Transportation Technical Report
Honolulu High-Capacity Transit Corridor Project

August 15, 2008
Prepared for:
City and County of Honolulu

Preface

This technical report supports the Draft Environmental Impact Statement (EIS) prepared for the Honolulu High-Capacity Transit Corridor Project. It provides additional detail and information as it relates to:

- Methodology used for the analysis
- Applicable regulations
- Results of the technical analysis
- Proposed mitigation
- Coordination and consultation (as appropriate)
- References
- Model output (as appropriate)
- Other information/data

As described in the Draft EIS, the Locally Preferred Alternative, called the “Full Project,” is an approximate 30-mile corridor from Kapolei to the University of Hawaiʻi at Mānoa with a connection to Waikīkī. However, currently available funding sources are not sufficient to fund the Full Project. Therefore, the focus of the Draft EIS is on the “First Project,” a fundable approximately 20-mile section between East Kapolei and Ala Moana Center. The First Project is identified as “the Project” for the purpose of the Draft EIS.

This technical report documents the detailed analysis completed for the Full Project, which includes the planned extensions, related transit stations, and construction phasing. The planned extensions and related construction planning have not been fully evaluated in the Draft EIS and are qualitatively discussed in the Cumulative Effects section of the Draft EIS as a foreseeable future project(s). Once funding is identified for these extensions, a full environmental evaluation will be completed in a separate environmental study (or studies), as appropriate.

Figure 1-3 through Figure 1-6 (in Chapter 1, Background) show the proposed Build Alternatives and transit stations, including the areas designated as planned extensions.

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Acronyms and Abbreviations

ADA	American with Disabilities Act
AVO	average vehicle occupancy
DBEDT	Department of Business, Economic Development and Tourism
DFM	City and County of Honolulu Department of Facility Maintenance
DTS	City and County of Honolulu Department of Transportation Services
EIS	environmental impact statement
‘Ewa (direction)	toward the west (see also Wai‘anae)
FTA	Federal Transit Administration
FY	fiscal year
H-1	Interstate Route H-1 (the H-1 Freeway)
H-2	Interstate Route H-2 (the H-2 Freeway)
H-3	Interstate Route H-3 (the H-3 Freeway)
HCM	Highway Capacity Manual
HDOT	Hawai‘i Department of Transportation
HOV	high occupancy vehicle
HPMS	Highway Performance Monitoring System
ITS	Intelligent Transportation Systems
IVT	in-vehicle time
Koko Head (direction)	toward the east
LCC	Leeward Community College
LOS	level of service
LOTMA	Leeward O‘ahu Transportation Management Association
makai (direction)	toward the sea
mauka (direction)	toward the mountains
MOT	Maintenance of Traffic
mph	miles per hour
MTA	Metropolitan Transportation Authority

NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NTD	National Transit Database
O‘ahuMPO	O‘ahu Metropolitan Planning Organization
ORTP	O‘ahu Regional Transportation Plan 2030
OTS	O‘ahu Transit Services
PCE	passenger car equivalents
PUC	Primary Urban Center
RTD	City and County of Honolulu Department of Transportation Services Rapid Transit Division
TAA	Transportation Analysis Area
TCC	Traffic Control Center
TDM	Transportation Demand Management
TMC	Traffic Management Center
TMP	Transit Mitigation Program
TPSS	traction power substation
TRB	Transportation Research Board
TSM	Transportation Systems Management
UH	University of Hawai‘i
UPASS	University Student Discount Bus Pass
V/C	volume-to-capacity (ratio)
VHD	vehicle hours of delay
VHT	vehicle hours traveled
VMT	vehicle miles traveled
vph	vehicles per hour
Wai‘anae (direction)	toward the west (see also ‘Ewa)

Summary

The City and County of Honolulu Department of Transportation Services Rapid Transit Division (RTD), in coordination with the U.S. Department of Transportation Federal Transit Administration (FTA) is preparing a Draft Environmental Impact Statement (EIS) to evaluate alternatives that would provide high-capacity transit service on O‘ahu. The alternatives being considered are as follows:

- No Build Alternative
- Fixed Guideway Transit Alternative via Salt Lake Boulevard (Salt Lake Alternative)
- Fixed Guideway Transit Alternative via the Airport (Airport Alternative)
- Fixed Guideway Transit Alternative via the Airport & Salt Lake (Airport & Salt Lake Alternative)

Existing Transportation Conditions

The bus-only transit system operating on O‘ahu is one of the most effective and productive in the country, exceeding several systems that operate in larger metropolitan areas. However, increasing traffic congestion and constrained transit operating conditions have reduced system reliability and mobility for all travelers. Operating buses exclusively in mixed traffic has led to slower speeds, increased costs, and reduced service reliability.

Almost one-third of bus trips are not meeting their on-time performance. Conditions for bus operations have worsened to the point that some bus trips have to be turned back before they complete their scheduled trip. Using national standards for measuring reliability of transit service, the current transit service on O‘ahu ranks an “F” on a scale of A to F with A being best and F being worst.

General traffic conditions on O‘ahu are deteriorating. Recently, Honolulu was ranked, by a private corporation, as having the worst travel time loss in the U.S. due to congestion (HSB 2008). Poor operating conditions exist at several locations during peak travel periods. This increased traffic congestion and slower speeds have resulted in longer travel times for buses. The result is that trips occurring in peak periods take 47 percent longer than those made when traffic is not congested. Bus routes serving longer-distance travel markets are particularly affected by traffic congestion, decreasing transportation equity.

No Build Alternative

Under the No Build Alternative, transit operating speeds, reliability, and mobility would worsen in 2030. The decrease in transit service quality would continue in part because overall traffic congestion would worsen. Also contributing to these conditions is the lack of extensive transit-only facilities that avoid increased congestion. The worsening of traffic conditions would occur even with $3 billion in other planned transportation improvements. These conditions would affect mobility and reliability for all travelers.

Planned new developments in West Oʻahu create a need to provide transit connections to other parts of the island. However, serving these markets would be difficult given the expected increases in travel congestion and resulting delays. The lack of effective service to these emerging communities would affect the equitable access to transit. In general, equitable distribution of transportation services on Oʻahu would become more difficult as increasing congestion makes longer-distance trips slower and less reliable.

Effects of the Build Alternatives

Transit service mobility, reliability, equity, and access to new development would improve and be enhanced under any of the Build Alternatives. Transit travel times on the fixed guideway would be reliable and consistent regardless of traffic congestion on the street. For transit users, the availability of fixed guideway service would result in substantially lower travel times for major markets as compared to travel times under the No Build Alternative. Higher transit speeds would reduce travel times and improve operating efficiency.

Vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay would all decline, compared with the No Build Alternative. However, transit travel times would improve between major employment centers, such as Downtown, and emerging population and employment centers in West Oʻahu. Overall transit system access would be improved resulting in transit carrying a greater share of total travel, particularly for work-related trips during peak hours. For example, daily transit ridership would grow 40 percent over the No Build Alternative. With improved transit travel times and reliability, transit equity would also improve. Travel times would be reduced between areas with high concentrations of transit-dependent households and major employment areas. Comfort and convenience would be enhanced through a smooth ride on the fixed guideway and frequent service available 20 hours a day. Service frequencies of between 3 and 10 minutes in peak periods would be a major convenience to riders.

The fixed guideway would affect transportation conditions at some locations. Support columns would affect some existing streets, parking, and pedestrian and bicycle facilities. Potential localized traffic effects relating to the fixed guideway were assessed, including general traffic at park-and-ride facilities, as well as kiss-and-ride and local transit access to stations. While the guideway system is expected to reduce lane widths at some locations, it would not substantially affect traffic operations. Some mitigation would be required to address potential traffic-related effects at the East Kapolei and Pearl Highlands Stations areas. Effects to parking and other transportation elements would be minimized or mitigated. No long-term negative effects on traffic would occur on major roadways or near stations.

User Benefits

Overall transit user benefits would increase compared to the No Build Alternative. Most areas of O‘ahu are expected to experience benefits under the Build Alternatives when compared to No Build conditions. The main contributing factor for user benefits is the reduction in transit travel times that would result from the Build Alternatives.

Construction Impacts

Construction activity would temporarily affect the transportation system, including traffic, parking, bus service, and access to some businesses and residences. Mitigation to address construction-related effects will involve two major items: a Maintenance of Traffic Plan to address temporary effects; and a Transit Mitigation Program that will identify measures, including additional bus service, to address construction-related effects.

1.1 Introduction

The City and County of Honolulu Department of Transportation Services Rapid Transit Division (RTD), in cooperation with the U.S. Department of Transportation Federal Transit Administration (FTA), is evaluating fixed-guideway alternatives that would provide high-capacity transit service on O‘ahu. The project study area is the travel corridor between Kapolei and the University of Hawai‘i at Mānoa (UH Mānoa) (Figure 1-1). This corridor includes the majority of housing and employment on O‘ahu. The east-west length of the corridor is approximately 23 miles. The north-south width is, at most, 4 miles because the Ko‘olau and Wai‘anae Mountain Ranges bound much of the corridor to the north and the Pacific Ocean to the south.

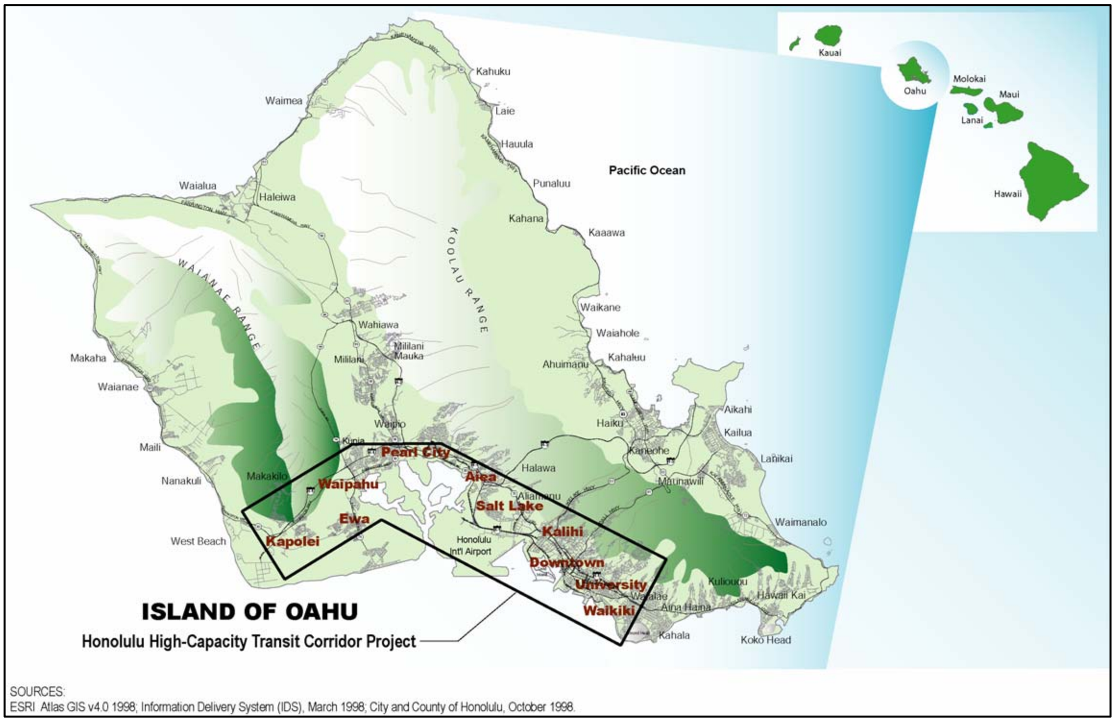


Figure 1-1: Project Vicinity

1.2 Description of the Study Corridor

The Honolulu High-Capacity Transit Corridor extends from Kapolei in the west (Wai‘anae or ‘Ewa direction) to UH Mānoa in the east (Koko Head direction) and is confined by the Wai‘anae and Ko‘olau Mountain Ranges in the mauka direction (towards the mountains, generally to the north within the study corridor) and the Pacific Ocean in the makai direction (towards the sea, generally to the south within the study corridor). Between Pearl City and ‘Aiea, the corridor’s width is less than 1 mile between Pearl Harbor and the base of the Ko‘olau Mountains (Figure 1-2).

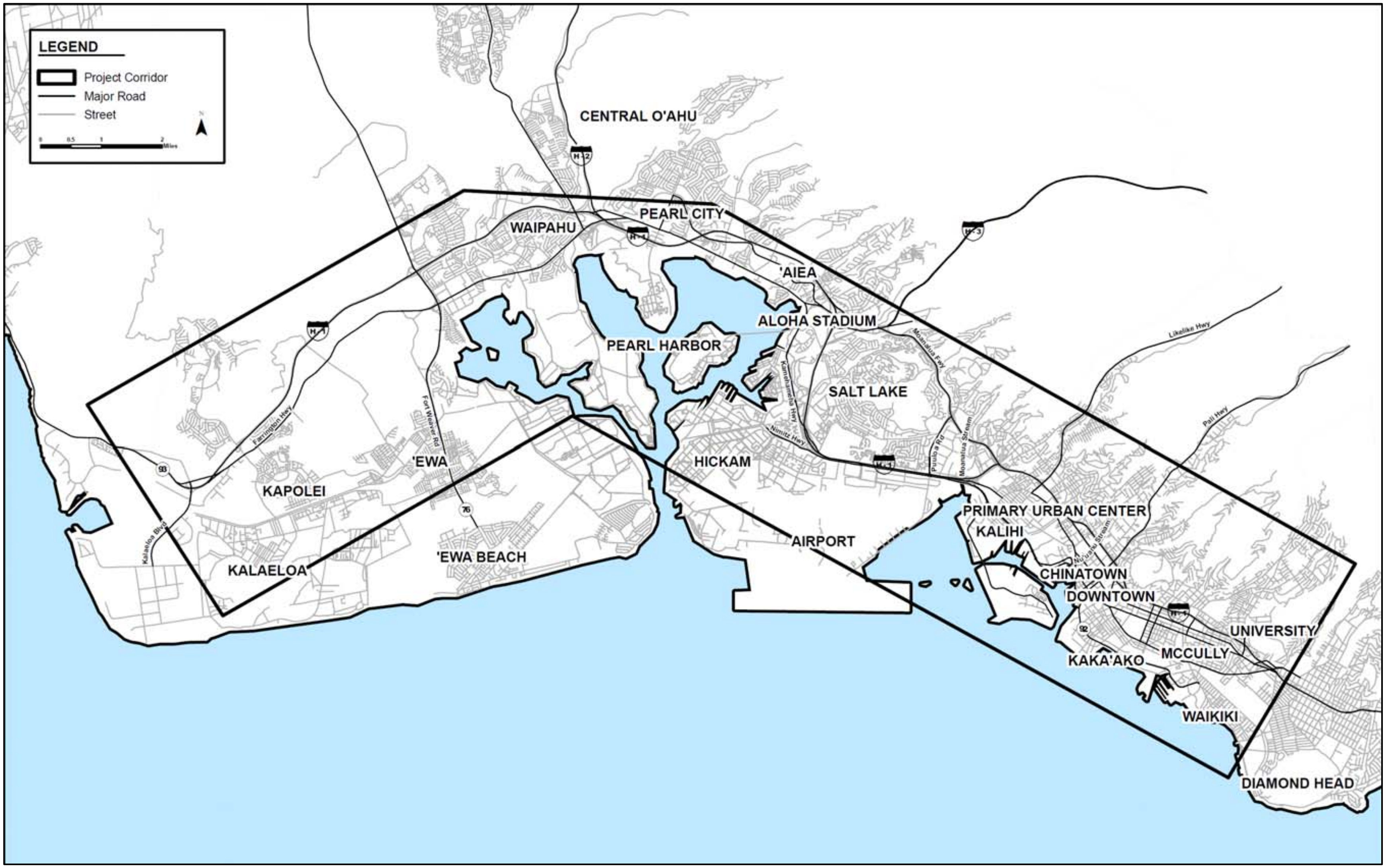


Figure 1-2: Areas and Districts in the Study Corridor

1.3 Alternatives

Four alternatives are being evaluated in the Environmental Impact Statement (EIS). They were developed through a screening process that considered alternatives identified through previous transit studies, a field review of the study corridor, an analysis of current and projected population and employment data for the corridor, a literature review of technology modes, work completed by the O‘ahu Metropolitan Planning Organization (O‘ahuMPO) for its *O‘ahu Regional Transportation Plan 2030* (ORTP) (O‘ahuMPO 2007), a rigorous Alternatives Analysis process, selection of a Locally Preferred Alternative by the City Council, and public and agency comments received during the separate formal project scoping processes held to satisfy National Environmental Policy Act (NEPA) (USC 1969) requirements and the Hawai‘i EIS Law (Chapter 343) (HRS 2008). The alternatives evaluated are as follows:

1. No Build Alternative
2. Salt Lake Alternative
3. Airport Alternative
4. Airport & Salt Lake Alternative

1.3.1 No Build Alternative

The No Build Alternative includes existing transit and highway facilities and committed transportation projects anticipated to be operational by 2030. Committed transportation projects are those identified in the ORTP*,* as amended (O‘ahuMPO 2007). Highway elements of the No Build Alternative also are included in the Build Alternatives. The No Build Alternative would include an increase in bus fleet size to accommodate growth, allowing service frequencies to remain the same as today.

