and include pedestrian, bicycle (or other non-motorized vehicle used for transportation) and transit trips. Multimodal trips and existing mode splits were determined based on data collected at Fort Weaver Road/Aikanaka Road and the JCHS driveways along North Road. As noted previously, transit riders using the City bus were counted as pedestrians and not transit users because they travel between bus stops and the JCHS campus on foot and cannot be distinguished from pedestrians. In addition, because school bus loading occurs on campus, the school bus is counted as a single vehicle trip, and riders are not counted as transit users.

In order to estimate the percent of pedestrians walking to/from transit, the existing mode split for the study parcel was determined based on the ORTP 2040 TDFM. According to the TDFM, approximately 25% of pedestrian trips are to/from transit versus 75% of pedestrian trips remaining as pedestrians for the full trip from origin to destination. The pedestrian count data was modified to reflect the assumed 25% of pedestrian trips as transit trips.

Pedestrian, bicycle and transit trips were assumed to grow similar to vehicle trips, with the potential to increase by approximately 18.7% by full build-out of the Project. The peak hour and second highest peak hour multimodal trip generation for the Project are shown in Tables 2.18 and 2.19, respectively.

Because pedestrian, bicycle and transit trips at the study intersections are not differentiated as a JCHS trip or other trip, the 18.7% growth rate for JCHS was applied to all bicycle and pedestrian crossing volumes at the study intersections. This growth rate is considered conservative since the rate exceeds the ORTP 2040 TDFM growth rates for vehicles described in Section 2.2.1 and is expected to cover all Project-related or ambient growth in the study area.

Based on the collected data for the peak hours and second highest peak hours of traffic, the following average mode splits were observed for JCHS. These mode splits are expected to remain for Future Year 2032.

- Vehicle: 64%
- Pedestrian: 23%
- Bicycle: 5%
- Transit: 8%

Table 2.18: Project Peak Hour Multimodal Trip Generation

Mode	Land Use	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Pedestrian	Existing JCHS	531	30	561	11	52	64	72	898	970
	Proposed JCHS	631	36	667	13	62	75	85	1066	1151
	Net New Trips	100	6	106	2	10	11	13	168	181
Bicycle	Existing JCHS	89	0	89	6	16	22	11	127	138
	Proposed JCHS	106	0	106	7	19	26	13	151	164
	Net New Trips	17	0	17	1	3	4	2	24	26
Transit	Existing JCHS	177	10	187	4	18	21	24	300	324
	Proposed JCHS	210	12	222	5	21	26	28	356	384
	Net New Trips	33	2	35	1	3	5	4	56	60

Table 2.19: Project Second Highest Peak Hour Multimodal Trip Generation

Mode	Land Use	AM Peak Hour			PM Peak Hour			School PM Peak Hour		
		Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Pedestrian	Existing JCHS	145	10	155	14	28	42	31	61	93
	Proposed JCHS	172	12	184	17	33	50	37	72	109
	Net New Trips	27	2	29	3	5	8	6	11	16
Bicycle	Existing JCHS	26	0	26	4	7	11	5	16	21
	Proposed JCHS	31	0	31	5	8	13	6	19	25
	Net New Trips	5	0	5	1	1	2	1	3	4
Transit	Existing JCHS	49	3	52	5	9	14	11	21	31
	Proposed JCHS	58	4	62	6	11	17	13	25	38
	Net New Trips	9	1	10	1	2	3	2	4	7

2.3.1.3 Trip Assignment and Distribution

Trips generated by the proposed Project were assigned throughout the study area generally based upon existing travel patterns for JCHS.

On average, vehicles were assumed to be distributed as follows:

- 65% To/from the north via Fort Weaver Road
- 10% To/from the south via Fort Weaver Road
- 5% To/from the east via North Road
- 20% To/from the west via Kimopelekane Road and Aikanaka Road

It was assumed that pedestrians and bicyclists would be distributed as follows:

- 45% To/from the north via Fort Weaver Road
- 20% To/from the south via Fort Weaver Road and Kilaha Street
- 15% To/from the east via North Road
- 20% To/from the west via Kimopelekane Road and Aikanaka Road

Because the Project proposes to consolidate the two (2) easternmost parking lots and driveways along North Road and limit the adjacent parking lot to school bus pick-up/drop-off and parking only, the driveway across from Kilaha Street is expected to provide the only ingress access to the parent pick-up/drop-off area in the future. As a result, the majority of trips at existing North Road driveways were rerouted to the easternmost driveway across from Kilaha Street.

Figure 2.12 illustrates the overall vehicle trip distribution. Figure 2.13 illustrates the overall pedestrian and bicycle distribution. Figures 2.14 and 2.15 illustrate the Project-generated multimodal trip distribution for vehicles and pedestrians and bicycles, respectively. Figure 2.16 and 2.17 illustrate the resulting Future Year 2032 volumes for vehicles and pedestrians and bicycles, respectively.

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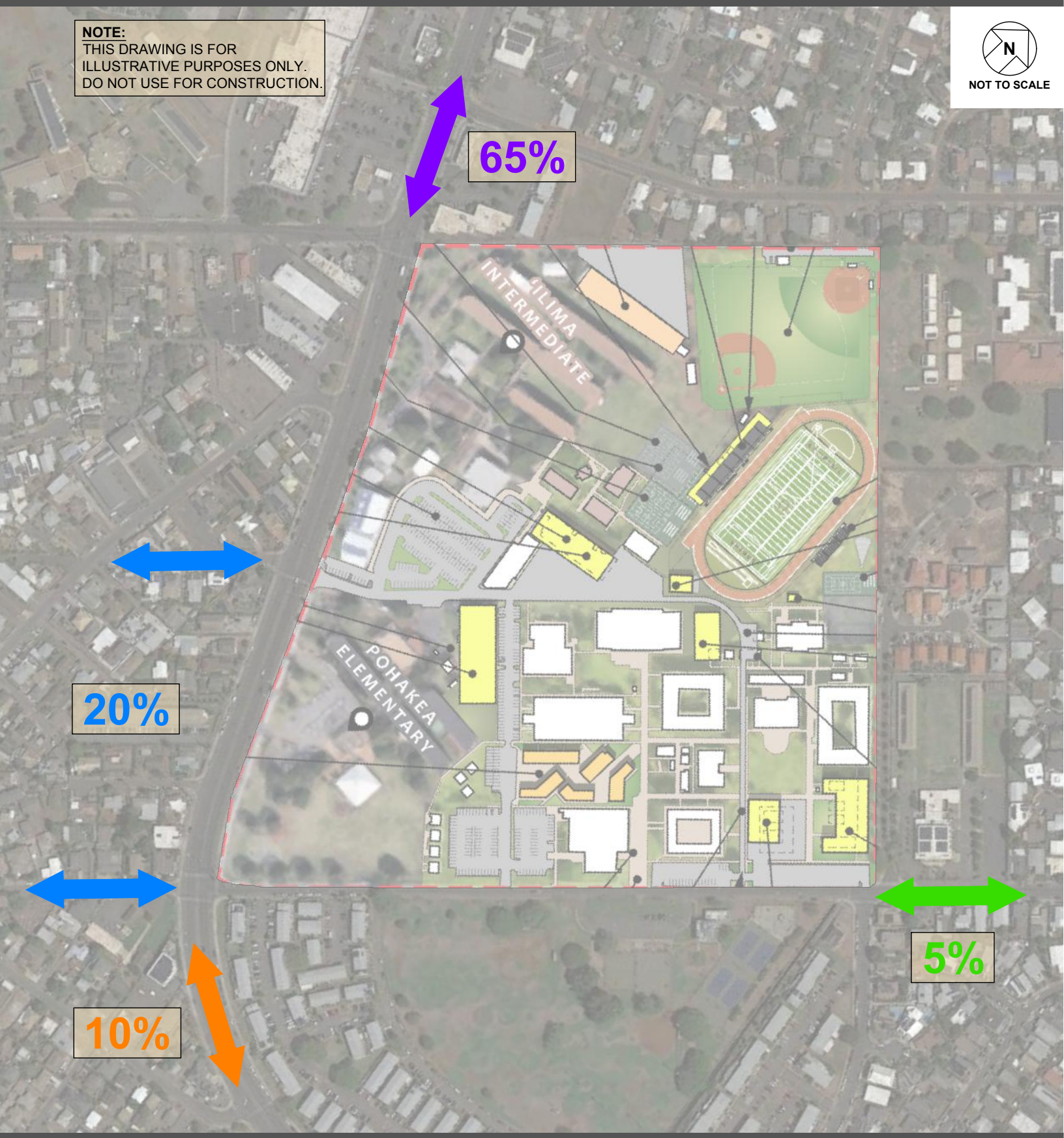

FIGURE 2.12

VEHICLE TRIP DISTRIBUTION

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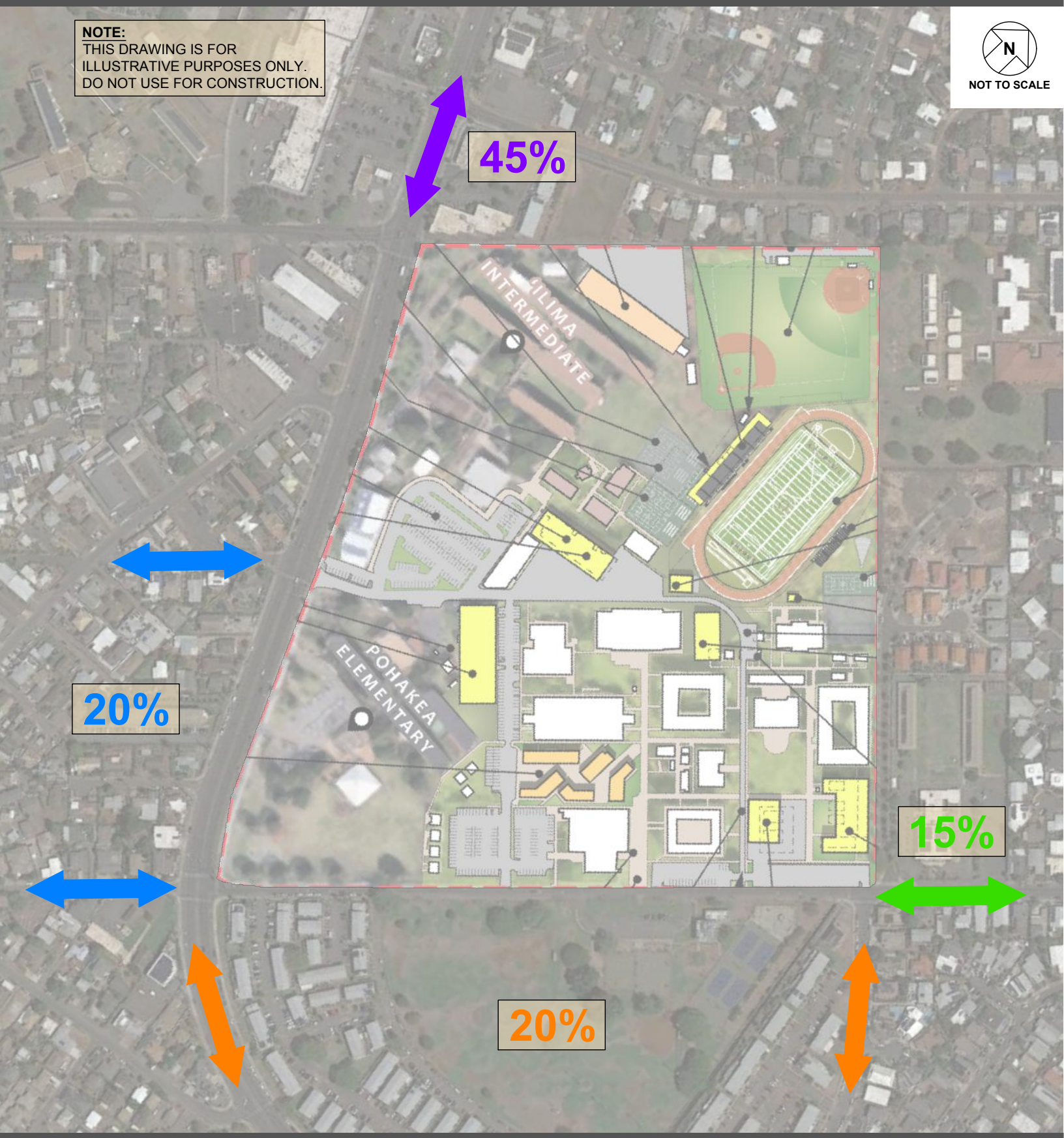

FIGURE 2.13

PEDESTRIAN AND BICYCLE TRIP DISTRIBUTION

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##(##)[##] - AM 2ND PEAK(PM 2ND PEAK)[SCHOOL PM 2ND PEAK] VEHICLE VOLUMES

(X) - UNSIGNALIZED INTERSECTION X

(Y) - SIGNALIZED INTERSECTION Y

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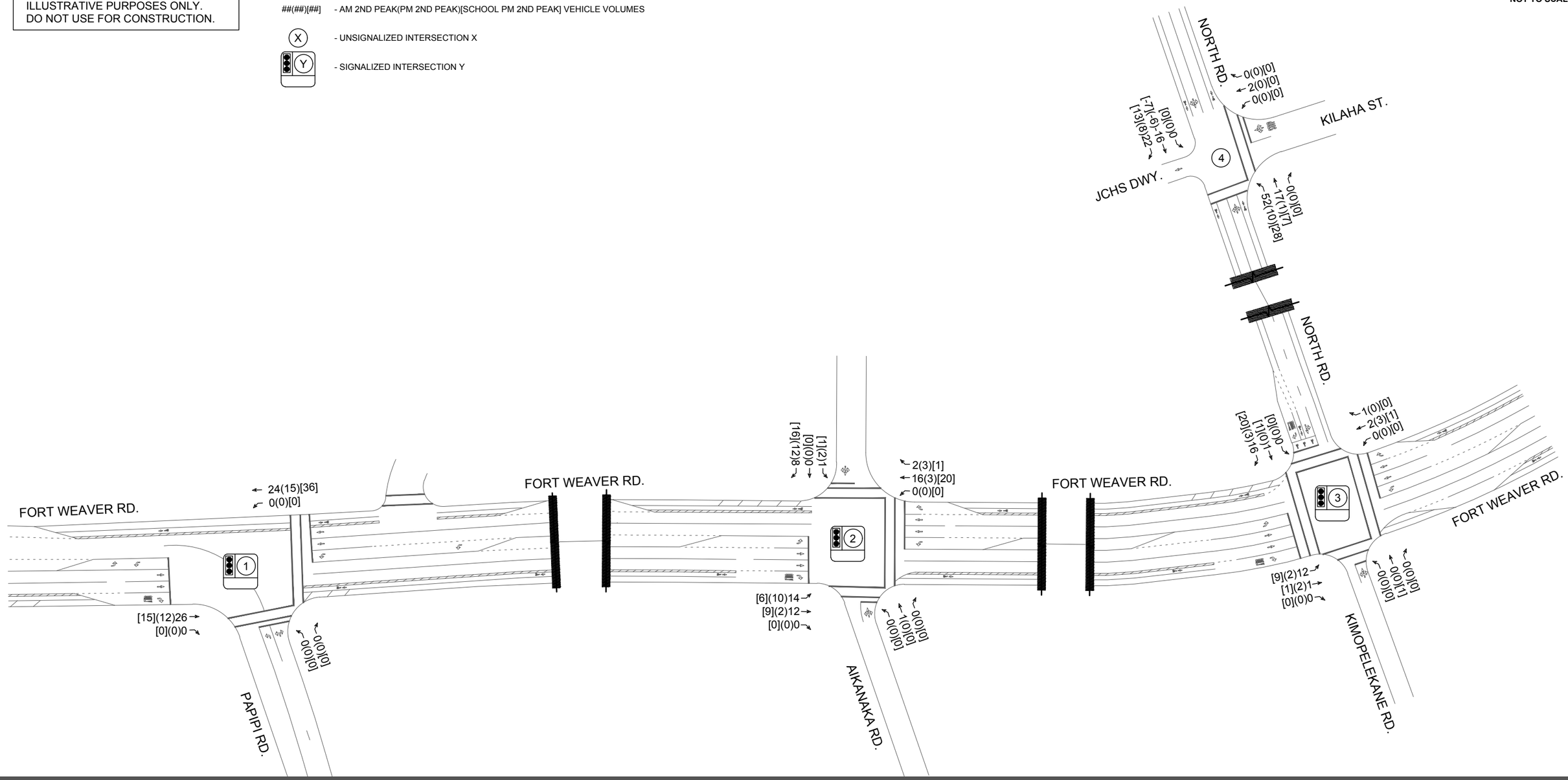

FIGURE 2.14

PROJECT-GENERATED VEHICLE TRIPS

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LEGEND

- X - UNSIGNALIZED INTERSECTION X
- Y - SIGNALIZED INTERSECTION Y
- ##(##)[##] - AM(PM)[SCHOOL PM] BICYCLE VOLUMES
- ##(##)[##] - AM(PM)[SCHOOL PM] PEDESTRIAN CROSSINGS

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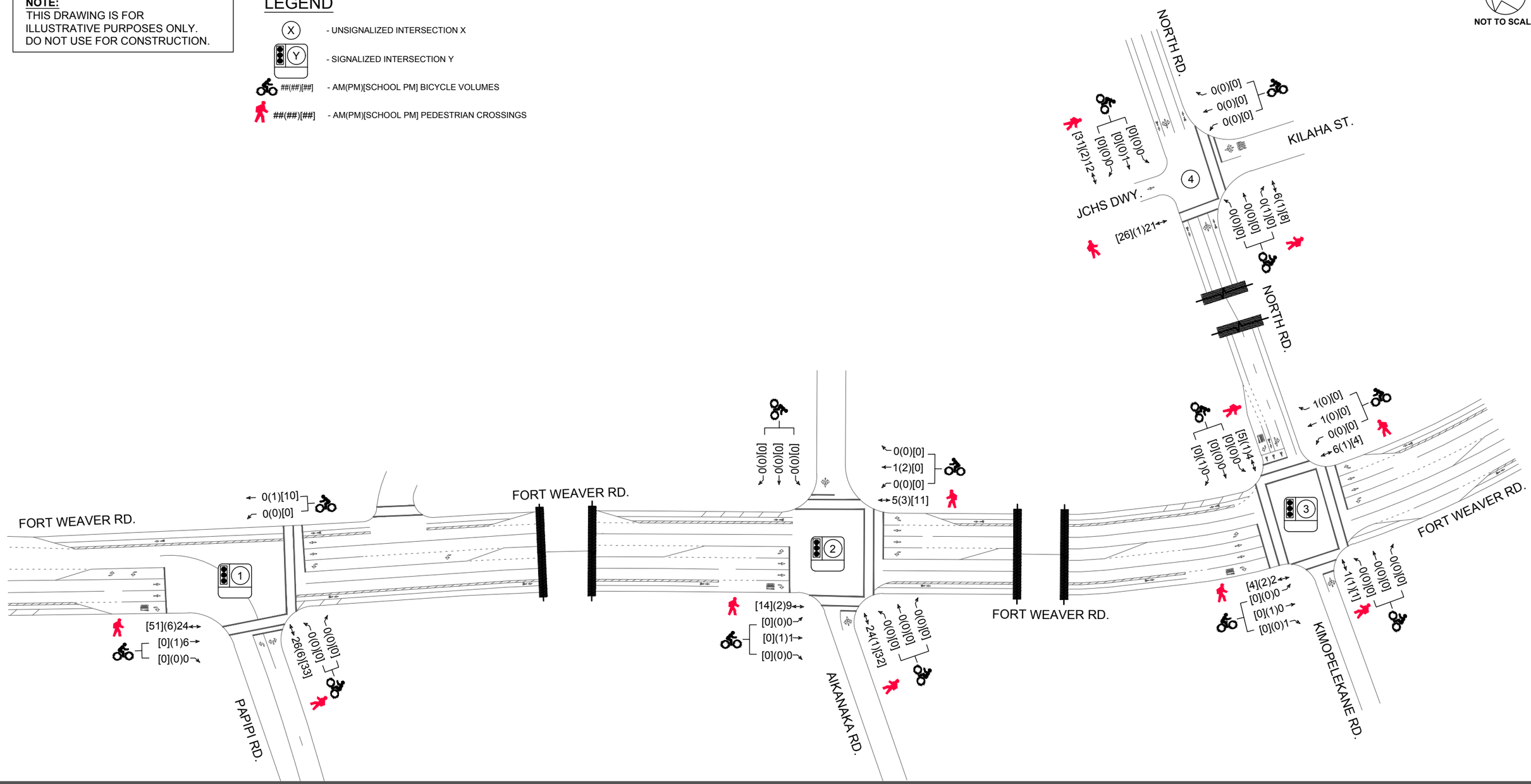

FIGURE 2.15

PROJECT-GENERATED PEDESTRIAN AND BICYCLE TRIPS

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LEGEND

##(##)[##]	- AM 2ND PEAK(PM 2ND PEAK)[SCHOOL PM 2ND PEAK] VEHICLE VOLUMES
(X)	- UNSIGNALIZED INTERSECTION X
(Y) / X/X/X	- SIGNALIZED INTERSECTION Y, OVERALL AM 2ND PEAK/PM 2ND PEAK/SCHOOL PM 2ND PEAK LOS
X(X)[X]	- AM 2ND PEAK(PM 2ND PEAK)[SCHOOL PM 2ND PEAK] LOS

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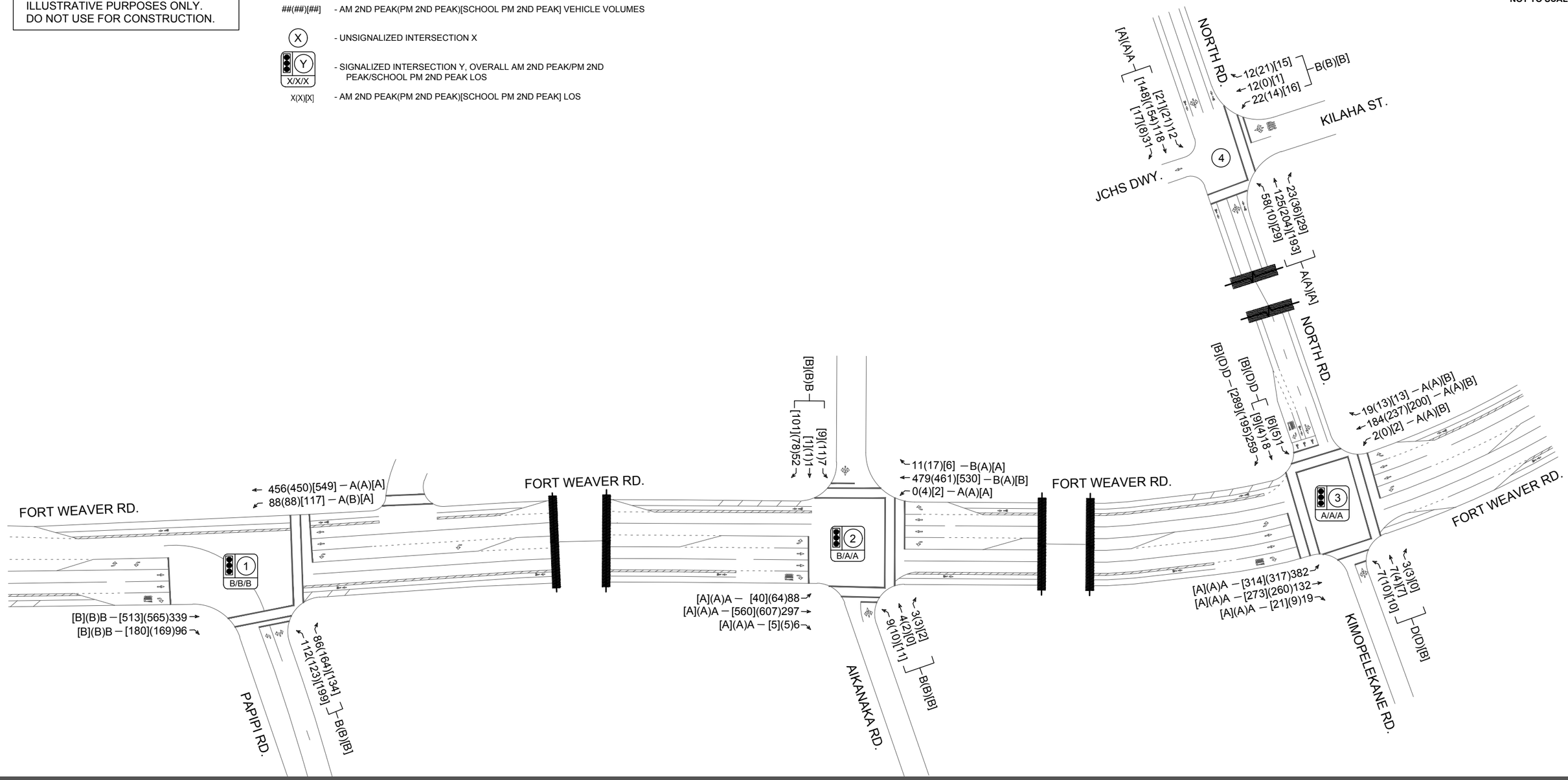

FIGURE 2.16

FUTURE YEAR 2032 LANE CONFIGURATION, VEHICLE VOLUMES AND MOVEMENT LOS

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LEGEND

- (X) - UNSIGNALIZED INTERSECTION X
- (Y) - SIGNALIZED INTERSECTION Y
- ##(##)[##] - AM(PM)[SCHOOL PM] BICYCLE VOLUMES
- ##(##)[##] - AM(PM)[SCHOOL PM] PEDESTRIAN CROSSINGS

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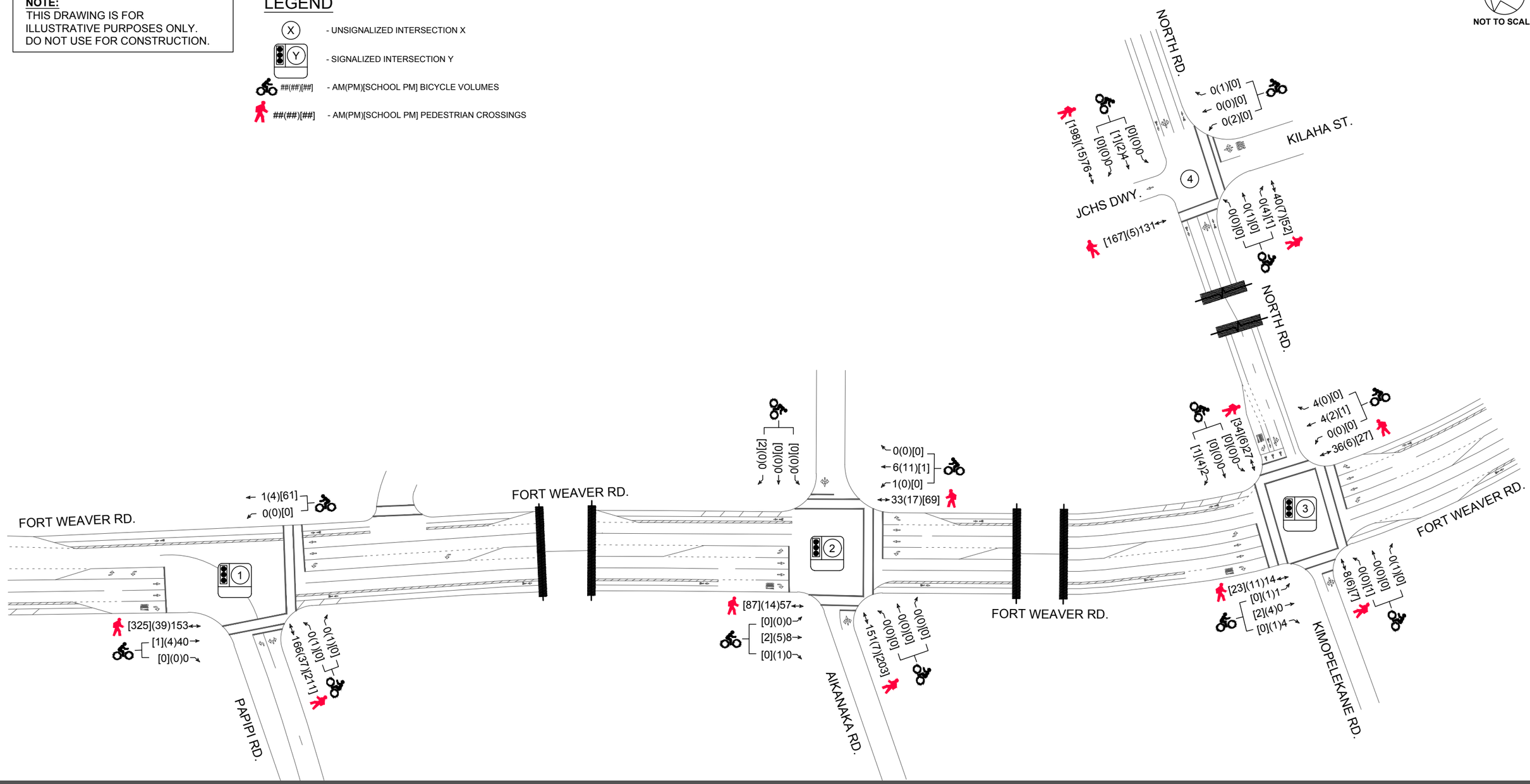

FIGURE 2.17

FUTURE YEAR 2032 PEDESTRIAN AND BICYCLE VOLUMES

2.4 Level and Quality of Service by Mode

2.4.1 Future Pedestrian Analysis

According to the Oahu Pedestrian Plan Draft, the following projects have been identified in the study area and were assumed to be completed by 2032:

- New walkway along the makai side of North Road between Kulana Place and Kilaha Street (Tier 2 – midterm priority)
- Walkway upgrade along the mauka side of North Road between Fort Weaver Road and Kulana Place and Kilaha Street to Kehue Street

Because plans for the North Road walkway projects have not been completed at the time of this report, improvements were assumed based on existing conditions, available right-of-way (ROW) and additional planned bicycle facilities. It was assumed that the sidewalk fronting the Project, along the westbound side of the roadway, would not be widened, but areas paved with asphalt would be raised and paved with concrete. Along the eastbound side of the roadway, it was assumed that the unpaved area between the travel way and the Ewa Beach Community Park fence line, which is currently being used for parking, would host a bike lane and raised concrete sidewalk. The assumed typical cross-section for North Road is shown in Figure 2.18. Note that the mauka sidewalk is expected to generally follow the current layout which may not be reflected in the assumed typical section since the sidewalk location varies throughout the segment based on utility poles, fire hydrants and bus stops.

The future modal priority scores are shown in Tables 2.20 and 2.21 and illustrated in Figure 2.19. PEQI worksheets are included in Appendix C. No intersection improvements are planned for the study intersections, and no change in modal priority scores is expected. Scores at the Fort Weaver Road/Papipi Road, Fort Weaver Road/Aikanaka Road and North Road/Kilaha Street intersections would improve with the provision of additional marked crosswalks on all intersection approaches. However, striping additional crosswalks at these locations is not proposed given existing vehicle turning movement conflicts. With the inclusion of the aforementioned North Road walkway improvements, pedestrian operations along the North Road study segments are anticipated to improve. With the exception of the eastbound North Road segment, all study segments will provide reasonable pedestrian conditions, meeting the PEQI Modal Priority Score targets.

Table 2.20: Future Pedestrian Intersection Modal Priority Scores

Intersection Description	PEQI Score		Modal Priority Score		
	Existing	FY 2032	Existing	FY 2032	Target
Fort Weaver Rd & Papipi Rd	56.0 (basic)	56.0 (basic)	2	2	1
Fort Weaver Rd & Aikanaka Rd	59.7 (basic)	59.7 (basic)	2	2	1
Fort Weaver Rd & North Rd & Kimopelekane Rd	72.3 (reasonable)	72.3 (reasonable)	1	1	1
North Rd & Kilaha St	45.7 (basic)	45.7 (basic)	2	2	1

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

Table 2.21: Future Pedestrian Segment Modal Priority Scores

Segment Description	PEQI Score		Modal Priority Score		
	Existing	FY 2032	Existing	FY 2032	Target
Fort Weaver Road North Road/Kimopelekane Road to Papipi Road (Northbound)	67.5 (reasonable)	67.5 (reasonable)	1	1	1
Fort Weaver Road Papipi Road to North Road/Kimopelekane Road (Southbound)	60.3 (reasonable)	60.3 (reasonable)	1	1	1
North Road Fort Weaver Road to Kilaha Street (Eastbound)	32.5 (poor)	59.6 (basic)	3	2	1
North Road Kilaha Street to Fort Weaver Road (Westbound)	57.1 (basic)	64.7 (reasonable)	2	1	1

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

2.4.2 Future Bicycle Analysis

According to the Oahu Bike Plan, the following projects have been identified in the study area and were assumed to be completed by 2032:

- Fort Weaver Road Priority 1 Shared Use Path – Keaunui Street to end of public roadway
- Fort Weaver Road Priority 1 Buffered Bike Lane – Keoneula Boulevard to Kilaha Street
- North Road Priority 2 Bike Lane – Fort Weaver Road to Iroquois Avenue

Priority 1 projects are identified as the highest priority projects with target implementation in 0-5 years. Priority 2 projects are to be implemented after Priority 1 projects or when a street is resurfaced.

As noted in Section 2.4.1, plans for the identified pedestrian and bicycle facilities have not been completed at the time of this report. Therefore, anticipated future cross-sections for Fort Weaver Road and North Road were assumed based on available ROW and existing layouts. The assumed future cross-sections in this study are shown in Figure 2.18. The proposed Fort Weaver Road Shared Use Path was assumed to use the existing 10-foot sidewalk width and not require additional widening.

The future modal priority scores are shown in Table 2.22 and illustrated in Figure 2.19. Bike LTS worksheets are included in Appendix C. Buffered bike lanes along Fort Weaver Road are expected to improve Bike LTS from LTS 3 to LTS 2. New bike lanes along both sides of North Road are expected to improve Bike LTS from LTS 3 to LTS 1. The bicycle facility improvements are anticipated to result in Bike LTS scores exceeding target scores for both Fort Weaver Road and North Road.

Table 2.22: Future Bicycle Modal Priority Score

Segment Description	Bike LTS		Modal Priority Score		
	Existing	FY 2032	Existing	FY 2032	Target
Fort Weaver Road North Rd/Kimopelekana Rd to Papipi Rd (Northbound)	LTS 3	LTS 2	3	2	3
Fort Weaver Road Papipi Rd to North Rd/ Kimopelekana Rd (Southbound)	LTS 3	LTS 2	3	2	3
North Road Fort Weaver Rd to Kilaha St (Eastbound)	LTS 3	LTS 1	3	1	3
North Road Kilaha Rd to Fort Weaver Rd (Westbound)	LTS 3	LTS 1	3	1	3

Score at or better than target
Score 1 or worse than target
Score 2 or worse than target

2.4.3 Future Transit Analysis

Changes to nearby bus stops are not anticipated as a result of the Project. However, bus routes may be modified in the future to provide additional service to and from Honolulu Rail Transit. The Honolulu Rail Transit is a fixed guideway rail system that is projected to span 20 miles between East Kapolei and Honolulu. At full completion, it will provide 21 stations at key commuter and visitor destinations. By 2031, the rail system is expected to be completed from the Kualakai Transit Station in East Kapolei to the Kaakaukukui Transit Station in Ward, serving a total of 19 stations.[2] The remaining stations servicing Kakaako and Ala Moana are planned to be completed at a later date.

The Bus/Rail Integration Plan for the West Oahu Station Group Final Update, dated April 2014, and the Bus/Rail Integration Plan for the Farrington Highway Station Group Final, dated April 2014, have preliminarily identified the following proposed bus route modifications to routes serving the study area:

- Route 41 – Current route will be modified to serve the Kualakai Transit Station (East Kapolei) and Keoneae Transit Station (University of Hawaii West Oahu) prior to servicing Kapolei Transit Center. During peak hours, headways are proposed to be decreased to every 15 minutes compared to the existing 60-minute headway. A maximum of four (4) peak hour bus trips are anticipated in each direction.
- Route 42 – Current route will be modified to serve the Hoaeae Transit Station (West Loch) and the Pouhala Transit Station (Waipahu Transit Center). The route will terminate at the Pouhala Transit Station when the rail is operational. However, the existing route to Waikiki will be maintained during the nighttime hours when rail is not operational. During peak hours, headways are proposed to be decreased to every 10 minutes compared to the existing 30-minute headway. A maximum of six (6) peak hour bus trips are anticipated in each direction.