1.3.2 Build Alternatives

The fixed guideway alternatives would include the construction and operation of a grade-separated fixed guideway transit system between East Kapolei and Ala Moana Center (Figure 1-3 to Figure 1-6). Planned extensions are anticipated to West Kapolei, UH Mānoa, and Waikīkī. The system evaluated a range of fixed-guideway transit technologies that met performance requirements, which could be either automated or employ drivers. All parts of the system would either be elevated or in exclusive right-of-way.

Steel-wheel-on-steel-rail transit technology has been proposed through a comparative process based on the ability of various transit technologies to cost-effectively meet project requirements. As such, this technology is assumed in this analysis.

The guideway would follow the same alignment for all Build Alternatives through most of the study corridor. The Project would begin by following North-South Road and other future roadways to Farrington Highway. Proposed station locations and other project features in this area are shown in Figure 1-3. The guideway would follow Farrington Highway Koko Head on an elevated structure and continue along Kamehameha Highway to the vicinity of Aloha Stadium (Figure 1-4).

Between Aloha Stadium and Kalihi, the alignment differs for each of the Build Alternatives, as detailed later in this section (Figure 1-5). Koko Head of Middle Street, the guideway would follow Dillingham Boulevard to the vicinity of Kaʻaahi Street and then turn Koko Head to connect to Nimitz Highway in the vicinity of Iwilei Road.

The alignment would follow Nimitz Highway Koko Head to Halekauwila Street, then along Halekauwila Street past Ward Avenue, where it would transition to Queen Street and Kona Street. Property on the mauka side of Waimanu Street would be acquired to allow the alignment to cross over to Kona Street. The guideway would run above Kona Street through Ala Moana Center.

Planned extensions would connect at both ends of the corridor. At the Waiʻanae end of the corridor, the alignment would follow Kapolei Parkway to Wākea Street and then turn makai to Saratoga Avenue. The guideway would continue on future extensions of Saratoga Avenue and North-South Road. At the Koko Head end of the corridor, the alignment would veer mauka from Ala Moana Center to follow Kapiʻolani Boulevard to University Avenue, where it would again turn mauka to follow University Avenue over the H-1 Freeway to a proposed terminal facility in UH Mānoa's Lower Campus. A branch line with a transfer point at Ala Moana Center or the Hawaiʻi Convention Center into Waikīkī would follow Kalākaua Avenue to Kūhiō Avenue to end near Kapahulu Avenue (Figure 1-6).

Salt Lake Alternative

The Salt Lake Alternative would leave Kamehameha Highway immediately ʻEwa of Aloha Stadium, cross the Aloha Stadium parking lot, and continue Koko Head along Salt Lake Boulevard (Figure 1-5). It would follow Pūkōloa Street through Māpunapuna before crossing Moanalua Stream, turning makai, crossing the H-1 Freeway and continuing to the Middle Street Transit Center. Stations would be constructed near Aloha Stadium and Ala Likoʻi. The total guideway length for this alternative would be approximately 19 miles and it would include 19 stations. The eventual guideway length, including planned extensions, for this alternative would be approximately 28 miles and it would include 31 stations.

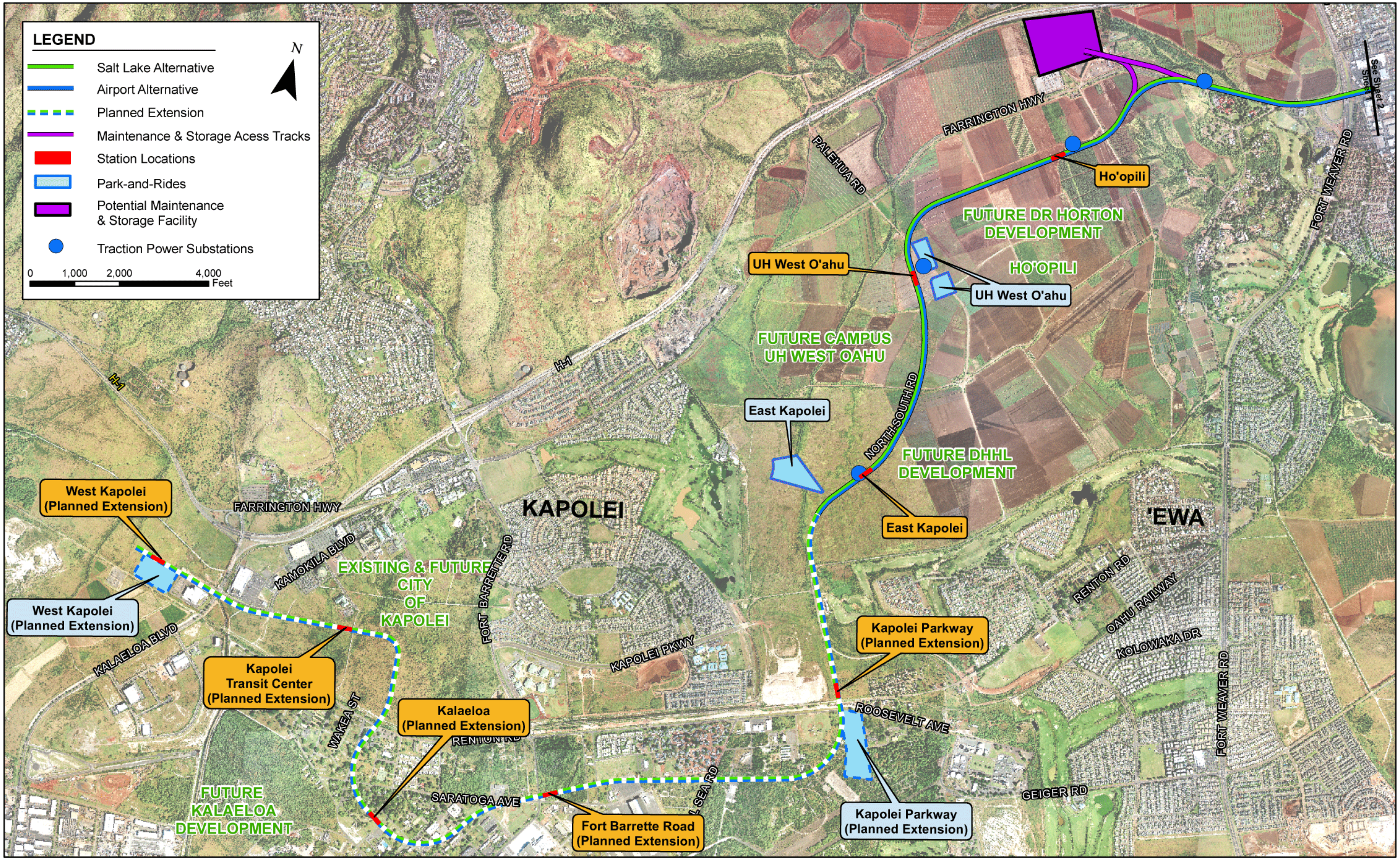


Figure 1-3: Fixed Guideway Transit Alternative Features (Kapolei to Fort Weaver Road)

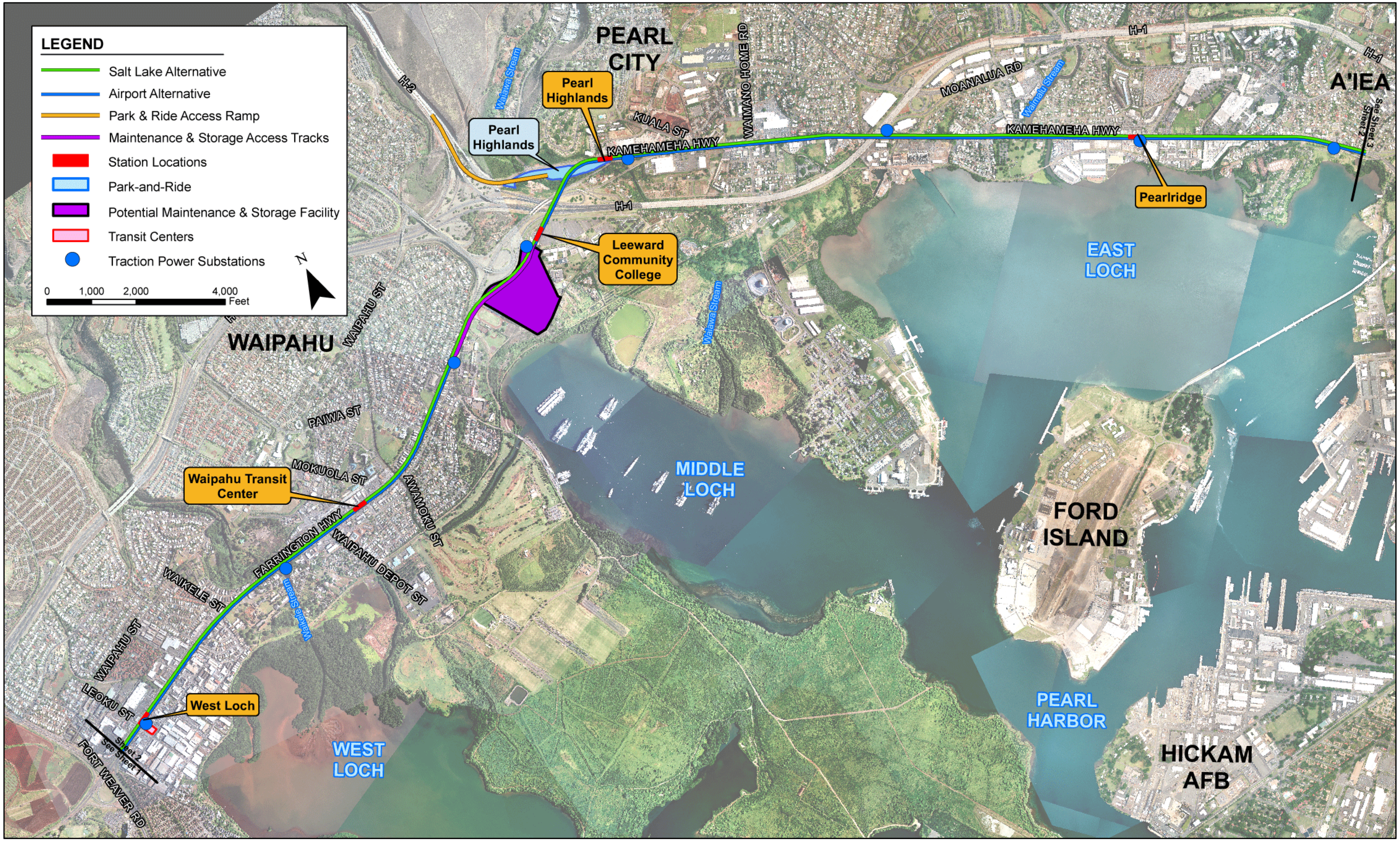


Figure 1-4: Fixed Guideway Transit Alternative Features (Fort Weaver Road to Aloha Stadium)

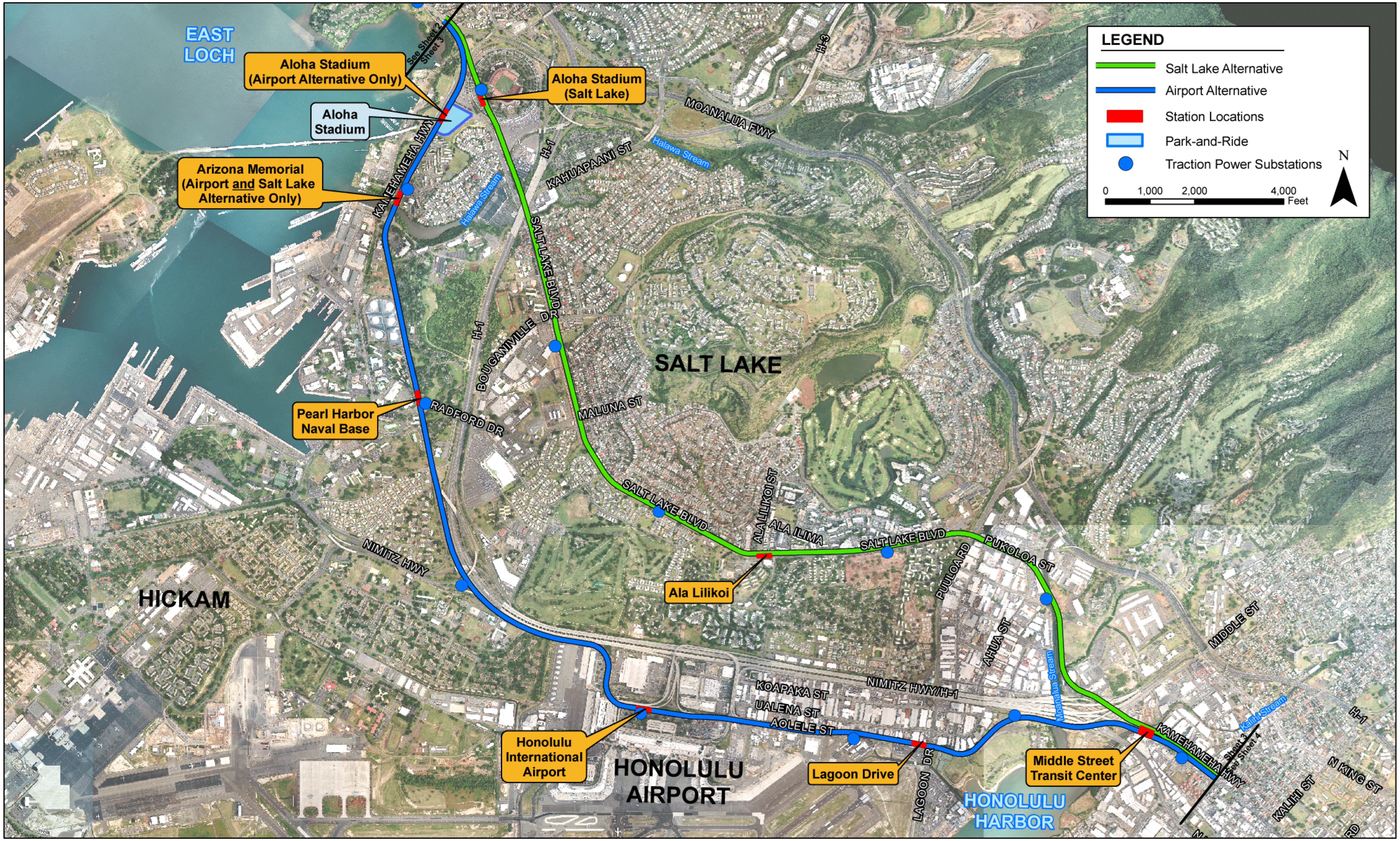


Figure 1-5: Fixed Guideway Transit Alternative Features (Aloha Stadium to Kalihi)

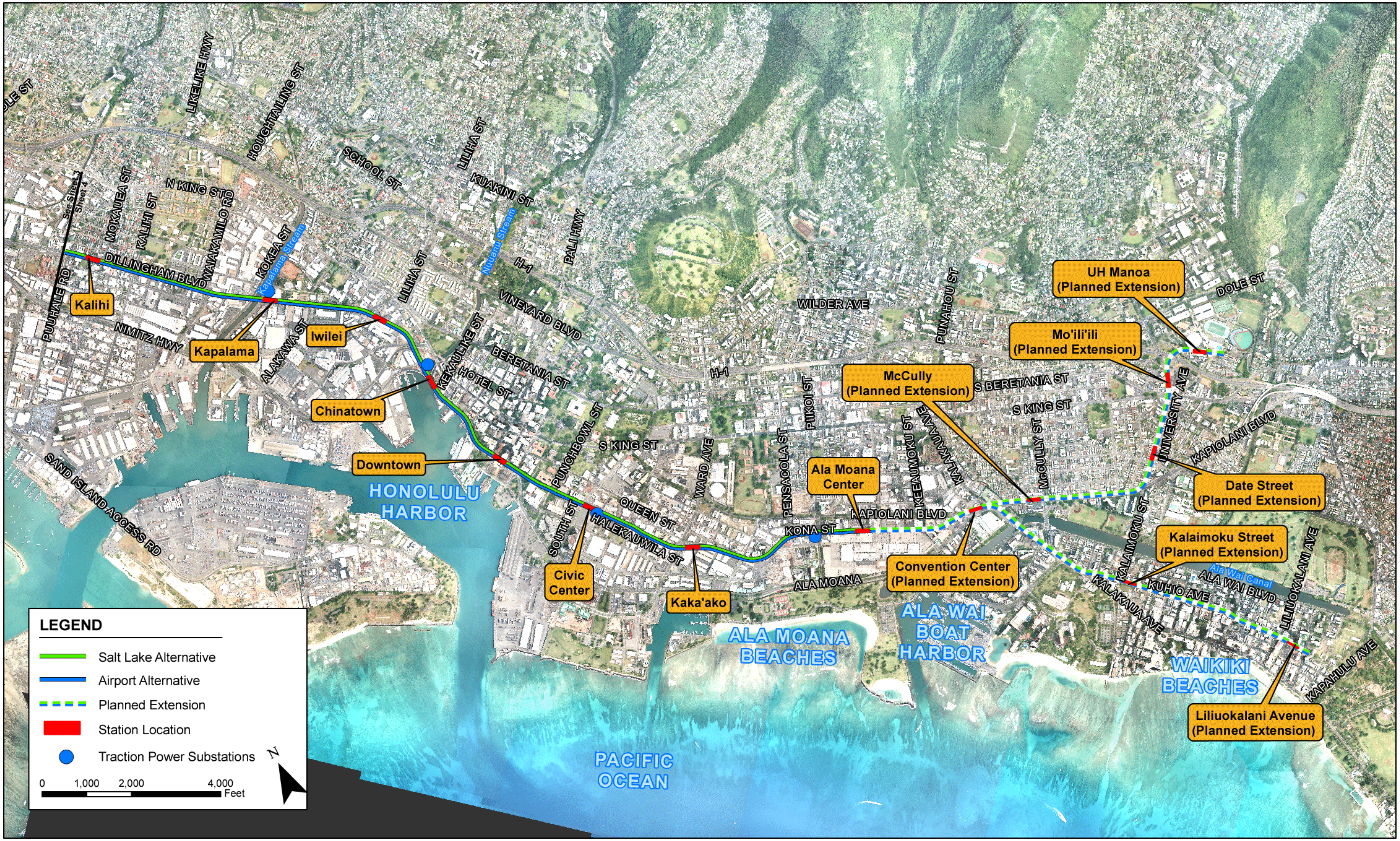


Figure 1-6: Fixed Guideway Transit Alternative Features (Kalihi to UH Mānoa)

Airport Alternative

The Airport Alternative would continue along Kamehameha Highway makai past Aloha Stadium to Nimitz Highway and turn makai onto Aolele Street and then follow Aolele Street Koko Head to reconnect to Nimitz Highway near Moanalua Stream and continuing to the Middle Street Transit Center (Figure 1-5). Stations would be constructed at Aloha Stadium, Pearl Harbor Naval Base, Honolulu International Airport, and Lagoon Drive. The total guideway length for this alternative would be approximately 20 miles and it would include 21 stations. The eventual guideway length, including planned extensions, for this alternative would be approximately 29 miles and it would include 33 stations.

Airport & Salt Lake Alternative

The Airport & Salt Lake Alternative is identical to the Salt Lake Alternative, with the exception of also including a future fork in the alignment following Kamehameha Highway and Aolele Street at Aloha Stadium that rejoins at Middle Street. The station locations discussed for the Salt Lake Alternative would all be provided as part of this alternative. Similarly, all the stations discussed for the Airport Alternative also would be constructed at a later phase of the project; however, the Aloha Stadium Station would be relocated makai to provide an Arizona Memorial Station instead of a second Aloha Stadium Station. At the Middle Street Transit Center Station, each line would have a separate platform with a mezzanine providing a pedestrian connection between them to allow passengers to transfer. The total guideway length for this alternative would be approximately 24 miles and it would include 23 stations. The eventual guideway length, including planned extensions, for this alternative would be approximately 34 miles and it would include 35 stations.

1.3.3 Features Common to All Build Alternatives

In addition to the guideway, the project will require the construction of stations and supporting facilities. Supporting facilities include a maintenance and storage facility, transit centers, park-and-ride lots, and traction power substations (TPSS). The maintenance and storage facility would either be located between North-South Road and Fort Weaver Road or near Leeward Community College (Figure 1-3 and Figure 1-4). Some bus service would be reconfigured to transport riders on local buses to nearby fixed guideway transit stations. To support this system, the bus fleet would be expanded.

2 Methodology

This chapter identifies the methodology used to estimate the potential transportation-related effects of the alternatives considered for the Honolulu High-Capacity Transit Corridor Project (the Project). It discusses the analytical tools used and the approach taken to develop these estimates.

2.1 Analytical Tools and Data Sources

Recently, several urban areas have developed travel forecasting model sets which apply the “sequential” approach. In the sequential approach, travel patterns are assumed to be the product of a sequence of individual decisions:

- The number of trips that a household will make—*trip generation*
- The destinations of these trips—*trip distribution*
- The forms of transportation that will be used for travel—*mode choice*
- The paths on the network that the trips will take—*network assignment*

The primary quantitative basis for evaluating the alternatives of the Project is a travel demand forecasting model used by O‘ahuMPO for the ORTP (O‘ahuMPO 2007). The O‘ahuMPO model uses the aforementioned sequential approach and is based on “best-practices” for urban travel models developed for urban travel modes in the U.S. This modeling approach has proven effective in estimating ridership levels in other areas such as Los Angeles County, Salt Lake City, and the Denver Region in the last 10 years.

The existing model was reviewed, enhanced, recalibrated, and validated consistent with current FTA guidelines. For the purpose of this Project, the current O‘ahuMPO model was refined and augmented to better represent transit alternatives in the corridor. Concurrently, a new on-board transit survey was completed in December 2005 and January 2006 and the latest socio-economic information was incorporated. Finally, the mode choice component of the travel demand forecasting model was recalibrated and validated using the updated socio-economic data and results from the new on-board survey.

Additional details of the updated socio-economic methodology, input, model coding, and the results are documented in the *Honolulu High Capacity Transit Corridor Project Travel Forecasting Methodology Report* (RTD 2008).

2.2 Approach to Estimating Transportation Effects

Using the results of travel demand forecasting model applications and other information sources, existing (2007) transportation system conditions and performance were analyzed. Future 2030 No Build Alternative conditions and performance were then analyzed and compared to existing conditions. Finally, Build

Alternatives' conditions and performance were analyzed and compared to No Build Alternative conditions and performance.

The O'ahuMPO travel demand forecasting model was used to generate traffic volume forecasts, parking demand information, and transit ridership statistics. The model results discussed in this report include:

- Trip volumes by purpose
- Trip volumes by mode (e.g., car, bus, fixed guideway, walk, bike)
- Trip time
- Vehicle miles traveled (VMT)
- Vehicle hours traveled (VHT)
- Vehicle hours of delay (VHD)

Traffic effects at intersections within the study corridor were estimated using procedures in the Transportation Research Board (TRB)'s *Highway Capacity Manual 2000* (HCM) (TRB 2000). The analysis identified existing operating conditions at intersections and projected conditions under the No Build Alternative and Build Alternatives in areas that would be affected by the fixed guideway system.

Effects were determined by comparing changes in level-of-service (LOS) among the No Build Alternative and the Build Alternatives in 2030. An effect was considered to exist when the Project would cause any of the following conditions during either the a.m. or p.m. peak hours:

- The LOS declines from D or better to E or F
- The LOS declines from E to F
- The No Build Alternative LOS is E or F and the average vehicle delay increases over the No Build conditions

Modeling outputs include travel time changes by alternative for transit trips, and changes in transit ridership. It also includes results for selected travel markets and changes in mode shares. Information from the model has been used to estimate user benefits from the Build Alternatives versus the No Build Alternative. Chapter 5 of this report provides more information on user benefits.

2.3 Existing Transportation Conditions—Study Locations, Data Collection, and Methodology

This section describes the approach used to identify and assess existing transportation conditions in the vicinity of proposed Project stations.

2.3.1 Traffic Study Locations

The analysis of existing traffic conditions in the vicinity of proposed Project stations provided a basis for subsequent transportation analyses. To better understand traffic operating conditions along the proposed alignment, it was necessary to identify the intersections in the immediate vicinity of proposed stations and the major intersections located nearby or on the Project alignment.

This analysis focuses on areas where proposed fixed guideway stations would have the greatest influence on traffic flows and travel patterns. A total of 215 intersections were analyzed.

2.3.2 Traffic Data Collection

Historical data were examined to identify peak travel periods along the proposed fixed guideway alignments, and traffic counts were conducted during these time frames. Weekday a.m. and p.m. peak-period traffic counts were conducted at 211 intersections on typical weekdays in October and November 2007. Additional counts were conducted for the remaining four locations in January and March 2008.

A.M. peak-period data was collected between 6:30 a.m. and 8:30 a.m. and p.m. peak-period data was collected between 3:30 p.m. and 5:30 p.m. for most locations. The main exception were counts along Kamehameha Highway, which were collected between 4:15 p.m. and 6:15 p.m. for the p.m. peak period.

Detailed signal timing operation plans for the signalized locations were obtained from the City and County of Honolulu Department of Transportation Services (DTS). At locations where signal plans were not available, field observations were used for cycle time and signal phasing.

2.3.3 Traffic Analysis Methodology

Level-of-Service

The Synchro 6.0 software suite (Syncro) was used for intersection analysis. Synchro applied the HCM Operational Analysis methodology and intersection input data to estimate control delay at each study intersection. Control delay is the quantitative performance measure to determine LOS. For signalized intersections, control delay included the delay attributed to signal operations and included initial deceleration, queue move-up time, stopped delay, and acceleration delay. For intersections controlled by stop signs, the unsignalized intersection methodology was used. This methodology defines LOS based on the longest delay experienced by any single movement.

LOS categories range from excellent, nearly free-flow traffic at LOS A to overloaded, stop-and-go conditions at LOS F. LOS definitions are provided in Table 2-1 and Table 2-2, respectively, for signalized intersections and stop-controlled (unsignalized) intersections. The LOS definitions, ranges of delay, and ranges of average stopped delay shown in these tables represent average conditions for all vehicles at an intersection across an entire hour. Delays longer than the average condition can be experienced by motorists for some movements and/or during peak times within the peak hour.

Intersection turning movements were evaluated by applying the operational analysis methodology from the *HCM*.

Table 2-1: Level-of-Service Definitions for Signalized Intersections

Level-of-Service	Control Delay (seconds/vehicle)	Interpretation
A	≤10.0	LOS A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low density.
B	>10.0 and ≤20.0	LOS B generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	>20.0 and ≤35.0	At LOS C, higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear. The number of vehicles stopping is substantial, although many still pass through the intersection without stopping.
D	>35.0 and ≤55.0	At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume thresholds. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	>55.0 and ≤80.0	LOS E is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume thresholds. Individual cycle failures are frequent occurrences.
F	>80.0	LOS F, which is considered to be unacceptable to most drivers, often occurs with oversaturation (i.e., when arrival flow rates exceed the intersection's capacity). It may also occur at high volume thresholds below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to these delay levels.

Source: Highway Capacity Manual 2000 (TRB 2000)

Table 2-2: Level-of-Service Definitions for Stop-Controlled Unsignalized Intersections

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

Source: Highway Capacity Manual 2000 (TRB 2000)

Intersection Impact Criteria

The Operational Analysis method from the *HCM* was used to perform the intersection LOS analysis at signalized intersections. This method determined two key operating characteristics for signalized intersections: (1) the average stopped delay experienced per vehicle, and (2) the volume-to-capacity (V/C) ratio at intersections. This was based on the amount of traffic traveling through the intersection, travel lane geometries, and other factors affecting capacity (e.g., on-street-parking, bus operations near each intersection, and pedestrian volumes at crosswalks).

LOS provided a qualitative assessment of an intersection's operating conditions. According to the *HCM*, most planning efforts use LOS C or D as acceptable operating service levels. LOS D is the most common LOS threshold used by cities and is the point at which a city can cost effectively plan the roadway system. If an intersection is operating at LOS D, and would degrade to LOS E or worse with the addition of Project traffic, then the Project is considered to have an effect at this location. If an intersection is operating at LOS E or F under the No Build Alternative and the Project would add delay to the intersection, the Project is also considered to have an effect.

Peak Hour Screenline Level-of-Service Methodology

To measure and describe the local roadway network's operational status, an LOS grading system was developed to describe a facility's operation, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (over-saturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). The operation of the roadway segments was calculated by comparing traffic volumes on roadway facilities to the saturated volume LOS thresholds for each individual facility. The LOS is reported for each individual screenline facility, then weighted by traffic volumes to report overall operating conditions across each screenline (screenlines are imaginary lines drawn across the road network, used to group traffic volumes together to represent operating conditions for the entire corridor). This methodology was used to analyze a.m. and p.m. peak hour traffic volumes across each screenline under 2005 conditions, 2030 No Build Alternative conditions, and 2030 Build Alternative conditions.

The LOS was assessed for each roadway facility at each screenline. To estimate the LOS for each facility, data from several sources were used to develop a technique that would directly provide an LOS based on projected peak hour volumes. These sources included techniques from the *HCM*, roadway LOS thresholds from the *Quality/Level of Service Handbook* (FDOT 2002), and consultant experience related to planning-level approaches to assessing LOS for roadways at segment levels. These techniques combine traffic volumes, speed, peak hour factors, and traffic signal data. Data for LOS thresholds by type of roadway facility are in Appendix A.

Screenline Operating Conditions

The operation of the roadway segments was calculated by comparing traffic volumes on a roadway to the saturated volume LOS thresholds for each individual facility. The saturated volume thresholds were developed based on the roadway functional classification and operating characteristics (e.g., number of intersections or interchanges per mile, divided or undivided roadways, number of travel lanes, and one-way or two-way facility).