With the decreased headways and increased bus service, transit operations along the study segments are anticipated to improve. In addition, as stated in previous sections, both the pedestrian and bicycle environments are anticipated to improve with identified walkway and bicycle facility improvement projects, which are expected to contribute to increased rider comfort when waiting for and accessing transit. Although improvements are expected along all studied segments, only the southbound Fort Weaver Road segment is expected to improve from Transit LOS D to LOS C. However, the modal priority score is expected to remain at 3, which is below the target score.

The future modal priority scores are shown in Table 2.23 and illustrated in Figure 2.19. TCQSM worksheets are included in Appendix C.

[2] According to the Honolulu Authority for Rapid Transit (www.honolulutransit.org). Date Accessed July 1, 2022.

Table 2.23: Future Transit Modal Priority Score

Segment Description	Transit LOS		Modal Priority Score		
	Existing	FY 2032	Existing	FY 2032	Target
Fort Weaver Road North Rd/Kimopelekane Rd to Papipi Rd (Northbound)	A	A	1	1	1
Fort Weaver Road Papipi Rd to North Rd/Kimopelekane Rd (Southbound)	D	C	3	3	1
North Road Fort Weaver Rd to Kilaha St (Eastbound)	-	-	-	-	3
North Road Kilaha St to Fort Weaver Rd (Westbound)	A	A	1	1	3

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

2.4.4 Future Auto Analysis

With the Project as well as ambient growth anticipated in the area, traffic at the study intersections is anticipated to increase. As noted in Section 2.3.1.1, the Project is anticipated to generate 82(35)[68] new vehicle trips during the second highest peak hours for the AM(PM)[School PM] periods. As a result of Project plans to consolidate the two (2) easternmost parking lots and driveways along North Road, the majority of trips currently entering JCHS from North Road are expected to instead enter via the driveway across from Kilaha Street. Under Future Year 2032 conditions including the Project, all intersections and roadway segments are anticipated to continue operating similar to existing conditions. The future modal priority scores are shown in Tables 2.24 and 2.25 and illustrated in Figure 2.19. Vehicle LOS worksheets are included in Appendix C.

Table 2.24: Future Auto Intersection Modal Priority Score

Intersection Description	Modal Priority Score		
	Existing	FY 2032	Target
Fort Weaver Road & Papipi Road	1	1	2
Fort Weaver Road & Aikanaka Road	1	1	2
Fort Weaver Road & North Road/Kimopelekane Road	1	1	2
North Road & Kilaha Street	1	1	2

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

Table 2.25: Future Auto Segment Modal Priority Score

Segment Description	# of Lanes		AADT		Modal Priority Score		
	Existing	FY 2032	Existing	FY 2032	Existing	FY 2032	Target
Fort Weaver Road – North Road/Kimopelekane Road to Papipi Road	4	4	21,200	23,332	2	2	2
North Road – Fort Weaver Road to Kilaha Street	2	2	6,800	6,906	2	2	2

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

2.4.5 Future Parking Analysis

The Project proposes to construct a new 3-story parking garage as well as expand select existing on-campus parking lots. With the proposed changes, the available JCHS parking is anticipated to increase from the existing 329 stalls to a minimum of 459 stalls at full build-out.

As noted in Sections 2.4.1 and 2.4.2, various pedestrian and bicycle improvement projects are planned along North Road. It was assumed that the existing on-street parking on the makai side of North Road would be removed in the future in order to accommodate new sidewalks and bicycle lanes. The assumed future North Road cross-section is shown in Figure 2.18. The approximately 59 vehicles currently parking along North Road are expected to instead utilize Fort Weaver Road on-street parking or the expanded JCHS facilities with the removal of existing North Road on-street parking.

Based on existing JCHS parking occupancy data, JCHS currently operates at an assumed 100% utilization of the available 329 available on-campus parking stalls. In addition, approximately 50 parking spaces along North Road were observed to be used by JCHS students and faculty/staff. With potential growth in enrollment with the Project, the existing 379-stall parking demand could be expected to increase to 450 stalls at full build-out, resulting in an on-campus parking occupancy of 98% during the peak period of demand if the Project only constructs the minimum number of parking stalls required by the LUO. Based on the C&C TIA Guide, the target parking occupancy rate is typically 85%.

Because parking demand currently exceeds available parking stalls during normal school hours as well as during athletics and other special events, JCHS parking is observed to overflow onto the surrounding roadways and impact on-street parking for nearby residential areas. The master plan will consider providing additional parking above the minimum parking stall count recommended by the LUO in order to account for heavy parking demand during normal school hours and special events and limit impacts to the surrounding neighborhood. Note that per the Institute of Transportation Engineers (ITE) Parking Generation Manual, 5th Edition, a high school with an enrollment of 3,651 students, which represents a growth of 18.7% over the current 3,100 students, would generate a parking demand of 881 stalls during a typical weekday. Therefore, providing above the minimum 459 parking stalls recommended by the LUO is expected to continue to be well below the latent demand of the Project site and is not expected to encourage additional private vehicle usage.

On-street parking along Fort Weaver Road is expected to increase with the assumed removal of parking along North Road. For the purposes of this study, all non-JCHS vehicles displaced from North Road were assumed to park along Fort Weaver Road within the studied segment between North Road/Kimopelekane Road and Papipi Road. However, on-street parking is generally available along all roadways in the area, and vehicles may park along segments outside of the studied area if more convenient. The existing parking occupancy and modal priority scores are shown in Table 2.26 and illustrated in Figure 2.19.

Table 2.26: Future Parking Modal Priority Score

Segment ID	Segment Description	FY 2032 Stalls	FY 2032 Demand	FY 2032 Occupancy	Modal Priority Score		
					Existing	FY 2032	Target
1	Fort Weaver Road North Rd/Kimopelekane Rd to Papipi Rd (Northbound)	11	10	91%	1	4	3
2	Fort Weaver Road Papipi Rd to North Rd/Kimopelekane Rd (Southbound)	15	14	93%	4	4	3
3	North Road Fort Weaver Rd to Kilaha St (Eastbound)	-	-	-	-	-	3
4	North Road Kilaha St to Fort Weaver Rd (Westbound)	-	-	-	-	-	3

Score at or better than target
Score 1 worse than target
Score 2 or more worse than target

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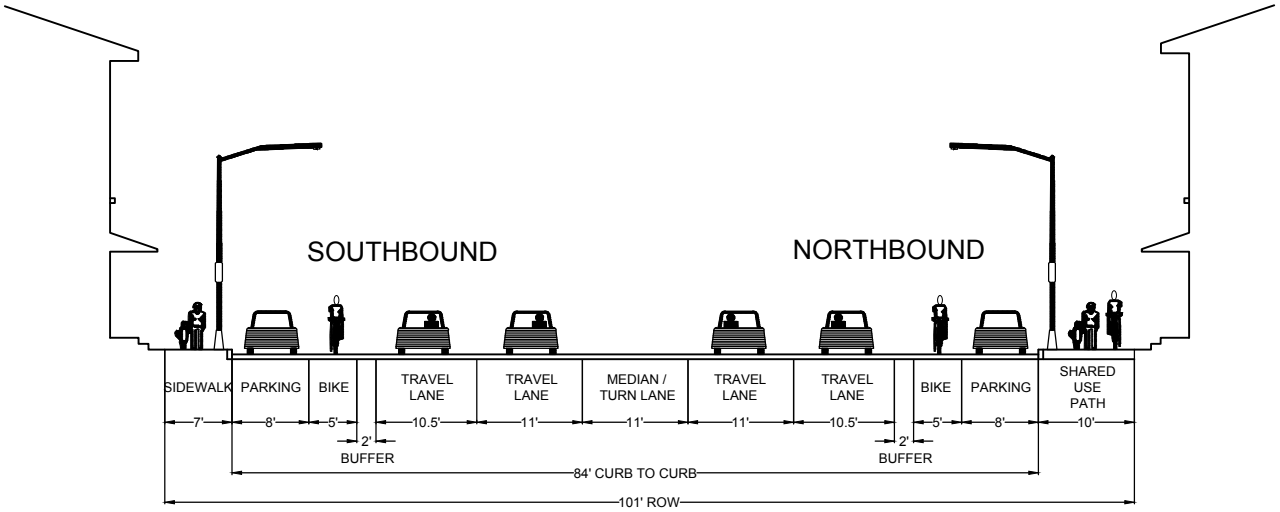
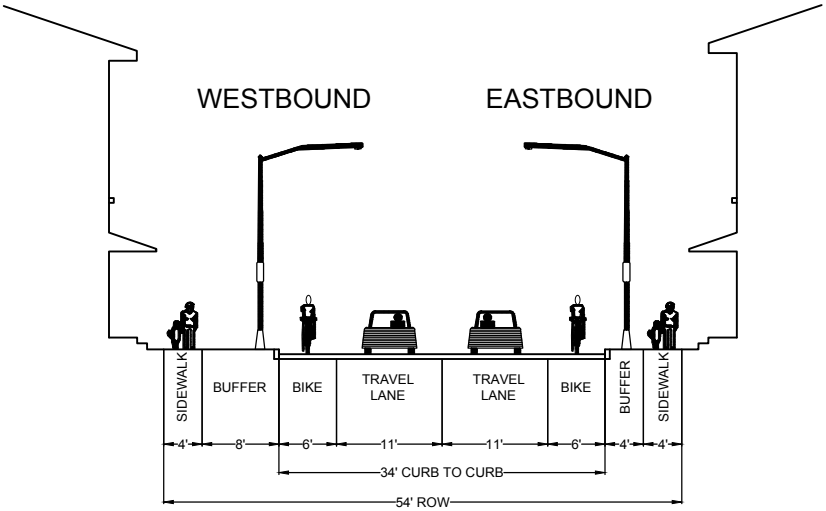


FORT WEAVER ROAD
NORTH ROAD TO PAPIPI ROAD



NORTH ROAD
FORT WEAVER ROAD TO KILAHA STREET

NOTE: EXISTING SIDEWALK AND BUFFER WIDTH ALONG WESTBOUND SIDE OF NORTH ROAD VARIES; ASSUMED THAT FUTURE CROSS-SECTION WILL FOLLOW EXISTING WHICH MAY NOT BE REFLECTED IN THE ABOVE CROSS-SECTION.

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LEGEND

- PEDESTRIAN MODAL PRIORITY
- BICYCLE MODAL PRIORITY
- TRANSIT MODAL PRIORITY
- VEHICLE MODAL PRIORITY
- PARKING MODAL PRIORITY
- MODAL PRIORITY SCORE AT OR BETTER THAN TARGET
- MODAL PRIORITY SCORE 1 WORSE THAN TARGET
- MODAL PRIORITY SCORE 2 OR MORE WORSE THAN TARGET

FIGURE 2.19

FUTURE YEAR 2032 MODAL PRIORITY

2.5 Complete Streets Modal Priority Analysis

The Multimodal Radar Diagram was developed by the City and County of Honolulu in order to further illustrate the Complete Street Modal Priority Analysis. Based on the performance evaluation methods summarized in the previous sections, each street segment receives a score (1-4) for each mode, where one (1) represents a high comfort level and four (4) represents a low comfort level. The scores generate a visual diagram which compares the target performance to the actual or design performance.

The Existing and Future Year 2032 with Project modal priority scores for the studied Fort Weaver Road and North Road segments are summarized in Table 2.27 below. Multimodal performance of the segments, as well as multimodal radar diagrams are included in the following sections.

Table 2.27: Summary Table of Multimodal Radar Diagram Results.

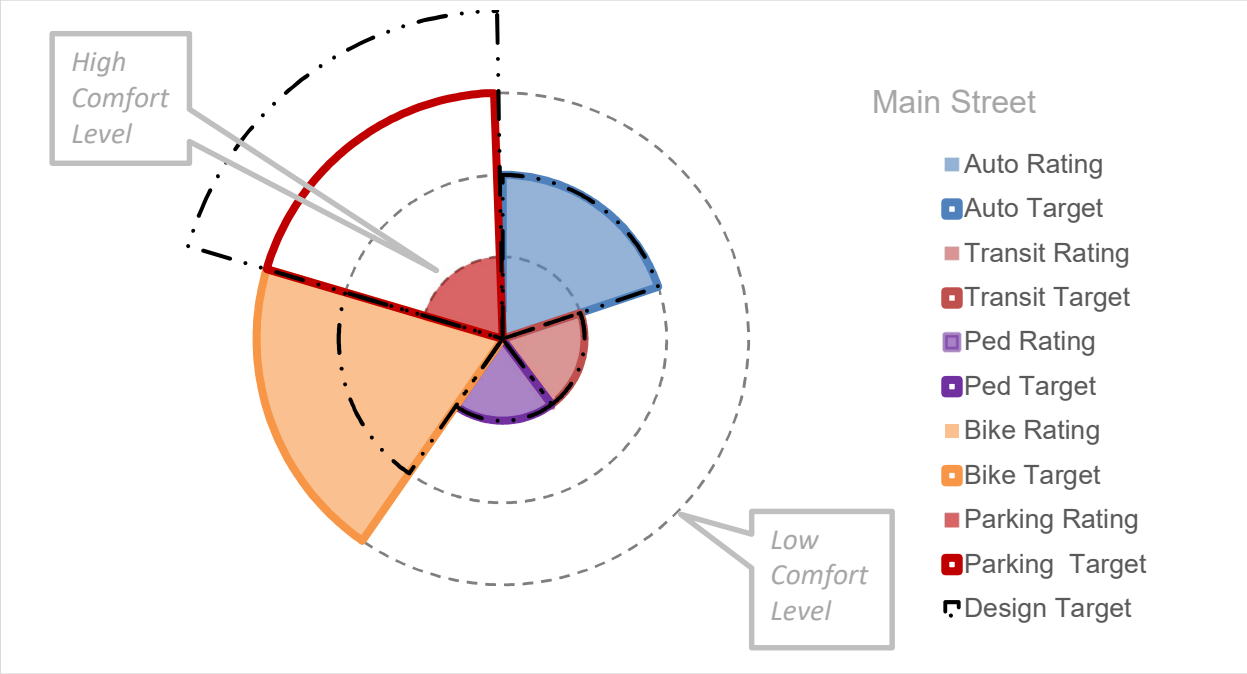
Segment	Street Type	Mode	Existing Score	Target Score	FY 2032 Score
Fort Weaver Rd North Rd/ Kimopelekane Rd to Papipi Rd (Northbound)	Main Street	Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	1	1	1
		Auto	2	2	2
		Parking	1	3	4
Fort Weaver Rd Papipi Rd to North Rd/ Kimopelekane Rd (Southbound)		Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	3	1	3
		Auto	2	1	2
		Parking	4	3	4
North Rd Fort Weaver Rd to Kilaha St (Eastbound)	Street	Pedestrian	3	1	2
		Bicycle	3	3	1
		Transit	-	3	-
		Auto	2	2	2
		Parking	4	3	-
North Rd Kilaha St to Fort Weaver Rd (Westbound)		Pedestrian	2	1	1
		Bicycle	3	3	1
		Transit	1	3	1
		Auto	2	2	2
		Parking	-	3	-

Score at or better than target
Score 1 or worse than target
Score 2 or more worse than target

2.5.1 Fort Weaver Road Northbound

Based on the Modal Priority Analysis, northbound Fort Weaver Road from North Road/Kimopelekane Road to Papipi Road currently meets target modal priority scores for all modes except for parking, which was observed to be largely underutilized because of the lack of adjacent residential land use or JCHS, which are the main on-street parking generators in the area. By Future Year 2032, the addition of buffered bicycle lanes is expected to further improve bicycle operations and provide a more comfortable environment for riders. In addition, on-street parking utilization is expected to increase and operate closer to the target 85% utilization with the removal of on-street parking on North Road. The multimodal radar diagram for the northbound study segment of Fort Weaver Road is shown in Figure 2.20.

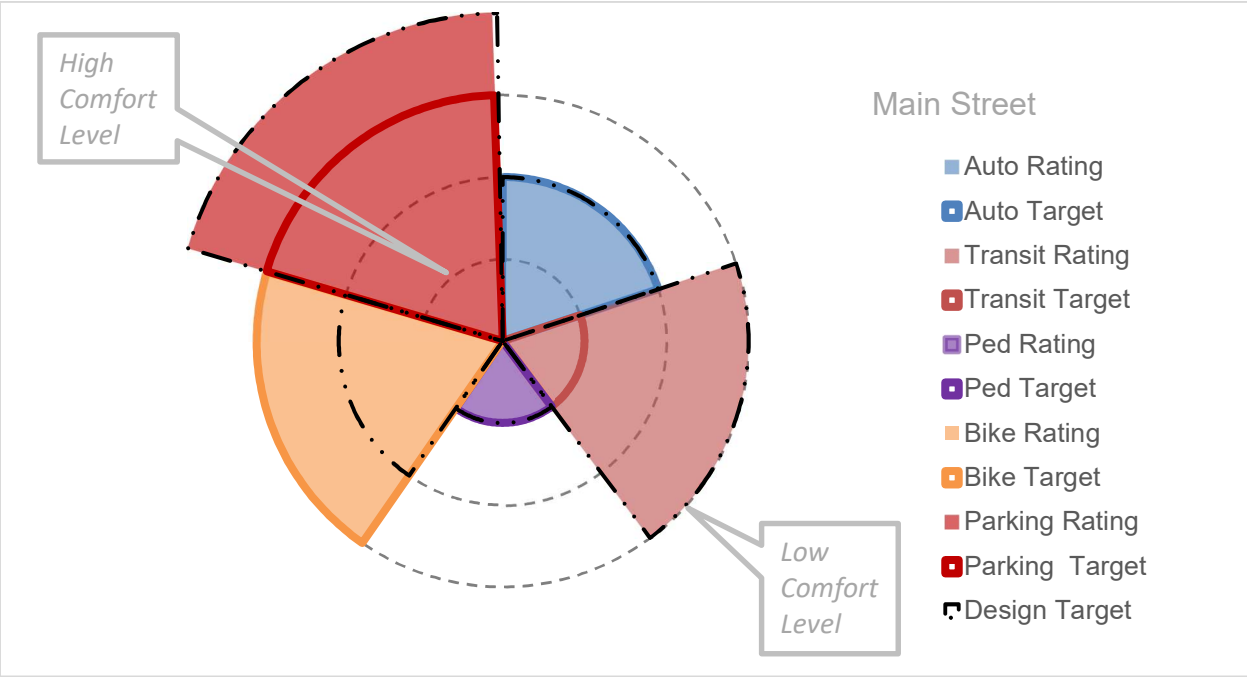
Figure 2.20: Fort Weaver Road Northbound – Future Year 2032 Multimodal Radar Diagram



2.5.2 Fort Weaver Road Southbound

Based on the Modal Priority Analysis, southbound Fort Weaver Road from Papipi Road to North Road/Kimopelekane Road currently meets target modal priority scores for all modes except for transit and parking. Transit operates with a lower modal priority score as a result of a single bus route serving the southbound Fort Weaver Road bus stops and low transit speeds within the study segment. Although bus frequency is expected to increase by Future Year 2032 with additional service added to support Honolulu Rail Transit, transit will continue to operate with a modal priority score of 3. Given the limited areas served by the southbound bus route, an additional increase in service is not expected. However, additional factors such as travel time and wait time may improve in the future, which is not accounted for the future transit scores. Parking is expected to operate with a modal priority score of 4 in both existing and future conditions as a result of the heavy demand for parking by nearby residences. As noted in Section 2.5.1, the addition of buffered bicycle lanes is expected to improve comfort levels for riders in the southbound direction as well. The multimodal radar diagram for the southbound study segment of Fort Weaver Road is shown in Figure 2.21.

Figure 2.21: Fort Weaver Road Southbound – Future Year 2032 Multimodal Radar Diagram



2.5.3 North Road Eastbound

Based on the Modal Priority Analysis, eastbound North Road from Fort Weaver Road to Kilaha Street currently meets target modal priority scores for bicycle and auto modes. Pedestrians currently experience low comfort levels due to a lack of sidewalk, which forces pedestrians to walk in the narrow area between parked vehicles and the adjacent travel lane. With identified walkway and bicycle improvements along North Road, pedestrian and bicycle operations are expected to improve, although the pedestrian mode is still anticipated to operate below the target score. Actual bicycle and pedestrian operations will be dependent on the final roadway design. Transit stops are not currently provided or proposed along eastbound North Road and on-street parking was assumed to be removed by Future Year 2032 to accommodate a sidewalk and bicycle lanes. Therefore, transit and parking scores are not provided for Future Year 2032. The multimodal radar diagram for the eastbound study segment of North Road is shown in Figure 2.22.

2.5.4 North Road Westbound

Based on the Modal Priority Analysis, westbound North Road from Kilaha Street to Fort Weaver Road currently meets target modal priority scores for all modes except for pedestrians. Although a sidewalk is provided and is generally buffered from the adjacent travel lane, the sidewalk is narrow and at-grade for the majority of the segment, which contributes to a lower comfort level for pedestrians. By Future Year 2032, identified walkway and bicycle facility improvements are anticipated to increase the comfort level for pedestrian and bicycle modes, and the westbound North Road segment is expected to meet target modal priority scores for all modes. Note that on-street parking is not currently provided or proposed along this segment of North Road and was not evaluated. The multimodal radar diagram for the westbound study segment of North Road is shown in Figure 2.23.

Figure 2.22: North Road Eastbound – Future Year 2032 Multimodal Radar Diagram

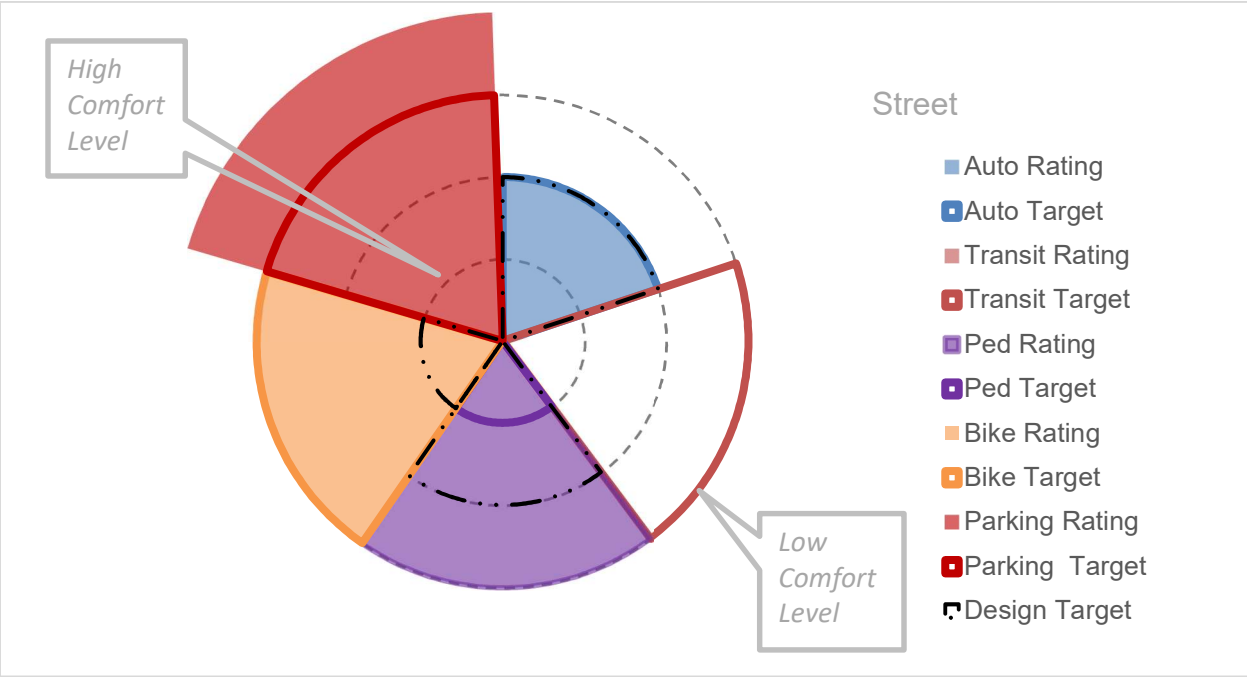
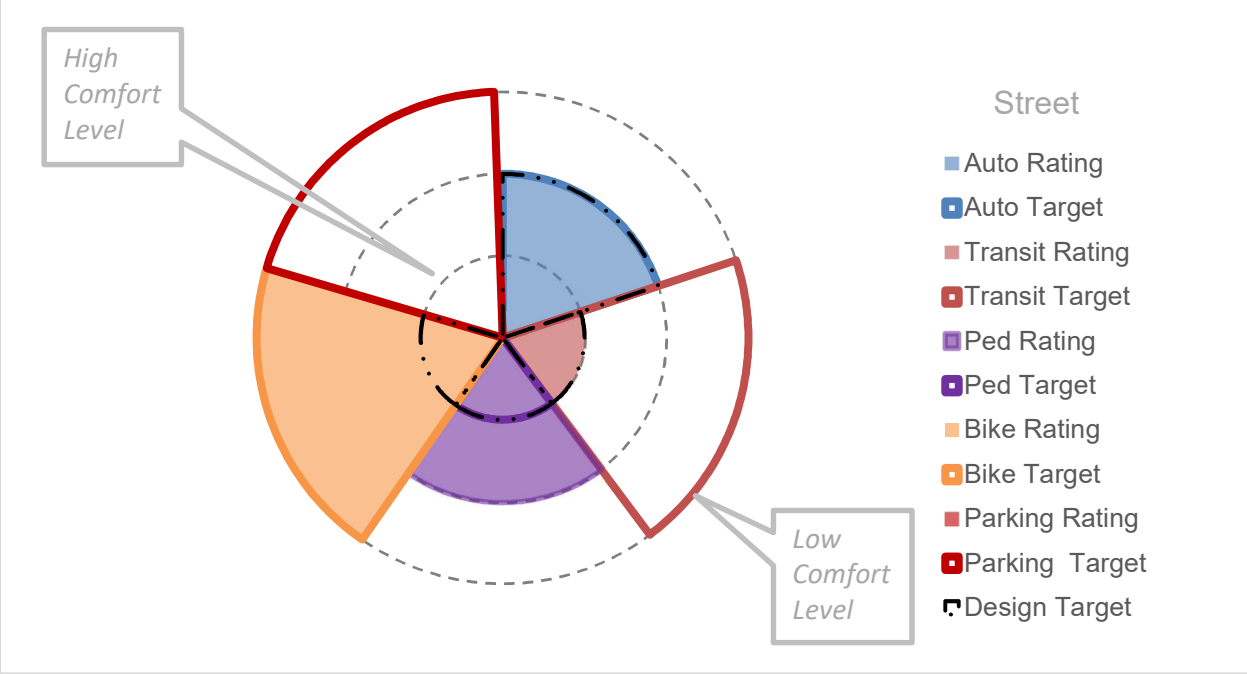


Figure 2.23: North Road Westbound – Future Year 2032 Multimodal Radar Diagram



2.6 Safety Analysis

Collision data for the study corridor for the most recent five (5) years of data (2014-2018) are summarized in Table 2.28 below. Collision data was obtained from the State Department of Health Injury Prevention and Control Section online database. Based on the State of Hawaii Department of Transportation Highways Program Status, none of the collisions in the Study Area from 2014 to 2018 resulted in a fatality. Collision data locations along the study corridor are illustrated in Figure 2.24.

Table 2.28: Study Area Collision History

Description	Total Collisions	% Auto Only	% Pedestrian	% Bicycle
Fort Weaver Road/Papipi Road Intersection	7	29%	14 %	57%
Fort Weaver Road/Aikanaka Road Intersection	1	100%	0%	0%
Fort Weaver Road/North Road Intersection	5	80%	20%	0%
North Road/Kilaha Street Intersection	1	100%	0%	0%
Fort Weaver Road – Papipi Street to North Road Segment	4	0%	50%	50%
North Road – Fort Weaver Road to Kilaha Street Segment	4	50%	25%	25%
Total	22	45%	23%	32%

Crash modification factors (CMF) were used to estimate the ability of the identified future walkway and bicycle facility improvements to reduce the number of crashes and crash severity. The CMF Clearninghouse database was used to identify the CMF for the walkway and bicycle facility improvements identified in Sections 2.4.1 and 2.4.2. The CMF selected is based on the countermeasure evaluated, quality of the study, and users involved in the crash (e.g., vehicle-vehicle, vehicle-pedestrian). Due to the limitations in the crash data, details including crash type (e.g., rear-end, sideswipe) and the five categories of crash severity (KABCO) were not available. The crash data available was categorized by vehicle, pedestrian, or bicycle collision.

Based on available data, CMFs are not available or applicable for installing or improving sidewalks and installing a bicycle lane buffer to an existing bicycle lane. Installing bicycle lanes is estimated to have a CMF of 0.734 in reducing all crash types and severities. Therefore, the CMF was applied to all collisions along North Road and at intersections with North Road. With the construction of bicycle lanes along North Road, the expected number of total collisions in the study area is expected to decrease for a total of 19 collisions during a five (5) year period.

Table 2.29: Estimated Future Study Area Collisions

Description	Total Collisions	Auto Only	Pedestrian	Bicycle
Existing Collisions	22	10	5	7
Bicycle Lane CMF (Applied to North Road only)	0.734	0.734	0.734	0.734
Future Year 2032 Estimated Collisions	19	8	4	7

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N
NOT TO SCALE

LEGEND

TOTAL # OF VEHICLE CRASHES (2014 - 2018):
- 1
- 2
- 3+

TOTAL # OF PEDESTRIAN CRASHES (2014 - 2018):
- 1
- 2
- 3+

TOTAL # OF BICYCLE CRASHES (2014 - 2018):
- 1
- 2
- 3+

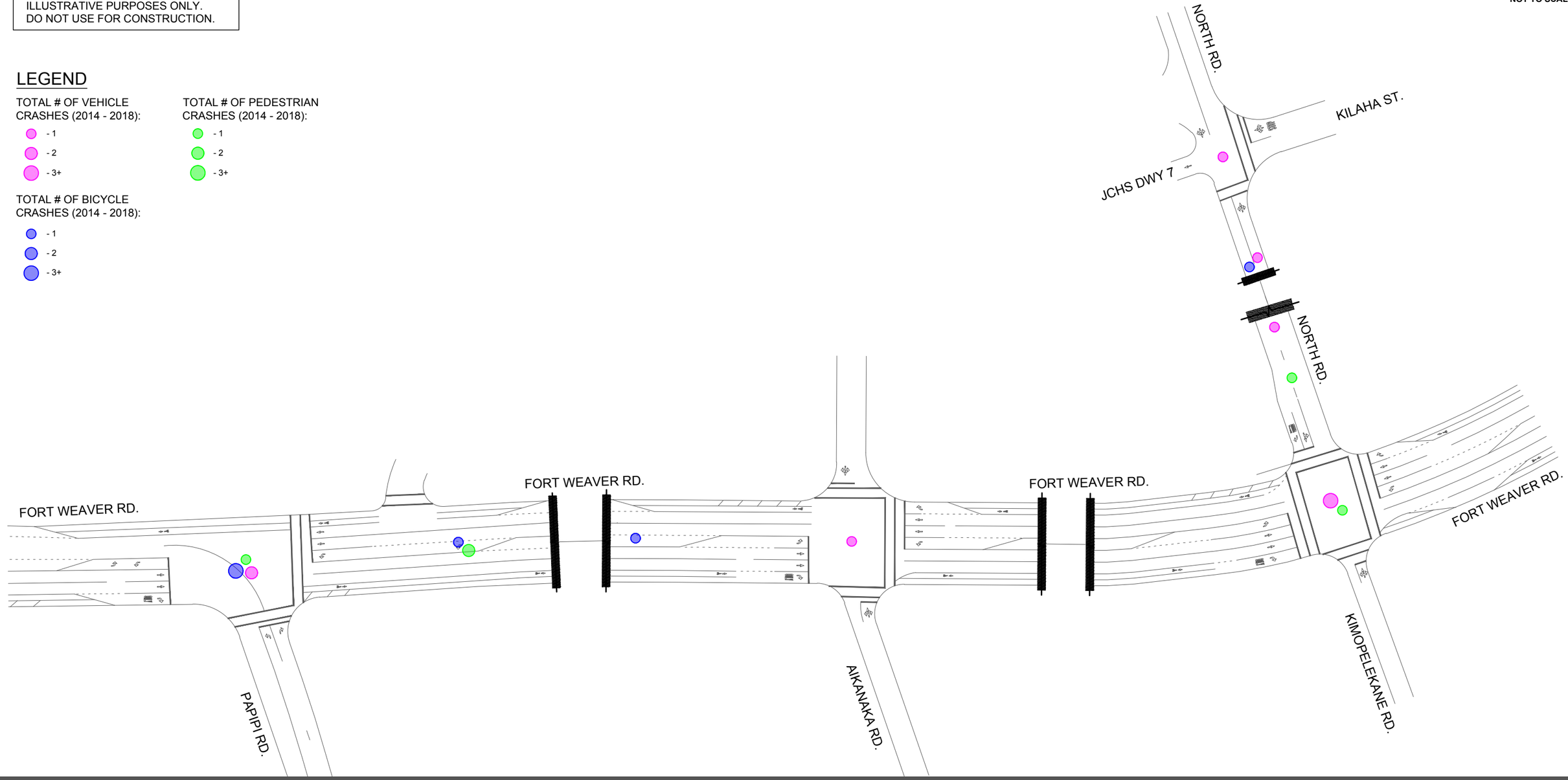

FIGURE 2.24

COLLISION DATA

3. Project Mitigation

The Project will consider the implementation of various Transportation Demand Management (TDM) strategies and Transportation Improvement strategies based on feasibility. A comprehensive list of TDM and Transportation Improvement strategies that are proposed or will be considered with the Project include the following:

- Reduce the number of JCHS driveways along North Road to reduce opportunities for vehicle and pedestrian/bicyclist conflicts.
- Provide a new plaza entrance to JCHS along North Road to facilitate a central location for pedestrian and bicyclist access to the school, further reducing opportunities for vehicle and pedestrian/bicyclist conflicts.
- Provide a new sidewalk along the easternmost JCHS driveway to provide an additional pedestrian entrance to JCHS for students entering from the east or via Kilaha Street in order to reduce pedestrian crossings and vehicle conflicts at the JCHS driveways.
- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.
- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program, and encourage carpooling.
- Provide additional on-site bicycle parking for faculty/staff and students.
- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.
- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.
- Encourage volunteer efforts from JCHS service organizations to clean and maintain existing City and County of Honolulu bus stops along the Project frontage in order to maintain a comfortable environment for transit users.
- Consider shifting JCHS start and end times to avoid overlap with Ilima Intermediate School and Pohakea Elementary School. It should be noted that any changes to the bell schedule would require a faculty vote of approval.

4. CONCLUSIONS & RECOMMENDATIONS

4.1 Project Description

The Project will be located at the existing JCHS campus at 91-980 North Road on the northeast corner of Fort Weaver Road and North Road/Kimopelekane Road. The JCHS campus is located on an approximately 57-acre lot, identified as TMK (1) 9-1-001:002, which is shared with Ilima Intermediate School, Pohakea Elementary School, the Hale Pono Boys and Girls Club and the Ewa Beach Public Library.

The Project proposes to construct improvements on the JCHS campus, including athletic facilities improvements, a new 3-story parking garage and new multipurpose, administration and classroom buildings to replace existing portables. With the proposed improvements, academic classroom space is expected to increase approximately 18.7% over existing for a total of approximately 341,000 square feet and parking stalls are expected to increase to at least 459 stalls from 329 stalls. Completion of the proposed master plan improvements is anticipated by 2032.

Access to/from the Project site will continue to be provided via driveways along North Road and via Aikanaka Road from Fort Weaver Road. With the Project, two (2) of the driveways along North Road will be removed with the consolidation of the two (2) easternmost existing parking lots. The existing fire lane connecting the JCHS campus to North Road is proposed to be converted into a new service/bus access road, primarily to be used by visiting teams' school buses during athletic events. The access road will be gated when not in use. In addition to the new access roadway, a new plaza is proposed along North Road to provide a central access for pedestrians and bicyclists. An additional sidewalk entrance will also be provided at the easternmost JCHS driveway across Kilaha Street to allow pedestrians entering from the opposite end of the campus to enter without having to cross heavy vehicle traffic entering and exiting the JCHS driveways.

4.2 Existing Traffic Conditions

Vehicular, pedestrian and bicycle traffic along Fort Weaver Road and North Road is largely impacted by the nearby JCHS, Ilima Intermediate School and Pohakea Elementary School campuses. Heavy volumes of all modes were observed during the AM and School PM peak hours as a result, with peak volumes occurring in an approximately 15 to 30-minute peak surrounding the school start and end times. Outside of the peak AM and School PM periods, volumes of all modes were significantly lighter.

Along the study segment of Fort Weaver Road, the majority of modes operate with a modal priority score at or better than the target score, with the exception of transit in the southbound direction and parking in both directions. Transit service is limited in the southbound direction due to the limited area serviced to the south of the Project area and is not expected to have major impacts on transit ridership. On-street parking was observed to be unevenly utilized with heavy utilization on the southbound side of the roadway fronting the residential area and light utilization on the northbound side of the roadway fronting Pohakea Elementary School.

Along the study segment of North Road, the lack of sidewalks on the eastbound side of the roadway and at-grade sidewalks for the majority of the segment on the westbound side of the roadway contributes to pedestrian modal priority scores lower than the target scores. In the eastbound direction, on-street parking also scores lower than the target score as a result of

heavily utilized parking by JCHS students and nearby residents. The remaining modes currently score at or better than the target scores.

4.3 Project Specific Traffic Conditions

The Project is projected to generate 299(64)[142] net new vehicular trips and 158(20)[267] net new multimodal trips (pedestrian, bicycle, transit) during the AM(PM)[School MD] peak hours of traffic. During the second highest peak hours of traffic, the Project is projected to generate 82(35)[68] net new vehicular trips and 44(13)[27] net new multimodal trips during the AM 2nd Peak(PM 2nd Peak)[School PM 2nd Peak] periods. The Complete Streets Modal Priority Analysis for Existing conditions and Future Year 2032 with Project conditions is shown in Table 4.1 below.

Identified walkway and bicycle facility improvement projects are anticipated to be completed by Future Year 2032 and were included in the multimodal analysis based on an assumed design in lieu of completed plans. With the improvements, all pedestrian and bicycle segment scores along North Road are expected to improve, with only eastbound North Road expected to operate with a pedestrian score one (1) below the target score. Parking and transit are expected to continue not meeting target scores along Fort Weaver Road. However, as mentioned under existing conditions, transit along southbound Fort Weaver Road serves limited areas and an increase in service is not expected to be required. Parking along Fort Weaver Road is expected to be more evenly utilized in the future as a result of parking removal along North Road to accommodate new sidewalks and bicycle lanes.

As part of the Project, the Developer will consider implementing the following Transportation Demand Management (TDM) and Transportation Improvement strategies to promote the use of multimodal transportation alternatives in the Project area, if feasible:

- Reduce the number of JCHS driveways along North Road to reduce opportunities for vehicle and pedestrian/bicyclist conflicts.
- Provide a new plaza entrance to JCHS along North Road to facilitate a central location for pedestrian and bicyclist access to the school, further reducing opportunities for vehicle and pedestrian/bicyclist conflicts.
- Provide a new sidewalk along the easternmost JCHS driveway to provide an additional pedestrian entrance to JCHS for students entering from the east or via Kilaha Street in order to reduce pedestrian crossings and vehicle conflicts at the JCHS driveways.
- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.
- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program and encourage carpooling.
- Provide additional on-site bicycle parking for faculty/staff and students.
- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.
- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.

- Encourage volunteer efforts from JCHS service organizations to clean and maintain existing City and County of Honolulu bus stops along the Project frontage in order to maintain a comfortable environment for transit users.
- Consider shifting JCHS start and end times to avoid overlap with Ilima Intermediate School and Pohakea Elementary School. It should be noted that any changes to the bell schedule would require a faculty vote of approval.

Table 4.1: Future Year 2032 Complete Streets Modal Priority Analysis

Segment	Street Type	Mode	Existing Score	Target Score	FY 2032 Score
Fort Weaver Rd North Rd/ Kimopelekane Rd to Papipi Rd (Northbound)	Main Street	Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	1	1	1
		Auto	2	2	2
		Parking	1	3	4
Fort Weaver Rd Papipi Rd to North Rd/ Kimopelekane Rd (Southbound)		Pedestrian	1	1	1
		Bicycle	3	3	2
		Transit	3	1	3
		Auto	2	1	2
		Parking	4	3	4
North Rd Fort Weaver Rd to Kilaha St (Eastbound)	Street	Pedestrian	3	1	2
		Bicycle	3	3	1
		Transit	-	3	-
		Auto	2	2	2
		Parking	4	3	-
North Rd Kilaha St to Fort Weaver Rd (Westbound)		Pedestrian	2	1	1
		Bicycle	3	3	1
		Transit	1	3	1
		Auto	2	2	2
		Parking	-	3	-

Score at or better than target
Score 1 or worse than target
Score 2 or more worse than target

5. REFERENCES

1. City & County of Honolulu Complete Streets, Right-of-Way Widths for Planned Street Improvements, November 2021.

2. City & County of Honolulu Complete Streets, Transportation Impact Assessment Guide, November 2020.

3. City & County of Honolulu Department of Transportation Services, Oahu Bike Plan, December 2019.

4. City & County of Honolulu Department of Transportation Services, Oahu Pedestrian Plan Draft, June 2021.

5. Institute of Transportation Engineers, Parking Generation, 5th Edition, 2019.

6. Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021.

7. Oahu Metropolitan Planning Organization, Oahu Regional Transportation Plan 2045, 2021.

8. State of Hawaii Department of Transportation Highway Division, Statewide Pedestrian Master Plan, May 2013.

9. Transportation Research Board, Highway Capacity Manual, 6th Edition.

APPENDICES

APPENDIX A

TRAFFIC COUNT DATA

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Phone: (808)533-3646 Fax: (808)526-1267

File Name : Papipi Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	Southbound Approach Southbound				FORT WEAVER RD Westbound				PAPIPI RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	0	0	0	9	99	0	0	19	0	4	1	0	39	10	0	181
06:15 AM	0	0	0	1	14	98	0	3	14	0	14	1	0	50	7	0	202
06:30 AM	0	0	0	4	18	99	0	3	23	0	21	7	0	46	17	0	238
06:45 AM	0	0	1	6	27	113	0	8	28	0	35	6	0	114	22	0	360
Total	0	0	1	11	68	409	0	14	84	0	74	15	0	249	56	0	981
07:00 AM	0	0	0	21	24	140	0	25	30	0	23	25	0	167	33	0	488
07:15 AM	0	0	0	45	19	209	0	42	44	0	27	32	0	249	45	0	712
07:30 AM	0	0	0	70	25	230	0	50	69	0	32	51	0	229	43	0	799
07:45 AM	0	0	0	32	47	260	0	23	41	0	39	21	0	181	23	0	667
Total	0	0	0	168	115	839	0	140	184	0	121	129	0	826	144	0	2666
08:00 AM	0	0	1	5	28	143	0	8	24	0	33	6	0	103	21	0	372
08:15 AM	0	0	0	5	17	92	0	6	26	0	19	2	0	73	23	0	263
08:30 AM	1	0	0	8	16	80	0	6	30	0	9	8	0	64	22	0	244
08:45 AM	0	0	0	2	20	86	0	2	23	0	18	8	0	51	22	0	232
Total	1	0	1	20	81	401	0	22	103	0	79	24	0	291	88	0	1111
09:00 AM	0	0	0	1	14	93	0	1	27	0	19	3	0	51	25	0	234
09:15 AM	0	0	0	0	12	81	0	0	24	0	16	2	0	64	31	0	230
09:30 AM	0	0	0	4	13	65	0	3	38	0	18	3	0	65	26	0	235
09:45 AM	0	0	0	1	19	66	0	2	39	0	16	5	0	73	24	0	245
Total	0	0	0	6	58	305	0	6	128	0	69	13	0	253	106	0	944
10:00 AM	0	0	0	1	17	78	0	1	24	0	18	2	0	66	25	0	232
10:15 AM	0	0	0	0	12	65	0	0	35	0	20	2	0	56	29	0	219
10:30 AM	0	0	0	0	15	66	0	0	30	2	14	4	0	64	22	0	217
10:45 AM	0	0	0	0	18	73	0	1	29	0	29	2	1	70	30	0	253
Total	0	0	0	1	62	282	0	2	118	2	81	10	1	256	106	0	921
11:00 AM	0	0	0	2	31	89	0	4	34	0	24	1	0	83	25	0	293
11:15 AM	0	0	0	0	16	98	0	1	27	0	23	2	0	90	33	0	290
11:30 AM	0	0	0	2	27	86	0	4	52	0	33	4	0	55	37	0	300
11:45 AM	0	0	0	3	18	79	0	2	34	0	37	4	0	83	27	0	287
Total	0	0	0	7	92	352	0	11	147	0	117	11	0	311	122	0	1170
12:00 PM	0	0	0	0	13	79	0	2	36	1	25	0	1	59	36	0	252
12:15 PM	0	0	0	0	18	59	0	0	40	0	21	1	0	84	26	0	249
12:30 PM	0	0	0	3	14	63	0	3	32	0	25	1	0	77	26	0	244
12:45 PM	0	0	0	2	20	84	0	2	33	0	25	4	0	79	44	0	293
Total	0	0	0	5	65	285	0	7	141	1	96	6	1	299	132	0	1038
01:00 PM	0	0	0	5	12	98	0	5	29	0	12	4	1	68	32	0	266
01:15 PM	0	0	0	4	16	76	0	0	34	0	26	4	0	89	40	0	289
01:30 PM	0	0	0	1	14	103	0	4	67	0	23	0	0	117	45	0	374
01:45 PM	0	0	0	3	14	76	0	2	73	0	36	5	0	131	49	0	389
Total	0	0	0	13	56	353	0	11	203	0	97	13	1	405	166	0	1318
02:00 PM	0	0	0	74	32	185	0	55	54	0	22	25	0	143	47	0	637
02:15 PM	0	0	0	64	28	216	0	66	52	0	33	105	0	158	35	0	757
02:30 PM	0	0	0	47	51	217	2	44	55	0	30	117	0	126	34	0	723
02:45 PM	0	0	1	14	26	139	0	13	46	0	21	27	0	128	49	0	464
Total	0	0	1	199	137	757	2	178	207	0	106	274	0	555	165	0	2581
03:00 PM	0	0	0	8	38	144	0	9	41	0	20	17	0	103	45	0	425
03:15 PM	0	0	0	3	26	96	0	4	49	0	33	10	0	103	46	0	370

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File Name : Papipi Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	Southbound Approach Southbound				FORT WEAVER RD Westbound				PAPIPI RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	0	0	0	11	27	118	0	3	49	0	43	7	0	118	48	0	424
03:45 PM	0	0	0	3	16	119	0	5	44	1	27	6	0	139	26	0	386
Total	0	0	0	25	107	477	0	21	183	1	123	40	0	463	165	0	1605
04:00 PM	0	0	0	4	28	130	0	9	29	0	33	10	0	129	26	0	398
04:15 PM	0	0	0	4	24	120	0	11	31	0	29	16	0	144	43	0	422
04:30 PM	0	0	0	2	23	119	0	6	38	0	50	1	0	111	36	0	386
04:45 PM	0	0	1	2	24	110	0	8	27	0	32	7	0	120	43	0	374
Total	0	0	1	12	99	479	0	34	125	0	144	34	0	504	148	0	1580
05:00 PM	0	0	0	1	14	102	0	2	30	0	31	6	0	125	39	0	350
05:15 PM	0	0	0	6	18	99	0	13	30	0	47	10	0	127	39	0	389
05:30 PM	0	0	1	4	25	93	0	2	26	0	41	2	0	142	34	0	370
05:45 PM	0	0	0	6	26	84	0	2	30	0	31	2	0	130	47	0	358
Total	0	0	1	17	83	378	0	19	116	0	150	20	0	524	159	0	1467
Grand Total	1	0	5	484	1023	5317	2	465	1739	4	1257	589	3	4936	1557	0	17382
Apprch %	0.2	0	1	98.8	15	78.1	0	6.8	48.5	0.1	35	16.4	0	76	24	0	
Total %	0	0	0	2.8	5.9	30.6	0	2.7	10	0	7.2	3.4	0	28.4	9	0	
Motorcycles	0	0	0	0	10	27	0	0	13	0	9	0	0	31	12	0	102
% Motorcycles	0	0	0	0	1	0.5	0	0	0.7	0	0.7	0	0	0.6	0.8	0	0.6
Cars & Light Goods	0	0	4	0	1000	5064	0	0	1689	3	1216	0	1	4757	1493	0	15227
% Cars & Light Goods	0	0	80	0	97.8	95.2	0	0	97.1	75	96.7	0	33.3	96.4	95.9	0	87.6
Buses	0	0	0	0	4	110	0	0	19	0	7	0	0	50	21	0	211
% Buses	0	0	0	0	0.4	2.1	0	0	1.1	0	0.6	0	0	1	1.3	0	1.2
Single-Unit Trucks	0	0	0	0	6	29	0	0	13	1	16	0	1	25	19	0	110
% Single-Unit Trucks	0	0	0	0	0.6	0.5	0	0	0.7	25	1.3	0	33.3	0.5	1.2	0	0.6
Articulated Trucks	0	0	0	0	1	6	0	0	3	0	3	0	0	5	7	0	25
% Articulated Trucks	0	0	0	0	0.1	0.1	0	0	0.2	0	0.2	0	0	0.1	0.4	0	0.1
Bicycles on Road	1	0	1	0	2	81	2	0	2	0	6	0	1	68	5	0	169
% Bicycles on Road	100	0	20	0	0.2	1.5	100	0	0.1	0	0.5	0	33.3	1.4	0.3	0	1
Bicycles on Crosswalk	0	0	0	18	0	0	0	38	0	0	0	46	0	0	0	0	102
% Bicycles on Crosswalk	0	0	0	3.7	0	0	0	8.2	0	0	0	7.8	0	0	0	0	0.6
Pedestrians	0	0	0	466	0	0	0	427	0	0	0	543	0	0	0	0	1436
% Pedestrians	0	0	0	96.3	0	0	0	91.8	0	0	0	92.2	0	0	0	0	8.3

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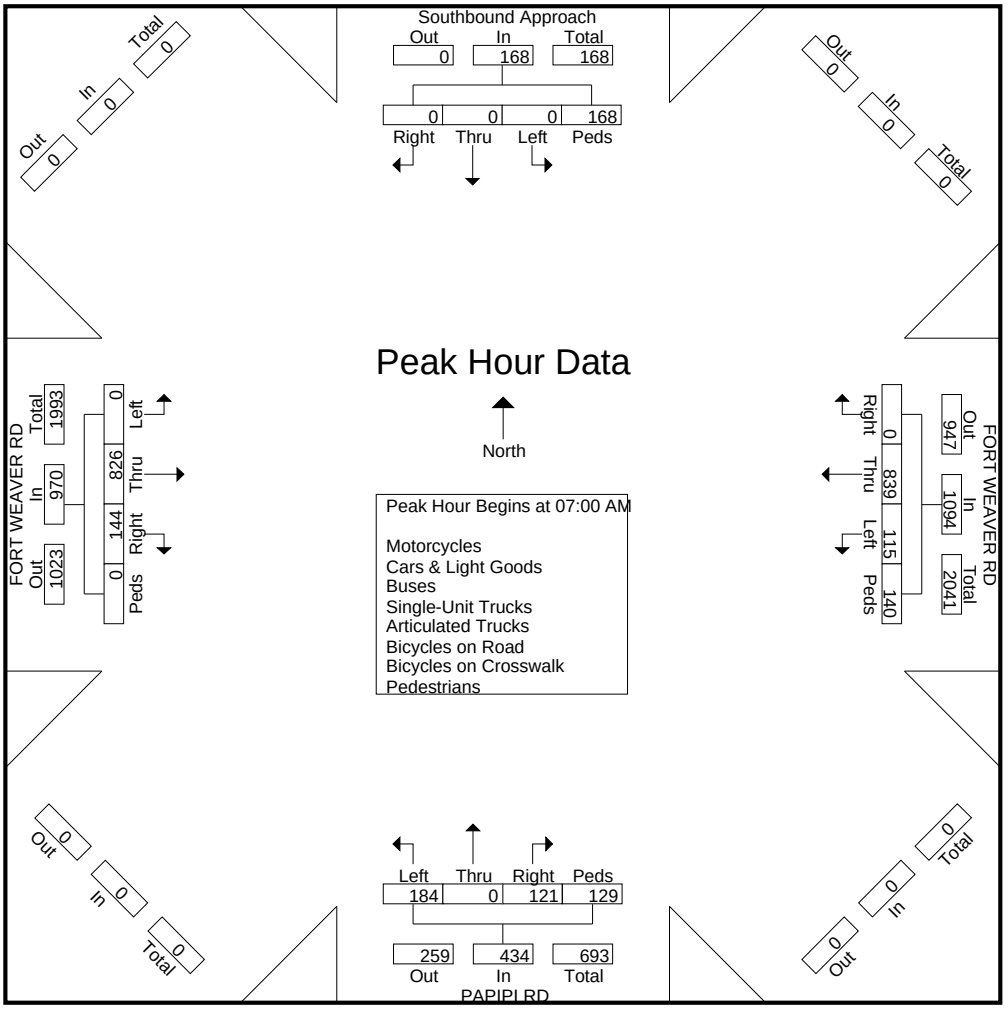
File Name : Papipi Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 3

	Southbound Approach Southbound					FORT WEAVER RD Westbound					PAPIPI RD Northbound					FORT WEAVER RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	21	21	24	140	0	25	189	30	0	23	25	78	0	167	33	0	200	488
07:15 AM	0	0	0	45	45	19	209	0	42	270	44	0	27	32	103	0	**249**	**45**	0	**294**	712
07:30 AM	0	0	0	**70**	**70**	25	230	0	**50**	305	**69**	0	32	**51**	**152**	0	229	43	0	272	**799**
07:45 AM	0	0	0	32	32	**47**	**260**	0	23	**330**	41	0	**39**	21	101	0	181	23	0	204	667
Total Volume	0	0	0	168	168	115	839	0	140	1094	184	0	121	129	434	0	826	144	0	970	2666
% App. Total	0	0	0	100		10.5	76.7	0	12.8		42.4	0	27.9	29.7		0	85.2	14.8	0		
PHF	.000	.000	.000	.600	.600	.612	.807	.000	.700	.829	.667	.000	.776	.632	.714	.000	.829	.800	.000	.825	.834



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File Name : Aikanaka Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 1

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	AIKANAKA RD Southbound				FORT WEAVER RD Westbound				AIKANAKA RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	0	0	1	1	97	0	1	6	0	0	0	0	38	0	0	144
06:15 AM	0	0	6	3	0	107	1	3	3	0	1	0	8	54	0	0	186
06:30 AM	1	1	4	6	0	122	5	3	1	1	1	0	14	54	2	0	215
06:45 AM	1	0	14	13	1	117	4	8	4	1	0	1	32	111	0	0	307
Total	2	1	24	23	2	443	10	15	14	2	2	1	54	257	2	0	852
07:00 AM	5	1	25	7	2	142	11	20	8	4	0	11	50	111	0	0	397
07:15 AM	6	2	58	4	2	162	23	28	9	16	0	14	57	156	1	0	538
07:30 AM	8	5	61	16	2	195	30	29	0	35	1	8	53	169	3	0	615
07:45 AM	1	7	62	1	3	203	21	50	15	52	0	15	38	121	3	0	592
Total	20	15	206	28	9	702	85	127	32	107	1	48	198	557	7	0	2142
08:00 AM	2	1	24	12	0	147	4	17	1	3	2	0	38	100	2	0	353
08:15 AM	2	0	11	5	0	90	2	1	2	0	0	0	13	71	2	0	199
08:30 AM	1	0	5	5	0	93	2	5	4	0	1	0	13	52	1	1	183
08:45 AM	1	0	4	3	0	100	1	1	2	0	0	0	10	42	1	0	165
Total	6	1	44	25	0	430	9	24	9	3	3	0	74	265	6	1	900
09:00 AM	1	0	1	0	1	105	1	0	1	0	0	0	9	63	1	0	183
09:15 AM	1	0	7	1	0	92	2	3	3	0	0	2	15	58	2	0	186
09:30 AM	2	0	7	6	1	72	2	1	5	0	0	0	5	66	0	0	167
09:45 AM	0	2	2	3	2	76	1	1	3	0	3	1	4	87	1	0	186
Total	4	2	17	10	4	345	6	5	12	0	3	3	33	274	4	0	722
10:00 AM	0	0	4	1	0	86	1	0	3	0	1	2	3	69	2	0	172
10:15 AM	0	0	1	0	0	71	0	0	3	0	0	1	4	68	0	0	148
10:30 AM	0	0	2	1	1	79	0	1	1	0	0	1	1	71	0	0	158
10:45 AM	0	0	5	0	1	88	0	1	4	0	0	0	3	86	1	0	189
Total	0	0	12	2	2	324	1	2	11	0	1	4	11	294	3	0	667
11:00 AM	2	0	21	1	2	91	1	3	1	0	1	3	5	83	1	0	215
11:15 AM	2	0	11	2	0	99	4	6	2	0	0	1	4	91	2	0	224
11:30 AM	1	0	12	1	1	101	4	3	2	0	0	0	6	83	1	0	215
11:45 AM	3	0	3	1	0	88	3	1	2	1	0	1	2	105	1	0	211
Total	8	0	47	5	3	379	12	13	7	1	1	5	17	362	5	0	865
12:00 PM	1	0	3	1	0	86	1	0	2	0	0	0	5	70	1	0	170
12:15 PM	0	0	2	2	0	65	0	0	3	0	0	1	4	88	1	0	166
12:30 PM	0	0	7	3	2	64	2	1	3	0	0	1	4	89	1	1	178
12:45 PM	2	1	16	5	1	84	0	5	4	0	1	3	7	91	1	0	221
Total	3	1	28	11	3	299	3	6	12	0	1	5	20	338	4	1	735
01:00 PM	0	0	5	4	0	104	1	2	3	1	1	4	4	71	1	0	201
01:15 PM	0	7	5	2	0	84	4	0	0	0	1	3	4	95	1	0	206
01:30 PM	3	0	6	2	0	94	2	0	5	1	1	1	9	127	3	2	256
01:45 PM	0	0	5	5	2	91	8	8	0	0	4	3	16	132	2	0	276
Total	3	7	21	13	2	373	15	10	8	2	7	11	33	425	7	2	939
02:00 PM	12	1	30	28	1	173	7	38	4	0	1	7	23	119	1	0	445
02:15 PM	2	2	40	11	3	171	7	95	3	0	1	43	23	145	5	0	551
02:30 PM	5	3	48	13	4	191	8	28	7	0	3	12	12	153	1	0	488
02:45 PM	1	1	30	6	3	135	6	10	4	0	0	11	11	124	1	0	343
Total	20	7	148	58	11	670	28	171	18	0	5	73	69	541	8	0	1827
03:00 PM	3	0	30	10	0	144	3	10	2	0	1	5	5	113	2	0	328
03:15 PM	1	0	14	0	0	112	0	2	1	0	1	0	5	120	1	0	257

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Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	AIKANAKA RD Southbound				FORT WEAVER RD Westbound				AIKANAKA RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	3	1	22	0	0	108	1	4	5	0	0	2	17	134	1	0	298
03:45 PM	1	0	19	2	2	110	1	0	3	0	0	1	7	145	1	0	292
Total	8	1	85	12	2	474	5	16	11	0	2	8	34	512	5	0	1175
04:00 PM	1	1	19	7	0	141	4	3	2	0	0	5	3	140	3	0	329
04:15 PM	1	0	13	3	0	116	3	1	2	0	2	1	11	137	0	0	290
04:30 PM	1	0	16	2	0	131	4	2	2	0	0	5	11	142	1	0	317
04:45 PM	4	0	21	5	1	118	5	1	1	1	1	1	9	131	3	0	302
Total	7	1	69	17	1	506	16	7	7	1	3	12	34	550	7	0	1238
05:00 PM	2	0	20	0	0	96	0	3	2	0	0	3	4	134	0	0	264
05:15 PM	0	0	14	7	2	99	2	2	1	0	2	5	13	139	0	0	286
05:30 PM	3	1	11	4	1	112	7	1	6	1	0	4	28	158	2	0	339
05:45 PM	1	0	16	3	1	92	19	0	4	0	0	0	29	120	1	0	286
Total	6	1	61	14	4	399	28	6	13	1	2	12	74	551	3	0	1175
Grand Total	87	37	762	218	43	5344	218	402	154	117	31	182	651	4926	61	4	13237
Apprch %	7.9	3.4	69	19.7	0.7	89	3.6	6.7	31.8	24.2	6.4	37.6	11.5	87.3	1.1	0.1	
Total %	0.7	0.3	5.8	1.6	0.3	40.4	1.6	3	1.2	0.9	0.2	1.4	4.9	37.2	0.5	0	
Motorcycles	0	0	3	0	3	32	2	0	0	1	3	0	1	40	2	0	87
% Motorcycles	0	0	0.4	0	7	0.6	0.9	0	0	0.9	9.7	0	0.2	0.8	3.3	0	0.7
Cars & Light Goods	83	35	742	0	31	5138	208	0	151	116	19	0	640	4759	54	0	11976
% Cars & Light Goods	95.4	94.6	97.4	0	72.1	96.1	95.4	0	98.1	99.1	61.3	0	98.3	96.6	88.5	0	90.5
Buses	2	1	5	0	0	105	5	0	1	0	1	0	2	51	1	0	174
% Buses	2.3	2.7	0.7	0	0	2	2.3	0	0.6	0	3.2	0	0.3	1	1.6	0	1.3
Single-Unit Trucks	2	0	2	0	2	29	2	0	1	0	1	0	3	34	0	0	76
% Single-Unit Trucks	2.3	0	0.3	0	4.7	0.5	0.9	0	0.6	0	3.2	0	0.5	0.7	0	0	0.6
Articulated Trucks	0	0	1	0	0	5	1	0	0	0	0	0	0	5	0	0	12
% Articulated Trucks	0	0	0.1	0	0	0.1	0.5	0	0	0	0	0	0	0.1	0	0	0.1
Bicycles on Road	0	1	9	0	7	35	0	0	1	0	7	0	5	37	4	0	106
% Bicycles on Road	0	2.7	1.2	0	16.3	0.7	0	0	0.6	0	22.6	0	0.8	0.8	6.6	0	0.8
Bicycles on Crosswalk	0	0	0	22	0	0	0	22	0	0	0	10	0	0	0	0	54
% Bicycles on Crosswalk	0	0	0	10.1	0	0	0	5.5	0	0	0	5.5	0	0	0	0	0.4
Pedestrians	0	0	0	196	0	0	0	380	0	0	0	172	0	0	0	4	752
% Pedestrians	0	0	0	89.9	0	0	0	94.5	0	0	0	94.5	0	0	0	100	5.7

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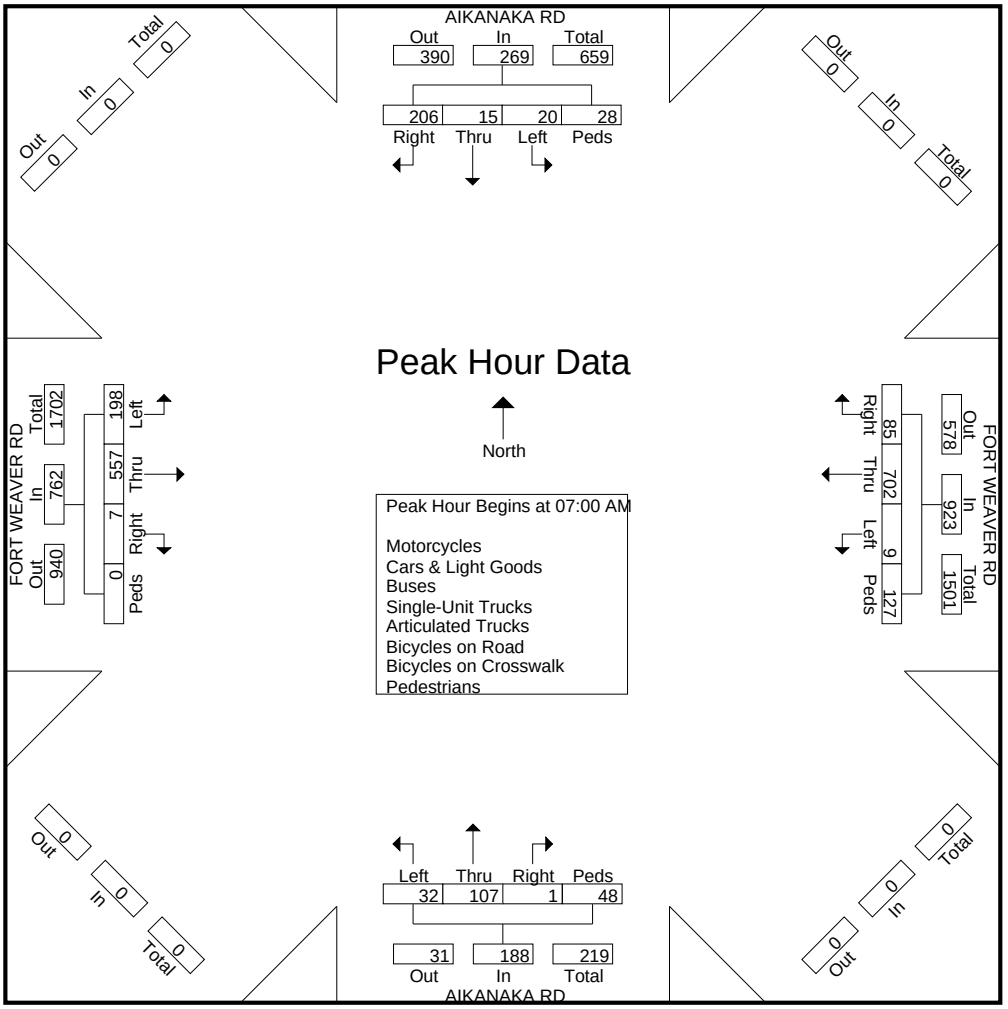
File Name : Aikanaka Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 3

	AIKANAKA RD Southbound					FORT WEAVER RD Westbound					AIKANAKA RD Northbound					FORT WEAVER RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	5	1	25	7	38	2	142	11	20	175	8	4	0	11	23	50	111	0	0	161	397
07:15 AM	6	2	58	4	70	2	162	23	28	215	9	16	0	14	39	**57**	156	1	0	214	538
07:30 AM	**8**	5	61	**16**	**90**	2	195	**30**	29	256	0	35	**1**	8	44	53	**169**	**3**	0	**225**	**615**
07:45 AM	1	**7**	**62**	1	71	**3**	**203**	21	**50**	**277**	**15**	**52**	0	**15**	**82**	38	121	3	0	162	592
Total Volume	20	15	206	28	269	9	702	85	127	923	32	107	1	48	188	198	557	7	0	762	2142
% App. Total	7.4	5.6	76.6	10.4		1	76.1	9.2	13.8		17	56.9	0.5	25.5		26	73.1	0.9	0		
PHF	.625	.536	.831	.438	.747	.750	.865	.708	.635	.833	.533	.514	.250	.800	.573	.868	.824	.583	.000	.847	.871



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File Name : North Rd_Kimopelekane Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 1

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				FORT WEAVER RD Westbound				KIMOPELEKANE RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	1	53	0	0	42	1	0	1	0	0	0	22	13	1	0	134
06:15 AM	0	0	52	0	0	48	2	0	2	0	0	1	38	11	0	0	154
06:30 AM	0	2	64	0	0	54	1	0	3	2	0	0	41	11	0	1	179
06:45 AM	1	0	73	5	1	53	5	0	2	1	0	0	80	16	1	1	239
Total	1	3	242	5	1	197	9	0	8	3	0	1	181	51	2	2	706
07:00 AM	1	5	99	5	0	59	9	2	2	3	0	4	87	16	2	4	298
07:15 AM	1	7	113	5	0	75	13	2	6	11	1	3	85	32	6	3	363
07:30 AM	1	9	124	14	1	81	18	1	8	11	0	2	93	42	9	10	424
07:45 AM	8	11	135	6	1	49	26	2	6	23	0	3	101	32	2	6	411
Total	11	32	471	30	2	264	66	7	22	48	1	12	366	122	19	23	1496
08:00 AM	1	10	95	7	1	39	6	4	2	5	3	4	71	34	4	5	291
08:15 AM	0	4	53	3	0	38	8	1	4	2	0	0	40	28	3	2	186
08:30 AM	0	1	48	0	1	40	3	0	1	0	0	0	29	25	0	2	150
08:45 AM	0	2	44	1	0	52	1	0	0	0	0	0	23	16	0	1	140
Total	1	17	240	11	2	169	18	5	7	7	3	4	163	103	7	10	767
09:00 AM	0	0	47	1	0	53	1	1	1	0	0	1	35	29	0	0	169
09:15 AM	0	1	50	1	0	41	1	0	0	1	0	0	35	22	1	1	154
09:30 AM	3	0	34	1	0	38	1	1	0	1	0	2	34	28	2	2	147
09:45 AM	0	1	41	0	0	28	0	1	1	1	0	2	27	54	3	0	159
Total	3	2	172	3	0	160	3	3	2	3	0	5	131	133	6	3	629
10:00 AM	0	3	39	0	0	47	3	0	0	1	1	1	30	43	0	0	168
10:15 AM	0	0	34	1	0	35	0	1	0	1	0	3	32	29	3	0	139
10:30 AM	0	1	49	1	0	31	1	0	0	2	1	3	34	37	2	0	162
10:45 AM	1	3	41	0	1	45	4	0	1	2	2	1	44	34	5	0	184
Total	1	7	163	2	1	158	8	1	1	6	4	8	140	143	10	0	653
11:00 AM	2	1	52	0	0	42	4	0	1	0	0	1	46	39	0	6	194
11:15 AM	1	1	67	0	0	43	2	1	2	1	0	2	51	40	3	1	215
11:30 AM	0	0	60	1	0	37	1	0	1	1	0	1	50	34	1	2	189
11:45 AM	1	2	48	0	0	38	1	1	1	4	0	0	55	47	2	2	202
Total	4	4	227	1	0	160	8	2	5	6	0	4	202	160	6	11	800
12:00 PM	0	0	39	1	0	41	1	1	1	1	0	1	31	35	0	0	152
12:15 PM	1	2	34	0	0	32	0	1	1	0	0	1	37	49	2	0	160
12:30 PM	1	3	34	2	1	34	4	1	2	2	0	1	48	39	1	0	173
12:45 PM	1	0	45	1	0	39	3	0	1	0	0	0	49	39	2	2	182
Total	3	5	152	4	1	146	8	3	5	3	0	3	165	162	5	2	667
01:00 PM	1	2	67	0	0	37	1	0	0	3	0	0	36	28	1	2	178
01:15 PM	2	3	46	3	2	50	8	0	2	2	1	1	44	28	4	0	196
01:30 PM	0	0	43	1	1	70	0	1	3	1	0	1	58	41	3	2	225
01:45 PM	0	0	49	3	0	56	5	0	4	2	0	0	55	45	5	3	227
Total	3	5	205	7	3	213	14	1	9	8	1	2	193	142	13	7	826
02:00 PM	2	2	62	12	1	46	9	1	4	8	0	4	74	66	3	4	298
02:15 PM	11	27	121	4	0	71	6	1	7	12	0	4	75	57	4	19	419
02:30 PM	7	10	110	6	1	43	5	0	4	2	1	1	92	67	10	6	365
02:45 PM	1	2	88	1	1	48	6	4	4	1	0	10	61	63	4	0	294
Total	21	41	381	23	3	208	26	6	19	23	1	19	302	253	21	29	1376
03:00 PM	2	3	91	2	0	41	5	2	3	1	0	1	57	53	4	2	267
03:15 PM	0	3	61	0	0	50	1	0	1	1	0	1	67	49	6	2	242