The LOS across the screenline is reported for each screenline facility and then weighted by volumes to report the overall operating conditions across each screenline. This same methodology was used to analyze the a.m. and p.m. peak hour traffic volumes across each screenline under Year 2005 conditions. Facility and area types for each roadway link crossing the screenlines of interest were obtained from the travel demand forecasting model's Year 2007 baseline database. Facility type relates to a facility's functional class. Area type is estimated by the model as a function of population and employment densities within the transportation analysis area containing the roadway link. A transportation analysis area (TAA) is a geographic area used for transportation planning purposes.

Criteria for Identifying Transportation Project Effects and Cumulative Effects

Although the City and County of Honolulu has not established guidelines for assessing traffic effects on specific arterial/freeway segments' operating conditions that are attributable to a project, based on the *HCM* it is generally accepted that LOS D is the minimum acceptable LOS for urban areas on O'ahu. Using this standard as the key criterion, the following guidelines and thresholds have been established for the purpose of evaluating the Project's effect on O'ahu's local and regional highway system:

- A roadway segment, as measured at a screenline, operates at LOS D or better under 2030 No Build Alternative conditions (i.e., without the Project) and degrades to LOS E or F with the Project.
- A roadway segment, as measured at a screenline, operates at LOS E or F under 2030 No Build Alternative conditions (i.e., without the Project) and experiences an increase in vehicular volume with the Project.

Analysis Methodologies and Criteria for Determining Effects

The *HCM* Operational Analysis method for signalized intersections was used to conduct the intersection analysis at each signalized intersection. The travel demand forecasting model, which provided roadway segment volumes for the screenline analysis described previously, was also used for the intersection analysis.

The peak hour turning movement projections produced by the travel demand forecasting model were adjusted with a post-processor developed for the Project. This post-processing was in accordance with the methodology and guidelines presented in *National Cooperative Highway Research Program (NCHRP) Report*

255: Highway Traffic Data for Urbanized Area Project Planning and Design (TRB 1982).

2.3.4 Localized Traffic Analysis at and near Stations

The previously identified methodology for screenline-level traffic analyses were directed at potential system-level effects of the Project along the corridor. The corridor-wide performance analysis indicates that, because the Project is projected to increase the usage of the overall transit system along the study corridor, vehicular traffic volumes would generally remain at the same level or decrease at each of the analyzed screenlines.

However, the nature of the system's operation is such that traffic could increase at localized levels, thereby requiring further analysis. These reasons include the following factors:

- Some stations would include a park-and-ride facility designed to attract potential transit patrons who will be driving from the trip origin (normally the rider's residence) via a private automobile and then transferring to the fixed guideway system at these stations. Local streets near these stations could experience an increase in traffic volume at one or more of the locations that provide access to the stations. Areas that have stations with a planned park-and-ride facility were subjected to a more detailed local traffic effect analysis, to assess the potential effect of the park-and-ride vehicles.
- Many transit patrons are expected to access the Project by riding a bus from their trip origin to one of the proposed stations. The increased number of buses at or near some stations may be of sufficient magnitude that the buses themselves may generate an effect on local streets in the area. At stations where a substantial number of added bus trips would be required, the resulting added traffic was subject to a more detailed analysis.
- A review of patronage forecasts indicates that some patrons may be attracted to stations without formal park-and-ride facilities. Depending on parking supply conditions surrounding these non-park-and-ride stations, this projected informal parking may spillover into the neighborhoods to park thereby affecting the local street system and existing parking supply. The patronage forecasts indicate that some stations may attract a sufficient amount of "spillover parking" to warrant a traffic analysis.
- There are two locations being considered for a maintenance and storage facility. Approximately 420 people would be employed at a facility, which has the potential to affect traffic conditions in the surrounding area.

Method Used to Conduct Localized Traffic Impact Analysis

To properly analyze the traffic effect at a localized level (primarily at the intersection), traffic volume forecasts at the intersection turning movement level of detail were developed for the planning horizon of Year 2030.

A comprehensive process addressed several areas of analysis, including the overall systemwide travel demand forecasting model, stations where the detailed analyses was conducted, and the projections of park-and-ride patrons, kiss-and-ride patrons, and feeder bus activity at these stations.

Development of Future (2030) Turning Movements

To assess the effects that the park-and-ride trips, kiss-and-ride trips, bus feeder service, and maintenance and storage facility would have on the highway network, intersections around each station were evaluated. These types of vehicle trips are expected to add new traffic activity to the local intersections around each of the stations.

The travel demand forecasting model was used as the basis for assessing the effect of vehicles using the park-and-ride facilities. However, peak-period projections derived from the model required refinement because model forecasts are often insensitive to parameters such as lane geometry, signal timing, and pedestrian activity.

The purpose for making adjustments to the model forecasts is to achieve consistency with base year traffic count data. With the travel demand forecasting model, the volumes estimated in the base year (2007) were assumed to be consistent with the future year (2030). When forecast volumes are consistent with each other, future year forecasts can be adjusted using the same factors used to adjust the base year model volumes to achieve consistency with the empirical count data. Refinements to the model are made based on the degree of variation between the base year model volume and the observed count. Three model components were adjusted (post-processed): the base year count, the base year assignment, and the forecast year assignment.

The TRB provides direction on the adjustment of model forecasts. However, each situation can be unique and may necessitate a different methodology or mixture of methodologies.

NCHRP Report 255 (TRB 1982) presents guidelines for using model data and is the basis of the methodology presented in this report. The following procedure was used for the Project:

- **Adjust Link Volumes**—adjust the peak hour link volumes in and out of each leg of the intersection (generally eight segments or links for a standard four-way intersection) using either an incremental or ratio adjustment process. The choice of which to use is dependent on the magnitude of the difference between the modeled and actual volumes. Where model estimates are very low (generally less than 50 percent of actual volumes), an incremental adjustment of an absolute volume is applied. Otherwise, a ratio adjustment is applied.
- **Factor Turn Volumes**—factor the base year turn movement count at the intersection until the total volumes in and out of each leg closely match the

adjusted link volumes. A common factoring algorithm is named after its creator, *Furness*.

- **Check Increments**—in some cases the factored turn movements are lower than the base year traffic counts due to large increases in certain exiting movements that divert traffic away from other movements. If the adjustment is appropriate, forecast turn movements can be decreased from the base year traffic counts. If not, the volumes are reset to be no lower than the base year traffic counts.

This methodology was used to develop turning movement traffic projections for each key location, for the No Build Alternative and the following Build Alternatives as well as planned extensions beyond the Project:

- Salt Lake Alternative
- Airport Alternative
- Airport & Salt Lake Alternative
- Potential Extensions:
  - West Kapolei to East Kapolei planned extension
  - Ala Moana to the UH Mānoa planned extension
  - Waikīkī planned extension

Volume Projections for Park-and-Ride, Kiss-and-Ride, Feeder Bus and Maintenance and Storage Facilities

The travel demand forecasting model calculates traffic volumes resulting from park-and-ride, kiss-and-ride, spillover parking, and maintenance and storage facilities and feeder buses near each fixed guideway station. Vehicle projections were developed, as described further in this section, to supplement the post-processed model forecasts.

Daily park-and-ride, spillover parking, and kiss-and-ride person trip productions and attractions were modeled for each park-and-ride station. These numbers were converted to daily origin and destination vehicle trip projections for the stations. Each kiss-and-ride person trip was assumed to arrive as a single fixed guideway passenger in a vehicle. It was assumed that each vehicle with a kiss-and-ride passenger would arrive and depart at the station during the same a.m. peak hour.

A description of future feeder bus service was developed for each station. These projections were used to determine the number of additional buses that would serve station areas under each of the Build Alternatives. Bus headways were converted into vehicle trips, and these were converted into passenger car equivalents using a value of three cars per bus. The estimated bus trips were translated into turning movements at each intersection, to provide an estimate of additional vehicular traffic at each intersection near each station that would result from the additional bus service required for the fixed guideway service.

Based on operating experience at other high capacity transit systems in Denver and Los Angeles, as well as information from the travel demand forecasting model, estimates were provided for three traffic-related items: conversion of daily volumes to a.m. and p.m. peak hour volumes; inbound and outbound directional distribution for a.m. and p.m. peak hour; and average vehicle occupancy.

The daily vehicle trip projections for each station were then converted to peak hour origin and destination vehicle trip generation projections for each station. An average vehicle occupancy of 1.16 persons per vehicle was used to convert the daily person trips into daily vehicle trips for each of the park-and-ride lots in the system. The projected daily park-and-ride trips for each station were then divided by half to estimate the total inbound and outbound vehicle trips. The total inbound trips per day were converted into a peak hour projection by applying a factor of 0.40. It was assumed that the peak hour trips from the park-and-ride demand during the a.m. peak hour would be primarily inbound vehicles with negligible outbound vehicles, and vice versa during the p.m. peak hour.

In addition, each kiss-and-ride person trip was assumed to generate a vehicle trip to ensure that the trip generation estimate would be conservative. The daily kiss-and-ride vehicle projections for each station were first divided by half to estimate the daily directional trips. The daily inbound trips were converted to peak hour inbound trips by applying a factor of 0.4. To further ensure conservatism in the projections, it was assumed that each vehicle with a kiss-and-ride passenger would arrive and depart at the station in the same peak hour. Therefore, the peak hour outbound trips are equal to the peak hour inbound trips during both the a.m. and p.m. peak hours. The peak hour vehicle trip projections are provided under the analysis for each separate station.

Regarding the fixed guideway maintenance and storage facility, for the purpose of the traffic effect analysis, it was estimated that 30 percent of the employees working the daylight shift (approximately 63 employees) would arrive at the facility during the typical a.m. peak hour and same number of employees would leave the facility during the typical p.m. peak hour. A large percentage of the employee commute trips are expected to be made by single occupant vehicles. In summary, the traffic analysis assumes that the maintenance facility would generate approximately 63 vehicle trips that would be distributed on the local roadway system (based on the regional travel patterns) during the typical a.m. and p.m. traffic peak hours.

The vehicular trips generated by either of these maintenance and storage facility options under consideration would be expected to add new traffic to the local street network and intersections in addition to the park-and-ride, kiss-and-ride, and bus feeder services. To assess the level of traffic effect of the two maintenance and storage facility options, several intersections in the vicinity of each facility were selected for analysis. The methodology for the development of turning movement traffic projections is the same as that used for park-and-ride, kiss-and-ride, and feeder bus analysis. The travel demand forecasting model was used and calibrated as the basis for developing future intersection turning movements for analyzed locations and for assessing the effect of employee trips generated by the maintenance and storage facility. Analysis was conducted for several scenarios—2030 No Build Alternative, 2030 Build Alternatives, and 2030 Build Alternatives with one maintenance and storage facility.

2.3.5 Parking Information

Several sources were used to identify parking-related items:

- Information on existing parking in the study corridor was obtained from DTS and augmented by field surveys in June 2008 in station areas.
- The review of parking costs in Honolulu and other U.S. cities was based on the *2008 North America Central Business District Parking Rate Survey* conducted by Colliers International.
- Estimates of potential parking losses resulting from the Build Alternatives were identified through a review of conceptual design plans for both on-street and off-street spaces.
- The travel demand forecasting model was used to estimate potential spillover parking at fixed guideway stations that would not have park-and-ride facilities.

2.3.6 Pedestrian/Bike Access

Pedestrian and bike access in proposed guideway station areas was evaluated based on field surveys in Spring 2008 and a review of existing and planned facilities. Potential future facilities have been identified in the *State of Hawai'i Master Plan, Bike Plan Hawai'i Master Plan* (HDOT 2003) and *Honolulu Bicycle Master Plan* (DTS 1999).

2.3.7 Bus Access

Three steps were used to evaluate and identify the Build Alternatives' effect on bus access in station areas:

- Reviewing existing operations information for TheBus;
- Estimating future demand on local bus routes that would serve guideway stations under the No Build Alternative and Build Alternatives; and
- Determining how well future bus service would accommodate estimated future demand at each station area under each Build Alternative.

2.3.8 Analysis of Feeder Buses at Stations

In order to ensure the effect of feeder buses was not underestimated, a methodology was used to convert buses into passenger car equivalents (PCE). Traffic engineering research indicates that one transit bus would have the same effect on the capacity of the street system as three passenger vehicles. Therefore, all bus volumes were multiplied by a PCE factor of 3.0.

It was determined that stations with a large number of feeder buses would be analyzed. The specific criterion used was similar to that used to determine the effect of traffic generated by spillover parking. If a station generated additional bus traffic equivalent of 50 vehicles per hour in one direction, it was sufficient to justify a detailed analysis. The total number of buses serving each station can be found in Appendix B, along with more detailed information on specific routes.

Review of Existing Bus Operations in Station Areas

Bus operations data identified for 2007 were used to provide a basis for assessing system performance. Information is provided in Chapter 5 on 2007 bus routes in the a.m. peak period that serve the proposed station locations. The existing level of performance provides a baseline or *average* performance value for bus routes serving the location, which was then compared with future conditions.

It should be noted that the assessment also included routes serving stations on potential extensions of the Project. This information is presented to allow any necessary evaluation of future extensions.

Estimated Future Demand on Routes Serving Station Areas

The travel demand forecasting model identified the number of bus passenger boardings at each station. These boardings were then compared to the number of bus departures occurring during the same time period, to calculate a relative level of performance among all stations and between the Build Alternatives.

It is assumed that peak-period service levels for TheHandi-Van would be proportionate to the TheBus peak-period service levels throughout O‘ahu. Therefore, performance was exclusively focused on variations in the characteristics of TheBus services.

Determining Performance Levels for Bus Routes Serving Stations

Performance at guideway stations was calculated by initially identifying the number of bus departures during the peak hour from each station. This information, along with the estimated passenger demand identified at each station, provides a station-by-station projection of demand per bus trip. This information can then be compared to 2007 baseline conditions. This helps determine the total number of buses passing within 0.5 miles of each proposed guideway station area during the peak hour in 2007 that would be affected by the Build Alternatives.

2.3.9 Effects on TheBus Operations

The fixed-guideway bus networks were developed building upon planned changes to the current bus system and elements from the No Build and TSM alternatives. Road network additions and improvements described in the 2030 O‘ahu Regional

Transportation Plan were assumed to be completed. These include the p.m. zipper lane, the Nimitz Flyover and other projects.

Development of the supporting bus network for the fixed-guideway alternatives used the following guiding principles:

- The community-oriented services developed in recent years will be continued and enhanced with the terminus of those services to be located at the new station serving that community.
- A route will be realigned and truncated at a fixed-guideway station if the estimated out of direction passenger travel time for local and community circulator routes is impacted by no more than 10 minutes of actual travel time.
- Local routes will be either discontinued or reclassified as a feeder service where major local routes serve the same general alignment as the fixed-guideway. The exceptions are those routes deemed essential to provide local bus stop service along the fixed-guideway alignment. Selected local routes will operate their full length alignment in the late evenings when the fixed-guideway is not operating. These routes will provide 24-hour service.
- Peak-period, peak-direction express bus routes in competition with the fixed-guideway system will be discontinued in favor of the fixed-guideway alignment if the estimated passenger travel time is impacted by no more than 15 additional actual travel time minutes.
- Community circulator routes will be reoriented and extended to serve a fixed-guideway station if the mileage impact is no more than two additional miles. The exception is for those route changes deemed necessary, especially during the peak periods, to avoid a double transfer to reach a fixed-guideway station.
- Community circulator routes will retain the same span of service and headways as in the TSM Alternative unless a route has the same alignment as the fixed-guideway and is eliminated or forecasted ridership is such that additional service is warranted due to overcrowding.
- Ferry services will continue to operate between Leeward O‘ahu and Aloha Tower in downtown Honolulu. Routes designed specifically for connections to the ferry are identified with an “F” preceding the route number.

Routes were realigned to serve fixed-guideway stations based upon the guiding principles and prior No Build and TSM Alternative development. The travel demand forecasting model was run with these adjustments. Frequencies of routes were refined based upon the review of model output.