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File Name : North Rd_Kimopelekane Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				FORT WEAVER RD Westbound				KIMOPELEKANE RD Northbound				FORT WEAVER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	0	1	60	0	1	44	3	0	2	3	0	1	61	66	2	0	244
03:45 PM	4	1	54	0	1	50	4	0	4	1	0	0	80	64	1	2	266
Total	6	8	266	2	2	185	13	2	10	6	0	3	265	232	13	6	1019
04:00 PM	2	0	95	2	1	46	0	1	1	0	0	2	70	61	2	1	284
04:15 PM	3	2	66	1	0	42	5	1	1	3	1	5	87	54	4	0	275
04:30 PM	1	3	55	2	0	75	5	3	0	2	0	2	75	61	2	2	288
04:45 PM	2	3	48	0	0	67	3	0	2	2	0	0	58	71	1	2	259
Total	8	8	264	5	1	230	13	5	4	7	1	9	290	247	9	5	1106
05:00 PM	2	0	41	0	0	51	3	0	1	0	2	4	74	53	1	3	235
05:15 PM	1	1	48	1	0	44	6	4	4	2	0	4	74	54	8	0	251
05:30 PM	0	0	53	1	0	55	1	1	3	0	1	3	87	70	4	0	279
05:45 PM	5	3	66	1	0	37	3	0	1	2	0	0	60	54	1	3	236
Total	8	4	208	3	0	187	13	5	9	4	3	11	295	231	14	6	1001
Grand Total	70	136	2991	96	16	2277	199	40	101	124	14	81	2693	1979	125	104	11046
Apprch %	2.1	4.1	90.8	2.9	0.6	89.9	7.9	1.6	31.6	38.8	4.4	25.3	54.9	40.4	2.6	2.1	
Total %	0.6	1.2	27.1	0.9	0.1	20.6	1.8	0.4	0.9	1.1	0.1	0.7	24.4	17.9	1.1	0.9	
Motorcycles	0	1	18	0	0	19	4	0	0	1	1	0	16	20	4	0	84
% Motorcycles	0	0.7	0.6	0	0	0.8	2	0	0	0.8	7.1	0	0.6	1	3.2	0	0.8
Cars & Light Goods	67	132	2833	0	14	2209	188	0	100	120	9	0	2623	1888	110	0	10293
% Cars & Light Goods	95.7	97.1	94.7	0	87.5	97	94.5	0	99	96.8	64.3	0	97.4	95.4	88	0	93.2
Buses	1	1	98	0	0	13	1	0	0	0	0	0	22	28	3	0	167
% Buses	1.4	0.7	3.3	0	0	0.6	0.5	0	0	0	0	0	0.8	1.4	2.4	0	1.5
Single-Unit Trucks	1	1	19	0	1	18	0	0	0	2	1	0	20	17	1	0	81
% Single-Unit Trucks	1.4	0.7	0.6	0	6.2	0.8	0	0	0	1.6	7.1	0	0.7	0.9	0.8	0	0.7
Articulated Trucks	0	0	3	0	0	2	0	0	0	0	0	0	3	1	0	0	9
% Articulated Trucks	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0.1	0.1	0	0	0.1
Bicycles on Road	1	1	20	0	1	16	6	0	1	1	3	0	9	25	7	0	91
% Bicycles on Road	1.4	0.7	0.7	0	6.2	0.7	3	0	1	0.8	21.4	0	0.3	1.3	5.6	0	0.8
Bicycles on Crosswalk	0	0	0	11	0	0	0	5	0	0	0	16	0	0	0	9	41
% Bicycles on Crosswalk	0	0	0	11.5	0	0	0	12.5	0	0	0	19.8	0	0	0	8.7	0.4
Pedestrians	0	0	0	85	0	0	0	35	0	0	0	65	0	0	0	95	280
% Pedestrians	0	0	0	88.5	0	0	0	87.5	0	0	0	80.2	0	0	0	91.3	2.5

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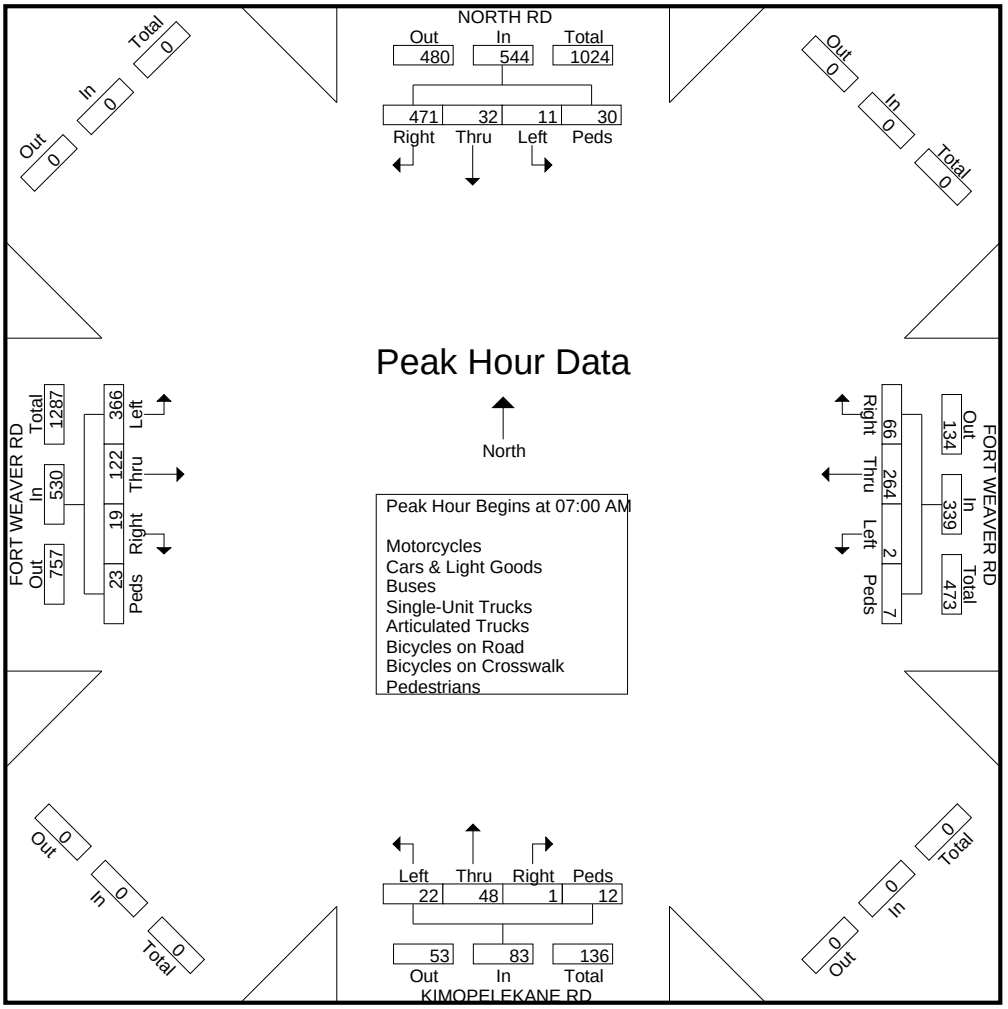
File Name : North Rd_Kimopelekane Rd - Fort Weaver Rd
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 3

	NORTH RD Southbound					FORT WEAVER RD Westbound					KIMOPELEKANE RD Northbound					FORT WEAVER RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	5	99	5	110	0	59	9	**2**	70	2	3	0	**4**	9	87	16	2	4	109	298
07:15 AM	1	7	113	5	126	0	75	13	2	90	6	11	**1**	3	21	85	32	6	3	126	363
07:30 AM	1	9	124	**14**	148	**1**	**81**	18	1	**101**	**8**	11	0	2	21	93	**42**	**9**	**10**	**154**	**424**
07:45 AM	**8**	**11**	**135**	6	**160**	1	49	**26**	2	78	6	**23**	0	3	**32**	**101**	32	2	6	141	411
Total Volume	11	32	471	30	544	2	264	66	7	339	22	48	1	12	83	366	122	19	23	530	1496
% App. Total	2	5.9	86.6	5.5		0.6	77.9	19.5	2.1		26.5	57.8	1.2	14.5		69.1	23	3.6	4.3		
PHF	.344	.727	.872	.536	.850	.500	.815	.635	.875	.839	.688	.522	.250	.750	.648	.906	.726	.528	.575	.860	.882



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File Name : North Rd - Kulana Pl
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				KULANA PL Westbound				NORTH RD Northbound				Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	42	0	0	2	0	0	0	0	20	3	0	0	0	0	0	67
06:15 AM	0	39	0	1	5	0	0	2	0	38	0	0	0	0	0	0	85
06:30 AM	0	55	0	0	6	0	0	0	0	40	2	2	0	0	0	0	105
06:45 AM	2	72	0	4	3	0	2	7	0	83	0	2	0	0	0	0	175
Total	2	208	0	5	16	0	2	9	0	181	5	4	0	0	0	0	432
07:00 AM	0	87	0	16	3	0	0	7	0	87	3	0	0	0	0	0	203
07:15 AM	0	118	0	19	7	0	0	8	0	110	1	1	0	0	0	0	264
07:30 AM	0	122	0	21	3	0	0	4	0	117	3	0	0	0	0	0	270
07:45 AM	0	143	0	19	3	0	1	7	0	144	1	0	0	0	0	0	318
Total	0	470	0	75	16	0	1	26	0	458	8	1	0	0	0	0	1055
08:00 AM	0	101	0	8	2	0	0	5	0	81	1	0	0	0	0	0	198
08:15 AM	1	50	0	3	5	0	2	2	0	46	3	7	0	0	0	0	119
08:30 AM	0	39	0	0	3	0	0	0	0	27	1	1	0	0	0	0	71
08:45 AM	2	44	0	0	1	0	1	0	0	21	1	0	0	0	0	0	70
Total	3	234	0	11	11	0	3	7	0	175	6	8	0	0	0	0	458
09:00 AM	1	38	0	0	3	0	0	0	0	33	2	0	0	0	0	0	77
09:15 AM	0	45	0	1	5	0	0	1	0	31	1	1	0	0	0	0	85
09:30 AM	1	33	0	6	0	0	1	0	0	33	2	2	0	0	0	0	78
09:45 AM	0	41	0	0	0	0	1	0	0	25	0	1	0	0	0	0	68
Total	2	157	0	7	8	0	2	1	0	122	5	4	0	0	0	0	308
10:00 AM	0	40	0	3	1	0	2	0	0	32	0	0	0	0	0	0	78
10:15 AM	1	29	0	0	2	0	0	0	0	32	1	0	0	0	0	0	65
10:30 AM	0	45	0	1	2	0	2	2	0	32	3	0	0	0	0	0	87
10:45 AM	1	35	0	1	3	0	0	0	0	45	1	0	0	0	0	0	86
Total	2	149	0	5	8	0	4	2	0	141	5	0	0	0	0	0	316
11:00 AM	1	48	0	3	3	0	0	0	0	47	0	0	0	0	0	0	102
11:15 AM	1	62	0	0	2	0	2	1	0	47	5	0	0	0	0	0	120
11:30 AM	1	53	0	2	0	0	0	1	0	48	0	0	0	0	0	0	105
11:45 AM	1	48	0	2	1	0	0	2	0	54	2	0	0	0	0	0	110
Total	4	211	0	7	6	0	2	4	0	196	7	0	0	0	0	0	437
12:00 PM	0	34	0	0	0	0	2	0	0	28	1	0	0	0	0	0	65
12:15 PM	0	29	0	0	0	0	1	1	0	33	0	0	0	0	0	0	64
12:30 PM	0	37	0	0	1	0	0	3	0	48	2	1	0	0	0	0	92
12:45 PM	0	39	0	2	4	0	1	1	0	44	2	0	0	0	0	0	93
Total	0	139	0	2	5	0	4	5	0	153	5	1	0	0	0	0	314
01:00 PM	1	58	0	1	3	0	0	0	0	33	3	0	0	0	0	0	99
01:15 PM	1	45	0	1	4	0	0	3	0	42	4	1	0	0	0	0	101
01:30 PM	0	41	0	1	1	0	0	5	0	53	0	2	0	0	0	0	103
01:45 PM	0	40	0	3	1	0	0	2	0	54	4	1	0	0	0	0	105
Total	2	184	0	6	9	0	0	10	0	182	11	4	0	0	0	0	408
02:00 PM	2	60	0	19	3	0	1	6	0	79	4	23	0	0	0	0	197
02:15 PM	1	158	0	31	5	0	0	11	0	87	3	2	0	0	0	0	298
02:30 PM	5	115	0	5	5	0	1	9	0	91	4	1	0	0	0	0	236
02:45 PM	1	83	0	7	4	0	0	3	0	66	4	0	0	0	0	0	168
Total	9	416	0	62	17	0	2	29	0	323	15	26	0	0	0	0	899
03:00 PM	1	85	0	0	4	0	0	0	0	50	5	7	0	0	0	0	152
03:15 PM	0	60	0	0	4	0	0	0	0	62	2	0	0	0	0	0	128

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File Name : North Rd - Kulana Pl
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				KULANA PL Westbound				NORTH RD Northbound				Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	1	59	0	1	1	0	0	0	0	60	4	0	0	0	0	0	126
03:45 PM	0	55	0	2	1	0	0	0	0	72	7	1	0	0	0	0	138
Total	2	259	0	3	10	0	0	0	0	244	18	8	0	0	0	0	544
04:00 PM	0	95	0	0	3	0	0	0	0	67	2	1	0	0	0	0	168
04:15 PM	1	65	0	5	2	0	3	1	0	84	7	0	0	0	0	0	168
04:30 PM	0	53	0	0	2	0	0	1	0	64	3	0	0	0	0	0	123
04:45 PM	1	47	0	3	3	0	0	1	0	64	2	0	0	0	0	0	121
Total	2	260	0	8	10	0	3	3	0	279	14	1	0	0	0	0	580
05:00 PM	0	41	0	1	2	0	2	4	0	66	5	0	0	0	0	0	121
05:15 PM	3	42	0	3	1	0	0	2	0	66	4	0	0	0	0	0	121
05:30 PM	0	46	0	6	6	0	1	2	0	75	4	0	0	0	0	0	140
05:45 PM	1	70	0	2	2	0	1	1	0	53	5	0	0	0	0	0	135
Total	4	199	0	12	11	0	4	9	0	260	18	0	0	0	0	0	517
Grand Total	32	2886	0	203	127	0	27	105	0	2714	117	57	0	0	0	0	6268
Apprch %	1	92.5	0	6.5	49	0	10.4	40.5	0	94	4.1	2	0	0	0	0	
Total %	0.5	46	0	3.2	2	0	0.4	1.7	0	43.3	1.9	0.9	0	0	0	0	
Motorcycles	1	21	0	0	0	0	2	0	0	18	0	0	0	0	0	0	42
% Motorcycles	3.1	0.7	0	0	0	0	7.4	0	0	0.7	0	0	0	0	0	0	0.7
Cars & Light Goods	23	2725	0	0	124	0	21	0	0	2639	115	0	0	0	0	0	5647
% Cars & Light Goods	71.9	94.4	0	0	97.6	0	77.8	0	0	97.2	98.3	0	0	0	0	0	90.1
Buses	0	97	0	0	1	0	0	0	0	21	0	0	0	0	0	0	119
% Buses	0	3.4	0	0	0.8	0	0	0	0	0.8	0	0	0	0	0	0	1.9
Single-Unit Trucks	2	19	0	0	0	0	2	0	0	18	1	0	0	0	0	0	42
% Single-Unit Trucks	6.2	0.7	0	0	0	0	7.4	0	0	0.7	0.9	0	0	0	0	0	0.7
Articulated Trucks	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
% Articulated Trucks	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1
Bicycles on Road	6	21	0	0	2	0	2	0	0	15	1	0	0	0	0	0	47
% Bicycles on Road	18.8	0.7	0	0	1.6	0	7.4	0	0	0.6	0.9	0	0	0	0	0	0.7
Bicycles on Crosswalk	0	0	0	3	0	0	0	11	0	0	0	4	0	0	0	0	18
% Bicycles on Crosswalk	0	0	0	1.5	0	0	0	10.5	0	0	0	7	0	0	0	0	0.3
Pedestrians	0	0	0	200	0	0	0	94	0	0	0	53	0	0	0	0	347
% Pedestrians	0	0	0	98.5	0	0	0	89.5	0	0	0	93	0	0	0	0	5.5

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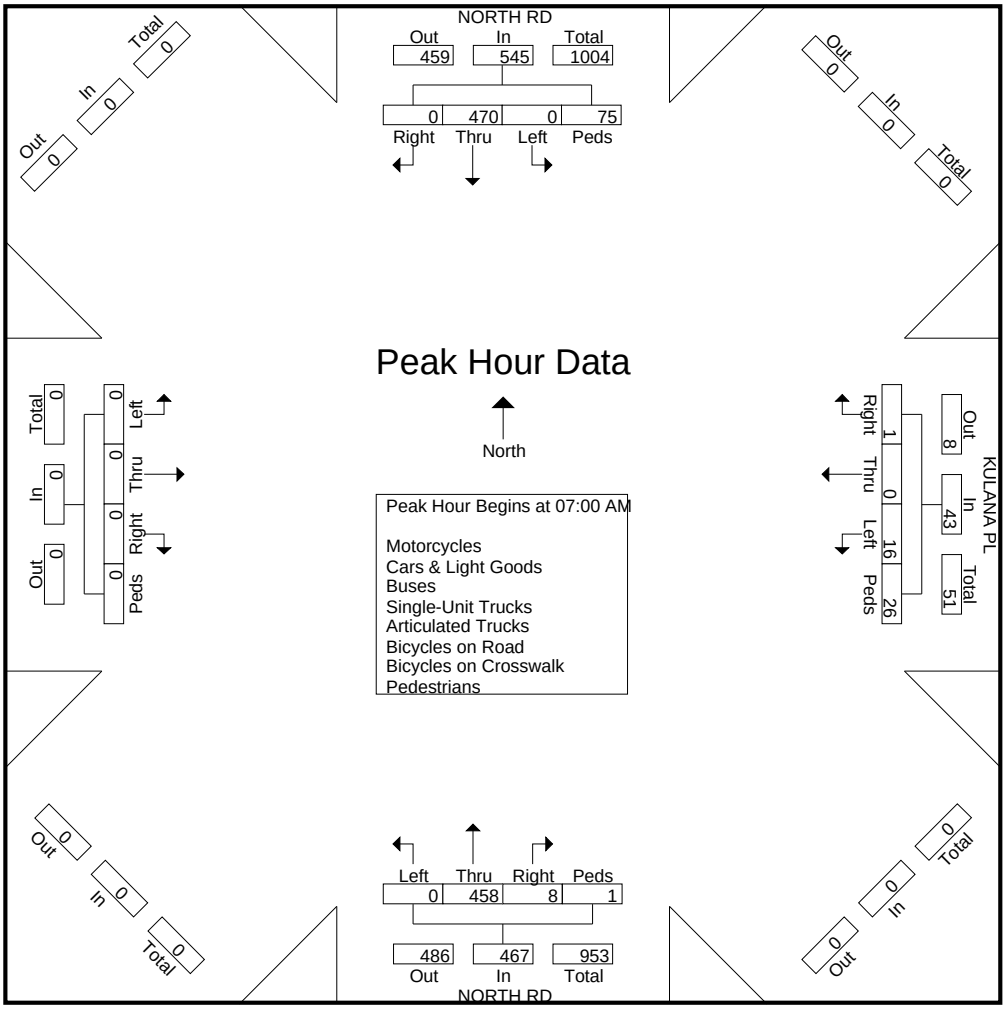
File Name : North Rd - Kulana Pl
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022
Page No : 3

	NORTH RD Southbound					KULANA PL Westbound					NORTH RD Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	87	0	16	103	3	0	0	7	10	0	87	**3**	0	90	0	0	0	0	0	203
07:15 AM	0	118	0	19	137	**7**	0	0	**8**	**15**	0	110	1	**1**	112	0	0	0	0	0	264
07:30 AM	0	122	0	**21**	143	3	0	0	4	7	0	117	3	0	120	0	0	0	0	0	270
07:45 AM	0	**143**	0	19	**162**	3	0	**1**	7	11	0	**144**	1	0	**145**	0	0	0	0	0	**318**
Total Volume	0	470	0	75	545	16	0	1	26	43	0	458	8	1	467	0	0	0	0	0	1055
% App. Total	0	86.2	0	13.8		37.2	0	2.3	60.5		0	98.1	1.7	0.2		0	0	0	0		
PHF	.000	.822	.000	.893	.841	.571	.000	.250	.813	.717	.000	.795	.667	.250	.805	.000	.000	.000	.000	.000	.829



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File Name : North Rd - CHS Dwy_Kilaha St
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				KILAHA ST Westbound				NORTH RD Northbound				CAMPBELL HS DWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	2	24	0	0	7	0	2	0	1	11	1	2	0	0	0	4	54
06:15 AM	3	34	1	0	1	0	6	0	2	20	5	3	0	0	0	2	77
06:30 AM	2	41	0	0	8	0	6	2	4	18	1	4	0	0	0	9	95
06:45 AM	6	46	2	0	5	5	4	2	10	26	10	3	0	0	0	2	121
Total	13	145	3	0	21	5	18	4	17	75	17	12	0	0	0	17	347
07:00 AM	7	48	8	0	3	2	10	1	10	29	5	8	0	0	0	5	136
07:15 AM	8	67	23	0	4	0	14	8	5	42	5	21	0	0	0	8	205
07:30 AM	18	86	35	0	10	4	23	12	4	74	9	33	0	0	0	24	332
07:45 AM	12	68	42	0	10	6	19	13	5	66	8	48	0	0	0	27	324
Total	45	269	108	0	27	12	66	34	24	211	27	110	0	0	0	64	997
08:00 AM	3	33	6	0	6	7	6	1	3	45	11	18	0	0	0	11	150
08:15 AM	3	30	0	0	5	1	3	2	1	25	6	7	0	0	0	7	90
08:30 AM	1	27	0	0	6	0	2	0	2	18	1	3	0	0	0	3	63
08:45 AM	5	43	3	0	5	2	1	0	0	19	5	3	0	0	0	0	86
Total	12	133	9	0	22	10	12	3	6	107	23	31	0	0	0	21	389
09:00 AM	0	34	1	0	2	0	2	1	1	21	6	2	0	0	0	0	70
09:15 AM	1	37	0	0	7	0	3	0	1	15	3	2	0	0	0	1	70
09:30 AM	6	21	3	0	4	0	3	0	0	26	2	1	0	0	0	6	72
09:45 AM	1	34	0	0	3	0	2	0	0	23	4	0	0	0	0	3	70
Total	8	126	4	0	16	0	10	1	2	85	15	5	0	0	0	10	282
10:00 AM	2	26	0	0	10	0	5	0	1	21	5	2	0	0	0	2	74
10:15 AM	2	19	0	0	5	0	5	2	0	25	4	1	0	0	0	2	65
10:30 AM	1	35	0	0	6	0	2	0	0	23	3	0	0	0	0	0	70
10:45 AM	7	23	3	0	4	0	4	0	1	31	6	1	0	0	0	3	83
Total	12	103	3	0	25	0	16	2	2	100	18	4	0	0	0	7	292
11:00 AM	1	28	0	0	0	0	4	0	1	35	6	2	0	0	0	6	83
11:15 AM	1	44	0	0	7	1	3	2	2	35	4	5	0	0	0	3	107
11:30 AM	5	33	1	0	3	0	5	0	1	34	5	2	0	0	0	9	98
11:45 AM	2	26	0	0	14	0	4	2	0	40	4	2	0	0	0	2	96
Total	9	131	1	0	24	1	16	4	4	144	19	11	0	0	0	20	384
12:00 PM	5	22	0	0	3	0	1	1	0	27	4	1	0	0	0	0	64
12:15 PM	4	21	0	0	3	0	6	0	0	23	5	1	0	0	0	2	65
12:30 PM	4	26	0	0	5	0	6	1	1	35	4	2	0	0	0	5	89
12:45 PM	1	30	2	0	1	0	4	1	2	34	3	3	0	0	0	8	89
Total	14	99	2	0	12	0	17	3	3	119	16	7	0	0	0	15	307
01:00 PM	4	28	0	0	4	0	3	0	0	25	5	1	0	0	0	0	70
01:15 PM	5	25	1	0	6	0	2	0	1	30	2	0	0	0	0	0	72
01:30 PM	4	39	1	0	4	0	11	1	2	32	7	1	0	0	0	5	107
01:45 PM	4	31	0	0	1	0	12	2	8	28	2	1	0	0	0	1	90
Total	17	123	2	0	15	0	28	3	11	115	16	3	0	0	0	6	339
02:00 PM	12	66	0	0	7	2	13	2	1	42	11	13	0	0	0	12	181
02:15 PM	27	50	11	0	8	1	26	38	1	77	29	105	0	0	0	129	502
02:30 PM	6	43	10	0	4	2	12	3	4	70	11	13	0	0	0	21	199
02:45 PM	6	48	2	0	7	0	6	1	3	45	6	10	0	0	0	5	139
Total	51	207	23	0	26	5	57	44	9	234	57	141	0	0	0	167	1021
03:00 PM	5	35	1	0	5	1	3	0	0	35	12	4	0	0	0	3	104
03:15 PM	7	38	0	0	4	0	5	0	0	51	8	2	0	0	0	4	119

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File Name : North Rd - CHS Dwy_Kilaha St
Site Code : 22-204 Campbell High School
Start Date : 4/26/2022

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	NORTH RD Southbound				KILAHA ST Westbound				NORTH RD Northbound				CAMPBELL HS DWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	4	39	2	0	4	0	4	0	0	49	2	2	1	0	0	6	113
03:45 PM	5	41	1	0	3	0	3	0	1	49	7	0	0	0	0	3	113
Total	21	153	4	0	16	1	15	0	1	184	29	8	1	0	0	16	449
04:00 PM	7	47	2	0	3	0	4	4	0	47	12	0	0	0	0	1	127
04:15 PM	7	37	0	0	8	0	8	0	0	52	11	2	0	0	0	4	129
04:30 PM	8	39	0	0	5	0	5	2	0	40	8	2	0	0	0	5	114
04:45 PM	5	30	0	0	4	0	4	0	0	48	5	1	0	0	0	3	100
Total	27	153	2	0	20	0	21	6	0	187	36	5	0	0	0	13	470
05:00 PM	5	44	0	0	2	0	4	1	0	44	11	2	0	0	0	2	115
05:15 PM	4	42	0	0	4	0	5	0	0	51	7	4	0	0	0	4	121
05:30 PM	7	42	0	0	4	0	8	3	0	58	13	1	0	0	0	4	140
05:45 PM	1	51	0	0	12	0	4	2	0	41	10	1	0	0	0	3	125
Total	17	179	0	0	22	0	21	6	0	194	41	8	0	0	0	13	501
Grand Total	246	1821	161	0	246	34	297	110	79	1755	314	345	1	0	0	369	5778
Apprch %	11	81.7	7.2	0	35.8	4.9	43.2	16	3.2	70.4	12.6	13.8	0.3	0	0	99.7	
Total %	4.3	31.5	2.8	0	4.3	0.6	5.1	1.9	1.4	30.4	5.4	6	0	0	0	6.4	
Motorcycles	8	16	0	0	6	0	2	0	0	22	5	0	0	0	0	0	59
% Motorcycles	3.3	0.9	0	0	2.4	0	0.7	0	0	1.3	1.6	0	0	0	0	0	1
Cars & Light Goods	230	1680	161	0	218	34	285	0	79	1684	299	0	1	0	0	0	4671
% Cars & Light Goods	93.5	92.3	100	0	88.6	100	96	0	100	96	95.2	0	100	0	0	0	80.8
Buses	1	82	0	0	16	0	2	0	0	21	1	0	0	0	0	0	123
% Buses	0.4	4.5	0	0	6.5	0	0.7	0	0	1.2	0.3	0	0	0	0	0	2.1
Single-Unit Trucks	3	18	0	0	1	0	6	0	0	18	2	0	0	0	0	0	48
% Single-Unit Trucks	1.2	1	0	0	0.4	0	2	0	0	1	0.6	0	0	0	0	0	0.8
Articulated Trucks	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
% Articulated Trucks	0	0.2	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0.1
Bicycles on Road	4	22	0	0	5	0	2	0	0	7	7	0	0	0	0	0	47
% Bicycles on Road	1.6	1.2	0	0	2	0	0.7	0	0	0.4	2.2	0	0	0	0	0	0.8
Bicycles on Crosswalk	0	0	0	0	0	0	0	1	0	0	0	7	0	0	0	15	23
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0.9	0	0	0	2	0	0	0	4.1	0.4
Pedestrians	0	0	0	0	0	0	0	109	0	0	0	338	0	0	0	354	801
% Pedestrians	0	0	0	0	0	0	0	99.1	0	0	0	98	0	0	0	95.9	13.9

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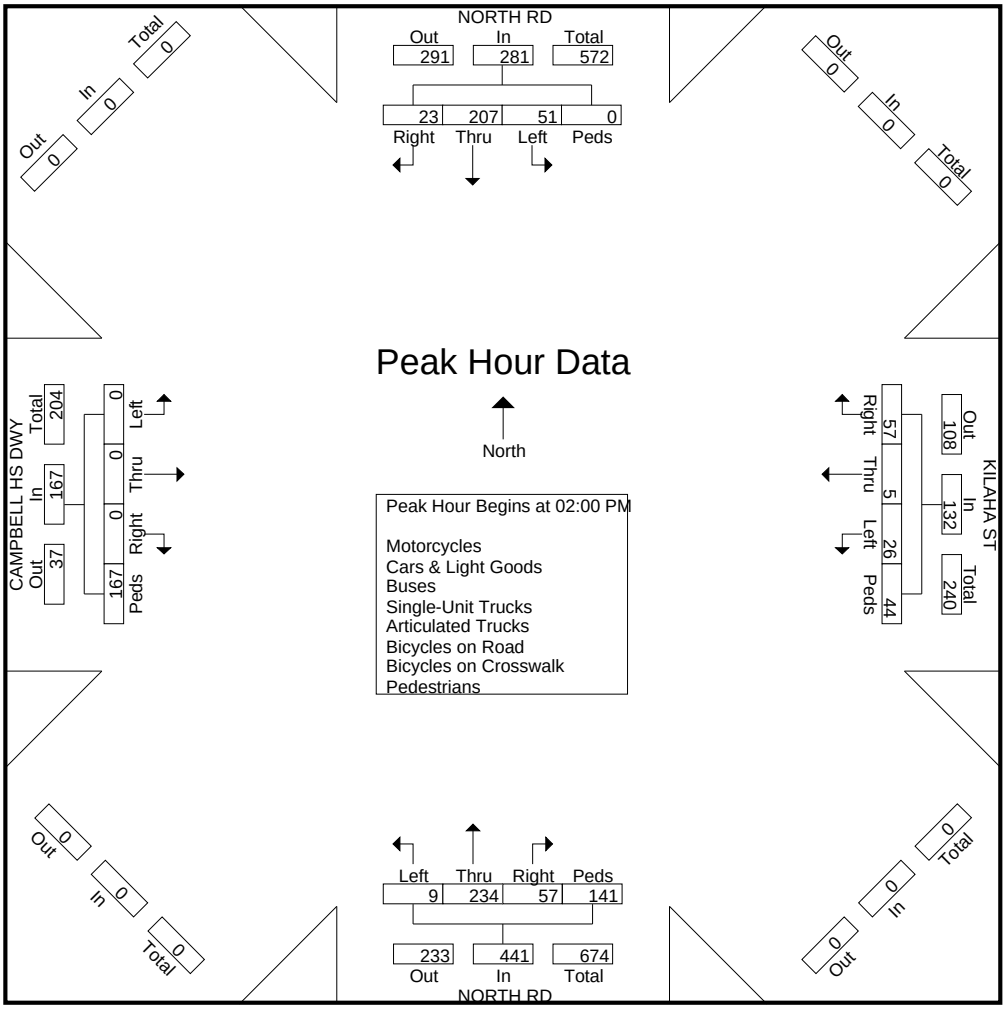
Start Date : 4/26/2022
Page No : 3

	NORTH RD Southbound					KILAHA ST Westbound					NORTH RD Northbound					CAMPBELL HS DWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	12	**66**	0	0	78	7	**2**	13	2	24	1	42	11	13	67	0	0	0	12	12	181
02:15 PM	**27**	50	**11**	0	**88**	**8**	1	**26**	**38**	**73**	1	**77**	**29**	**105**	**212**	0	0	0	**129**	**129**	**502**
02:30 PM	6	43	10	0	59	4	2	12	3	21	**4**	70	11	13	98	0	0	0	21	21	199
02:45 PM	6	48	2	0	56	7	0	6	1	14	3	45	6	10	64	0	0	0	5	5	139
Total Volume	51	207	23	0	281	26	5	57	44	132	9	234	57	141	441	0	0	0	167	167	1021
% App. Total	18.1	73.7	8.2	0		19.7	3.8	43.2	33.3		2	53.1	12.9	32		0	0	0	100		
PHF	.472	.784	.523	.000	.798	.813	.625	.548	.289	.452	.563	.760	.491	.336	.520	.000	.000	.000	.324	.324	.508



James Campbell High School 12-Hour Driveway Counts
Count Date: 4/26/2022

	JCHS Dwy 1		Ewa Beach Public Library		JCHS Dwy 2		Midblock Ped Crossing	JCHS Dwys 3-4		JCHS Dwys 5-6		JCHS Dwys 7-8	
	IN	OUT	IN	OUT	IN	OUT		IN	OUT	IN	OUT	IN	OUT
6:00	3	2	0	0	1	0	0	1	0	3	0	1	0
6:15	8	6	0	0	1	0	0	2	0	3	2	3	1
6:30	14	13	0	0	2	0	2	4	4	6	3	4	2
6:45	28	22	0	0	4	0	3	14	13	10	7	17	5
7:00	23	21	0	0	2	0	8	31	29	4	3	20	8
7:15	24	11	0	0	1	0	12	62	60	2	2	28	21
7:30	23	11	0	0	1	0	18	74	69	0	0	43	45
7:45	39	24	0	0	0	0	58	77	77	5	4	53	43
8:00	12	12	0	0	2	0	11	22	32	15	13	16	20
8:15	8	5	1	1	0	0	2	2	2	10	7	2	2
8:30	3	1	0	2	0	0	0	1	1	4	5	2	2
8:45	1	1	0	0	0	0	0	0	0	7	6	5	4
9:00	2	1	0	0	0	0	0	0	0	5	6	2	3
9:15	3	1	1	0	0	0	0	2	2	11	7	1	0
9:30	3	7	1	0	0	0	1	0	1	4	5	3	4
9:45	3	1	0	0	0	0	6	1	1	3	2	0	0
10:00	1	0	0	0	1	0	0	1	1	4	9	1	0
10:15	2	1	0	0	0	0	0	1	1	6	4	0	0
10:30	0	0	2	0	0	1	0	2	1	4	4	0	0
10:45	4	3	3	3	0	0	0	1	1	6	6	4	2
11:00	4	14	0	0	0	0	4	6	6	5	7	1	3
11:15	4	4	1	1	0	0	0	1	2	13	11	3	2
11:30	3	8	1	0	0	0	5	2	2	5	5	2	3
11:45	0	0	0	1	0	0	0	1	0	6	5	0	0
12:00	0	0	3	1	0	1	0	0	1	3	7	0	1
12:15	0	0	3	3	0	0	0	1	1	4	3	0	0
12:30	1	0	2	3	1	1	0	2	1	4	3	1	0
12:45	7	4	0	0	1	0	1	3	4	5	5	4	3
13:00	2	9	1	1	0	0	3	3	4	7	9	0	1
13:15	2	3	1	1	0	1	0	2	1	4	6	2	2
13:30	9	3	1	0	0	0	2	4	2	2	4	3	2
13:45	5	4	0	2	1	0	0	5	1	1	2	8	5
14:00	22	7	1	0	0	2	3	7	5	4	2	3	1
14:15	16	54	2	1	0	2	108	26	32	2	1	13	17
14:30	9	29	5	4	1	3	13	26	28	16	11	16	13
14:45	14	16	1	1	1	2	9	12	13	7	9	5	9
15:00	3	17	2	6	1	5	4	9	14	6	8	2	9
15:15	4	9	2	1	0	3	1	7	8	6	4	0	4
15:30	3	4	3	3	0	0	4	6	7	7	7	2	3
15:45	5	8	0	1	0	0	4	11	5	3	4	2	2
16:00	3	6	0	2	0	1	6	30	37	6	11	2	6
16:15	3	5	1	1	0	0	0	12	14	3	5	0	0
16:30	0	2	1	1	0	0	0	4	6	1	4	0	1
16:45	2	3	0	0	0	0	0	5	6	0	1	0	0
17:00	0	0	0	0	0	0	0	1	1	0	0	0	1
17:15	2	1	0	0	0	0	0	2	2	0	3	0	0
17:30	4	3	0	1	0	0	0	0	0	0	2	0	0
17:45	6	8	0	0	0	0	1	0	0	0	2	0	0