The maximum load point passengers per trip for each route and direction were calculated from the a.m. 1-hour peak, a.m. 2-hour peak, and all-day travel demand forecasting model results. The passengers per trip at the maximum load point for each route was compared to the vehicle capacity and desired load standard. In some cases, passenger overloads were able to be accommodated by changing vehicle size. In other cases, more trips were added to the route to accommodate forecasted demand.

After refinements were made to the bus routes, the travel demand forecasting model was rerun and additional adjustments were made based upon the new results.

In some cases, bus routes show low passenger boardings. While these routes were adjusted to reflect low utilization, the frequency of service was not reduced to below 2007 service.

Performance of TheBus routes in 2007 was compared to the future (2030) No Build Alternative and Build Alternatives. The analysis determined how routes are affected by potential additional ridership associated with bus access to guideway stations. The added ridership could affect the ability of these routes to provide community-oriented mobility services. Therefore, a complete description of fixed-route services was necessary.

Route Description

Routes are described by route number, direction, and variation or segment. Route segments were determined from vehicle assignments and route schedules. In some cases, a route variation may occur during a school day or holiday. The detailed route descriptions helped develop accurate annual estimates for the 2007 base year.

Trip Mileage

Mileage was calculated for each route and route deviation using GIS software. A street shapefile was obtained from the City and County of Honolulu, Department of Planning and Permitting and used as a base map for calculating mileage.

All route segments were drawn and aligned to the street network at the vertices for maximum accuracy (snapped to the street shapefile). Mileage was validated against the travel demand forecasting model’s output, and any anomalies were corrected.

Time Periods

Bus operations information was analyzed for several time periods to recognize variations in demand and operations during the day. For each service period, analysis included running time, layover and recovery time, number of bus trips, and mileage.

The following time periods are represented in the data spreadsheet:

- 4:00 a.m.–5:30 a.m.—early a.m.
- 5:31 a.m.–8:59 a.m.—peak a.m.
- 9:00 a.m.–2:59 p.m.—midday
- 3:00 p.m.–5:59 p.m.—peak p.m.
- 6:00 p.m.–10:59 p.m.—p.m.

- 11:00 p.m.–3:59 a.m.—night or owl
- Day Period Totals

Running Time

Running times were determined from the O‘ahuMPO travel demand forecasting model’s highway speeds for route times, layover and recovery times, vehicle assignments, and route schedules for each route segment and are presented in minutes. In many cases, the running time varied within a time period. In these cases, an average running time was calculated for each time period.

Number of Bus Trips

The number of bus trips for each individual route variation or segment in each time period was determined from vehicle assignments and route schedules. Bus trips were included in the time period for which the bus trip began, although in some cases the bus trips ended in another time period. Many route segments do not involve a complete trip. For example, Route A has a complete one-way trip from Waipahu to the UH at Mānoa. However, many Route A trips start at the Middle Street Transit Center. All trip segments were counted, resulting in a total of 4,077 trips.

Layover and Recovery Time

Layover and recovery times were determined from vehicle assignments and are presented in minutes. Recovery time is built into vehicle schedules to allow for daily fluctuations caused by on-time performance delays. These delays are affected by traffic, heavy passenger volumes, and other circumstances affecting timely performance. Layover times may vary between bus trips for each time period. In these cases, layover times were averaged for the time period.

Mileage

Mileage was calculated in each time period by multiplying the number of bus trips operating in each variation by the route variation mileage.

Summarizing the Data

The totals sum the information for each route and route variation for the number of bus trips, running time, layover time, and mileage from each time period. Included in the totals are a “Total Time” category and a category for the maximum number of vehicles required by time period.

3 Existing Conditions and Performance

This chapter describes existing conditions and the performance of transportation infrastructure and services operating within the study corridor and on the island of O‘ahu. This includes transit, streets and highways, parking, and pedestrian and bike facilities. Unless otherwise noted, the source of information presented in this chapter is the O‘ahuMPO travel demand forecasting model (O‘ahuMPO 2007).

The remainder of this chapter is organized into seven sections beginning with Section 3.1 which discusses existing travel patterns. Sections 3.2 through 3.6 describe the existing condition and performance of various components of the overall transportation system, such as transit, streets and highways, and bicycle and pedestrian facilities.

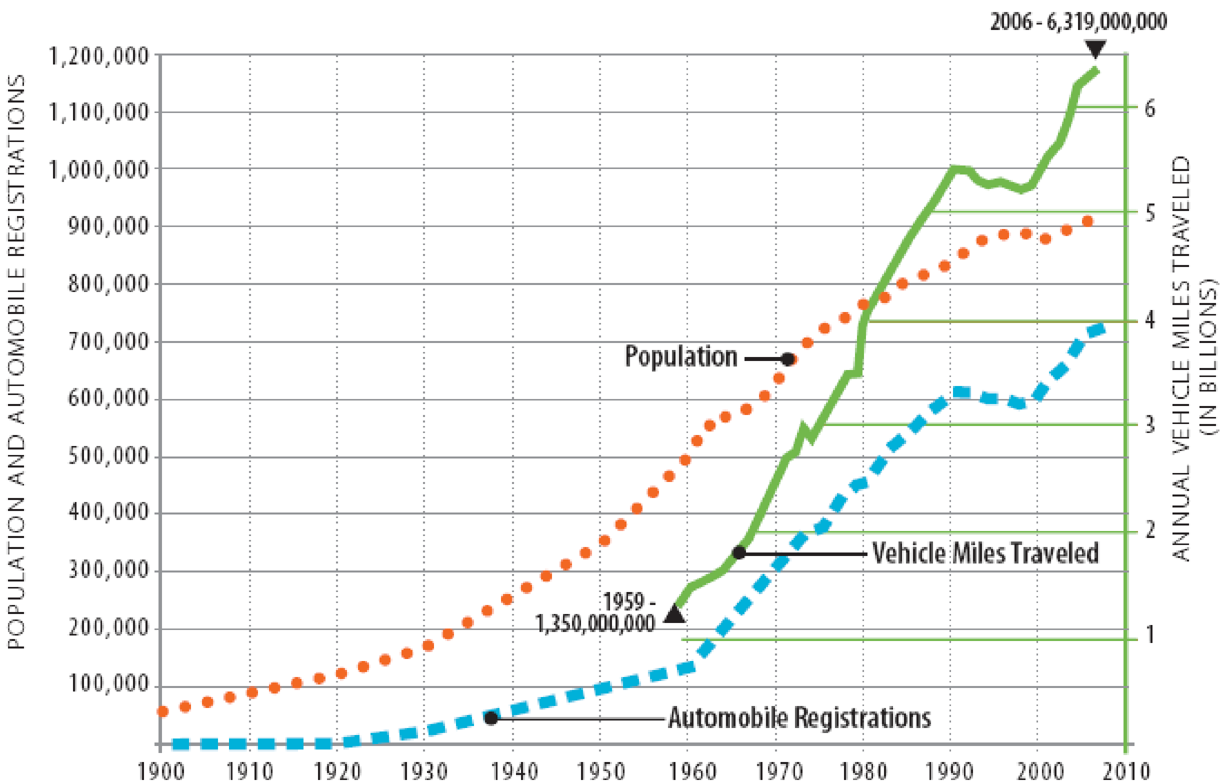
Information presented in this section primarily involves islandwide travel conditions and performance. Islandwide data reflects traffic and conditions for the study corridor since this corridor dominates in terms of total transportation demand. For example, 83 percent of both islandwide daily and peak-period work-related transit trips originate within the study corridor. The study corridor also attracts 90 percent of total islandwide daily transit trips and 94 percent of peak-period work-related transit trips.

3.1 Travel Patterns

Travel statistics in this report provide a snapshot of the travel habits exhibited on O‘ahu. The O‘ahuMPO travel demand forecasting model was used in this report to estimate various islandwide statistics for travel patterns on O‘ahu. These statistics were developed for Year 2007, which is the base year for the model. The model consists of networks that represent the existing roadway and transit system. It produces estimates of vehicular travel on the highway network and estimates of person travel on the transit network through the typical four-stage modeling process of trip generation, trip distribution, mode split, and network assignment. This process is driven by socioeconomic data based on the Year 2000 census and provided by the City and County of Honolulu Department of Planning and Permitting. Further information about the travel demand forecasting model is provided in Chapter 2 of this report. Figure 1-2 in Chapter 1 shows a map of the study corridor and existing roadway system.

The vast majority of trips made on the island occur within the study corridor. Currently, morning travel patterns in the study corridor are heavily directional. Morning Downtown-bound (Koko Head-direction) traffic volumes through the Waipahu and ‘Aiea areas are over twice the volume traveling in the ‘Ewa direction. Afternoon flows are less directional, with ‘Ewa-bound traffic volumes about 50 percent greater than Downtown-bound (Koko Head-bound) traffic.

Trends in population, automobile registration, and vehicle miles traveled for O‘ahu are shown in Figure 3-1. For this figure, data for vehicle miles traveled are from the HDOT Highway Performance Monitoring System (HPMS) which monitors traffic volumes on O‘ahu’s streets and highways and estimates volumes for streets and roads that are not actually monitored. It provides a historical perspective on traffic trends for the entire island. The O‘ahuMPO travel demand forecasting model, explained in Chapter 2 of this report and which is used for this study, focuses primarily on streets and highways in the study corridor.



Source: City and County of Honolulu Department of Business, Economic Development and Tourism, 2007.

Figure 3-1: Historic Trends in Population, Vehicle Ownership, and Vehicle Miles Traveled for O‘ahu

3.1.1 Islandwide Person Trips

Trip origins correlate closely to the level of population in a given area, while trip destinations correlate to a high degree with the level of employment. Based on these data, 2,036,000, or 73 percent, of the approximately 2,790,000 islandwide daily trips by residents, and 350,000, or 64 percent, of the 544,000 a.m. peak-period work-related trips are currently generated within the study corridor. The study corridor attracts an even higher percentage of islandwide work-related trips with 446,000, or 82 percent, of a.m. peak-period work-related trips having destinations within the study corridor. Figure 3-2 provides information on the daily person-trip patterns on O‘ahu.

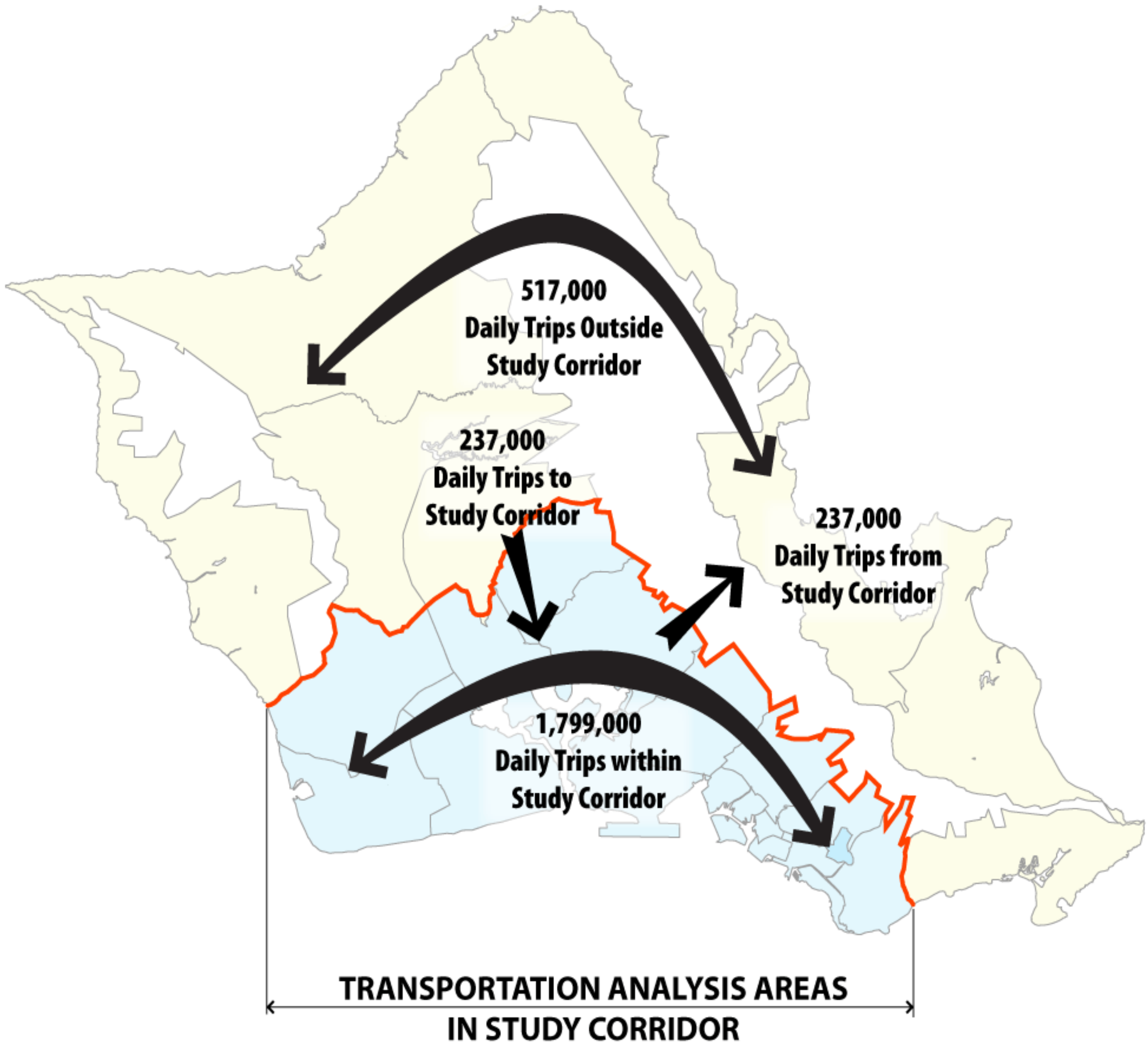


Figure 3-2: Current (2007) Person-Trip Patterns on Oʻahu (Residents)

The travel demand forecasting model estimates that more than 3.2 million person trips are made on a daily (average weekday) basis on O‘ahu (residents, truck trips, ground access by air passengers, and visitors). As shown in Table 3-1, 86 percent of total daily person trips are estimated to be made by residents. Of this total, 34 percent of daily person trips either originate or end at work. Visitor trips comprise the largest portion of non-resident trips at 11 percent of the total.

Table 3-1: Existing Daily Islandwide Person Trips (Year 2007)

Purpose of Trip	Daily Person Trips	Percent
Trips by Residents		
1. To and from work	932,600	29%
2. While at work	173,100	5%
3. To and from school/university	287,900	9%
4. To and from shopping/other	994,800	31%
5. Do not end at work or home	401,600	12%
Total Trips by Residents	*2,790,000*	*86%*
Other Trips		
6. Trips by truck	44,700	1%
7. Ground access trips by air passengers	60,000	2%
8. Trips by visitors	364,400	11%
Total Daily Person Trips	*3,259,100*	*100%*

Source: O‘ahuMPO Travel Demand Forecasting Model
Trips rounded to nearest hundred

3.1.2 Islandwide Mode of Travel

O‘ahu has a relatively high number of transit, bicycle and walking trips. Of the approximately 2.8 million daily person trips completed by residents, 6 percent are made by transit and 12 percent are made by biking or walking (Table 3-2).

Table 3-2: Islandwide Mode Split Estimates—Residents (Year 2007)

Mode	Daily Resident Person Trips	Percent
Private Automobile Trips	2,291,400	82%
Transit Trips	165,900	6%
Bike and Walk Trips	332,700	12%
Total Daily Resident Person Trips	*2,790,000*	*100%*

Source: O‘ahuMPO Travel Demand Forecasting Model
Trips rounded to the nearest hundred

Table 3-3 shows islandwide mode split for daily visitor person trips. Of the 364,400 daily trips made by visitors, 5 percent are by transit and 45 percent are by biking or walking.