James Campbell High School Peak Hour Multimodal Counts
Count Date: 4/26/2022

	Fort Weaver Rd/Aikanaka Rd			JCHS Dwy 1			JCHS Dwy 2-3			JCHS Dwy 4-5			JCHS Dwy 6-7			JCHS Dwy 8			Total		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
PEDESTRIANS																					
AM PEAK (7:00 AM - 8:00 AM)	348	9	357	32	12	44	112	14	126	31	3	34	143	2	145	42	0	42	708	40	748
AM 2ND PEAK (8:00 AM - 9:00 AM)	57	5	62	35	4	39	29	0	29	23	0	23	41	4	45	9	0	9	194	13	207
SCHOOL PM PEAK (2:00 PM - 3:00 PM)	44	571	615	2	43	45	25	144	169	14	181	195	11	252	263	0	7	7	96	1198	1294
SCHOOL PM 2ND PEAK (3:00 PM - 4:00 PM)	21	32	53	1	9	10	7	17	24	2	8	10	9	14	23	2	2	4	42	82	124
PM PEAK (3:45 PM - 4:45 PM)	6	31	37	1	6	7	2	16	18	6	7	13	0	8	8	0	2	2	15	70	85
PM 2ND PEAK (4:45 PM - 5:45 PM)	6	19	25	7	4	11	3	5	8	2	4	6	1	5	6	0	0	0	19	37	56
BICYCLES																					
AM PEAK (7:00 AM - 8:00 AM)	78	0	78	3	0	3	1	0	1	4	0	4	3	0	3	0	0	0	89	0	89
AM 2ND PEAK (8:00 AM - 9:00 AM)	22	0	22	2	0	2	1	0	1	0	0	0	1	0	1	0	0	0	26	0	26
SCHOOL PM PEAK (2:00 PM - 3:00 PM)	4	106	110	1	6	7	1	3	4	5	9	14	0	3	3	0	0	0	11	127	138
SCHOOL PM 2ND PEAK (3:00 PM - 4:00 PM)	3	14	17	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0	5	16	21
PM PEAK (3:45 PM - 4:45 PM)	4	15	19	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	6	16	22
PM 2ND PEAK (4:45 PM - 5:45 PM)	0	2	2	4	4	8	0	0	0	0	1	1	0	0	0	0	0	0	4	7	11
VEHICLES																					
AM PEAK (7:00 AM - 8:00 AM)	390	241	631	112	71	183	4	231	235	253	7	260	12	129	141	144	0	144	915	679	1594
AM 2ND PEAK (8:00 AM - 9:00 AM)	86	51	137	23	20	43	2	36	38	27	34	61	37	28	65	25	0	25	200	169	369
SCHOOL PM PEAK (2:00 PM - 3:00 PM)	97	175	272	70	121	191	4	83	87	70	28	98	30	46	76	37	0	37	308	453	761
SCHOOL PM 2ND PEAK (3:00 PM - 4:00 PM)	39	94	133	21	52	73	2	44	46	34	26	60	24	23	47	6	0	6	126	239	365
PM PEAK (3:45 PM - 4:45 PM)	44	72	116	12	28	40	0	65	65	59	27	86	16	15	31	4	0	4	135	207	342
PM 2ND PEAK (4:45 PM - 5:45 PM)	70	76	146	13	8	21	0	10	10	11	6	17	0	1	1	0	0	0	94	101	195

APPENDIX B

NACTO SAFE SPEED STUDY

NACTO City Limits - Conflict Density and Activity Level Analysis for Speed Limit Determination

Fort Weaver Road - North Road to Papipi Road

CONFLICT DENSITY ANALYSIS CHECKLIST	
Do any of the following apply to the street?	
No Sidewalks	No
Bicycle traffic in the traffic lane, even where marked or signed (e.g., sharrows)	No
Sidewalks directly adjacent to moving traffic	No
≥3 "through" or "T" intersections (signalized or unsignalized), major driveways, or other crossing points per 1/4 mile	Yes
CONFLICT DENSITY	**HIGH**

ACTIVITY LEVEL ANALYSIS CHECKLIST	
Do any of the following apply to the street?	
Downtown/Central Business District street	No
Retail corridor	No
High density residential or commercial street	No
Do any of the following apply to the street?	
Moderate density residential or commercial street	Yes
Street with light retail activity	Yes
Mixed use corridor	Yes
ACTIVITY LEVEL	**MODERATE**

SPEED LIMIT DETERMINATION	20 MPH

NACTO City Limits - Conflict Density and Activity Level Analysis for Speed Limit Determination

North Road - Fort Weaver Road to Kilaha Street

CONFLICT DENSITY ANALYSIS CHECKLIST

Do any of the following apply to the street?	
No Sidewalks	Yes
Bicycle traffic in the traffic lane, even where marked or signed (e.g., sharrows)	Yes
Sidewalks directly adjacent to moving traffic	No
≥3 "through" or "T" intersections (signalized or unsignalized), major driveways, or other crossing points per 1/4 mile	Yes

CONFLICT DENSITY	**HIGH**

ACTIVITY LEVEL ANALYSIS CHECKLIST

Do any of the following apply to the street?	
Downtown/Central Business District street	No
Retail corridor	No
High density residential or commercial street	No

Do any of the following apply to the street?	
Moderate density residential or commercial street	Yes
Street with light retail activity	No
Mixed use corridor	No

ACTIVITY LEVEL	**MODERATE**

SPEED LIMIT DETERMINATION	**20 MPH**

APPENDIX C

MULTIMODAL ANALYSIS

APPENDIX C

MULTIMODAL ANALYSIS

PEQI

Existing PEQI Intersection Analysis

	Intersection ID	1		2		3		4	
	Street 1	**Fort Weaver Rd**		**Fort Weaver Rd**		**Fort Weaver Rd**		**North Rd**	
	Street 2	**Papipi Rd**		**Aikanaka Rd**		**North Rd/Kimopelekane Rd**		**Kilaha St/Campbell High School Dwy 7**	
1	Crosswalks	C. 2 Directions	15	D. 3 Directions	18	E. 4+ Directions	21	C. 2 Directions	15
2	Ladder Crosswalks	C. 2 Directions	16	D. 3 Directions	20	E. 4+ Directions	24	C. 2 Directions	16
3	Pedestrian Signals	E. 2 Directions w/ Countdown	13	G. 3 Directions w/ Countdown	17	I. 4+ Directions w/ Countdown	21	A. 0 Directions	5
4	Stop Signs	A. 0 Directions	8	A. 0 Directions	8	A. 0 Directions	8	B. 1 Directions	11
5	No RTOR	A. 0 Directions	5	A. 0 Directions	5	A. 0 Directions	5	A. 0 Directions	5
6	Curb Cuts	C. 2 Directions	11	D. 3 Directions	15	E. 4+ Directions	19	C. 2 Directions	11
7	Traffic Signal	B. Yes		B. Yes		B. Yes		A. No	
7a	Crossing Time	35		35		34			
7b	Crossing Distance	90		95		92		68	
7c	Crossing Speed	2.571428571	20	2.714285714	20	2.705882353	20	0	9
8	Crosswalk Scramble	A. No	5	A. No	5	A. No	5	A. No	5
9	Intersection TCFs	B. 1-2 Features	15	B. 1-2 Features	15	B. 1-2 Features	15	A. 0 Features	9
10	Additional Pedestrian Signs	B. Yes	17	B. Yes	17	B. Yes	17	B. Yes	17
	T-Intersection	B. Yes		A. No		A. No		B. Yes	
	Weighted Sum		**117**		**132**		**147**		**90**
	Final PEQI Score		**56.00**		**59.66**		**72.27**		**45.68**
	Modal Priority Score (1-4)		**2**		**2**		**1**		**2**

PEQI INTERSECTION AND STREET SCORES

- 0-20 Environment not suitable for pedestrians
- 21-40 Poor pedestrian conditions exist
- 41-60 Basic pedestrian conditions exist
- 61-80 Reasonable pedestrian conditions exist
- 81-100 Ideal pedestrian conditions exist

Source: Walkability & Pedestrian Safety in Boyle Heights (posted to NACTO website)

Existing PEQI Segment Analysis

	Segment ID	**1**		**2**		**3**	**4**	
	Street Name	**Fort Weaver Rd**		**Fort Weaver Rd**		**North Rd**	**North Rd**	
From	Cross Street 1	**North Road/Kimopelekane Rd**		**North Road/Kimopelekane Rd**		**Fort Weaver Rd**	**Fort Weaver Rd**	
To	Cross Street 2	**Papipi Rd**		**Papipi Rd**		**Kilaha St**	**Kilaha St**	
	Side of Street	**North**		**South**		**East**	**West**	
11	# Lanes	E. 4+ Lanes	4	E. 4+ Lanes	4	C. 2 Lanes	19	C. 2 Lanes	19
12	2-Way traffic	B. Yes	10	B. Yes	10	B. Yes	10	B. Yes	10
13	Posted Speed (mph)	E. 25	22	E. 25	22	E. 25	22	E. 25	22
14	Street TCF	A. None	7	A. None	7	A. None	7	A. None	7
15	Sidewalk Width	D. 8 ft - 11 ft 11 in	19	D. 8 ft - 11 ft 11 in	19	A. No Sidewalk	4	B. < 5 ft	7
16	Sidewalk Surface Condition	D. No Impediments	24	D. No Impediments	24	A. No Sidewalk	4	C. Few Impediments	17
17	Large Sidewalk Obstructions	E. No Obstructions	15	B. Permanent Obstructions	9	A. No Sidewalk	5	E. No Obstructions	15
18	Curb	B. Yes	17	B. Yes	17	A. No	7	B. Yes	17
19	Driveway Cuts	B. 1-5	15	C. 5+	5	B. 1-5	15	C. 5+	5
20	Trees	B. Sporadically Lined	11	C. No Trees	7	B. Sporadically Lined	11	B. Sporadically Lined	11
21	Planters/Gardens	B. Yes	9	A. No	4	A. No	4	B. Yes	9
22	Public Seating	B. Yes	13	A. No	7	A. No	7	B. Yes	13
23	Presence of Buffers	E. 2 of Margin, Parking, Bike	21	E. 2 of Margin, Parking, Bike	21	A. No Buffer	4	B. Margin Only	13
24	Storefront/Retail Use	A. 0	9	C. 3+	19	A. 0	9	A. 0	9
25	Public Art/Historical Sites	A. No	6	A. No	6	A. No	6	A. No	6
26	Illegal Graffiti	A. Little or No Graffiti	9	A. Little or No Graffiti	9	A. Little or No Graffiti	9	A. Little or No Graffiti	9
27	Litter	B. Yes	5	A. No	10	B. Yes	5	B. Yes	5
28	Pedestrian-Scale Street Lighting	C. Yes, Public	20	C. Yes, Public	20	A. No	7	C. Yes, Public	20
29	Construction Sites	A. No	13	A. No	13	A. No	13	A. No	13
30	Abandoned Buildings	A. No	13	A. No	13	A. No	13	A. No	13
31	Vacant Lots	A. No	13	A. No	13	A. No	13	A. No	13
32	Bike Racks	A. No	5	A. No	5	A. No	5	A. No	5
33	Visually Attractive	B. 2 - Agree	15	B. 2 - Agree	15	C. 3 - Disagree	10	B. 2 - Agree	15
34	Feels Safe	A. 1 - Strongly Agree	20	B. 2 - Agree	15	C. 3 - Disagree	10	B. 2 - Agree	15
35	Strong Odors	B. 2 - A Little Odor	15	B. 2 - A Little Odor	15	C. 3 - Some Odors	10	B. 2 - A Little Odor	15
36	Noise Level	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15
37	Walkability	H. 8	15	G. 7	13	C. 3	5	E. 5	9
	Weighted Sum		**360**		**337**		**249**		**327**
	Final Score		**67.50788644**		**60.25236593**		**32.49211356**		**57.0977918**
	Modal Priority Score		**1**		**1**		**3**		**2**

PEQI INTERSECTION AND STREET SCORES

	0-20	Environment not suitable for pedestrians
	21-40	Poor pedestrian conditions exist
	41-60	Basic pedestrian conditions exist
	61-80	Reasonable pedestrian conditions exist
	81-100	Ideal pedestrian conditions exist

Source: Walkability & Pedestrian Safety in Boyle Heights (posted to NACTO website)

Future Year 2032 PEQI Intersection Analysis

	Intersection ID	1		2		3		4	
	Street 1	**Fort Weaver Rd**		**Fort Weaver Rd**		**Fort Weaver Rd**		**North Rd**	
	Street 2	**Papipi Rd**		**Aikanaka Rd**		**North Rd/Kimopelekane Rd**		**Kilaha St/Campbell High School Dwy 7**	
1	Crosswalks	C. 2 Directions	15	D. 3 Directions	18	E. 4+ Directions	21	C. 2 Directions	15
2	Ladder Crosswalks	C. 2 Directions	16	D. 3 Directions	20	E. 4+ Directions	24	C. 2 Directions	16
3	Pedestrian Signals	E. 2 Directions w/ Countdown	13	G. 3 Directions w/ Countdown	17	I. 4+ Directions w/ Countdown	21	A. 0 Directions	5
4	Stop Signs	A. 0 Directions	8	A. 0 Directions	8	A. 0 Directions	8	B. 1 Directions	11
5	No RTOR	A. 0 Directions	5	A. 0 Directions	5	A. 0 Directions	5	A. 0 Directions	5
6	Curb Cuts	C. 2 Directions	11	D. 3 Directions	15	E. 4+ Directions	19	C. 2 Directions	11
7	Traffic Signal	B. Yes		B. Yes		B. Yes		A. No	
7a	Crossing Time	35		35		34			
7b	Crossing Distance	90		95		92		68	
7c	Crossing Speed	2.571428571	20	2.714285714	20	2.705882353	20	0	9
8	Crosswalk Scramble	A. No	5	A. No	5	A. No	5	A. No	5
9	Intersection TCFs	B. 1-2 Features	15	B. 1-2 Features	15	B. 1-2 Features	15	A. 0 Features	9
10	Additional Pedestrian Signs	B. Yes	17	B. Yes	17	B. Yes	17	B. Yes	17
	T-Intersection	B. Yes		A. No		A. No		B. Yes	
	Weighted Sum		**117**		**132**		**147**		**90**
	Final PEQI Score		**56.00**		**59.66**		**72.27**		**45.68**
	Modal Priority Score (1-4)		**2**		**2**		**1**		**2**

PEQI INTERSECTION AND STREET SCORES

0-20	Environment not suitable for pedestrians
21-40	Poor pedestrian conditions exist
41-60	Basic pedestrian conditions exist
61-80	Reasonable pedestrian conditions exist
81-100	Ideal pedestrian conditions exist

Source: Walkability & Pedestrian Safety in Boyle Heights (posted to NACTO website)

Future Year 2032 PEQI Segment Analysis

	Segment ID	1		2		3		4	
	Street Name	**Fort Weaver Rd**		**Fort Weaver Rd**		**North Rd**		**North Rd**	
From	Cross Street 1	**North Road/Kimopelekane Rd**		**North Road/Kimopelekane Rd**		**Fort Weaver Rd**		**Fort Weaver Rd**	
To	Cross Street 2	**Papipi Rd**		**Papipi Rd**		**Kilaha St**		**Kilaha St**	
	Side of Street	**North**		**South**		**East**		**West**	
11	# Lanes	E. 4+ Lanes	4	E. 4+ Lanes	4	C. 2 Lanes	19	C. 2 Lanes	19
12	2-Way traffic	B. Yes	10	B. Yes	10	B. Yes	10	B. Yes	10
13	Posted Speed (mph)	D. 20	22	D. 20	22	D. 20	22	D. 20	22
14	Street TCF	A. None	7	A. None	7	A. None	7	A. None	7
15	Sidewalk Width	D. 8 ft - 11 ft 11 in	19	D. 8 ft - 11 ft 11 in	19	C. 5 ft - 7 ft 11 in	13	B. < 5 ft	7
16	Sidewalk Surface Condition	D. No Impediments	24	D. No Impediments	24	D. No Impediments	24	D. No Impediments	24
17	Large Sidewalk Obstructions	E. No Obstructions	15	B. Permanent Obstructions	9	E. No Obstructions	15	E. No Obstructions	15
18	Curb	B. Yes	17	B. Yes	17	B. Yes	17	B. Yes	17
19	Driveway Cuts	B. 1-5	15	C. 5+	5	B. 1-5	15	B. 1-5	15
20	Trees	B. Sporadically Lined	11	C. No Trees	7	B. Sporadically Lined	11	B. Sporadically Lined	11
21	Planters/Gardens	B. Yes	9	A. No	4	A. No	4	B. Yes	9
22	Public Seating	B. Yes	13	A. No	7	A. No	7	B. Yes	13
23	Presence of Buffers	E. 2 of Margin, Parking, Bike	21	E. 2 of Margin, Parking, Bike	21	D. Bike Only	13	E. 2 of Margin, Parking, Bike	21
24	Storefront/Retail Use	A. 0	9	C. 3+	19	A. 0	9	A. 0	9
25	Public Art/Historical Sites	A. No	6	A. No	6	A. No	6	A. No	6
26	Illegal Graffiti	A. Little or No Graffiti	9	A. Little or No Graffiti	9	A. Little or No Graffiti	9	A. Little or No Graffiti	9
27	Litter	B. Yes	5	A. No	10	A. No	10	A. No	10
28	Pedestrian-Scale Street Lighting	C. Yes, Public	20	C. Yes, Public	20	A. No	7	C. Yes, Public	20
29	Construction Sites	A. No	13	A. No	13	A. No	13	A. No	13
30	Abandoned Buildings	A. No	13	A. No	13	A. No	13	A. No	13
31	Vacant Lots	A. No	13	A. No	13	A. No	13	A. No	13
32	Bike Racks	A. No	5	A. No	5	A. No	5	A. No	5
33	Visually Attractive	B. 2 - Agree	15	B. 2 - Agree	15	B. 2 - Agree	15	B. 2 - Agree	15
34	Feels Safe	A. 1 - Strongly Agree	20	B. 2 - Agree	15	B. 2 - Agree	15	B. 2 - Agree	15
35	Strong Odors	B. 2 - A Little Odor	15	B. 2 - A Little Odor	15	B. 2 - A Little Odor	15	B. 2 - A Little Odor	15
36	Noise Level	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15	B. 2 - A Little Noise	15
37	Walkability	H. 8	15	G. 7	13	G. 7	13	G. 7	13
	Weighted Sum		**360**		**337**		**335**		**361**
	Final Score		**67.50788644**		**60.25236593**		**59.6214511**		**67.82334385**
	Modal Priority Score		**1**		**1**		**2**		**1**

PEQI INTERSECTION AND STREET SCORES

	0-20	Environment not suitable for pedestrians
	21-40	Poor pedestrian conditions exist
	41-60	Basic pedestrian conditions exist
	61-80	Reasonable pedestrian conditions exist
	81-100	Ideal pedestrian conditions exist

Source: Walkability & Pedestrian Safety in Boyle Heights (posted to NACTO website)

APPENDIX C

MULTIMODAL ANALYSIS

BICYCLE LTS

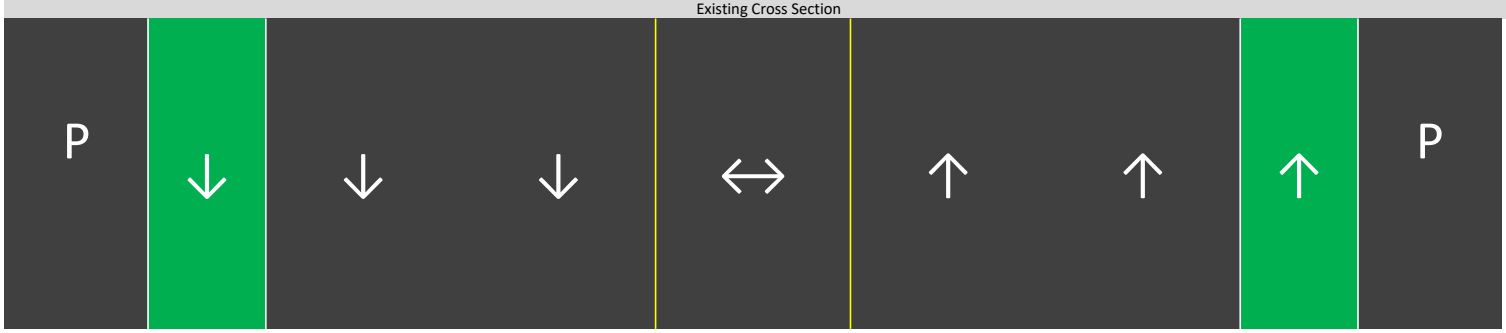
Existing Bike LTS: Fort Weaver Rd from North Rd to Papipi Rd

Level of Traffic Stress Assessment - Existing Street Configuration

Road name:	FORT WEAVER ROAD
From:	North Rd/Komopelekane Rd
To:	Papipi St

Curb to curb width (ft)	84
Existing stress in ↓ direction	LTS 3
Existing stress in ↑ direction	LTS 3

Existing Cross Section



Lane width (ft)	8	6.5	11	11	11	11	11	6.5	8
Lane type	Parking lane	Bike lane	Vehicle lane	Vehicle lane	TWLTL	Vehicle lane	Vehicle lane	Bike lane	Parking lane
Direction		↓	↓	↓		↑	↑	↑	

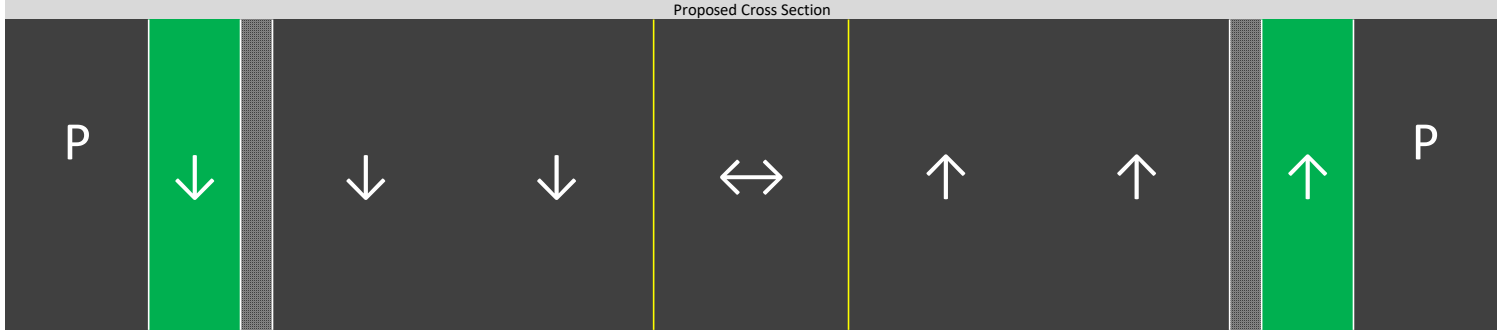
Prevailing speed	25
Marked centerline	Yes
AADT	18500

FY 2032 Bike LTS: Fort Weaver Rd from North Rd to Papipi Rd

Level of Traffic Stress Assessment - Proposed Street Configuration

Road name:	FORT WEAVER ROAD
From:	North Rd/Komopelekane Rd
To:	Papipi St
Alternative Name/Number:	Enter Alternative Name/Number
Curb to curb width (ft)	75
Proposed stress in ↓ direction	LTS 2
Proposed stress in ↑ direction	LTS 2

Proposed Cross Section



Lane width (ft)	8	5	1.5	10.5	11	11	11	10.5	1.5	5	8
Lane type	Parking lane	Bike lane	ed b	Vehicle lane	Vehicle lane	TWLTL	Vehicle lane	Vehicle lane	ed b	Bike lane	Parking lane
Direction		↓		↓	↓		↑	↑		↑	

Speed limit	20
Marked centerline	Yes
AADT	20211

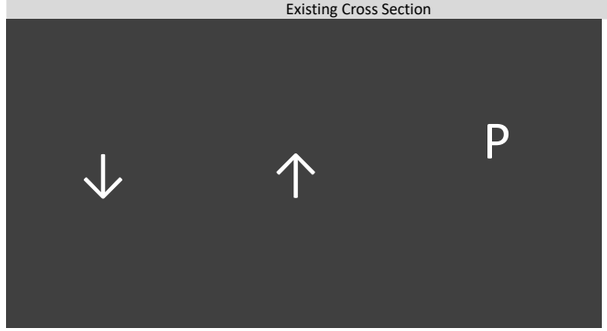
Existing and FY 2032 Bike LTS: North Rd from Fort Weaver Rd to Kilaha St

Level of Traffic Stress Assessment - Existing Street Configuration

R NORTH RD
F Fort Weaver Rd
T Kilaha St

Curb to curb width (ft)	34
Existing stress in ↓ direction	LTS 3
Existing stress in ↑ direction	LTS 3

Existing Cross Section



Lane width (ft)	11	11	12	
Lane type	Vehicle lane	Vehicle lane	Parking lane	
Direction	↓	↑		

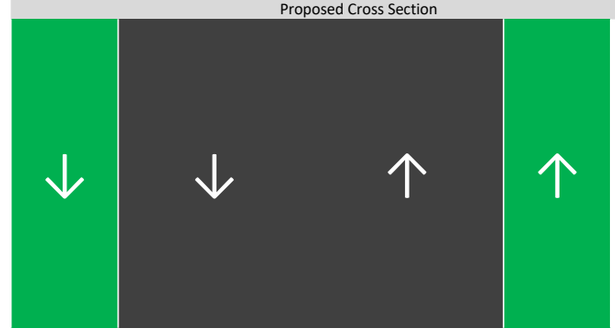
Prevailing speed	25
Marked centerline	Yes
AADT	4900

Level of Traffic Stress Assessment - Proposed Street Configuration

Road name:	NORTH RD
From:	Fort Weaver Rd
To:	Kilaha St
Alternative Na	Enter Alternative Name/N

Curb to curb width (ft)	34
Proposed stress in ↓ direction	LTS 1
Proposed stress in ↑ direction	LTS 1

Proposed Cross Section



Lane width (ft)	6	11	11	6
Lane type	Bike lane	Vehicle lane	Vehicle lane	Bike lane
Direction	↓	↓	↑	↑

Speed limit	20
Marked centerline	Yes
AADT	4966

APPENDIX C

MULTIMODAL ANALYSIS

TRANSIT LOS

Existing TCQSM Analysis

Multimodal Transit LOS Calculation

	Street Name:	Fort Weaver Rd North Rd/Kimopelekane	Fort Weaver Rd	North Rd	North Rd
	Cross Street 1	Rd	Papipi Rd North Rd/Kimopelekane	Fort Weaver Rd	Kilaha St
	Cross Street 2	Papipi Rd	Rd	Kilaha St	Fort Weaver Rd
	Direction of Traffic:	NB	SB	EB	WB

Inputs		**1**	**2**	**3**	**4**
	TRANSIT OPERATIONS INFORMATION	op 1089 + 1091 + 42	Stop 1804 + 1805	None	Stop 1087 + 1088
	Number of local buses on street segment per hour (bus/h)	6	2		6
	Number of express buses stopping in segment per hour (bus/h)	6	0		7
t_{ex}	Average excess wait time (min)	6.7	2.3		3.7
L_f	Average passenger load factor (p/seat)	0.1	0.1		0.2
S	Average transit travel speed (mi/h)	16.3	7.0		12.1
l_{pt}	Average passenger trip length (mi)	8.0	3.7		7.4
	Is the segment in the CBD of a metro area of 5 million or more?	No	No		No
	TRANSIT AMENITY DATA				
p_{sh}	Percent stops in segment with a shelter	67%	50%		100%
p_{be}	Percent stops in segment with a bench	67%	0%		100%
	PEDESTRIAN ENVIRONMENT DATA				
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	10.0	8.0		4.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0		4.0
	Does a continuous barrier exist between the street and sidewalk?	No	No		No
	Is the street divided?	No	No		No
	Are parking spaces striped?	No	No		No
p_{pk}	Proportion of on-street parking occupied	9%	93%		0%
W_{bl}	Bicycle lane width (ft)	6.5	6.5		0.0
W_{os}	Shoulder/parking lane width (ft)	8.0	8.0		0.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	11.0	11.0		11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	319	193		296
S_R	Average vehicle running speed, including intersection delay (mi/h)	33.0	33.0		28.0

Calculations					
f	Transit frequency (bus/h)	12	2	0	13
f_h	Headway factor	3.55	1.95	0.00	3.58
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.1	0.2	#DIV/0!	0.2
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	0.8	0.6	#DIV/0!	0.5
T_{ptt}	Perceived travel time rate (min/mi)	5.2	9.6	#DIV/0!	5.8
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.90	0.72	#DIV/0!	0.87
$s_{w\text{-}r}$	Transit wait-ride score	3.19	1.40	#DIV/0!	3.10
f_s	Motorized vehicle speed adjustment factor	0.44	0.44	0.00	0.31
f_v	Motorized vehicle volume adjustment factor	0.73	0.44	0.00	0.67
W_{aA}	Adjusted available sidewalk width (ft)	10.0	8.0	10.0	4.0
f_{sw}	Sidewalk width coefficient	3.00	3.60	3.00	4.80
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	17.5	17.5	0.0	11.0
W_v	Effective total width as a function of traffic volume (ft)	17.5	17.5	0.0	11.0
W_1	Effective width of combined bike lane and shoulder (ft)	14.5	10.0	0.0	0.0
f_w	Cross-section adjustment factor	-5.01	-5.63	-4.18	-4.34
I_p	Pedestrian environment score	2.20	1.30	1.87	2.70
	Pedestrian LOS	B	A	A	B
I_t	Transit LOS score	1.54	4.10	#DIV/0!	1.75

Output					
	Transit LOS	***A***	***D***	***#DIV/0!***	***A***

FY 2032 TCQSM Analysis

Multimodal Transit LOS Calculation

	Street Name:	Fort Weaver Rd North Rd/Kimopelekane	Fort Weaver Rd	North Rd	North Rd
	Cross Street 1	Rd	Papipi Rd North Rd/Kimopelekane	Fort Weaver Rd	Kilaha St
	Cross Street 2	Papipi Rd	Rd	Kilaha St	Fort Weaver Rd
	Direction of Traffic:	NB	SB	EB	WB

Inputs		**1**	**2**	**3**	**4**
	TRANSIT OPERATIONS INFORMATION	op 1089 + 1091 + 42	Stop 1804 + 1805	None	Stop 1087 + 1088
	Number of local buses on street segment per hour (bus/h)	13	5		13
	Number of express buses stopping in segment per hour (bus/h)	6	0		7
t_{ex}	Average excess wait time (min)	6.7	2.3		3.7
L_f	Average passenger load factor (p/seat)	0.1	0.1		0.2
S	Average transit travel speed (mi/h)	16.3	7.0		12.1
l_{pt}	Average passenger trip length (mi)	8.0	3.7		7.4
	Is the segment in the CBD of a metro area of 5 million or more?	No	No		No
	TRANSIT AMENITY DATA				
p_{sh}	Percent stops in segment with a shelter	67%	50%		100%
p_{be}	Percent stops in segment with a bench	67%	0%		100%
	PEDESTRIAN ENVIRONMENT DATA				
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	10.0	8.0		4.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0		4.0
	Does a continuous barrier exist between the street and sidewalk?	No	No		No
	Is the street divided?	No	No		No
	Are parking spaces striped?	No	No		No
p_{pk}	Proportion of on-street parking occupied	91%	93%		0%
W_{bl}	Bicycle lane width (ft)	7.0	7.0		6.0
W_{os}	Shoulder/parking lane width (ft)	8.0	8.0		0.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	10.5	10.5		11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	370	221		319
S_R	Average vehicle running speed, including intersection delay (mi/h)	20.0	20.0		20.0

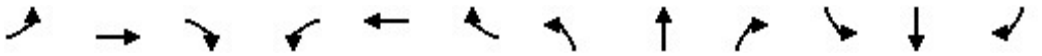
Calculations					
f	Transit frequency (bus/h)	19	5	0	20
f_h	Headway factor	3.71	3.00	0.00	3.72
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.1	0.2	#DIV/0!	0.2
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	0.8	0.6	#DIV/0!	0.5
T_{ptt}	Perceived travel time rate (min/mi)	5.2	9.6	#DIV/0!	5.8
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.90	0.72	#DIV/0!	0.87
$s_{w\text{-}r}$	Transit wait-ride score	3.33	2.15	#DIV/0!	3.22
f_s	Motorized vehicle speed adjustment factor	0.16	0.16	0.00	0.16
f_v	Motorized vehicle volume adjustment factor	0.84	0.50	0.00	0.73
W_{aA}	Adjusted available sidewalk width (ft)	10.0	8.0	10.0	4.0
f_{sw}	Sidewalk width coefficient	3.00	3.60	3.00	4.80
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	17.5	17.5	11.0	17.0
W_v	Effective total width as a function of traffic volume (ft)	17.5	17.5	22.0	17.0
W_1	Effective width of combined bike lane and shoulder (ft)	10.0	10.0	0.0	6.0
f_w	Cross-section adjustment factor	-5.63	-5.63	-4.85	-4.62
I_p	Pedestrian environment score	1.42	1.08	1.20	2.31
	Pedestrian LOS	A	A	A	B
I_t	Transit LOS score	1.21	2.94	#DIV/0!	1.51

Output					
	Transit LOS	***A***	***C***	***#DIV/0!***	***A***

APPENDIX C

MULTIMODAL ANALYSIS

VEHICLE LOS



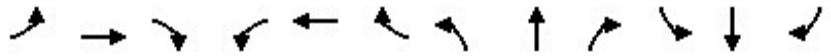
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	0	79	1	0	1	81	401	0	0	291	88
Future Volume (veh/h)	103	0	79	1	0	1	81	401	0	0	291	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		1.00	0.97		0.96	0.98		1.00	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	128	0	0	1	0	1	88	436	0	0	316	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1048	490	0	283	38	195	526	1709	0	168	1025	419
Arrive On Green	0.26	0.00	0.00	0.26	0.00	0.26	0.08	0.48	0.00	0.00	0.29	0.29
Sat Flow, veh/h	2714	1870	0	598	147	745	1781	3647	0	953	3554	1454
Grp Volume(v), veh/h	128	0	0	2	0	0	88	436	0	0	316	26
Grp Sat Flow(s),veh/h/ln	1357	1870	0	1490	0	0	1781	1777	0	953	1777	1454
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.0	0.0	1.3	3.1	0.0	0.0	3.0	0.6
Cycle Q Clear(g_c), s	1.6	0.0	0.0	0.0	0.0	0.0	1.3	3.1	0.0	0.0	3.0	0.6
Prop In Lane	1.00		0.00	0.50		0.50	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1048	490	0	516	0	0	526	1709	0	168	1025	419
V/C Ratio(X)	0.12	0.00	0.00	0.00	0.00	0.00	0.17	0.26	0.00	0.00	0.31	0.06
Avail Cap(c_a), veh/h	2557	1530	0	1323	0	0	1016	8639	0	1764	6977	2854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	0.0	11.7	0.0	0.0	8.1	6.6	0.0	0.0	11.9	11.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.0	0.0	1.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	0.0	0.0	11.7	0.0	0.0	8.3	6.6	0.0	0.0	12.1	11.1
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	B	B
Approach Vol, veh/h		128			2			524			342	
Approach Delay, s/veh		12.3			11.7			6.9			12.0	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		26.6		16.2	8.2	18.3		16.2				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		104.0		35.0	15.0	84.0		35.0				
Max Q Clear Time (g_c+I1), s		5.1		3.6	3.3	5.0		2.0				
Green Ext Time (p_c), s		3.3		0.4	0.1	2.4		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	9.4	
HCM 6th LOS	A	