Table 3-3: Islandwide Mode Split Estimates—Visitors (Year 2007)

Mode	Daily Visitor Person Trips	Percent
Automobile Trips	116,400	32%
Transit Trips	17,600	5%
Taxi	9,300	3%
Tour Bus	56,000	15%
Bike and Walk Trips	165,100	45%
Total Daily Visitor Person Trips	*364,400*	*100%*

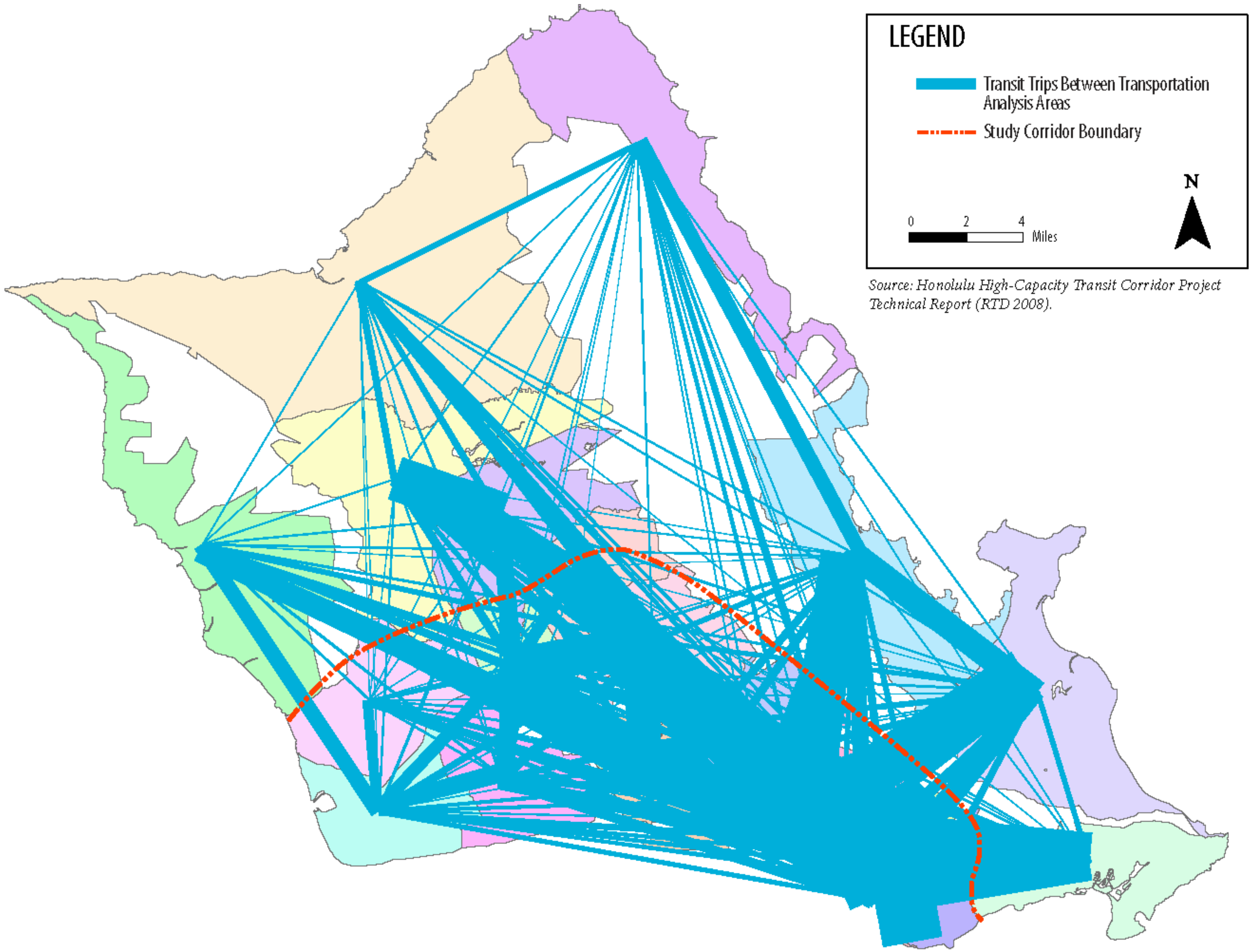
Source: O'ahuMPO Travel Demand Forecasting Model
Trips rounded to nearest hundred

3.1.3 Transit Travel Patterns

An on-board transit survey was conducted on all of the TheBus routes in December 2005 and January 2006. Information obtained from the survey included origins and destinations of current transit bus users across a variety of trip purposes, for both the 178,400 total daily linked trips and the 57,000 peak-period work trips. The survey data indicates that a substantial majority of transit trips on the island occur within the study corridor (Figure 3-3).

When compared to total travel, the current number of transit trips within the corridor as a percentage of total islandwide transit trips is even more pronounced. According to the travel demand forecasting model, 83 percent of both islandwide daily and peak-period work-related transit trips originate within the study corridor, and the study corridor attracts 90 percent of total islandwide daily transit trips and 94 percent of peak-period work-related transit trips.

Table 3-4 shows the top five trip generators and attractors for existing bus trips. As shown in the table, the major destinations for weekday bus riders are the Downtown and Mōʻiliʻili-Ala Moana areas. Downtown contains the region's highest concentration of jobs. Mōʻiliʻili-Ala Moana also contains a high concentration of jobs, as well as the Ala Moana Center, the State's largest shopping complex.



Source: Honolulu High-Capacity Transit Corridor Project Technical Report (RTD 2008).

Figure 3-3: Transit Travel Patterns

Table 3-4: Major Trip Generators and Attractors for Existing Bus Trips

Area	Percent of Islandwide Daily Transit Trips	
	Originating from	Attracted to
Downtown	3%	18%
Mōʻiliʻili-Ala Moana	2%	13%
Waikīkī	13%	6%
Kaimukī-Waiʻalae	7%	6%
Kalihi-Iwilei	7%	4%

3.1.4 Vehicle Occupancy

Given limited financial resources, transportation agencies are looking for ways to increase the efficiency of the existing transportation system. Vehicle occupancy is one measure of overall system efficiency. Vehicle occupancy is usually measured during peak traffic periods and describes the average number of people in a vehicle. This statistic can be used as a performance measure in evaluating current Transportation Demand Management (TDM)/Transportation Systems Management (TSM) programs (described further in Chapter 3.3.3 and 3.3.4 of this report).

HDOT periodically collects vehicle occupancy data at traffic monitoring stations. Vehicle occupancy data is available for 1998, the most recent year available, at the following locations on the highway network:

- Station No. C-4-K (Moanalua Freeway at Moanalua Stream Bridge)
- Station No. C-45-C (Kalanianaʻole Highway, 750 feet east of ʻĀinakoa Avenue)
- Station No. C-323-A (Pali Highway at Tunnel #1)
- Station No. C-323-B (Likelike Highway, North of Valley View Drive)

The available data for these stations is summarized in Table 3-5 and categorized by peak period (5:30 to 9:00 a.m.) and peak hour (these times are specific to each station, but generally fall between 6:00 and 7:30 a.m.). The data are summarized by occupants per vehicle, and the average vehicle occupancy (AVO) is calculated. A comparison of peak-period and peak hour vehicle occupancy counts at the monitoring stations indicates that AVO is generally higher during the single peak hour than during the longer peak period.

During peak periods at each monitoring station, the AVO ranges from 1.21 to 1.28 and the percentage of single-occupant vehicles ranges from 76 to 81 percent. Among the observed stations, the station on the Moanalua Freeway at Moanalua Stream Bridge experiences the highest peak-period AVO of 1.28 during the a.m. peak period from 5:30 to 9:00 a.m.

Table 3-5: Summary of Vehicle Occupancy Data

Station Number	Location	Traffic Direction	Time Period (A.M. Only)	Occupants Per Vehicle						Average Occupancy
				1P	2P	3P	4P	5P	6+	
C-4-K	Moanalua Freeway at Moanalua Stream Bridge	To Kahauiki Interchange	5:30-9:00 a.m.	9,787	2,702	305	65	10	8	
			(Peak Period)	76.0%	21.0%	2.4%	0.5%	0.1%	0.1%	1.28
			6:00-7:00 a.m.	4,310	1,320	135	28	2	3	
			(Peak Hour)	74.3%	22.8%	2.3%	0.5%	0.0%	0.1%	1.29
C-45-C	Kalanianaʻole Highway 750 feet East of ʻĀinakoa Avenue	To ʻĀinakoa Avenue	5:30-9:00 a.m.	10,024	2,011	329	35	3	5	
			(Peak Period)	80.8%	16.2%	2.7%	0.3%	0.0%	0.0%	1.23
			6:30-7:30 a.m.	3,722	962	142	15	1	4	
			(Peak Hour)	76.8%	19.9%	2.9%	0.3%	0.0%	0.1%	1.27
C-323-A	Pali Highway at Tunnel #1 (Honolulu Side)	To Vineyard Boulevard	5:30-9:00 a.m.	6,005	1,575	149	44	11	2	
			(Peak Period)	77.1%	20.2%	1.9%	0.6%	0.1%	0.0%	1.26
			6:30-7:30 a.m.	2,527	711	109	32	7	0	
			(Peak Hour)	74.6%	21.0%	3.2%	1.0%	0.2%	0.0%	1.31
C-323-B	Likelike Highway North of Valley View Dr	To Nimitz Highway	5:30-9:00 a.m.	5,373	1,115	106	19	1	2	
			(Peak Period)	81.2%	16.9%	1.6%	0.3%	0.0%	0.0%	1.21
			6:30-7:30 a.m.	2,217	622	68	14	1	1	
			(Peak Hour)	75.9%	21.3%	2.3%	0.5%	0.0%	0.0%	1.28

Source: State of Hawaiʻi Department of Transportation Highways Division Vehicle Occupancy Count Report No. A1.
All counts taken between August 24 and 26, 1998 and represent the most recent information available. Totals may not add to 100 percent due to rounding.

During the respective peak hours at each station, the AVO ranges from 1.27 to 1.31 and single-occupant vehicles range from 74 percent to 77 percent. The station on Pali Highway at Tunnel #1 experiences the highest peak hour AVO of 1.31 among the observed stations, during its a.m. peak hour from 6:30 to 7:30 a.m.

3.1.5 Vehicle Miles Traveled, Vehicle Hours Traveled and Vehicle Hours of Delay

Travel conditions can also be described by VMT, VHT, and VHD. VMT is computed by multiplying the number of trips on a roadway by the facility's total length. This reveals the total mileage traveled. VHT is derived by multiplying the number of trips on a roadway by the travel time for each trip. VHD is calculated by finding the difference between the congested VHT and the VHT that would be expected under free-flow conditions.

Table 3-6 summarizes the islandwide total daily VMT, VHT, and VHD by facility type on the street and highway system. As indicated in the table, the model forecasts that total daily VMT on the system is approximately 11.6 million miles. VMT on freeways and highways (including mainline sections and ramps) comprises approximately 58 percent of the daily total. (Freeways involve some separation from other roads, while highways can include at-grade access to other roads.)

Total daily VHT on the system is estimated at approximately 334,000 hours, with travel on the freeways and highways representing about 43 percent of the total. Total daily delay is estimated at approximately 74,000 hours, with trips on freeways and highways contributing approximately 47 percent of the total hours of delay.

Table 3-6: Islandwide Travel Statistics on the Street and Highway System (Year 2007)

Facility Type	Daily VMT		Daily VHT		Hours of Delay	
Freeways	5,410,000	47%	120,000	36%	31,000	42%
Highways	1,306,000	11%	25,000	7%	4,000	5%
Arterial	3,345,000	29%	114,000	34%	18,000	24%
Collector	1,281,000	11%	53,000	16%	10,000	14%
Local	239,000	2%	22,000	7%	11,000	15%
Total	*11,581,000*	*100%*	*334,000*	*100%*	*74,000*	*100%*

Source: O‘ahuMPO Travel Demand Forecasting Model
Rounded to nearest thousand

3.1.6 Traffic Generators

The traffic on O‘ahu is generated by commerce, industry, and tourism. However, the nature of the island creates centralized locations for these generators, and distinct travel patterns are dictated by geography and socioeconomic factors. The high concentration of military bases also adds to the uniqueness of O‘ahu's traffic generators.

Because of the constraints posed by geography and existing development, the expansion of existing roadways or the addition of new roadways in many sections of the study corridor would be extremely difficult and/or expensive. As a result, some sections of the study corridor are served by a relatively small number of roadway facilities. The lack of redundancy in the system at these locations can cause severe traffic problems if any roadway facility becomes overly congested or incapacitated.

An example of these constraints is in Pearl City where only three primary roadways (Interstate Route H-1 [the H-1 Freeway], Moanalua Road, and Kamehameha Highway) serve the high volume of traffic traversing this area. Of these roadways, the H-1 Freeway carries 70 to 75 percent of the a.m. and p.m. peak hour traffic. Hence, when traffic is congested on the H-1 Freeway through this location, traffic is affected for miles along the adjacent corridor segments.

Daily traffic trends indicate a distinct travel pattern: during the a.m. peak hour, most commute traffic travels inbound to the Downtown Honolulu area, and the converse is true during the p.m. peak hour when most traffic travels outbound from Downtown Honolulu. This pattern indicates a high concentration of employment and activity centers in Honolulu as can be seen in Figure 3-4. The Chinatown and Downtown areas, with 63,400 jobs, have the highest current employment density in the corridor.

Population patterns also influence traffic conditions. As indicated by Figure 3-5, Pearl City-‘Aiea currently has the highest concentration of population in the study corridor with approximately 78,600 residents.

Industrial areas scattered across the island and major shipping terminals near Honolulu Harbor generate a substantial amount of truck traffic. This is mainly related to the receiving, transfer, and warehousing of inbound and outbound cargo. Honolulu International Airport also serves the cargo industry and therefore generates truck trips.

Another large traffic generator is the tourism industry, largely because of Hawai‘i’s status as a popular vacation destination. O‘ahu hosts over 4.6 million visitors annually (DBEDT 2008). Although visitor traffic is substantial, traffic generated by tourism-oriented industries (such as tour buses) is equally substantial. Visitor-generated traffic is not limited to the Honolulu International Airport; cruise ship terminals at Honolulu Harbor also contribute to this traffic.