Notes

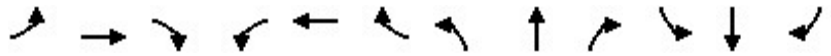
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	3	3	6	1	44	0	430	9	74	265	6
Future Volume (veh/h)	9	3	3	6	1	44	0	430	9	74	265	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.93	0.95		0.97	1.00		0.94	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	3	1	7	1	6	0	467	3	80	288	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	364	98	25	259	63	148	527	1167	490	500	1831	778
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.00	0.33	0.33	0.07	0.52	0.52
Sat Flow, veh/h	958	423	106	584	273	643	1781	3554	1493	1781	3554	1510
Grp Volume(v), veh/h	14	0	0	14	0	0	0	467	3	80	288	4
Grp Sat Flow(s),veh/h/ln	1487	0	0	1499	0	0	1781	1777	1493	1781	1777	1510
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.1	1.1	1.9	0.1
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.3	0.0	0.0	0.0	4.4	0.1	1.1	1.9	0.1
Prop In Lane	0.71		0.07	0.50		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	486	0	0	471	0	0	527	1167	490	500	1831	778
V/C Ratio(X)	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.40	0.01	0.16	0.16	0.01
Avail Cap(c_a), veh/h	1327	0	0	1307	0	0	935	7715	3240	1607	9356	3976
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	0.0	12.9	0.0	0.0	0.0	11.2	9.8	7.5	5.5	5.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.4	0.0	0.3	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	0.0	0.0	12.9	0.0	0.0	0.0	11.5	9.8	7.6	5.6	5.1
LnGrp LOS	B	A	A	B	A	A	A	B	A	A	A	A
Approach Vol, veh/h		14			14			470			372	
Approach Delay, s/veh		12.9			12.9			11.5			6.0	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	20.2		15.0	0.0	28.3		15.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	3.1	6.4		2.3	0.0	3.9		2.3
Green Ext Time (p_c), s	0.2	3.6		0.0	0.0	2.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	7	3	1	17	240	2	169	18	366	122	19
Future Volume (veh/h)	7	7	3	1	17	240	2	169	18	366	122	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.96	0.97		0.97	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	8	1	1	18	19	2	184	11	398	133	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	110	98	10	34	201	168	888	2375	1028	988	2683	1162
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.00	0.67	0.67	0.09	0.75	0.75
Sat Flow, veh/h	608	903	94	22	1840	1541	1781	3554	1539	1781	3554	1539
Grp Volume(v), veh/h	17	0	0	19	0	19	2	184	11	398	133	14
Grp Sat Flow(s),veh/h/ln	1606	0	0	1862	0	1541	1781	1777	1539	1781	1777	1539
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.3	0.0	2.2	0.3	7.8	1.1	0.3
Cycle Q Clear(g_c), s	1.0	0.0	0.0	1.1	0.0	1.3	0.0	2.2	0.3	7.8	1.1	0.3
Prop In Lane	0.47		0.06	0.05		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	219	0	0	235	0	168	888	2375	1028	988	2683	1162
V/C Ratio(X)	0.08	0.00	0.00	0.08	0.00	0.11	0.00	0.08	0.01	0.40	0.05	0.01
Avail Cap(c_a), veh/h	503	0	0	570	0	450	1032	2375	1028	1125	2683	1162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	0.0	0.0	48.1	0.0	48.2	6.5	7.0	6.7	4.0	3.7	3.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.5	0.0	0.5	0.0	0.8	0.1	2.4	0.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	0.0	48.3	0.0	48.5	6.5	7.0	6.7	4.3	3.8	3.7
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		17			38			197			545	
Approach Delay, s/veh		48.2			48.4			7.0			4.2	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.7	86.2		18.1	5.3	96.6		18.1
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.0	49.0		35.0	10.0	59.0		35.0
Max Q Clear Time (g_c+I1), s	9.8	4.2		3.0	2.0	3.1		3.3
Green Ext Time (p_c), s	0.9	1.3		0.0	0.0	1.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A

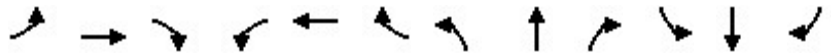
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	6	107	23	12	133	9	22	10	12	0	0	0
Future Vol, veh/h	6	107	23	12	133	9	22	10	12	0	0	0
Conflicting Peds, #/hr	21	0	3	3	0	21	31	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	116	25	13	145	10	24	11	13	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	176	0	0	144	0	0	353	348	132
Stage 1	-	-	-	-	-	-	146	146	-
Stage 2	-	-	-	-	-	-	207	202	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1400	-	-	1438	-	-	645	576	917
Stage 1	-	-	-	-	-	-	881	776	-
Stage 2	-	-	-	-	-	-	828	734	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1400	-	-	1434	-	-	615	0	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	615	0	-
Stage 1	-	-	-	-	-	-	874	0	-
Stage 2	-	-	-	-	-	-	796	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0.6	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	695	1400	-	-	1434	-	-
HCM Lane V/C Ratio	0.069	0.005	-	-	0.009	-	-
HCM Control Delay (s)	10.6	7.6	0	-	7.5	0	-
HCM Lane LOS	B	A	A	-	A	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-



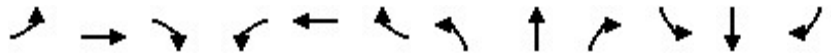
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	0	151	0	0	2	81	404	0	0	514	155
Future Volume (veh/h)	113	0	151	0	0	2	81	404	0	0	514	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	1.00		0.97	0.99		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	62	35	0	0	1	88	439	0	0	559	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	302	171	0	0	420	439	1810	0	143	1208	508
Arrive On Green	0.27	0.27	0.27	0.00	0.00	0.27	0.07	0.51	0.00	0.00	0.34	0.34
Sat Flow, veh/h	1377	1110	627	0	0	1541	1781	3647	0	950	3554	1495
Grp Volume(v), veh/h	79	0	97	0	0	1	88	439	0	0	559	71
Grp Sat Flow(s),veh/h/ln	1377	0	1737	0	0	1541	1781	1777	0	950	1777	1495
Q Serve(g_s), s	2.2	0.0	2.2	0.0	0.0	0.0	1.4	3.5	0.0	0.0	6.2	1.7
Cycle Q Clear(g_c), s	2.3	0.0	2.2	0.0	0.0	0.0	1.4	3.5	0.0	0.0	6.2	1.7
Prop In Lane	1.00		0.36	0.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	0	473	0	0	420	439	1810	0	143	1208	508
V/C Ratio(X)	0.15	0.00	0.21	0.00	0.00	0.00	0.20	0.24	0.00	0.00	0.46	0.14
Avail Cap(c_a), veh/h	1098	0	1206	0	0	1070	844	7331	0	1403	5921	2490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	0.0	14.1	0.0	0.0	13.4	8.8	6.9	0.0	0.0	13.0	11.5
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.8	0.0	0.0	0.0	0.5	1.0	0.0	0.0	2.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	14.3	0.0	0.0	13.4	9.0	7.0	0.0	0.0	13.3	11.7
LnGrp LOS	B	A	B	A	A	B	A	A	A	A	B	B
Approach Vol, veh/h		176			1			527			630	
Approach Delay, s/veh		14.3			13.4			7.3			13.1	
Approach LOS		B			B			A			B	

Timer - Assigned Phs	2		4	5	6		8					
Phs Duration (G+Y+Rc), s	31.7		18.7	8.5	23.1		18.7					
Change Period (Y+Rc), s	6.0		5.0	5.0	6.0		5.0					
Max Green Setting (Gmax), s	104.0		35.0	15.0	84.0		35.0					
Max Q Clear Time (g_c+I1), s	5.5		4.3	3.4	8.2		2.0					
Green Ext Time (p_c), s	3.3		0.8	0.1	4.7		0.0					

Intersection Summary		
HCM 6th Ctrl Delay		11.0
HCM 6th LOS		B

Notes

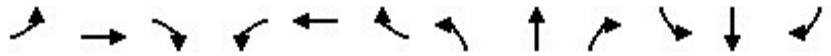
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2	3	9	1	66	4	425	14	54	562	5
Future Volume (veh/h)	10	2	3	9	1	66	4	425	14	54	562	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.97		0.97	0.99		0.95	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	2	1	10	1	6	4	462	6	59	611	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	44	11	243	33	55	452	1215	515	558	1421	607
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.01	0.34	0.34	0.06	0.40	0.40
Sat Flow, veh/h	965	434	108	659	321	534	1781	3554	1505	1781	3554	1517
Grp Volume(v), veh/h	14	0	0	17	0	0	4	462	6	59	611	3
Grp Sat Flow(s),veh/h/ln	1506	0	0	1514	0	0	1781	1777	1505	1781	1777	1517
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.1	0.7	4.1	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.3	0.0	0.0	0.0	3.2	0.1	0.7	4.1	0.0
Prop In Lane	0.79		0.07	0.59		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	0	0	331	0	0	452	1215	515	558	1421	607
V/C Ratio(X)	0.04	0.00	0.00	0.05	0.00	0.00	0.01	0.38	0.01	0.11	0.43	0.00
Avail Cap(c_a), veh/h	1761	0	0	1742	0	0	990	10274	4352	2088	12460	5317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	0.0	13.2	0.0	0.0	7.0	8.1	7.1	6.1	7.1	5.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.8	0.0	0.2	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	0.0	13.3	0.0	0.0	7.0	8.3	7.1	6.2	7.3	5.9
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		14			17			472			673	
Approach Delay, s/veh		13.2			13.3			8.3			7.2	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	17.1		8.3	5.2	19.0		8.3
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	2.2	5.2		2.2	2.0	6.1		2.3
Green Ext Time (p_c), s	0.1	3.6		0.0	0.0	4.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	4	3	5	4	190	0	217	13	312	240	9
Future Volume (veh/h)	10	4	3	5	4	190	0	217	13	312	240	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	4	1	5	4	5	0	236	9	339	261	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	35	6	94	62	102	874	2600	1127	985	2987	1293
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.00	0.73	0.73	0.07	0.84	0.84
Sat Flow, veh/h	908	522	95	704	917	1502	1781	3554	1540	1781	3554	1538
Grp Volume(v), veh/h	16	0	0	9	0	5	0	236	9	339	261	8
Grp Sat Flow(s),veh/h/ln	1525	0	0	1622	0	1502	1781	1777	1540	1781	1777	1538
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.4	0.0	2.3	0.2	5.2	1.5	0.1
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.5	0.0	0.4	0.0	2.3	0.2	5.2	1.5	0.1
Prop In Lane	0.69		0.06	0.56		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	0	0	157	0	102	874	2600	1127	985	2987	1293
V/C Ratio(X)	0.10	0.00	0.00	0.06	0.00	0.05	0.00	0.09	0.01	0.34	0.09	0.01
Avail Cap(c_a), veh/h	486	0	0	507	0	438	1021	2600	1127	1162	2987	1293
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	52.6	0.0	0.0	52.4	0.0	52.3	0.0	4.6	4.3	2.6	1.6	1.5
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.2	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.3	0.0	0.1	0.0	0.8	0.1	1.4	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	0.0	0.0	52.5	0.0	52.5	0.0	4.7	4.4	2.8	1.7	1.5
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		16			14			245			608	
Approach Delay, s/veh		52.9			52.5			4.7			2.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.1	93.8		13.1	0.0	106.9		13.1
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.0	49.0		35.0	10.0	59.0		35.0
Max Q Clear Time (g_c+I1), s	17.2	4.3		3.0	0.0	3.5		2.5
Green Ext Time (p_c), s	0.9	1.7		0.0	0.0	1.9		0.0

Intersection Summary		
HCM 6th Ctrl Delay	4.7	
HCM 6th LOS	A	

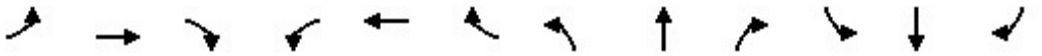
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	0	201	36	21	158	0	14	0	21	0	0	0
Future Vol, veh/h	0	201	36	21	158	0	14	0	21	0	0	0
Conflicting Peds, #/hr	13	0	4	4	0	13	8	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	218	39	23	172	0	15	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	185	0	0	261	0	0	468	473	242
Stage 1	-	-	-	-	-	-	242	242	-
Stage 2	-	-	-	-	-	-	226	231	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1390	-	-	1303	-	-	553	490	797
Stage 1	-	-	-	-	-	-	798	705	-
Stage 2	-	-	-	-	-	-	812	713	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1390	-	-	1298	-	-	535	0	794
Mov Cap-2 Maneuver	-	-	-	-	-	-	535	0	-
Stage 1	-	-	-	-	-	-	795	0	-
Stage 2	-	-	-	-	-	-	790	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	665	1390	-	-	1298	-	-
HCM Lane V/C Ratio	0.057	-	-	-	0.018	-	-
HCM Control Delay (s)	10.7	0	-	-	7.8	0	-
HCM Lane LOS	B	A	-	-	A	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-



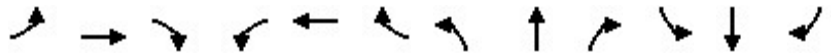
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	1	123	0	0	0	107	477	0	0	463	165
Future Volume (veh/h)	183	1	123	0	0	0	107	477	0	0	463	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		1.00	1.00		1.00	0.98		1.00	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	0	0	0	0	0	116	518	0	0	503	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1150	477	0	0	477	0	487	1891	0	139	1268	522
Arrive On Green	0.25	0.00	0.00	0.00	0.00	0.00	0.08	0.53	0.00	0.00	0.36	0.36
Sat Flow, veh/h	3416	1870	0	0	1870	0	1781	3647	0	883	3554	1463
Grp Volume(v), veh/h	229	0	0	0	0	0	116	518	0	0	503	62
Grp Sat Flow(s),veh/h/ln	1708	1870	0	0	1870	0	1781	1777	0	883	1777	1463
Q Serve(g_s), s	2.8	0.0	0.0	0.0	0.0	0.0	1.9	4.1	0.0	0.0	5.5	1.5
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.0	0.0	0.0	1.9	4.1	0.0	0.0	5.5	1.5
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1150	477	0	0	477	0	487	1891	0	139	1268	522
V/C Ratio(X)	0.20	0.00	0.00	0.00	0.00	0.00	0.24	0.27	0.00	0.00	0.40	0.12
Avail Cap(c_a), veh/h	2593	1267	0	0	1267	0	865	7155	0	1261	5779	2379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	0.0	0.0	0.0	0.0	0.0	8.3	6.6	0.0	0.0	12.4	11.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.0	0.0	0.0	0.6	1.2	0.0	0.0	1.9	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	0.0	0.0	0.0	0.0	0.0	8.5	6.7	0.0	0.0	12.6	11.3
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	B	B
Approach Vol, veh/h		229			0			634			565	
Approach Delay, s/veh		15.5			0.0			7.0			12.5	
Approach LOS		B						A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		33.5		18.2	9.1	24.4		18.2				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		104.0		35.0	15.0	84.0		35.0				
Max Q Clear Time (g_c+I1), s		6.1		4.8	3.9	7.5		0.0				
Green Ext Time (p_c), s		4.0		0.8	0.2	4.1		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			10.5									
HCM 6th LOS			B									

Notes

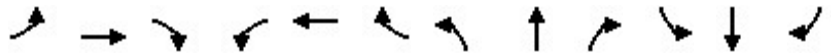
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	2	8	1	85	2	474	5	34	512	5
Future Volume (veh/h)	11	0	2	8	1	85	2	474	5	34	512	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.96		0.96	0.99		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	0	1	9	1	7	2	515	2	37	557	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	8	19	255	56	110	422	1181	505	470	1324	567
Arrive On Green	0.18	0.00	0.18	0.18	0.18	0.18	0.00	0.33	0.33	0.04	0.37	0.37
Sat Flow, veh/h	1248	45	108	568	319	621	1781	3554	1518	1781	3554	1521
Grp Volume(v), veh/h	13	0	0	17	0	0	2	515	2	37	557	3
Grp Sat Flow(s),veh/h/ln	1400	0	0	1508	0	0	1781	1777	1518	1781	1777	1521
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.5	4.2	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.3	0.0	0.0	0.0	4.0	0.0	0.5	4.2	0.0
Prop In Lane	0.92		0.08	0.53		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	0	0	421	0	0	422	1181	505	470	1324	567
V/C Ratio(X)	0.03	0.00	0.00	0.04	0.00	0.00	0.00	0.44	0.00	0.08	0.42	0.01
Avail Cap(c_a), veh/h	1548	0	0	1576	0	0	915	9342	3991	1888	11330	4848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	0.0	12.2	0.0	0.0	8.0	9.3	8.0	7.4	8.3	7.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.2	0.0	0.1	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	0.0	12.3	0.0	0.0	8.0	9.6	8.0	7.4	8.6	7.1
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		13			17			519			597	
Approach Delay, s/veh		12.2			12.3			9.6			8.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	17.9		11.3	5.1	19.3		11.3
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	2.2	6.0		2.2	2.0	6.2		2.3
Green Ext Time (p_c), s	0.1	4.0		0.0	0.0	4.4		0.1

Intersection Summary		
HCM 6th Ctrl Delay	9.1	
HCM 6th LOS	A	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	6	0	6	8	266	2	185	13	302	253	21
Future Volume (veh/h)	10	6	0	6	8	266	2	185	13	302	253	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		0.97	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	7	0	7	9	35	2	201	3	328	275	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	117	0	216	162	194	417	613	264	731	1327	577
Arrive On Green	0.13	0.13	0.00	0.13	0.13	0.13	0.00	0.17	0.17	0.20	0.37	0.37
Sat Flow, veh/h	675	932	0	433	1288	1541	1781	3554	1533	1781	3554	1544
Grp Volume(v), veh/h	18	0	0	16	0	35	2	201	3	328	275	10
Grp Sat Flow(s),veh/h/ln	1606	0	0	1720	0	1541	1781	1777	1533	1781	1777	1544
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.6	0.1	4.1	1.7	0.1
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.2	0.0	0.7	0.0	1.6	0.1	4.1	1.7	0.1
Prop In Lane	0.61		0.00	0.44		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	382	0	0	377	0	194	417	613	264	731	1327	577
V/C Ratio(X)	0.05	0.00	0.00	0.04	0.00	0.18	0.00	0.33	0.01	0.45	0.21	0.02
Avail Cap(c_a), veh/h	1837	0	0	1943	0	1679	966	4868	2100	1477	5974	2596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	0.0	12.4	0.0	12.6	10.9	11.7	11.0	6.5	6.8	6.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.0	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.5	0.0	0.9	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	0.0	12.4	0.0	13.0	10.9	12.0	11.0	6.9	6.9	6.4
LnGrp LOS	B	A	A	B	A	B	B	B	B	A	A	A
Approach Vol, veh/h		18			51			206			613	
Approach Delay, s/veh		12.4			12.8			11.9			6.9	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	11.5		9.0	5.1	18.0		9.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.0	44.0		35.0	10.0	54.0		35.0
Max Q Clear Time (g_c+I1), s	6.1	3.6		2.3	2.0	3.7		2.7
Green Ext Time (p_c), s	0.8	1.4		0.1	0.0	2.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

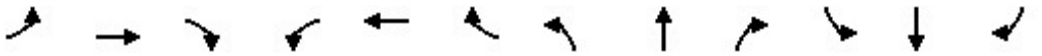
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	1	184	29	21	153	4	16	1	15	0	0	0
Future Vol, veh/h	1	184	29	21	153	4	16	1	15	0	0	0
Conflicting Peds, #/hr	16	0	0	0	0	16	8	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	200	32	23	166	4	17	1	16	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	186	0	0	232	0	0	440	450	216
Stage 1	-	-	-	-	-	-	218	218	-
Stage 2	-	-	-	-	-	-	222	232	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1388	-	-	1336	-	-	574	504	824
Stage 1	-	-	-	-	-	-	818	723	-
Stage 2	-	-	-	-	-	-	815	713	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1388	-	-	1336	-	-	558	0	824
Mov Cap-2 Maneuver	-	-	-	-	-	-	558	0	-
Stage 1	-	-	-	-	-	-	817	0	-
Stage 2	-	-	-	-	-	-	794	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	661	1388	-	-	1336	-	-
HCM Lane V/C Ratio	0.053	0.001	-	-	0.017	-	-
HCM Control Delay (s)	10.7	7.6	0	-	7.7	0	-
HCM Lane LOS	B	A	A	-	A	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-



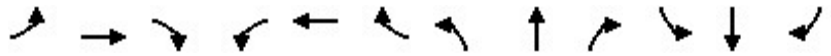
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	0	86	1	0	1	88	456	0	0	339	96
Future Volume (veh/h)	112	0	86	1	0	1	88	456	0	0	339	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		1.00	0.97		0.96	0.98		1.00	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	0	0	1	0	1	96	496	0	0	368	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1065	526	0	287	35	208	504	1727	0	152	1082	439
Arrive On Green	0.28	0.00	0.00	0.28	0.00	0.28	0.08	0.49	0.00	0.00	0.30	0.30
Sat Flow, veh/h	2702	1870	0	615	125	740	1781	3647	0	901	3554	1443
Grp Volume(v), veh/h	141	0	0	2	0	0	96	496	0	0	368	29
Grp Sat Flow(s),veh/h/ln	1351	1870	0	1480	0	0	1781	1777	0	901	1777	1443
Q Serve(g_s), s	1.8	0.0	0.0	0.0	0.0	0.0	1.6	3.9	0.0	0.0	3.8	0.7
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.0	1.6	3.9	0.0	0.0	3.8	0.7
Prop In Lane	1.00		0.00	0.50		0.50	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1065	526	0	530	0	0	504	1727	0	152	1082	439
V/C Ratio(X)	0.13	0.00	0.00	0.00	0.00	0.00	0.19	0.29	0.00	0.00	0.34	0.07
Avail Cap(c_a), veh/h	2308	1386	0	1195	0	0	935	7825	0	1481	6320	2567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	0.0	12.2	0.0	0.0	8.7	7.2	0.0	0.0	12.7	11.7
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.0	0.0	0.0	0.5	1.1	0.0	0.0	1.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	0.0	0.0	12.2	0.0	0.0	8.9	7.3	0.0	0.0	12.9	11.7
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	B	B
Approach Vol, veh/h		141			2			592			397	
Approach Delay, s/veh		12.9			12.2			7.6			12.8	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		29.0		18.3	8.6	20.4		18.3				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		104.0		35.0	15.0	84.0		35.0				
Max Q Clear Time (g_c+I1), s		5.9		3.9	3.6	5.8		2.0				
Green Ext Time (p_c), s		3.8		0.5	0.1	2.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	10.1	
HCM 6th LOS	B	

Notes

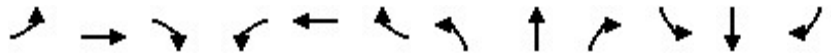
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	3	7	1	52	0	479	11	88	297	6
Future Volume (veh/h)	9	4	3	7	1	52	0	479	11	88	297	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.92	0.95		0.97	1.00		0.94	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	4	1	8	1	6	0	521	4	96	323	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	127	26	281	58	150	511	1208	504	478	1842	778
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.34	0.34	0.07	0.52	0.52
Sat Flow, veh/h	904	501	100	658	228	591	1781	3554	1483	1781	3554	1502
Grp Volume(v), veh/h	15	0	0	15	0	0	0	521	4	96	323	4
Grp Sat Flow(s),veh/h/ln	1506	0	0	1476	0	0	1781	1777	1483	1781	1777	1502
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.1	1.5	2.3	0.1
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.3	0.0	0.0	0.0	5.5	0.1	1.5	2.3	0.1
Prop In Lane	0.67		0.07	0.53		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	0	0	489	0	0	511	1208	504	478	1842	778
V/C Ratio(X)	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.43	0.01	0.20	0.18	0.01
Avail Cap(c_a), veh/h	1201	0	0	1165	0	0	876	6913	2885	1451	8384	3543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	0.0	13.6	0.0	0.0	0.0	12.3	10.6	8.2	6.2	5.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.9	0.0	0.5	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	0.0	0.0	13.6	0.0	0.0	0.0	12.6	10.6	8.4	6.2	5.6
LnGrp LOS	B	A	A	B	A	A	A	B	B	A	A	A
Approach Vol, veh/h		15			15			525			423	
Approach Delay, s/veh		13.6			13.6			12.6			6.7	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	22.4		17.3	0.0	31.0		17.3
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	3.5	7.5		2.3	0.0	4.3		2.3
Green Ext Time (p_c), s	0.2	4.1		0.0	0.0	2.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	7	3	1	18	259	2	184	19	382	132	19
Future Volume (veh/h)	7	7	3	1	18	259	2	184	19	382	132	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.96	0.97		0.97	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	8	1	1	20	21	2	200	12	415	143	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	107	11	34	224	187	855	2303	996	962	2638	1141
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.00	0.65	0.65	0.10	0.74	0.74
Sat Flow, veh/h	619	884	94	18	1845	1538	1781	3554	1536	1781	3554	1537
Grp Volume(v), veh/h	17	0	0	21	0	21	2	200	12	415	143	14
Grp Sat Flow(s),veh/h/ln	1597	0	0	1864	0	1538	1781	1777	1536	1781	1777	1537
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.5	0.0	2.5	0.3	8.7	1.3	0.3
Cycle Q Clear(g_c), s	1.0	0.0	0.0	1.2	0.0	1.5	0.0	2.5	0.3	8.7	1.3	0.3
Prop In Lane	0.47		0.06	0.05		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	0	0	258	0	187	855	2303	996	962	2638	1141
V/C Ratio(X)	0.07	0.00	0.00	0.08	0.00	0.11	0.00	0.09	0.01	0.43	0.05	0.01
Avail Cap(c_a), veh/h	502	0	0	571	0	449	999	2303	996	1086	2638	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	0.0	0.0	46.8	0.0	46.9	7.3	7.9	7.5	4.6	4.1	4.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.6	0.0	0.6	0.0	1.0	0.1	2.8	0.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	0.0	0.0	47.0	0.0	47.2	7.3	7.9	7.5	4.9	4.2	4.0
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		17			42			214			572	
Approach Delay, s/veh		46.9			47.1			7.9			4.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.6	83.8		19.6	5.3	95.1		19.6
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.6	49.0		35.0	10.0	59.0		35.0
Max Q Clear Time (g_c+I1), s	10.7	4.5		3.0	2.0	3.3		3.5
Green Ext Time (p_c), s	1.0	1.4		0.0	0.0	1.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

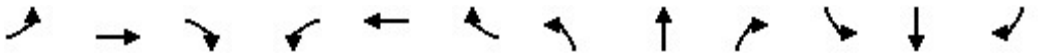
Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	58	125	23	12	118	31	22	12	12	0	0	0
Future Vol, veh/h	58	125	23	12	118	31	22	12	12	0	0	0
Conflicting Peds, #/hr	25	0	4	4	0	25	37	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	136	25	13	128	34	24	13	13	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	187	0	0	165	0	0	487	492	153
Stage 1	-	-	-	-	-	-	279	279	-
Stage 2	-	-	-	-	-	-	208	213	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1387	-	-	1413	-	-	540	478	893
Stage 1	-	-	-	-	-	-	768	680	-
Stage 2	-	-	-	-	-	-	827	726	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1387	-	-	1408	-	-	488	0	890
Mov Cap-2 Maneuver	-	-	-	-	-	-	488	0	-
Stage 1	-	-	-	-	-	-	727	0	-
Stage 2	-	-	-	-	-	-	790	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.2	0.6	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	581	1387	-	-	1408	-	-
HCM Lane V/C Ratio	0.086	0.045	-	-	0.009	-	-
HCM Control Delay (s)	11.8	7.7	0	-	7.6	0	-
HCM Lane LOS	B	A	A	-	A	A	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-



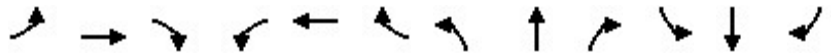
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	0	164	0	0	2	88	450	0	0	565	169
Future Volume (veh/h)	123	0	164	0	0	2	88	450	0	0	565	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	1.00		0.97	0.99		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	67	38	0	0	1	96	489	0	0	614	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	534	327	185	0	0	453	409	1805	0	129	1240	518
Arrive On Green	0.30	0.30	0.30	0.00	0.00	0.30	0.07	0.51	0.00	0.00	0.35	0.35
Sat Flow, veh/h	1373	1107	628	0	0	1537	1781	3647	0	907	3554	1485
Grp Volume(v), veh/h	86	0	105	0	0	1	96	489	0	0	614	87
Grp Sat Flow(s),veh/h/ln	1373	0	1734	0	0	1537	1781	1777	0	907	1777	1485
Q Serve(g_s), s	2.6	0.0	2.5	0.0	0.0	0.0	1.7	4.4	0.0	0.0	7.6	2.3
Cycle Q Clear(g_c), s	2.7	0.0	2.5	0.0	0.0	0.0	1.7	4.4	0.0	0.0	7.6	2.3
Prop In Lane	1.00		0.36	0.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	534	0	512	0	0	454	409	1805	0	129	1240	518
V/C Ratio(X)	0.16	0.00	0.21	0.00	0.00	0.00	0.23	0.27	0.00	0.00	0.50	0.17
Avail Cap(c_a), veh/h	989	0	1087	0	0	964	765	6622	0	1178	5348	2235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	14.8	0.0	0.0	13.9	9.7	7.8	0.0	0.0	14.3	12.6
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.9	0.0	0.0	0.0	0.6	1.4	0.0	0.0	2.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.0	0.0	15.0	0.0	0.0	13.9	10.0	7.9	0.0	0.0	14.6	12.7
LnGrp LOS	B	A	B	A	A	B	B	A	A	A	B	B
Approach Vol, veh/h		191			1			585			701	
Approach Delay, s/veh		15.0			13.9			8.3			14.4	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		34.3		21.5	8.9	25.5		21.5				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		104.0		35.0	15.0	84.0		35.0				
Max Q Clear Time (g_c+I1), s		6.4		4.7	3.7	9.6		2.0				
Green Ext Time (p_c), s		3.8		0.8	0.1	5.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

Notes

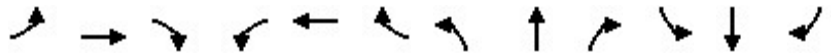
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2	3	11	1	78	4	461	17	64	607	5
Future Volume (veh/h)	10	2	3	11	1	78	4	461	17	64	607	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.97		0.97	0.99		0.95	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	2	1	12	1	8	4	501	7	70	660	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	46	12	229	42	67	437	1264	533	553	1496	636
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.01	0.36	0.36	0.07	0.42	0.42
Sat Flow, veh/h	986	403	107	579	368	583	1781	3554	1499	1781	3554	1511
Grp Volume(v), veh/h	14	0	0	21	0	0	4	501	7	70	660	3
Grp Sat Flow(s),veh/h/ln	1495	0	0	1530	0	0	1781	1777	1499	1781	1777	1511
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.7	0.1	0.8	4.6	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.4	0.0	0.0	0.1	3.7	0.1	0.8	4.6	0.0
Prop In Lane	0.79		0.07	0.57		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	356	0	0	337	0	0	437	1264	533	553	1496	636
V/C Ratio(X)	0.04	0.00	0.00	0.06	0.00	0.00	0.01	0.40	0.01	0.13	0.44	0.00
Avail Cap(c_a), veh/h	1640	0	0	1625	0	0	939	9587	4044	1961	11627	4945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	0.0	0.0	13.8	0.0	0.0	7.2	8.4	7.3	6.2	7.2	5.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.0	0.0	0.2	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	0.0	13.9	0.0	0.0	7.2	8.6	7.3	6.3	7.4	5.9
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		14			21			512			733	
Approach Delay, s/veh		13.8			13.9			8.6			7.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	18.4		9.0	5.2	20.7		9.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	2.2	5.7		2.2	2.1	6.6		2.4
Green Ext Time (p_c), s	0.2	3.9		0.0	0.0	5.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	4	3	5	4	195	0	237	13	317	260	9
Future Volume (veh/h)	10	4	3	5	4	195	0	237	13	317	260	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		1.00	0.98		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	4	0	5	4	5	0	258	9	345	283	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	38	0	100	67	112	847	2565	1110	960	2962	1280
Arrive On Green	0.07	0.07	0.00	0.07	0.07	0.07	0.00	0.72	0.72	0.07	0.83	0.83
Sat Flow, veh/h	997	513	0	717	898	1497	1781	3554	1538	1781	3554	1536
Grp Volume(v), veh/h	15	0	0	9	0	5	0	258	9	345	283	8
Grp Sat Flow(s),veh/h/ln	1510	0	0	1616	0	1497	1781	1777	1538	1781	1777	1536
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.4	0.0	2.6	0.2	5.5	1.7	0.1
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.5	0.0	0.4	0.0	2.6	0.2	5.5	1.7	0.1
Prop In Lane	0.73		0.00	0.56		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	165	0	0	168	0	112	847	2565	1110	960	2962	1280
V/C Ratio(X)	0.09	0.00	0.00	0.05	0.00	0.04	0.00	0.10	0.01	0.36	0.10	0.01
Avail Cap(c_a), veh/h	486	0	0	506	0	437	994	2565	1110	1132	2962	1280
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	51.8	0.0	0.0	51.6	0.0	51.5	0.0	5.0	4.7	2.9	1.8	1.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.3	0.0	0.1	0.0	0.9	0.1	1.5	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	0.0	51.7	0.0	51.7	0.0	5.1	4.7	3.1	1.9	1.7
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		15			14			267			636	
Approach Delay, s/veh		52.0			51.7			5.1			2.5	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.4	92.6		14.0	0.0	106.0		14.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.0	49.0		35.0	10.0	59.0		35.0
Max Q Clear Time (g_c+I1), s	7.5	4.6		2.9	0.0	3.7		2.5
Green Ext Time (p_c), s	0.9	1.9		0.0	0.0	2.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A

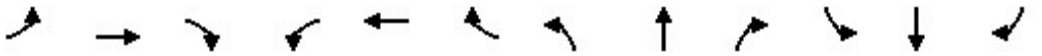
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	10	204	36	21	154	8	14	0	21	0	0	0
Future Vol, veh/h	10	204	36	21	154	8	14	0	21	0	0	0
Conflicting Peds, #/hr	15	0	5	5	0	15	9	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	222	39	23	167	9	15	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	191	0	0	266	0	0	496	506	247
Stage 1	-	-	-	-	-	-	269	269	-
Stage 2	-	-	-	-	-	-	227	237	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1383	-	-	1298	-	-	533	469	792
Stage 1	-	-	-	-	-	-	776	687	-
Stage 2	-	-	-	-	-	-	811	709	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1383	-	-	1292	-	-	511	0	788
Mov Cap-2 Maneuver	-	-	-	-	-	-	511	0	-
Stage 1	-	-	-	-	-	-	765	0	-
Stage 2	-	-	-	-	-	-	788	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0.9	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	648	1383	-	-	1292	-	-
HCM Lane V/C Ratio	0.059	0.008	-	-	0.018	-	-
HCM Control Delay (s)	10.9	7.6	0	-	7.8	0	-
HCM Lane LOS	B	A	A	-	A	A	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-



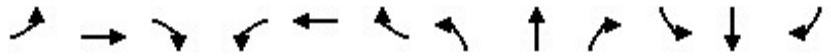
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	1	134	0	0	0	117	549	0	0	513	180
Future Volume (veh/h)	199	1	134	0	0	0	117	549	0	0	513	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		1.00	1.00		1.00	0.98		1.00	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	247	0	0	0	0	0	127	597	0	0	558	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1189	514	0	0	514	0	456	1885	0	128	1297	529
Arrive On Green	0.27	0.00	0.00	0.00	0.00	0.00	0.08	0.53	0.00	0.00	0.37	0.37
Sat Flow, veh/h	3400	1870	0	0	1870	0	1781	3647	0	821	3554	1450
Grp Volume(v), veh/h	247	0	0	0	0	0	127	597	0	0	558	79
Grp Sat Flow(s),veh/h/ln	1700	1870	0	0	1870	0	1781	1777	0	821	1777	1450
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	2.3	5.3	0.0	0.0	6.7	2.1
Cycle Q Clear(g_c), s	3.2	0.0	0.0	0.0	0.0	0.0	2.3	5.3	0.0	0.0	6.7	2.1
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1189	514	0	0	514	0	456	1885	0	128	1297	529
V/C Ratio(X)	0.21	0.00	0.00	0.00	0.00	0.00	0.28	0.32	0.00	0.00	0.43	0.15
Avail Cap(c_a), veh/h	2367	1161	0	0	1161	0	793	6556	0	1051	5295	2161
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	0.0	0.0	0.0	0.0	9.1	7.5	0.0	0.0	13.5	12.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	0.0	0.0	0.0	0.8	1.6	0.0	0.0	2.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	0.0	0.0	0.0	0.0	9.4	7.6	0.0	0.0	13.7	12.1
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	B	B
Approach Vol, veh/h		247			0			724			637	
Approach Delay, s/veh		16.1			0.0			7.9			13.5	
Approach LOS		B						A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		35.9		20.5	9.3	26.6		20.5				
Change Period (Y+Rc), s		6.0		5.0	5.0	6.0		5.0				
Max Green Setting (Gmax), s		104.0		35.0	15.0	84.0		35.0				
Max Q Clear Time (g_c+I1), s		7.3		5.2	4.3	8.7		0.0				
Green Ext Time (p_c), s		4.8		0.8	0.2	4.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