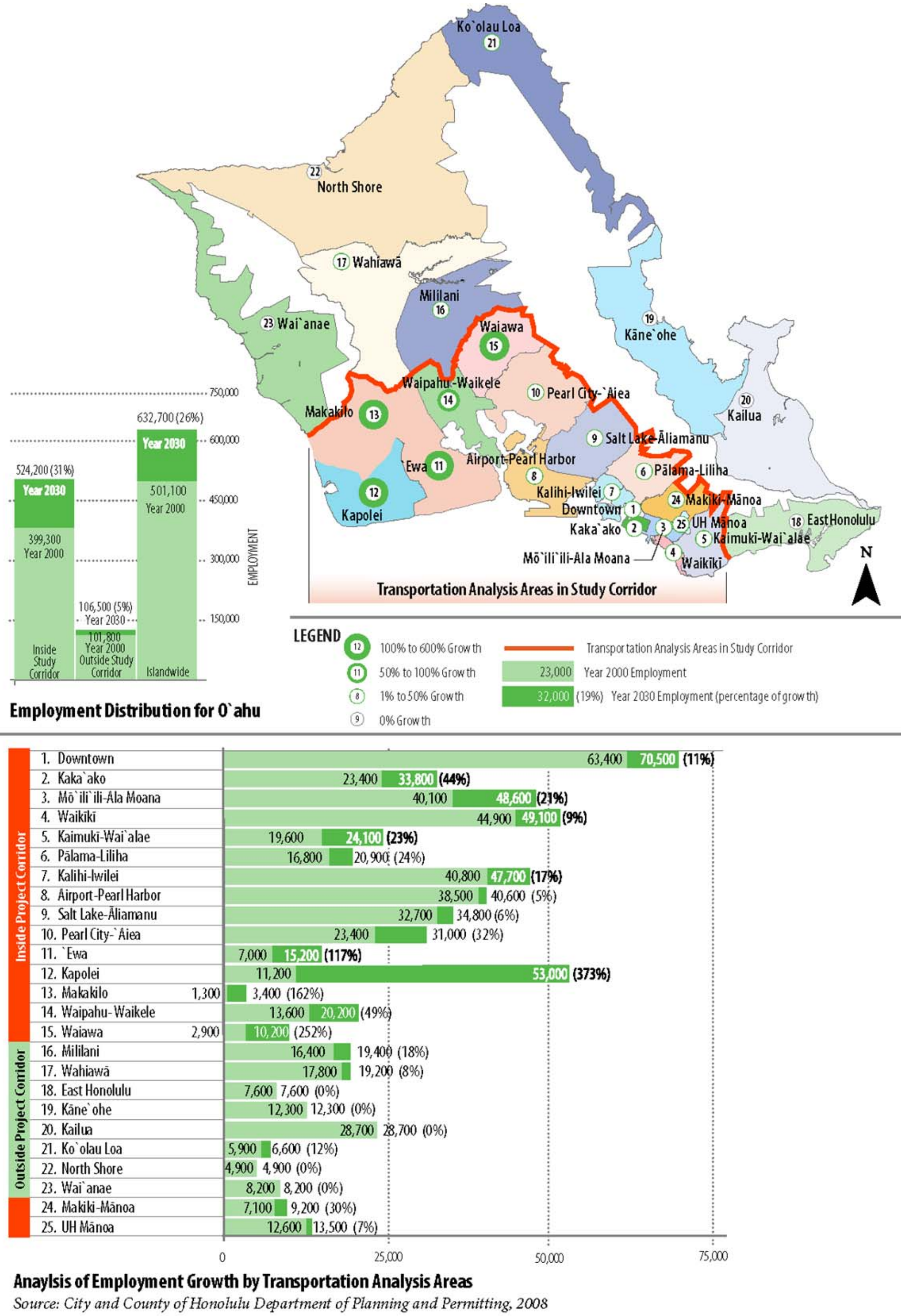


Figure 3-4: Employment Distribution for O'ahu

Source: City and County of Honolulu Department of Planning and Permitting, 2008

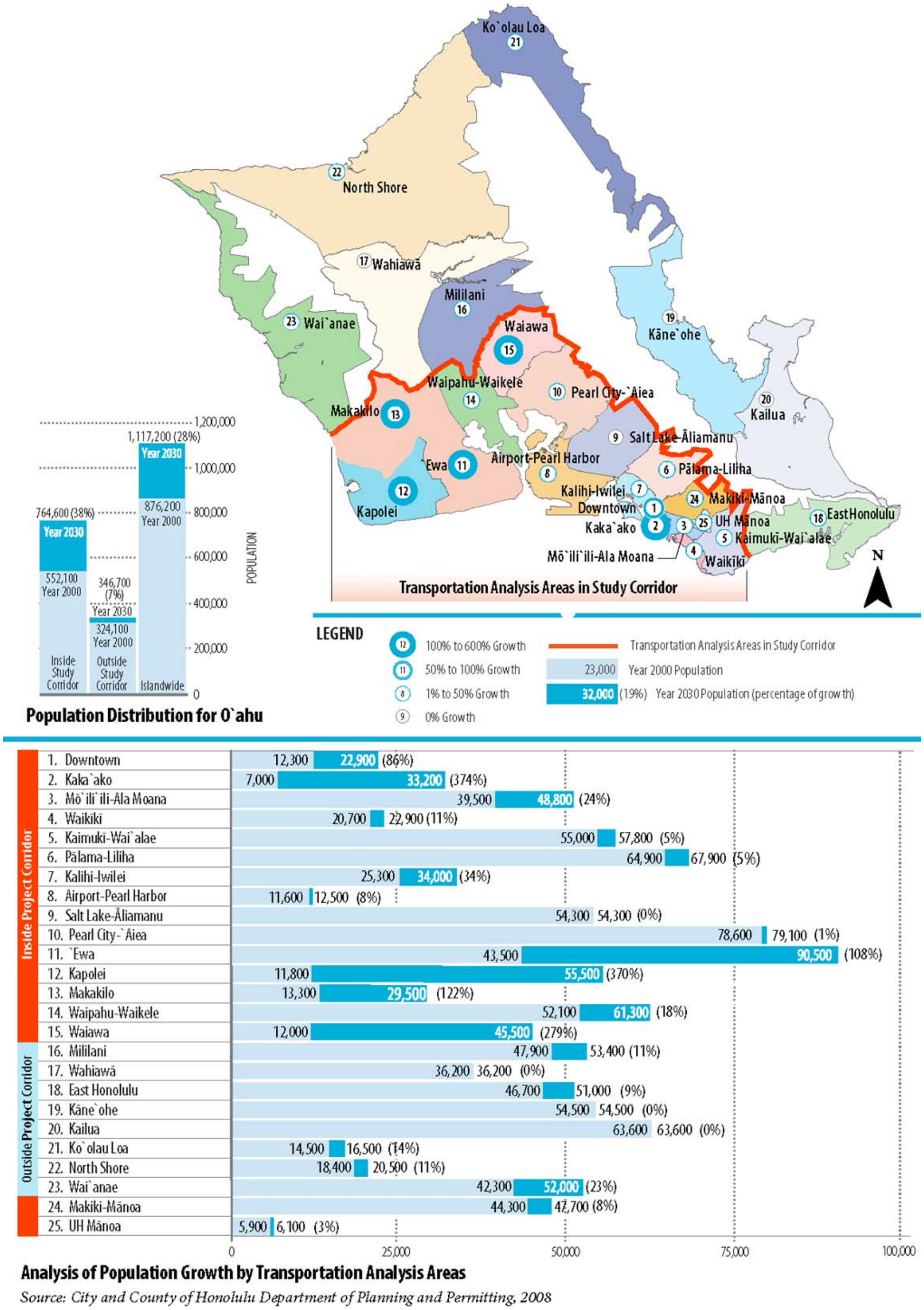


Figure 3-5: Analysis of Population Growth by Transportation Analysis Area

Source: City and County of Honolulu Department of Planning and Permitting, 2008

O‘ahu is home to a high concentration of military bases. Various bases throughout the island represent each branch of the U.S. Armed Forces. The concentration of military-based trips near Pearl Harbor and the Marine Corps Base Hawai‘i-Kāne‘ohe Bay (among others) is substantial. Traffic generated by these bases is not limited to the local support system: troops, base residents, and employees also travel on the public roadways. Military commute traffic peaks are often earlier than those for the island as a whole.

The population of university students in the corridor also contributes to traffic congestion. For example, UH Mānoa has an enrollment of more than 20,000 students and approximately 6,000 staff (UH 2005). Approximately 60 percent of students do not live within walking distance of campus (UH 2002) and must travel by personal vehicle or transit to attend classes.

Table 3-7 identifies existing a.m. peak period travel times for transit and autos, for selected origin and destination pairs in the study corridor. In most cases, transit travel times are longer than auto travel times, while in some cases, travel times are substantially longer than auto travel times.

Table 3-7: Existing A.M. Peak-Period Travel Times (in Minutes—Base Year 2007)

Travel Time Items	Travel Origin and Destination																
	From Wai`anae to Downtown	From Kapolei to Downtown	From `Ewa to Downtown	From Waipahu to Downtown	From Mililani Mauka to Downtown	From Pearlridge Center to Downtown	From Downtown to Ala Moana Center	From Downtown to Waikīkī	From Downtown to UH Mānoa	From Airport to Waikīkī	From Waipahu to Waikīkī	From Downtown to Kapolei	From Wai‘anae to UH Mānoa	From Kapolei to Ala Moana Center	From Salt Lake to Downtown	From `Ewa to Airport	From Airport to Downtown
Walk-to-Transit Travel Time	102	86	88	79	105	52	18	32	29	71	88	67	128	101	39	114	42
Auto Travel Time	100	89	88	58	84	35	14	19	18	35	69	32	109	94	26	75	25

Source: O‘ahuMPO Travel Demand Forecasting Model

3.1.7 Extent of Reverse Commute

Currently, commuter-related trips are dominated by travel demand into the Downtown TAA in the a.m. two hour peak period (6:00-8:00 a.m.) and away from Downtown in the p.m. two hour peak period (3:00-5:00 p.m.). (TAAs are geographical areas used for transportation planning purposes.) Downtown-bound (Koko-Head) traffic volumes through Waipahu and ‘Aiea during the a.m. two hour peak period are almost twice the volume traveling in the ‘Ewa direction. A sampling of origin and destination trips, to and from Downtown, is shown in Table 3-8. There are approximately 9,050 daily person trips into Downtown from ‘Aiea during the a.m. peak period, while there are approximately 5,090 daily person trips from Downtown to ‘Aiea during the p.m. peak period. This pattern is attributable to the dominance of Downtown and nearby employment centers.

Newly emerging employment centers in the ‘Ewa/Kapolei area are expected to generate more reverse commuting in the future. Figure 3-4 and Figure 3-5 show the current and projected population and employment distributions on O‘ahu.

Table 3-8: Existing (2007) Resident Origin-and-Destination Daily Person Trips to and from Downtown

Origins and Destinations to and from Downtown	Number of Trips
To Downtown from:	
Kapolei	1,240
‘Ewa	4,110
Waipahu	4,090
Pearl City/‘Aiea	9,050
From Downtown to (Reverse Commute):	
Kapolei	690
‘Ewa	2,090
Waipahu	2,170
Pearl City/‘Aiea	5,090

Source: O‘ahuMPO Travel Demand Forecasting Model

3.1.8 Captive versus Choice Riders

The on-board transit survey conducted in December 2005 and January 2006 provided information on captive versus choice riders. In general, captive (or transit-dependent) riders do not have access to a personal vehicle to make the trip. Choice riders have a vehicle available to make the trip but choose to use transit instead. The survey results indicated that 65 percent of the surveyed riders were captive riders. The remaining share consisted of 29 percent who could have used a personal vehicle and 6 percent who did not answer the question.

Figure 3-6 represents 2000 census data and shows the locations within the study corridor that have higher than average concentrations of transit-dependent households. Along the study corridor there are concentrations of transit-dependent households between Pearl Harbor and Downtown Honolulu. These areas represent a robust transit market because they already rely on existing transit and are likely to use an improved system.

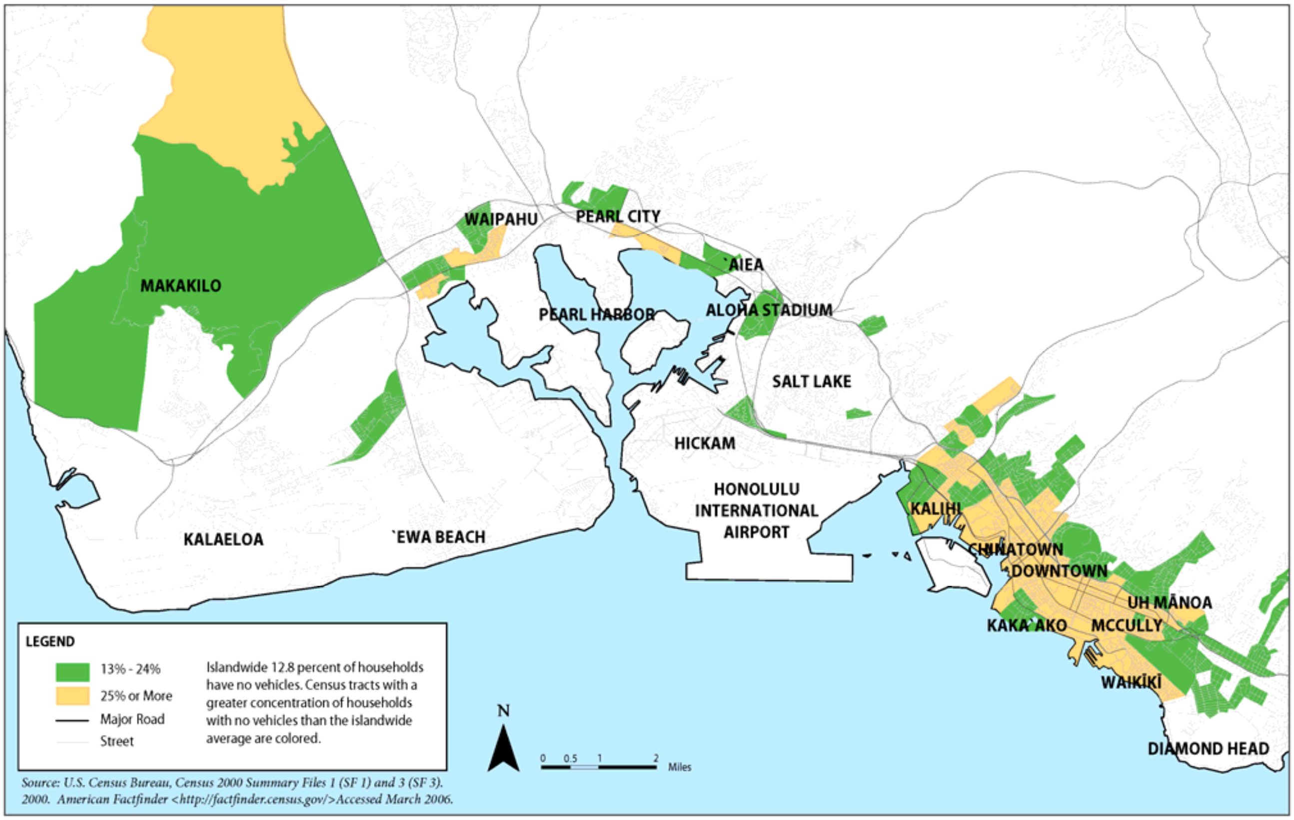


Figure 3-6: Concentrations of Transit-Dependent Households

3.2 Existing Conditions and Performance: Transit

This section describes O‘ahu’s current public transit system and its performance. It discusses the organization of transit services, current transit programs and facilities, and transit elements. Unless otherwise noted, these service features were effective as of June 2008.

3.2.1 Organization

Public transportation on the island of O‘ahu consists of a fixed-route bus transit service known as TheBus, ferry service known as TheBoat, and paratransit service known as TheHandi-Van. O‘ahu Transit Services, Inc. is the City’s transit management services contractor for TheBus and TheHandi-Van. HMS-PAC NAV, Inc. operates TheBoat under contract to the City.

3.2.2 Existing Transit Services

This section describes operating information, services, facility features, performance, and ridership of existing transit services on O‘ahu. The transit operating data described in the following sections are based on information that RTD submitted to the FTA National Transit Database (NTD) for Fiscal Year (FY) 2007 and previous years. Given the recent inauguration of service (September 2007) for TheBoat, NTD statistics are not currently available for this service. The Fiscal Year for the City of Honolulu and for NTD both range from July 1 through June 30 of the following year.

Transit Ridership—Systemwide

TheBus system serves more than 80 percent of O‘ahu’s developed areas. Boardings on TheBus represent the total number of passengers who get on to public transportation vehicles in a given time period. Passengers are counted each time they board vehicles, no matter how many vehicles they use to travel from their origin to their destination (FTA 2008). There were approximately 72 million annual passenger boardings reported for TheBus during FY 2007 ending on June 30, 2007. TheBus experiences about 251,400 boardings on an average weekday. Of these boardings, approximately 10 percent are made by visitors.

Figure 3-7 presents ridership data for FY 2000 through FY 2007. Ridership in FY 2004 was affected by a 34-day bus operator strike that ended on September 29, 2003.

Passenger boardings have continued to increase through FY 2007. Forecasts place FY 2008 annual trips at 74 million.

There were 807,000 passenger boardings reported for TheHandi-Van, a demand response paratransit service, in FY 2007. Paratransit passenger boardings have been increasing steadily since FY 2000, as shown in Figure 3-8. TheHandi-Van operators did not go on strike in FY 2004.