Notes

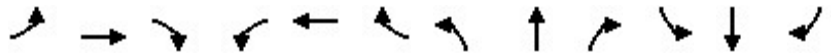
User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	2	9	1	101	2	530	6	40	560	5
Future Volume (veh/h)	11	0	2	9	1	101	2	530	6	40	560	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.95		0.96	0.99		0.95	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	0	1	10	1	12	2	576	3	43	609	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	7	22	221	56	160	399	1229	523	448	1388	592
Arrive On Green	0.20	0.00	0.20	0.20	0.20	0.20	0.00	0.35	0.35	0.05	0.39	0.39
Sat Flow, veh/h	1253	35	107	447	276	789	1781	3554	1514	1781	3554	1517
Grp Volume(v), veh/h	13	0	0	23	0	0	2	576	3	43	609	3
Grp Sat Flow(s),veh/h/ln	1396	0	0	1513	0	0	1781	1777	1514	1781	1777	1517
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.1	0.6	5.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.4	0.0	0.0	0.0	5.0	0.1	0.6	5.0	0.0
Prop In Lane	0.92		0.08	0.43		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	458	0	0	437	0	0	399	1229	523	448	1388	592
V/C Ratio(X)	0.03	0.00	0.00	0.05	0.00	0.00	0.01	0.47	0.01	0.10	0.44	0.01
Avail Cap(c_a), veh/h	1392	0	0	1424	0	0	844	8428	3590	1712	10222	4362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	0.0	12.8	0.0	0.0	8.6	10.1	8.5	7.8	8.9	7.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	1.5	0.0	0.2	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	0.0	12.8	0.0	0.0	8.6	10.4	8.5	7.9	9.1	7.4
LnGrp LOS	B	A	A	B	A	A	A	B	A	A	A	A
Approach Vol, veh/h		13			23			581			655	
Approach Delay, s/veh		12.7			12.8			10.4			9.0	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	19.7		13.0	5.1	21.5		13.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	30.0	94.0		35.0	10.0	114.0		35.0
Max Q Clear Time (g_c+I1), s	2.6	7.0		2.2	2.0	7.0		2.4
Green Ext Time (p_c), s	0.1	4.6		0.0	0.0	4.9		0.1

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	7	0	6	9	289	2	200	13	314	273	21
Future Volume (veh/h)	10	7	0	6	9	289	2	200	13	314	273	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		0.97	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	8	0	7	10	37	2	217	3	341	297	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	133	0	203	185	209	411	639	275	731	1367	593
Arrive On Green	0.14	0.14	0.00	0.14	0.14	0.14	0.00	0.18	0.18	0.21	0.38	0.38
Sat Flow, veh/h	639	978	0	377	1361	1535	1781	3554	1530	1781	3554	1542
Grp Volume(v), veh/h	19	0	0	17	0	37	2	217	3	341	297	11
Grp Sat Flow(s),veh/h/ln	1617	0	0	1739	0	1535	1781	1777	1530	1781	1777	1542
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.8	0.1	4.4	1.9	0.1
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.3	0.0	0.7	0.0	1.8	0.1	4.4	1.9	0.1
Prop In Lane	0.58		0.00	0.41		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	0	0	388	0	209	411	639	275	731	1367	593
V/C Ratio(X)	0.05	0.00	0.00	0.04	0.00	0.18	0.00	0.34	0.01	0.47	0.22	0.02
Avail Cap(c_a), veh/h	1768	0	0	1870	0	1600	936	4658	2005	1422	5716	2481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	0.0	12.6	0.0	12.8	11.2	12.0	11.3	6.7	6.9	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.6	0.0	1.0	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	0.0	12.7	0.0	13.2	11.2	12.3	11.3	7.1	7.0	6.4
LnGrp LOS	B	A	A	B	A	B	B	B	B	A	A	A
Approach Vol, veh/h		19			54			222			649	
Approach Delay, s/veh		12.7			13.1			12.3			7.1	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	12.0		9.6	5.1	18.9		9.6
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		5.0
Max Green Setting (Gmax), s	20.0	44.0		35.0	10.0	54.0		35.0
Max Q Clear Time (g_c+I1), s	6.4	3.8		2.3	2.0	3.9		2.7
Green Ext Time (p_c), s	0.9	1.5		0.1	0.0	2.2		0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	29	193	29	21	148	17	16	1	15	0	0	0
Future Vol, veh/h	29	193	29	21	148	17	16	1	15	0	0	0
Conflicting Peds, #/hr	19	0	0	0	0	19	9	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	210	32	23	161	18	17	1	16	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	198	0	0	242	0	0	515	534	226
Stage 1	-	-	-	-	-	-	290	290	-
Stage 2	-	-	-	-	-	-	225	244	-
Critical Hdwy	4.12	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1375	-	-	1324	-	-	520	452	813
Stage 1	-	-	-	-	-	-	759	672	-
Stage 2	-	-	-	-	-	-	812	704	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1375	-	-	1324	-	-	492	0	813
Mov Cap-2 Maneuver	-	-	-	-	-	-	492	0	-
Stage 1	-	-	-	-	-	-	739	0	-
Stage 2	-	-	-	-	-	-	790	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	608	1375	-	-	1324	-	-
HCM Lane V/C Ratio	0.057	0.023	-	-	0.017	-	-
HCM Control Delay (s)	11.3	7.7	0	-	7.8	0	-
HCM Lane LOS	B	A	A	-	A	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-	-

TRANSPORTATION MANAGEMENT PLAN
JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX FACILITIES AND MASTER PLAN

EWA BEACH, OAHU, HAWAII

DRAFT FINAL

February 22, 2023

Prepared for:

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TRANSPORTAION MANAGEMENT PLAN
JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX FACILITIES AND MASTER PLAN

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TABLE OF CONTENTS

TABLE OF CONTENTS
Cont'd

TABLES

FIGURES

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

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TRANSPORTATION MANAGEMENT PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX FACILITIES AND MASTER PLAN

Ewa Beach, Oahu, Hawaii

1. INTRODUCTION

This Traffic Management Plan (TMP) proposes transportation management strategies to reduce and minimize the traffic impacts resulting from the proposed James Campbell High School Athletic Complex Facilities and Master Plan project (hereinafter referred to as the "Project") located in Ewa Beach, Oahu, Hawaii.

1.1 Project Description

The Project site is located in Ewa Beach, within the James Campbell High School (JCHS) campus. The following master plan improvements are proposed with the Project:

- Phase 1 – Baseball/sofball field renovations with construction of a new small parking area (access via Kuhina Street), multi-purpose field replacement, and construction of a new track and field throwing pit.

- Phase 2 – Relocation of portable buildings 3 and 4, construction of new internal bus circulation road (entry via existing Fort Weaver Road driveway and exit via existing parking lot driveways along North Road), Ilima Intermediate School play court replacement, demolition of the existing field building, construction of new 3,000-seat homefield bleachers with press box and locker room facilities located beneath bleachers, construction of a new ticket booth/concession stand building, and construction of a new storage and bathroom building.

- Phase 3 – Construction of a new 3-story parking garage, multipurpose building, additional play courts, and 650-seat visitors' bleachers.

- Future Phases – Demolition of Building A and N and portable buildings 5-12 and 17-19, construction of new 2-story administration building, 3-story classroom building, and 2-story STEM Academy Building, and expansion of the existing parking lot.

It is our understanding that funding has been secured for the Phase 1 master plan improvements as well as select improvements in Phase 2, including the homefield bleachers with athletic facilities located below, the ticket booth/concession stand building, and the storage and bathroom building. Construction of these facilities is anticipated to begin in Spring 2025 and commence in Summer 2026. The remaining master plan improvements are anticipated to occur over a 10-year period with full build-out of the master plan to occur by 2032.

Access to the site will continue to be provided by existing driveways along North Road and by Aikanaka Road from Fort Weaver Road. Access to the proposed parking area adjacent to the baseball/softball field is expected to occur via the Kuhina Street/Pailani Street intersection.

See Figure 1.1 for the Project Location and Figure 1.2 for the Project site plan.

1.2 Study Methodology

This study will address the following:

- Identify existing and planned improvements that will improve pedestrian, bicycle, and transit accessibility within the study area.
- Provide recommendations for roadway, intersection, or on-site improvements or other mitigation measures, as appropriate, to reduce delay and queuing that may result from traffic generated by the Project.
- Suggest Travel Demand Management (TDM) measures and other transportation management strategies to help reduce the vehicular traffic demand during the peak hours of traffic.
- Provide general Construction Management Plan (CMP) measures and discussions related to the Project construction.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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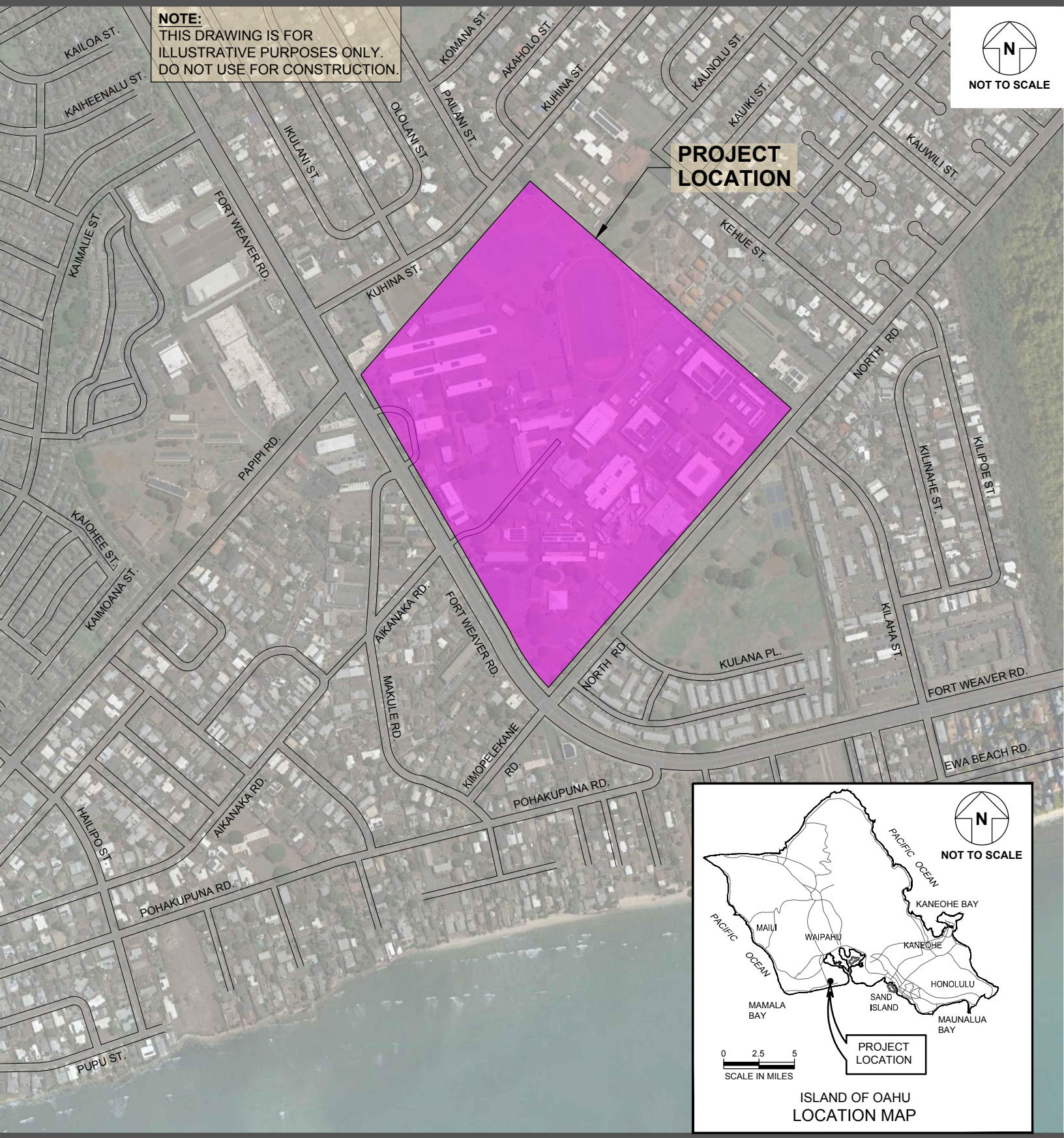

FIGURE 1.1

LOCATION MAP

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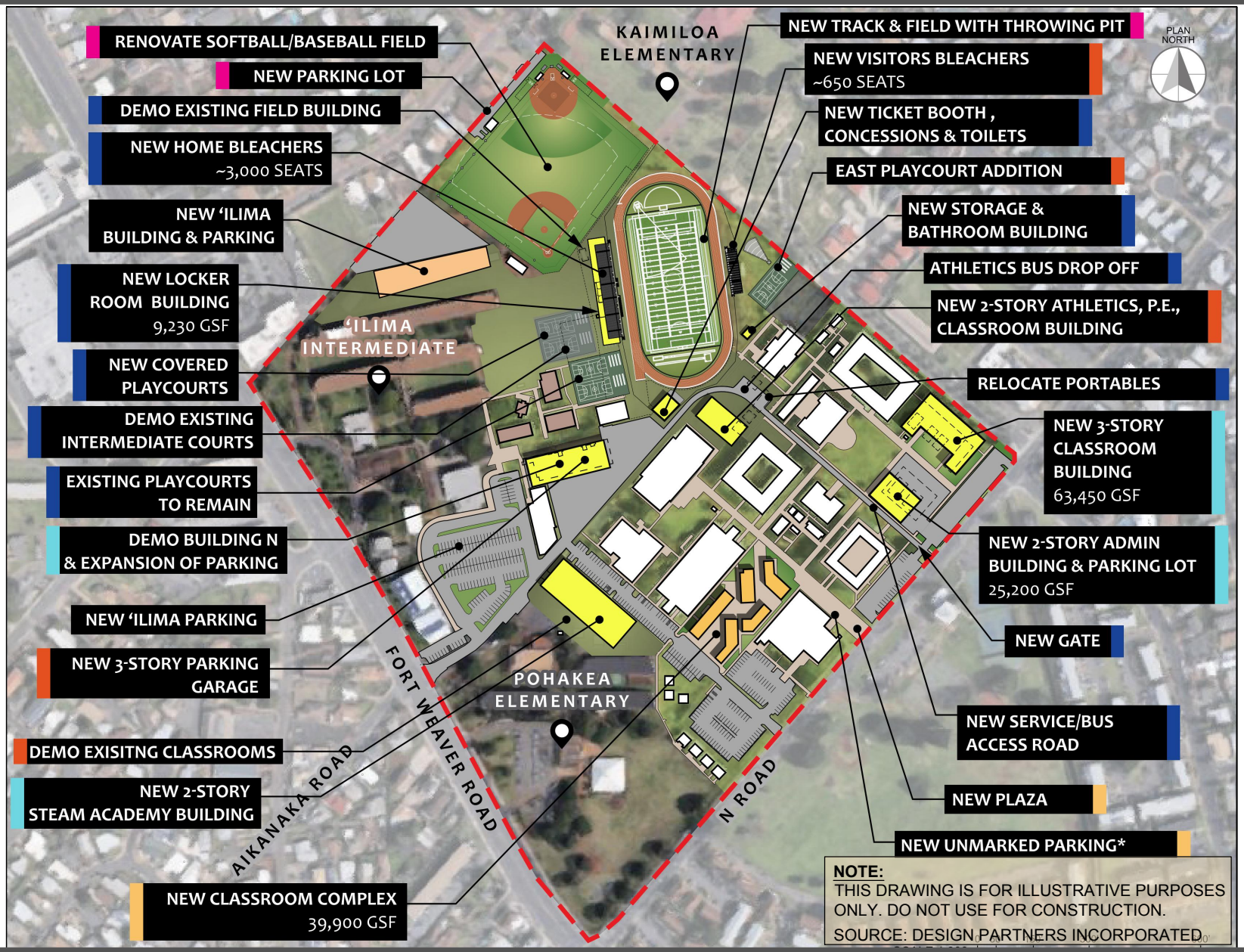

FIGURE 1.2

SITE PLAN

2. EXISTING AND FUTURE CONDITIONS

2.1 Pedestrian Accessibility

Existing Conditions

Sidewalks are provided along both sides of Fort Weaver Road. Generally, sidewalks adjacent to the Project along Fort Weaver Road are approximately 10 feet wide with little to no impediments. Sidewalks along the west side of Fort Weaver Road are approximately eight (8) feet wide with large utility poles in the middle of the sidewalk. Curb ramps are provided at all crossing locations to provide an ADA accessible route to/from the Project site.

An at-grade 4-foot-wide asphalt sidewalk, separated from the travel way with an asphalt curb, is present along North Road fronting the Project between Fort Weaver Road and Kilaha Street, with the exception of an approximately 320-foot section fronting the Ewa Beach Public Library which provides a concrete sidewalk. A 4.5-foot-wide concrete sidewalk is present along the makai side of North Road fronting the Ewa Apartments at Kulana complex between Fort Weaver Road and Kulana Place. There is no sidewalk fronting Ewa Beach Community Park between Kulana Place and Kilaha Street.

As a result of JCHS, Ilima Intermediate School and Pohakea Elementary School, heavy pedestrian traffic was observed in the study area during the morning and afternoon periods coinciding with the school start and end times. Pedestrian volumes were significantly lighter outside of these time periods.

Future Conditions

According to the Oahu Pedestrian Plan Draft dated June 2021, the following projects have been identified in the study area:

- New walkway along the makai side of North Road between Kulana Place and Kilaha Street (Tier 2 – midterm priority)
- Walkway upgrade along the mauka side of North Road between Fort Weaver Road and Kulana Place and Kilaha Street to Kehue Street

In addition to the proposed off-site walkway improvements, the Project proposes a new pedestrian plaza along North Road adjacent to the Ewa Beach Community Park midblock crossing. The plaza will provide a main access point for pedestrians along North Road and reduce the number of pedestrians that currently mix with vehicle traffic and enter the JCHS campus through the various parking lot driveways. An additional sidewalk entrance will also be provided at the easternmost JCHS driveway across Kilaha Street to allow pedestrians entering from the opposite end of the campus to enter without having to cross heavy vehicle traffic entering and exiting the JCHS driveways.

The existing and proposed pedestrian facilities in the study area are shown in Figure 2.1. Future pedestrian access and circulation with the Project is shown in Figure 2.2.

2.2 Bicycle Accessibility

Existing Conditions

Bicycle lanes are provided in both directions of Fort Weaver Road between Keoneula Boulevard and Ewa Beach Road/Kilaha Street. No bicycle facilities are currently provided along North Road.

Similar to pedestrian traffic, bicycle traffic was observed to be heaviest in conjunction with the school start and end times. Although significant bicycle trips were observed in the study area, bicyclists were generally observed to travel along sidewalks or within parking lanes along Fort Weaver Road in order to provide additional distance from vehicle traffic. Bicyclists were also often observed to travel in the opposite direction of traffic along Fort Weaver Road.

Future Conditions

According to the Oahu Bike Plan dated December 2019, the following projects have been identified in the study area:

- Fort Weaver Road Priority 1 Shared Use Path – Keaunui Street to end of public roadway
- Fort Weaver Road Priority 1 Buffered Bike Lane – Keoneula Boulevard to Kilaha Street
- North Road Priority 2 Bike Lane – Fort Weaver Road to Iroquois Avenue

Priority 1 projects are identified as the highest priority projects with target implementation in 0-5 years. Priority 2 projects are to be implemented after Priority 1 projects or when a street is resurfaced.

As noted under Section 2.1, the Project proposes new plaza and sidewalk entrances along North Road which will help to consolidate pedestrian and bicycle traffic entering the JCHS campus and reduce the mixing of pedestrians/bicyclists with vehicles at the parking lot driveways.

The existing and proposed bicycle facilities in the study area are shown in Figure 2.1. Future bicycle access and circulation with the Project are shown in Figure 2.2.

2.3 Transit Accessibility

2.3.1 School Bus Service

Existing Conditions

Students in grades 6-12 residing 1.5 miles or more from their home school qualify for regular school bus service. Regular school bus service is limited to transportation from the residential address of record to school and back home again. Bus riders can choose to pay quarterly – $36 one way per quarter (AM only or PM only) or $72 round trip – or via bus coupons – $10.00 per sheet of 10 coupons at one (1) coupon per ride (AM or PM). Students may also receive a free annual bus pass based on certain qualifications.

Currently, five (5) school buses serve JCHS covering the following school bus routes:

- Iroquois Point (2 routes)
- Summer Hill

- West Loch Estates, Fairways, and Honuliuli Road
- Kapolei Parkway, Hoakalei, Kekaiholo, and Kaileolea

Future Conditions

Changes to school bus routes will be dependent upon growth of the student population and changes in student needs. The addition of future JCHS school bus routes will be evaluated by the HIDOE Student Transportation Services Branch based on community growth and driver availability.

2.3.2 City Bus Transit

Existing Conditions

Oahu Transit Services (OTS) operates TheBus with a fleet of 540 fixed-route buses servicing the most populated areas of the island. TheBus is the primary form of public transit on Oahu. The cost of service is currently $3.00 for each one-way ride, $7.50 for a one-day pass, $80 for a monthly pass, and $880 for an annual pass[1]. Effective June 20, 2021, paper bus pass sales were discontinued and replaced with the Holo Card. Currently the Holo Card is only available to use on TheBus; however, in the future, the Holo Card will be available to use on TheHandi-Van and the Honolulu Rail Transit System.

TheHandi-Van serves as an extension to TheBus, designed to serve riders that require additional assistance. Passengers pre-arrange drop-off and pick-up with TheHandi-Van and share the vans with other riders. Daily service is generally available island wide between 4:00 AM and 1:00 AM while 24-hour service is available in areas located within ¾ miles of Routes 2 and 40. The fare is $2.25 per one-way trip. TheHandi-Van stops at the nearest curbside for both pick-ups and drop-offs.

The State of Hawaii Department of Education (HIDOE) is currently offering free city bus passes for students during the 2022-2023 school year as a part of the Expanding Ridership to Educate Students in Schools (EXPRESS) County Bus Pass pilot program.

As shown in Table 2.1, there are seven (7) bus routes that serve eight (8) stops along the study segments of Fort Weaver Road and North Road, including the Ewa Beach Transit Center, which is located adjacent to Hale Pono Boys & Girls Club along Fort Weaver Road.

Figure 2.3 identifies the bus stops that serve each bus route and identifies the bus stops with amenities (shelter and/or bench).

Future Conditions

Changes to nearby bus stops are not anticipated as a result of the Project. However, bus routes may be modified in the future to provide additional service to and from Honolulu Rail Transit. The Honolulu Rail Transit is a fixed guideway rail system that is projected to span 20 miles between East Kapolei and Honolulu. At full completion, it will provide 21 stations at key commuter and visitor destinations. By 2031, the rail system is expected to be completed from the Kualakai Transit

[1] According to TheBus (www.thebus.org). Date Accessed: July 1, 2022.

Station in East Kapolei to the Kaakaukukui Transit Station in Ward, serving a total of 19 stations.[2] The remaining stations serving Kakaako and Ala Moana are planned to be completed at a later date.

It is unknown at this time whether subsidized city bus passes will be provided to students through the EXPRESS County Bus Pass program in the future.

The existing and proposed transit facilities in the study area are shown in Figure 2.1. Future pedestrian and bicycle routes to transit stops are shown in Figure 2.2.

Table 2.1: Bus Route Summary

Bus Route	**Bus Stops On** (within the study area)	**Headways** (during the AM and PM commuter peaks)
Route 41 – Kapolei – Ewa Beach	Fort Weaver Road North Road	~60 min
Route 42 – Ewa Beach - Waikiki	Fort Weaver Road North Road	~30 min
Route 44 – Waipahu – Ewa Beach	Fort Weaver Road	~60-75 min
Route 91 – Ewa Beach Express	Fort Weaver Road North Road	~20-40 min
Route E – Country Express! Ewa Beach	Fort Weaver Road	~30 min
Route PH7 – Ewa Beach – Pearl Harbor Express	Fort Weaver Road North Road	1 AM and PM trip
Route W1 – Waipahu Via Farrington Highway Express	Fort Weaver Road North Road	~10-20 min

[2] According to the Honolulu Authority for Rapid Transit (www.honolulutransit.org). Date Accessed June 16, 2022.

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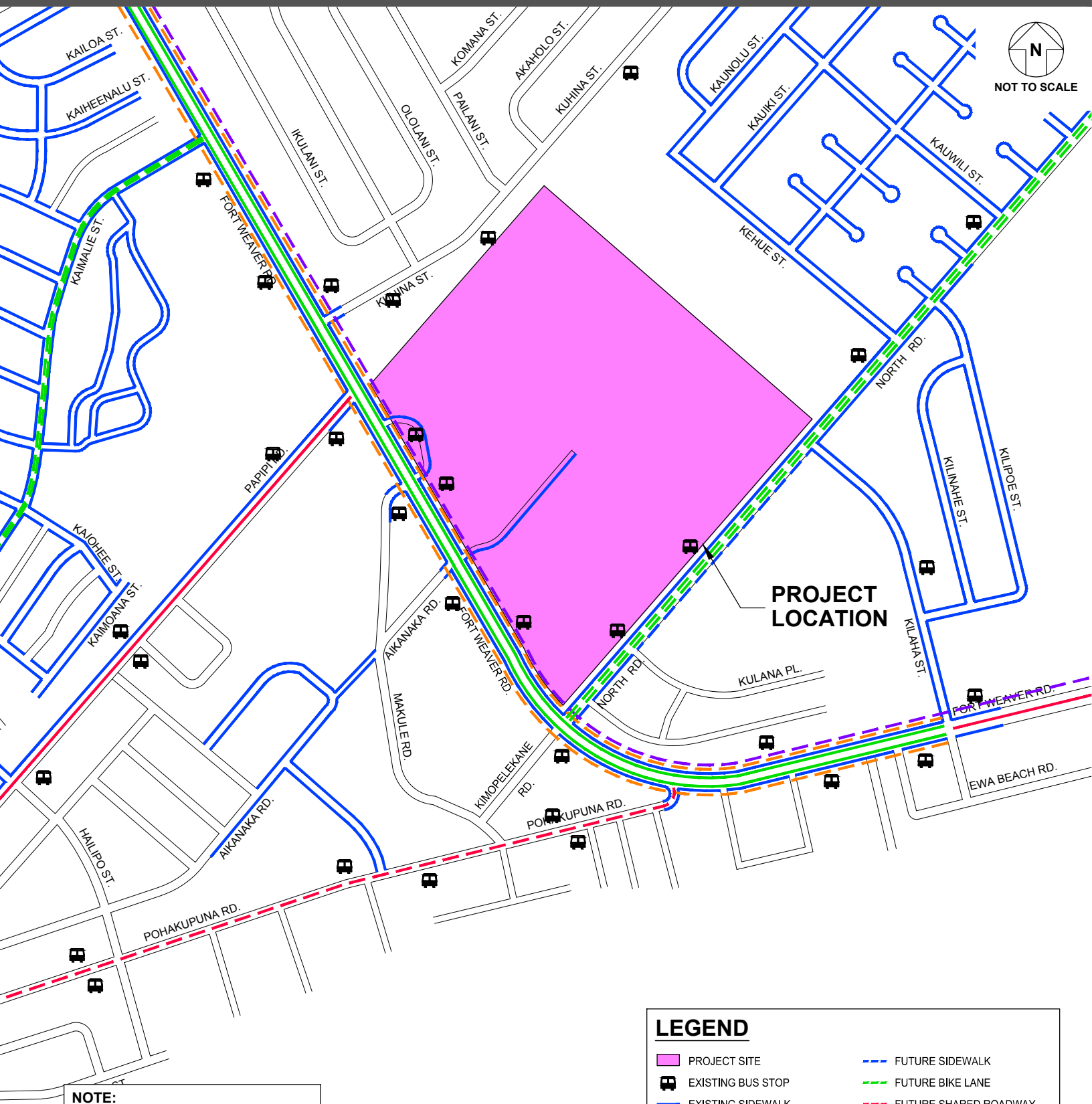

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LEGEND

- PROJECT SITE
- EXISTING BUS STOP
- EXISTING SIDEWALK
- EXISTING BIKE LANE
- EXISTING SHARED ROADWAY
- FUTURE SIDEWALK
- FUTURE BIKE LANE
- FUTURE SHARED ROADWAY
- FUTURE BUFFERED BIKE LANE
- FUTURE SHARED USE PATH

FIGURE 2.1

EXISTING AND FUTURE PEDESTRIAN, BICYCLE AND TRANSIT FACILITIES

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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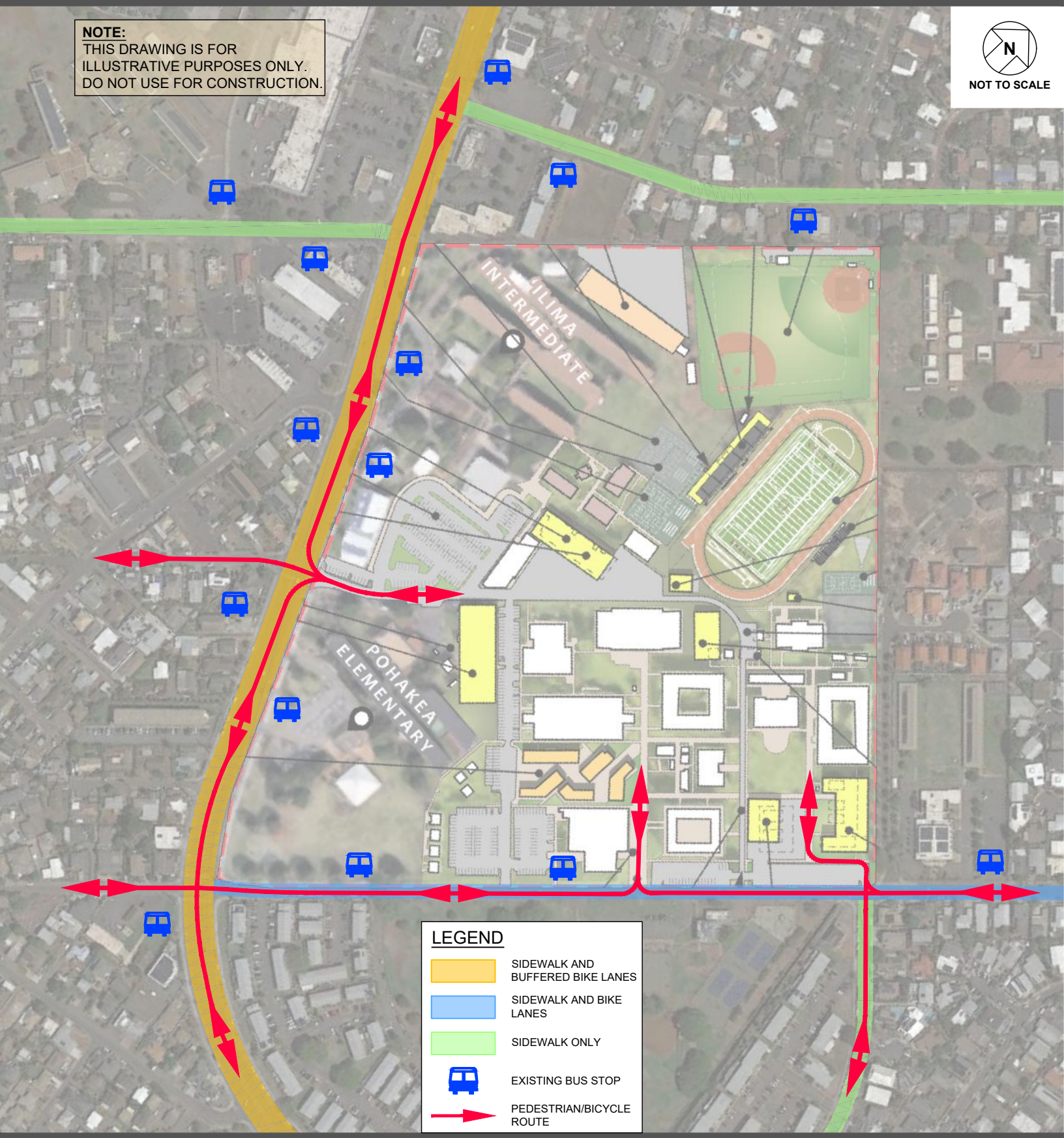

FIGURE 2.2

PEDESTRIAN AND BICYCLE ACCESS AND CIRCULATION PLAN

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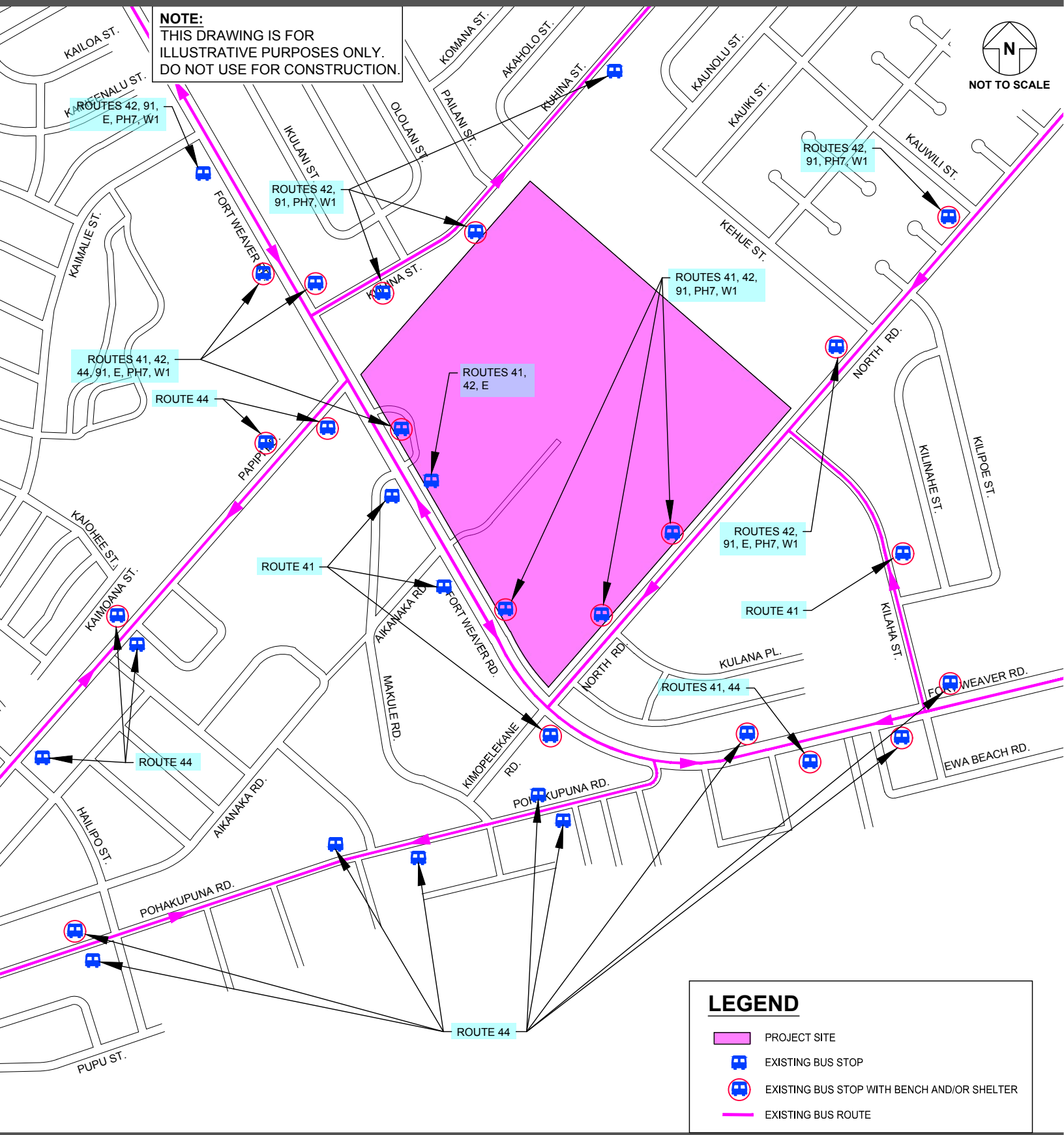

LEGEND

- PROJECT SITE
- EXISTING BUS STOP
- EXISTING BUS STOP WITH BENCH AND/OR SHELTER
- EXISTING BUS ROUTE

FIGURE 2.3

TRANSIT ROUTE INFORMATION

2.4 Roadway System

Existing Conditions

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Fort Weaver Road is a four (4) to six (6) lane, two-way, north-south, State roadway that transitions from Kunia Road to the north at its intersection with Farrington Highway and terminates to the southeast at its transition to Cormorant Avenue. Fort Weaver Road serves as a major arterial through Ewa and Ewa Beach, connecting various residential, commercial, recreational and medical land uses to Farrington Highway and the H-1 Freeway. Bike lanes and unmarked on-street parking are available along both sides of the roadway in the vicinity of the Project. Travel lanes are generally 11 – 12 feet wide with an estimated Average Annual Daily Traffic (AADT) 21,200 vehicles in the vicinity of the Project. The posted speed limit is 25 miles per hour (mph) in the vicinity of the Project.

North Road is a two lane, two-way, east-west, local roadway that begins to the west at its intersection with Fort Weaver Road and Kimopelekane Road and terminates to the east at its intersection with West Loch Drive. North Road provides access to James Campbell High School and residential areas within Ewa Beach. Unmarked on-street parking is available along the makai side of the roadway from Fort Weaver Road to Kilaha Street and along both sides of the roadway from Kilaha Street to just past Haiamu Street. Travel lanes are generally 10 – 18 feet wide with an estimated AADT of 6,800 vehicles in the vicinity of the Project. The posted speed limit is 25 mph in the vicinity of the Project.

Future Conditions

Changes to the geometry or lane assignments at the studied intersections are not anticipated. However, proposed walkway and bicycle facility improvements are expected to result in changes to the Fort Weaver Road and North Road cross-sections. Plans for walkway and bicycle facilities have not been completed at the time of this report, and assumed improvements were based on existing conditions and available right-of-way (ROW) along the roadways. The assumed typical cross-sections for Fort Weaver Road and North Road are shown in Figure 2.4.

The Project proposes to consolidate the two (2) easternmost parking lots along North Road and provide a new internal access road between Aikanaka Road and North Road. With the proposed parking lot consolidation, two (2) of the existing driveways along North Road will be removed. The new internal access road will be used by school buses during athletic events occurring outside of school hours only and will be gated during normal school hours. An existing fire lane will be used for athletics buses to exit the internal roadway to North Road and will not require an additional driveway to be constructed. The fire lane will be gated during normal school hours except for emergencies. The reduced number of driveways is expected to help reduce the number of conflict points between vehicles and pedestrians and bicyclists.

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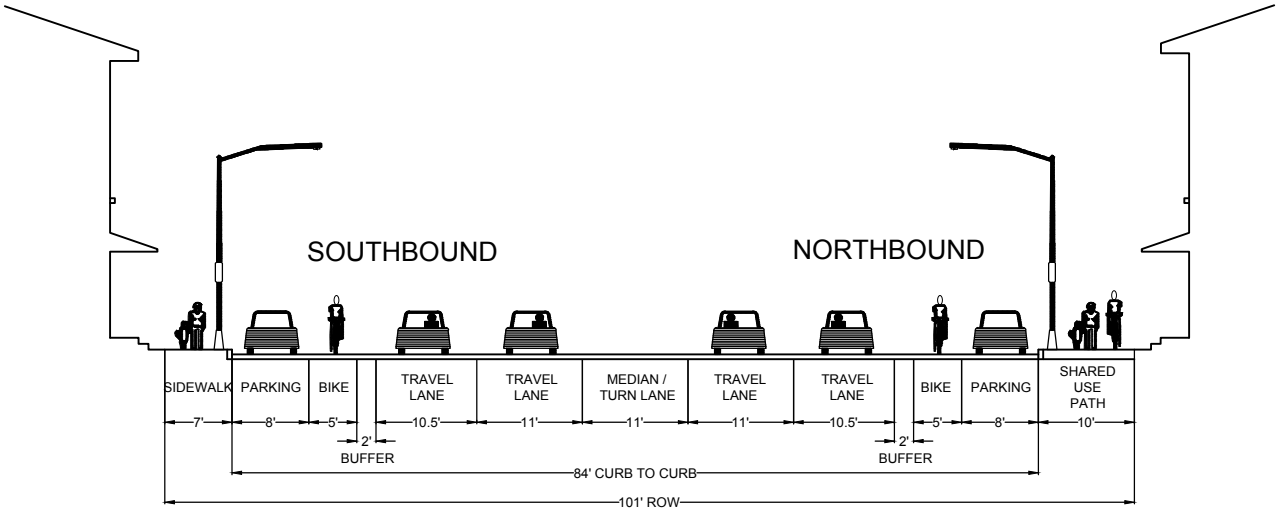
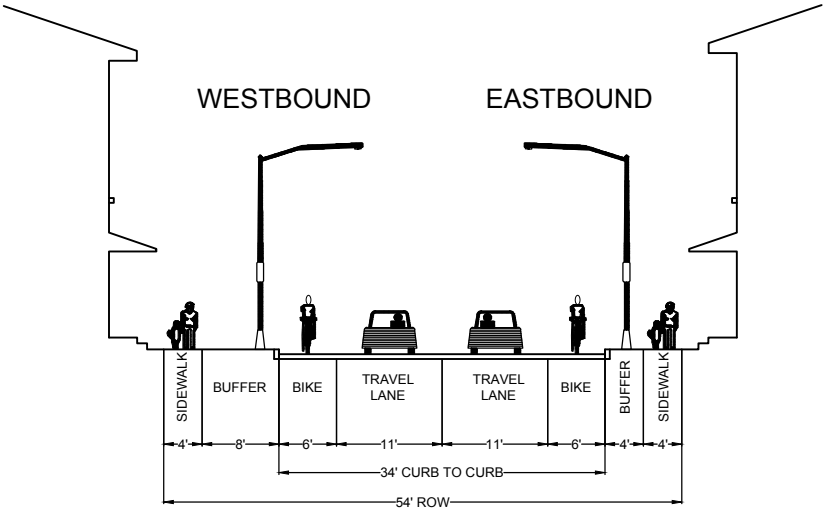


FORT WEAVER ROAD
NORTH ROAD TO PAPIPI ROAD



NORTH ROAD
FORT WEAVER ROAD TO KILAHA STREET

NOTE: EXISTING SIDEWALK AND BUFFER WIDTH ALONG WESTBOUND SIDE OF NORTH ROAD VARIES; ASSUMED THAT FUTURE CROSS-SECTION WILL FOLLOW EXISTING WHICH MAY NOT BE REFLECTED IN THE ABOVE CROSS-SECTION.

3. PROJECT RECOMMENDATIONS

3.1 Project Site Plan Recommendations

Driveways

Access to/from the Project site will continue to be provided via Aikanaka Road from Fort Weaver Road and from driveways along North Road. As noted in Section 2.4, the two (2) easternmost JCHS parking lots along North Road will be consolidated with the Project and two (2) of the existing driveways will be removed. The existing fire lanes that provide direct access to the JCHS campus located between the parking lots will remain but will be gated during normal school hours. The following actions at the Project driveways are recommended:

- **Maintain ingress/egress only operations at the North Road driveways** – With the Project, the four (4) easternmost existing JCHS parking lot driveways along North Road will be consolidated into two (2) driveways. The existing fire lanes will remain but will be gated during normal school hours as in existing conditions. Similar to existing conditions, providing one (1) ingress only driveway and one (1) egress only driveway to the parking lots is recommended to minimize conflicts at the driveways and provide a clear circulation pattern for vehicles performing pick-ups/drop-offs.
- **Encourage pedestrian/bicycle access via the plaza or sidewalk** – Pedestrians and bicyclists along North Road should be encouraged to enter/exit the JCHS campus through the proposed plaza or easternmost sidewalk entrance instead of through the vehicular driveways in order to reduce pedestrian/bicycle conflicts with vehicles. This may be achieved through improving access points from the plaza/sidewalk entrance and informing students of access patterns. Ingress and egress to the plaza should not be open for use as a vehicular driveway, except during off-peak hours or for emergencies, in order to limit conflict points.

Pick-Up/Drop-Off Areas

Pick-ups/drop-offs will continue to occur within the Ilima Intermediate School parking lot off of Aikanaka Road and within the JCHS parking lots along North Road. With the Project, the two (2) easternmost North Road parking lots will be consolidated and will provide one (1) parent pick-up/drop-off area versus the two (2) separate areas under existing conditions.

The Project also proposes to construct a new roadway through campus, connecting the existing access from Aikanaka Road to North Road via an existing fire lane. This internal roadway will be used outside of normal school hours during athletic events to provide a designated area for school buses from visiting teams to pick-up and drop-off players. When not in use, the connections to the internal roadway will be gated.

The following actions for pick-up/drop-off activities are recommended:

- **Maintain separate pick-up/drop-off areas for parents and school buses** – Under existing conditions, the three (3) easternmost parking lots along North Road are used as pick-up/drop-off areas. The outer two (2) lots are used for parent pick-ups/drop-offs and the middle lot is used for school buses. Because school buses require additional time to load and unload, it is recommended that school buses be provided with a separate designated pick-up/drop-off area, similar to existing conditions. The school bus pick-

up/drop-off area may be accommodated within the parking lot located to the west of the proposed gated bus access road with parent pick-up/drop-off accommodated in the new consolidated parking lot to the east of the gated bus access road.

- **Monitor the pick-up/drop-off areas** – School staff or security should actively monitor the pick-up/drop-off areas during the peak school periods to ensure vehicles do not park in the designated pick-up/drop-off areas or use areas meant for school bus traffic only. Vehicles should be asked to clear the pick-up/drop-off queue if students are not actively entering or exiting the vehicle in order to prevent queues from extending onto North Road or Fort Weaver Road. A bypass lane should also be provided adjacent to the pick-up/drop-off area in order to allow vehicles to enter or exit the queue at other locations, helping to provide faster turnover within the pick-up/drop-off area.

The proposed pick-up/drop-off areas and routes to/from the pick-up/drop-off areas are shown in Figures 3.1, 3.2 and 3.3 for parents, school buses and athletics buses, respectively.

Parking Areas

The Project proposes to construct a new parking garage with access provided via the Aikanaka Road entrance. In addition, the two (2) existing easternmost parking lots along North Road will be consolidated into a single parking lot with a new administrative building parking lot constructed adjacent to the consolidated lot. A new parking area will also be constructed adjacent to the baseball/softball field with access provided by the Kuhina Street/Pailani Street intersection. This parking area is expected to be used for athletic events occurring outside of school hours and will not be used for normal school operations.

The Land Use Ordinance (LUO) requires a minimum of an additional 130 stalls based on the Project master plan improvements which include additional classroom and administrative spaces. As shown in Table 3.1, the recently constructed classroom complex provided 109 stalls less than the required minimum through an approved exemption. Therefore, if the Project provides the minimum 130 required parking stalls, the total JCHS stalls will remain below the minimum required.

Table 3.1 Land Use Ordinance Parking Requirements

JCHS Improvement	Land Use Ordinance Requirement	Provided Stalls
Existing	310 Stalls	310 Stalls
New Classroom Complex	128 Stalls	19 Stalls
Master Plan (Minimum)	130 Stalls	130 Stalls
Total	**568 Stalls**	**459 Stalls**

While providing the minimum acceptable number of parking stalls may help to disincentivize students and faculty/staff from driving to/from the JCHS campus given the limited available parking, based on existing conditions, the lack of available parking results in overflow onto the adjacent roadways and into the surrounding neighborhood during both school hours and during special events, such as athletic events. Given the high occurrence of JCHS parking overflowing into surrounding street parking, the master plan will need to balance parking stall provisions in order to disincentivize the use of private vehicles while also minimizing negative impacts to the

Ewa Beach neighborhood. As such, the Project may provide more than the minimum 130 stalls required by the LUO.

The following actions for the parking areas are recommended:

- **Maximize distance between the proposed parking garage access and Fort Weaver Road** – Currently, queues entering the Ilima Intermediate School parking lot and the JCHS campus occasionally spill back to Fort Weaver Road during peak periods of demand. In order to prevent additional impacts to queuing from the parking garage, the access to the parking garage should be placed to maximize the distance between the access and the Ilima Intermediate School parking lot access.

The Project parking plan showing proposed parking inventory and circulation is shown in Figure 3.4.

Management

- **JCHS staff or security should monitor the pick-up/drop-off areas during peak periods of demand** – JCHS staff or security should ensure proper use of the pick-up/drop-off areas so that vehicle queues do not extend to North Road or Fort Weaver Road. An adjacent bypass lane to the pick-up/drop-off areas should remain clear for through travel at all times.

3.2 Traffic Demand Management Strategies

The following Traffic Demand Management (TDM) strategies may be considered, as feasible, to help reduce the vehicular impacts of the Project and promote the use alternative modes of transportation.

Disincentivize Private Vehicle Trips

- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.

Carpooling Programs

- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program, and encourage carpooling.

Bicycle Education and Accommodations

- Provide additional on-site bicycle parking for faculty/staff and students.
- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.

Transit Accommodations

- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.
- Encourage volunteer efforts from JCHS service organizations to clean and maintain existing City and County of Honolulu bus stops along the Project frontage in order to maintain a comfortable environment for transit users.

Peak Hour Demand Management

- Consider shifting JCHS start and end times to avoid overlap with Ilima Intermediate School and Pohakea Elementary School. It should be noted that any changes to the bell schedule would require a faculty vote of approval.

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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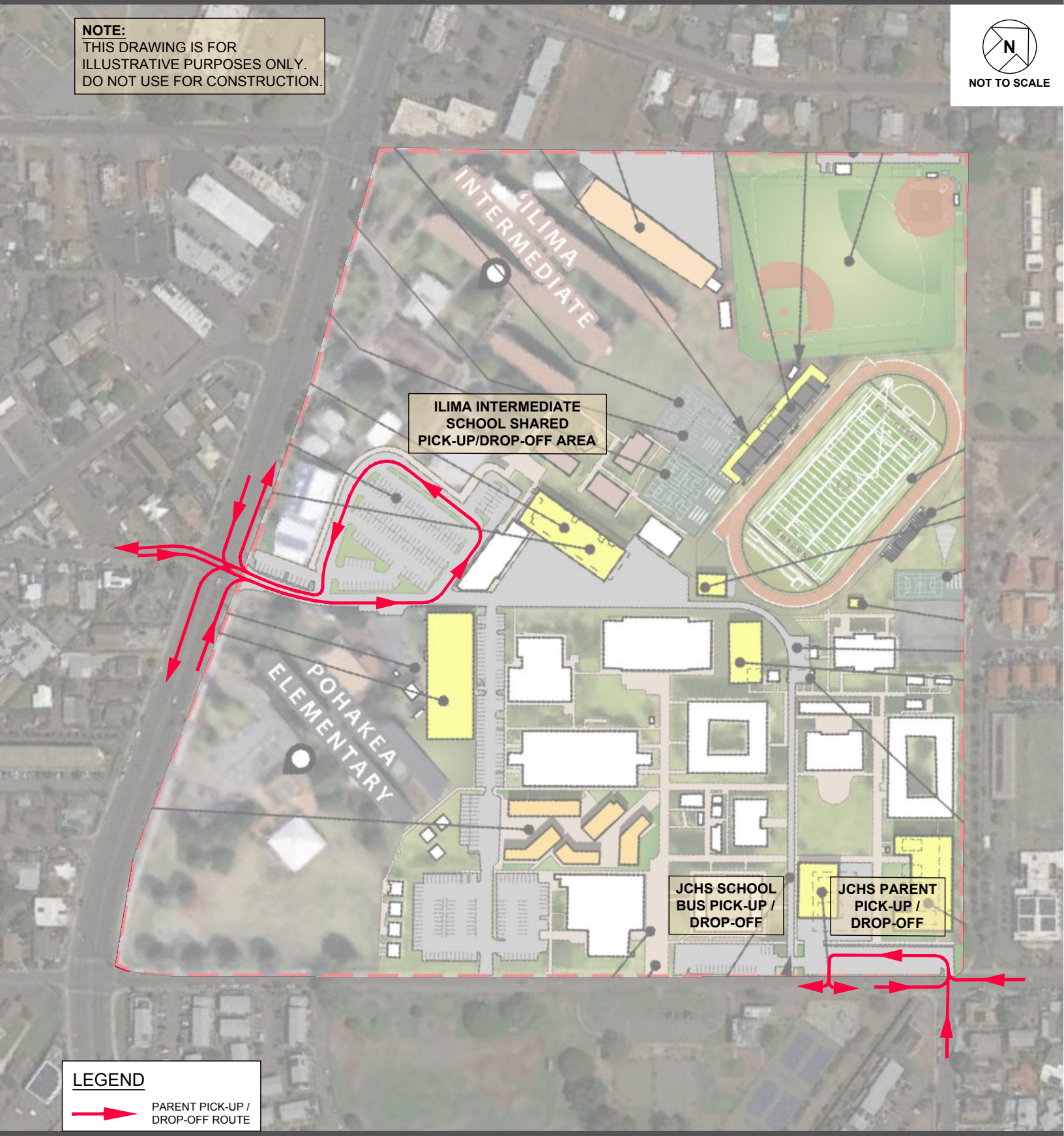

FIGURE 3.1

PARENT PICK-UP AND DROP-OFF AREAS ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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LEGEND

SCHOOL BUS PICK-UP / DROP-OFF ROUTE

FIGURE 3.2

SCHOOL BUS PICK-UP AND DROP-OFF AREAS ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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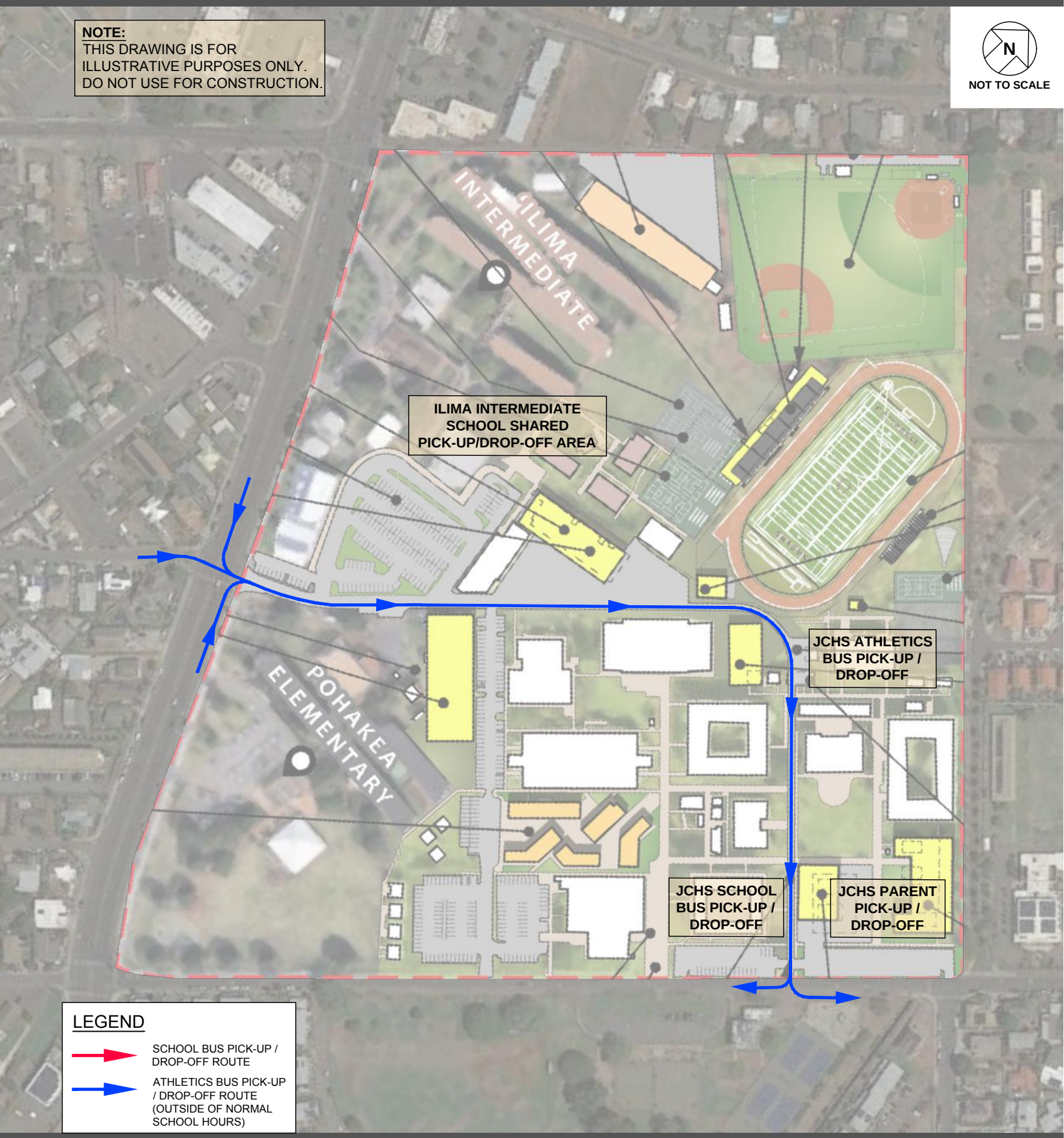

LEGEND

- SCHOOL BUS PICK-UP / DROP-OFF ROUTE
- ATHLETICS BUS PICK-UP / DROP-OFF ROUTE (OUTSIDE OF NORMAL SCHOOL HOURS)

FIGURE 3.3

ATHLETIC BUS PICK-UP AND DROP-OFF AREAS ACCESS AND CIRCULATION PLAN

JAMES CAMPBELL HIGH SCHOOL ATHLETIC COMPLEX AND MASTER PLAN TMP

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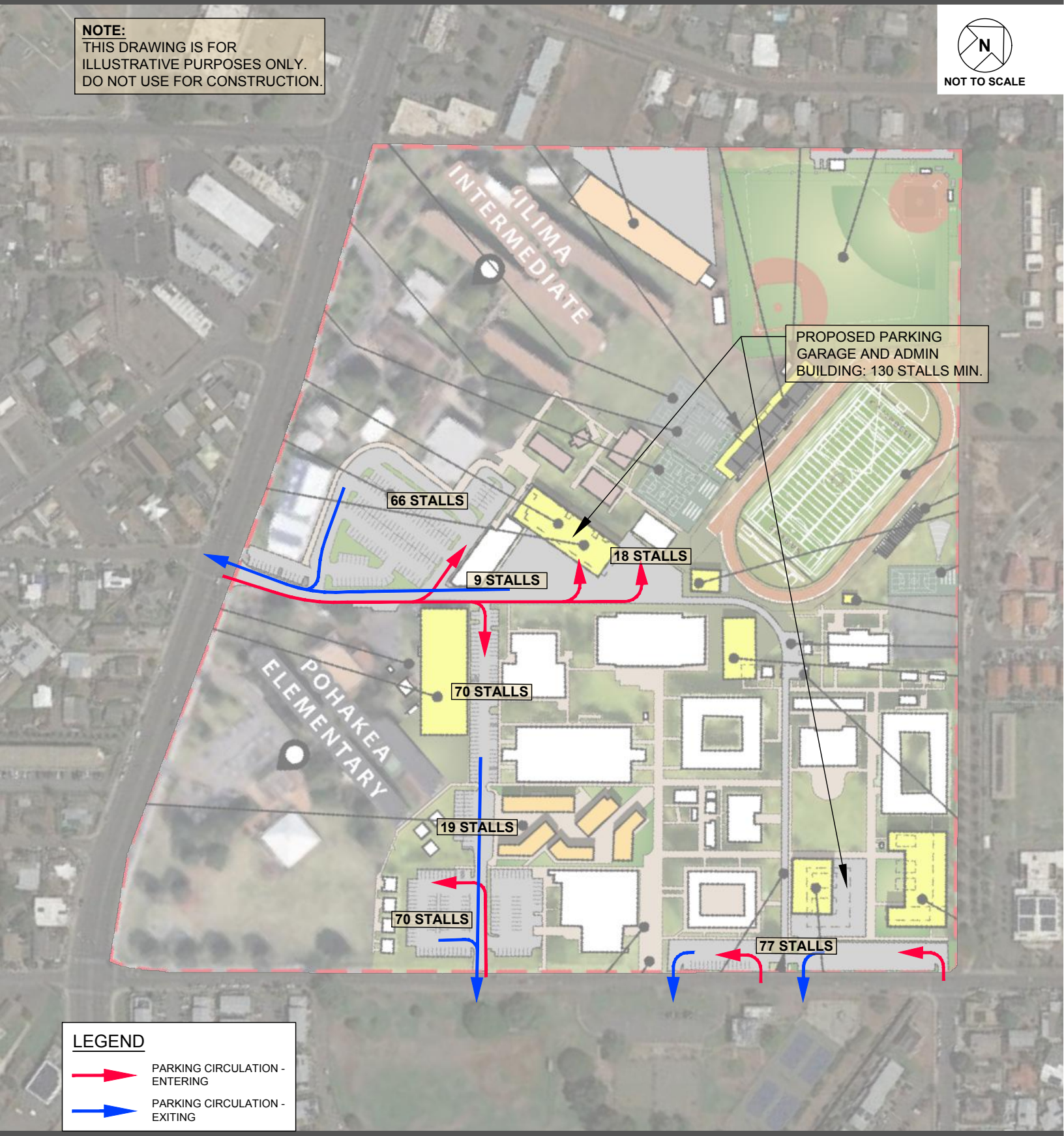

FIGURE 3.4

PROJECT PARKING PLAN

4. CONSTRUCTION MANAGEMENT PLAN

The following are general construction management recommendations. Actual recommendations for the Project site should be determined at a later date once construction plans for the Project are finalized. A Construction Management Plan (CMP) should be completed at that time.

4.1 Staging Area

Construction vehicle staging on adjacent public roadways is not allowed. All staging will occur on the JCHS campus. Exact staging locations on the JCHS campus will be determined at a later date based on the area under construction. All deliveries to the Project site should be coordinated and scheduled by the Contractor to ensure that delivery vehicles can be staged within the limits of the Project.

4.2 Construction Traffic

It is recommended that construction-related vehicles avoid weekday ingress and egress to the job site during peak periods due to potential for increased congestion and vehicle/pedestrian/bicycle conflicts. Based on collected data,[3] the peak periods of traffic in the study area generally coincide with the JCHS, Ilima Intermediate School and Pohakea Elementary School start and end times which are shown in Table 4.1. The peak hours of traffic occur between 7:00 AM and 8:00 AM, 2:00 PM to 3:00 PM and 3:45 PM to 4:45 PM for the AM, School PM and PM peak hours of traffic, respectively. Because students and parents were observed to arrive and depart campus surrounding the actual school start and end times, it is recommended that construction-related vehicle ingress and egress to the Project site avoid the 15-30 minutes prior to and following the school start and end times. Recommended hours for construction vehicle ingress and egress are shown in Table 4.2. Note that school start and end times vary by the day of the week and surrounding schools should be consulted for specific schedules.

Table 4.1: School Start and End Times

		James Campbell High School	Ilima Intermediate School	Pohakea Elementary School
Monday	Start	7:55 AM	7:55 AM	7:45 AM
	End	2:15 PM	2:01 PM	2:00 PM
Tuesday	Start	7:55 AM	7:55 AM	7:45 AM
	End	2:15 PM	2:01 PM	2:00 PM
Wednesday	Start	7:55 AM	7:55 AM	7:45 AM
	End	1:15 PM	2:01 PM	12:50 PM
Thursday	Start	7:55 AM	7:55 AM	7:45 AM
	End	2:15 PM	2:01 PM	2:00 PM
Friday	Start	7:55 AM	7:55 AM	7:45 AM
	End	2:15 PM	2:10 PM	2:00 PM

[3] Manual turning movement traffic counts were conducted at Fort Weaver Road/Papipi Road, Fort Weaver Road/Aikanaka Road, Fort Weaver Road/North Road/Kimopelekane Road and North Road/Kilaha Street on Tuesday, April 26, 2022.

Table 4.2: Recommended Construction Vehicle Access Times

Day of the Week	Recommended Access Times
Monday	8:30 AM to 1:30 PM 2:45 PM to 3:45 PM
Tuesday	8:30 AM to 1:30 PM 2:45 PM to 3:45 PM
Wednesday	8:30 AM to 12:30 PM 2:30 PM to 3:45 PM
Thursday	8:30 AM to 1:30 PM 2:45 PM to 3:45 PM
Friday	8:30 AM to 1:30 PM 2:45 PM to 3:45 PM

Based on standard weekday construction hours of 7:00 AM to 6:00 PM, construction workers are expected to arrive at the Project site prior to the AM peak hour of traffic and leave the Project site after the PM peak hour of traffic. If reduced construction hours are followed, workers should avoid the peak hours of traffic and periods of heavy pedestrian traffic.

The amount and type of heavy vehicle and worker trips to and from the Project site will be contingent on the scheduled work activities. It is recommended that all trips to and from the Project be staggered, where possible, to ensure adequate space is available on site to stage vehicles and to avoid surges in traffic at nearby intersections.

4.3 Parking

It is recommended that parking for construction workers be provided in designated areas on the Project site. If additional parking space is needed during construction, an agreement may be made with the adjacent Ilima Intermediate School and Pohakea Elementary School for use of underutilized parking stalls. In order to reduce the demand for construction worker parking, the Contractor should consider encouraging carpooling to the Project site from an off-site location, such as from the Contractor's shop

Due to heavy use of on-street parking by residents in the area, the Contractor should prohibit its workers from utilizing on-street parking within a one-mile radius of the Project site in order to minimize impacts to nearby residents.

4.4 Recommendations

- Avoid construction-related vehicular ingress or egress during the weekday morning, school dismissal and afternoon peak hours of traffic, if possible, which occur at 7:00 AM to 8:00 AM, 2:00 PM to 3:00 PM and 3:45 PM to 4:45 PM, respectively.
- Coordinate deliveries to ensure adequate space is available to stage vehicles on site.
- Provide a designated parking area on the Project site for the Contractor and workers and/or encourage carpooling to the Project site from an off-site location.
- Prohibit on-street parking within a one-mile radius of the Project site.

5. CONCLUSION

The Project proposes to construct phased master plan improvements on the James Campbell High School (JCHS) campus, which will include renovated/new athletic facilities, a 3-story parking garage and additional classroom and administrative buildings. Full build-out of the master plan is anticipated to occur by 2032. Access to the JCHS campus will continue to be provided by existing driveways along North Road and by Aikanaka Road from Fort Weaver Road.

5.1 Existing and Future Conditions

5.1.1 Pedestrian Accessibility

As a result of JCHS, Ilima Intermediate School and Pohakea Elementary School, heavy pedestrian traffic was observed in the study area during the morning and afternoon periods coinciding with the school start and end times. Pedestrian volumes were significantly lighter outside of these time periods. Sidewalks are currently provided along both sides of Fort Weaver Road and along the mauka side of North Road in the vicinity of the Project site.

Based on the Oahu Pedestrian Plan Draft, a new walkway along the makai side of North Road and walkway upgrades to the existing sidewalk along the mauka side of North Road have been identified for future improvement. The Project also proposes to provide increased pedestrian connectivity with the JCHS campus by providing new plaza and sidewalk entrances from North Road.

5.1.2 Bicycle Accessibility

Bicycle lanes are provided in both directions of Fort Weaver Road between Keoneula Boulevard and Ewa Beach Road/Kilaha Street. No bicycle facilities are currently provided along North Road. Similar to pedestrian traffic, bicycle traffic was observed to be heaviest in conjunction with the school start and end times. Although significant bicycle trips were observed in the study area, bicyclists were generally observed to travel along sidewalks or within parking lanes along Fort Weaver Road in order to provide additional distance from vehicle traffic.

Based on the Oahu Bike Plan, buffered bike lanes and a shared use path are planned along Fort Weaver Road and bike lanes are planned along North Road in the vicinity of the Project site. As noted under pedestrian accessibility, the Project proposes to construct new plaza and sidewalk entrances along North Road, which will provide increased bicycle accessibility as well.

5.1.3 Transit Accessibility

Five (5) school bus routes are provided for students residing 1.5 miles or more from their home school. Service is provided during both the morning and afternoon. Future changes to the school bus routes will be evaluated in the future as needed based on community growth and school bus driver availability.

There are seven (7) city bus routes that travel along Fort Weaver Road and North Road in the vicinity of the Project site, with all routes generally running at least once an hour, with the majority of the routes running two or more times an hour during the weekday peak periods. Additionally, TheHandi-Van, which serves as an extension to TheBus, provides prearranged service between 4:00 AM and 1:00 AM for riders that require additional assistance. Changes to nearby bus stops or bus routes are not anticipated as a result of the Project.

5.1.4 Roadway System

Changes to the geometry or lane assignments at the studied intersections are not anticipated. However, proposed walkway and bicycle facility improvements are expected to result in changes to the Fort Weaver Road and North Road cross-sections.

Although the Project does not propose any changes to the adjacent roadways, the Project proposes to reduce the number of JCHS driveways along North Road.

5.2 Project Recommendations

5.2.1 Project Site Plan Recommendations

The following actions for the proposed Project site plan are recommended:

Driveway

- Maintain ingress/egress only operations at the North Road driveways.
- Encourage pedestrian/bicycle access via the plaza or easternmost sidewalk entrance.

Pick-Up/Drop-Off Areas

- Maintain separate pick-up/drop-off areas for parents and school buses.
- Monitor the pick-up/drop-off areas.

Parking Areas

- Maximize distance between the proposed parking garage access and Fort Weaver Road.

Management

- JCHS staff or security should monitor the pick-up/drop-off areas during peak periods of demand.

5.2.2 Transportation Demand Management Strategies

The following TDM strategies may be considered, as feasible, with the Project:

- Consider minimizing the number of new parking stalls to disincentivize the use of private vehicles. The number of parking stalls may exceed the minimum stalls recommended by the LUO in order to provide enough event parking and limit parking overflow impacts to the surrounding neighborhood.
- Inform faculty/staff, parents and students of alternative transportation modes available in the area, such as the City and County of Honolulu Oahu Vanpool Incentive Program, and encourage carpooling.
- Provide additional on-site bicycle parking for faculty/staff and students.
- Explore coordinating with a local cycling organization to provide students with access to bicycle safety classes and/or educational pamphlets.
- Inform students of the EXPRESS County Bus Pass program for city buses and available school bus services.

- Encourage volunteer efforts from JCHS service organizations to clean and maintain existing City and County of Honolulu bus stops along the Project frontage in order to maintain a comfortable environment for transit users.
- Consider shifting JCHS start and end times to avoid overlap with Ilima Intermediate School and Pohakea Elementary School. It should be noted that any changes to the bell schedule would require a faculty vote of approval.

5.3 Construction Management Plan

The following actions are recommended to reduce the impacts resulting from the Project's construction-related activity:

- Avoid construction-related vehicular ingress or egress during the weekday morning, school dismissal and afternoon peak hours of traffic, if possible, which occur at 7:00 AM to 8:00 AM, 2:00 PM to 3:00 PM and 3:45 PM to 4:45 PM, respectively.
- Coordinate deliveries to ensure adequate space is available to stage vehicles on site.
- Provide a designated parking area on the Project site for the Contractor and workers and/or encourage carpooling to the Project site from an off-site location.
- Prohibit on-street parking within a one-mile radius of the Project site.

6. REFERENCES

1. The Association for Commuter Transportation in partnership with U.S. Department of Transportation – Federal Highway Administration, Mitigating Traffic Congestion: The Role of Demand-Side Strategies, October 2004.

2. City & County of Honolulu Department of Transportation Services, Oahu Bike Plan, December 2019.

3. City & County of Honolulu Department of Transportation Services, Oahu Pedestrian Plan Draft, June 2021.