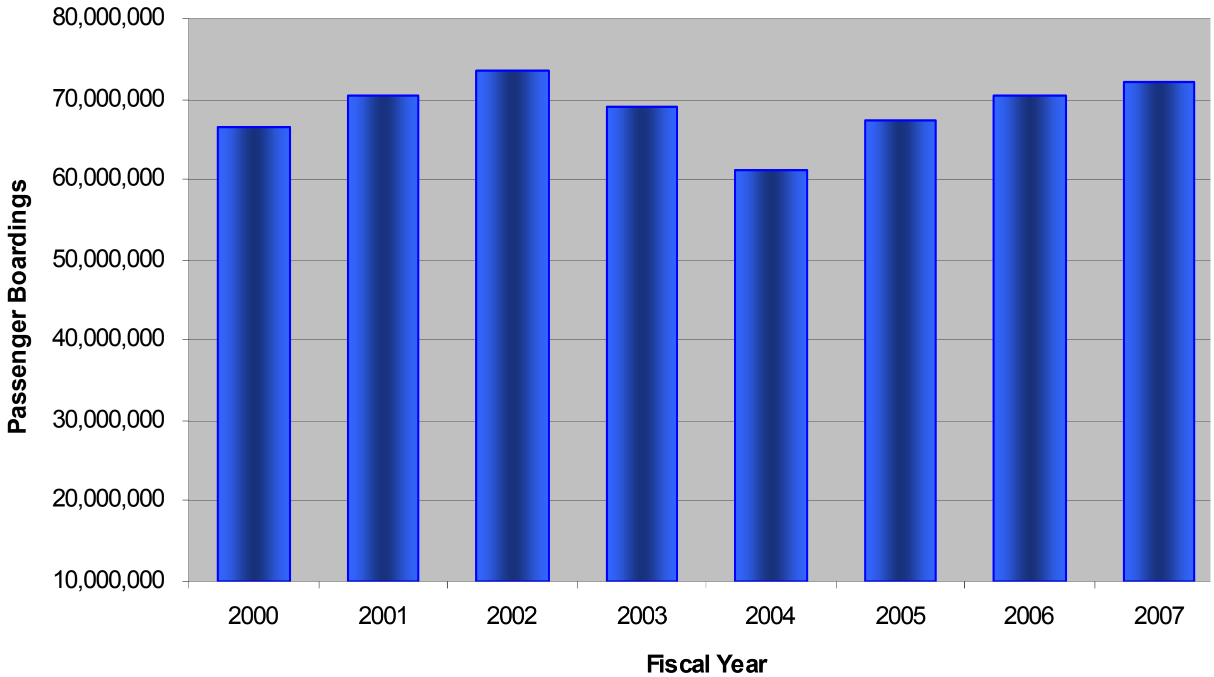


Figure 3-7: Fixed-Route Passenger Boardings

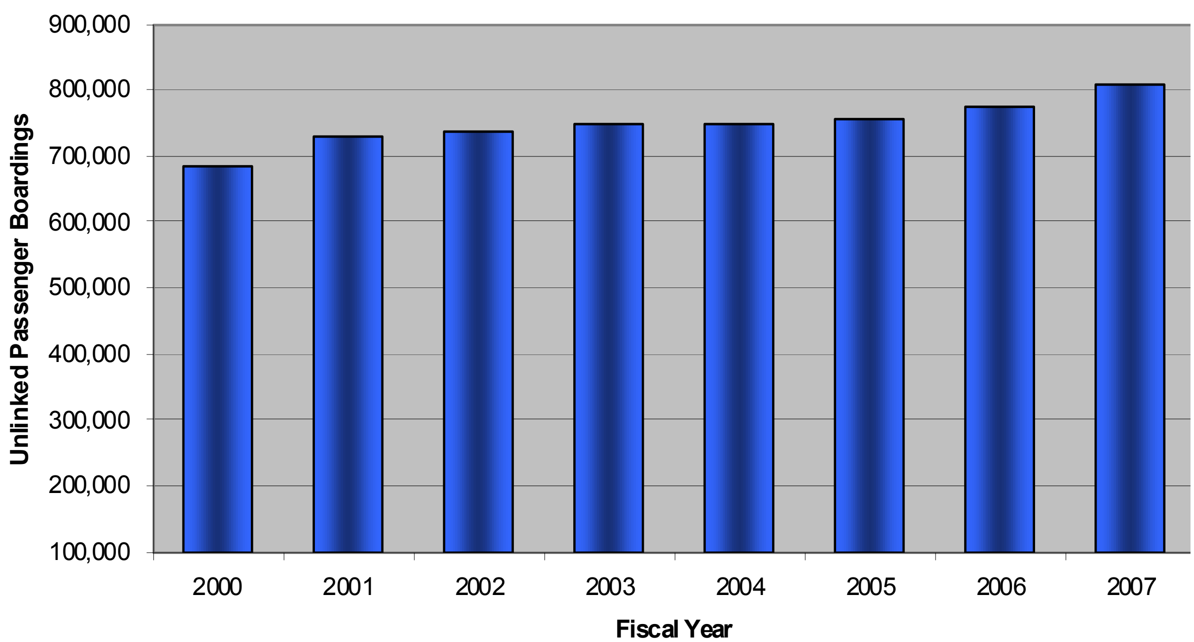


Figure 3-8: Annual Paratransit (TheHandi-Van) Passenger Boardings

Current Concentration of Transit Ridership

Approximately 50 percent of work trips taken from home during the a.m. peak period on TheBus can be attributed to the Waikīkī, Mōʻiliʻili/Ala Moana, Palama/Liliha, Waipahu/Waikele, and Kaimukī/Waiʻalae areas. These areas are all within the study corridor and are densely populated, with relatively high concentrations of transit-dependent households and activity centers.

Transit Ridership—Selected Routes in the Study Corridor

Routes 40, 42, 52, 55, and 62 are Suburban Trunk routes that travel through the study corridor and are part of the system's backbone. Figure 3-9 shows these selected routes. Routes 40 and 42 travel from the Mākaha Beach and ʻEwa Beach areas to Ala Moana Center and Waikīkī. Routes 52 and 55 jointly form the "Circle Isle" route, which travels from Ala Moana Center through Downtown, Mililani, Wahiawā, Haleʻiwa, and Kāneʻohe and returns to Ala Moana Center. Route 62 also travels from Wahiawā to Honolulu. Average weekday boardings are shown in Table 3-9.

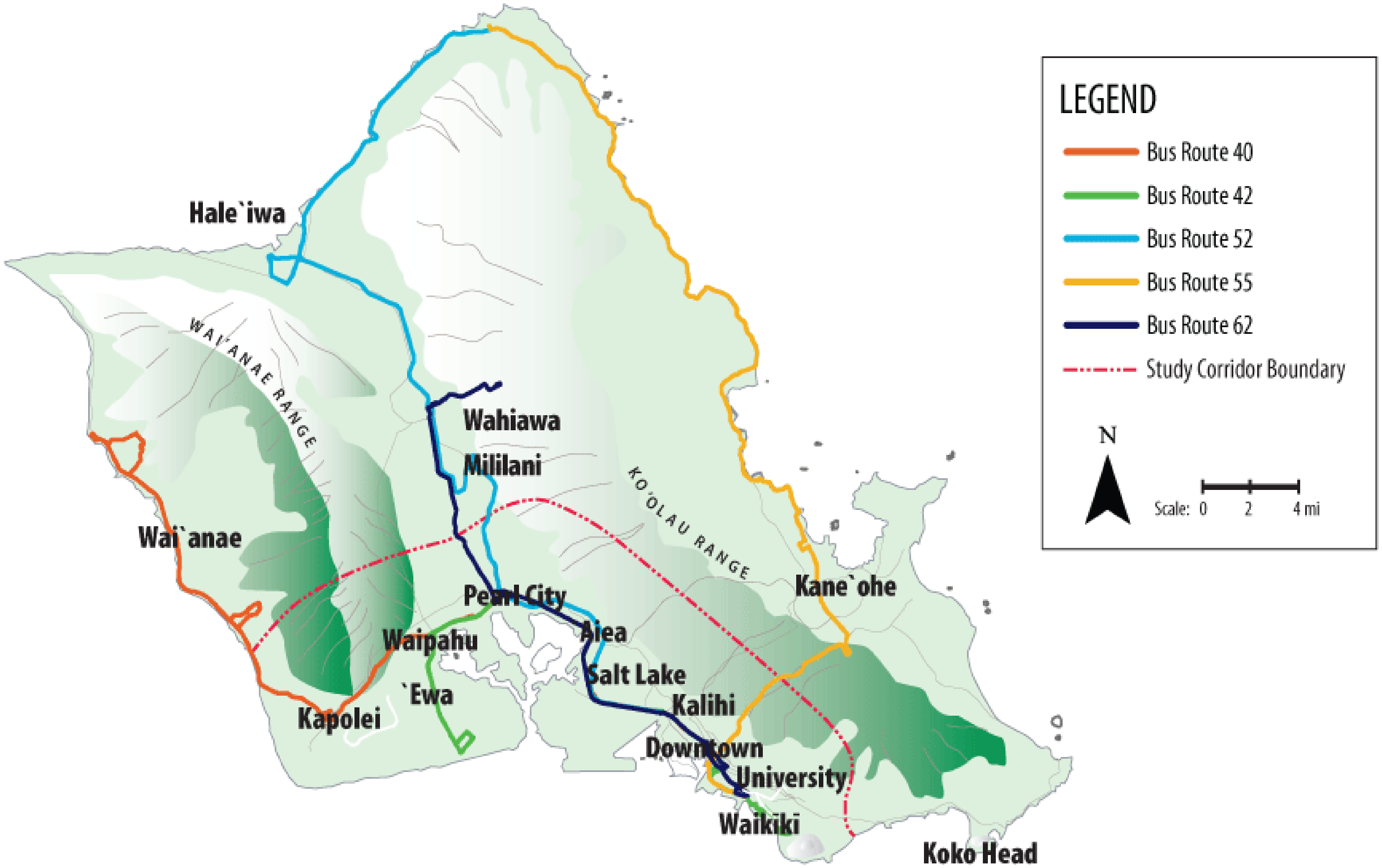


Figure 3-9: Example of Existing Transit Routes

Table 3-9: Average Weekday Boardings on Selected Routes in the Study Corridor—2008

Route	Average Weekday Boardings
40	10,600
42	9,300
52	5,700
55	3,300
62	4,900

TheBus Routes

TheBus currently operates a total of 108 routes. Of these routes, 99 are fixed routes, four are deviation routes (operated by the paratransit division), and five are feeder routes for TheBoat. Of the 99 fixed routes, five are limited-stop routes (Route 1L, *CityExpress!* A, *CityExpress!* B, *CountryExpress!* C, and *CountryExpress!* E) and 32 are peak-period, peak-direction-only express routes. Figures 3-10a, 3-10b, and 3-10c illustrate TheBus routes within the study corridor. These routes are effective as of 2008.

The five feeder bus routes for TheBoat also operate only during the a.m. and p.m. peak periods on limited schedules. Three of the express routes (Routes 201, 202, and 203—all bound for Waikīkī) operate seven days a week.

The 108 bus routes serve about 3,800 bus stops. Passenger amenities include approximately 980 passenger shelters and 2,400 benches.

Table 3-10 lists all bus routes currently operating on Oʻahu. Those routes serving the study corridor are denoted with a "y" for yes. Routes connecting to the corridor are designated with a "c". Many routes pass through the study corridor, such as Route 40 and *CityExpress!* A. A route was identified as serving the corridor if at least 50 percent of its ridership is attributable to person-trip origins within the study corridor.

Routes within and/or providing connections into the study corridor include all Community Circulators operating in Kapolei and Waipahu (Routes 44, 412, 413/415, 432); Routes 4, 5, 6, 7, 10, 15, and 17 in urban Honolulu; and Routes 71, 73, and 74 in Pearl City and ʻAiea. Express and local routes serving Windward and East Honolulu communities were not identified as operating in the study area, even though they travel to Downtown Honolulu. This is because the Project is assumed to have minimal effect on the routes and operating characteristics.

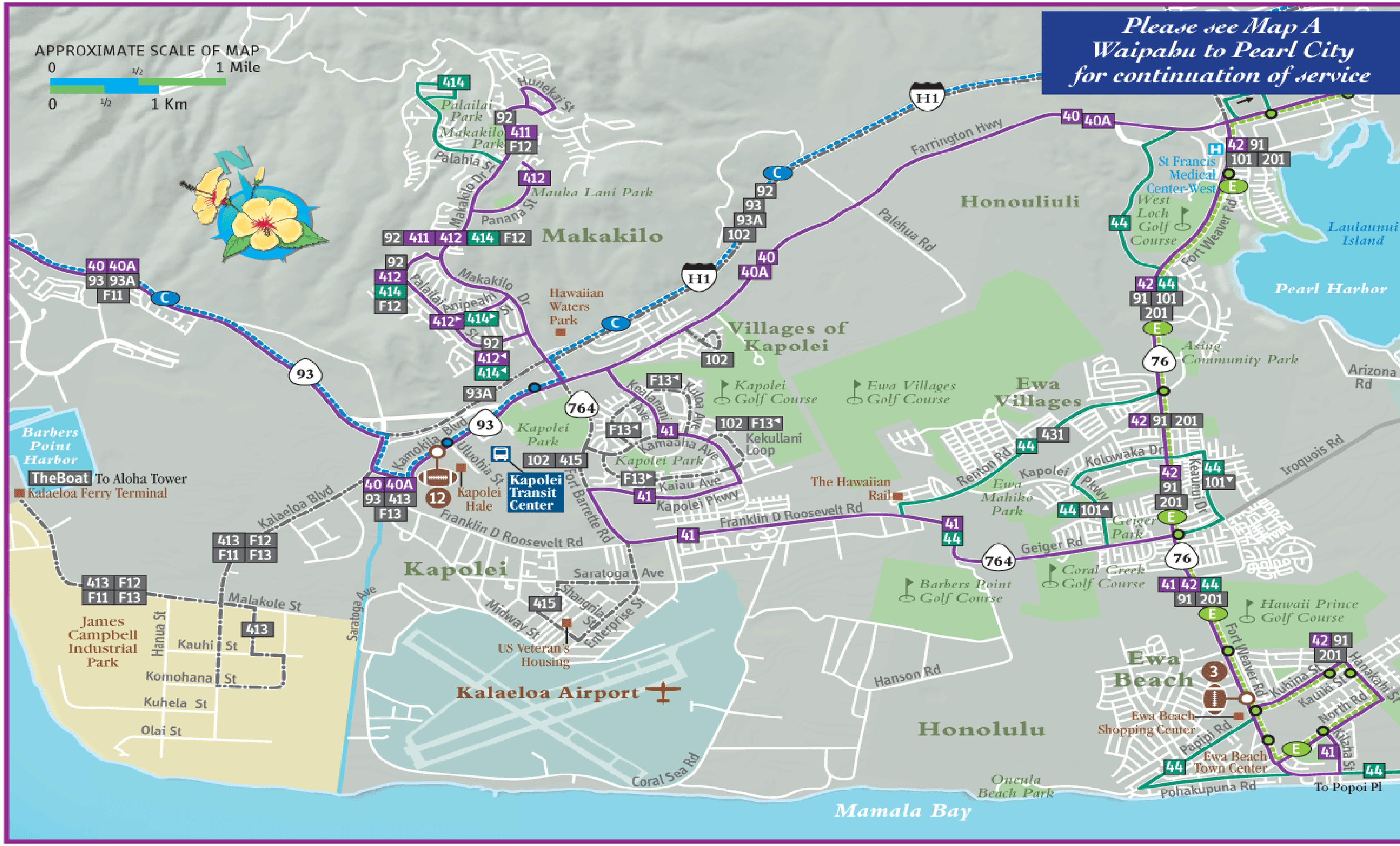


Figure 3-10a: TheBus Map—'Ewa Beach/Kapolei

Source: TheBus, 2008

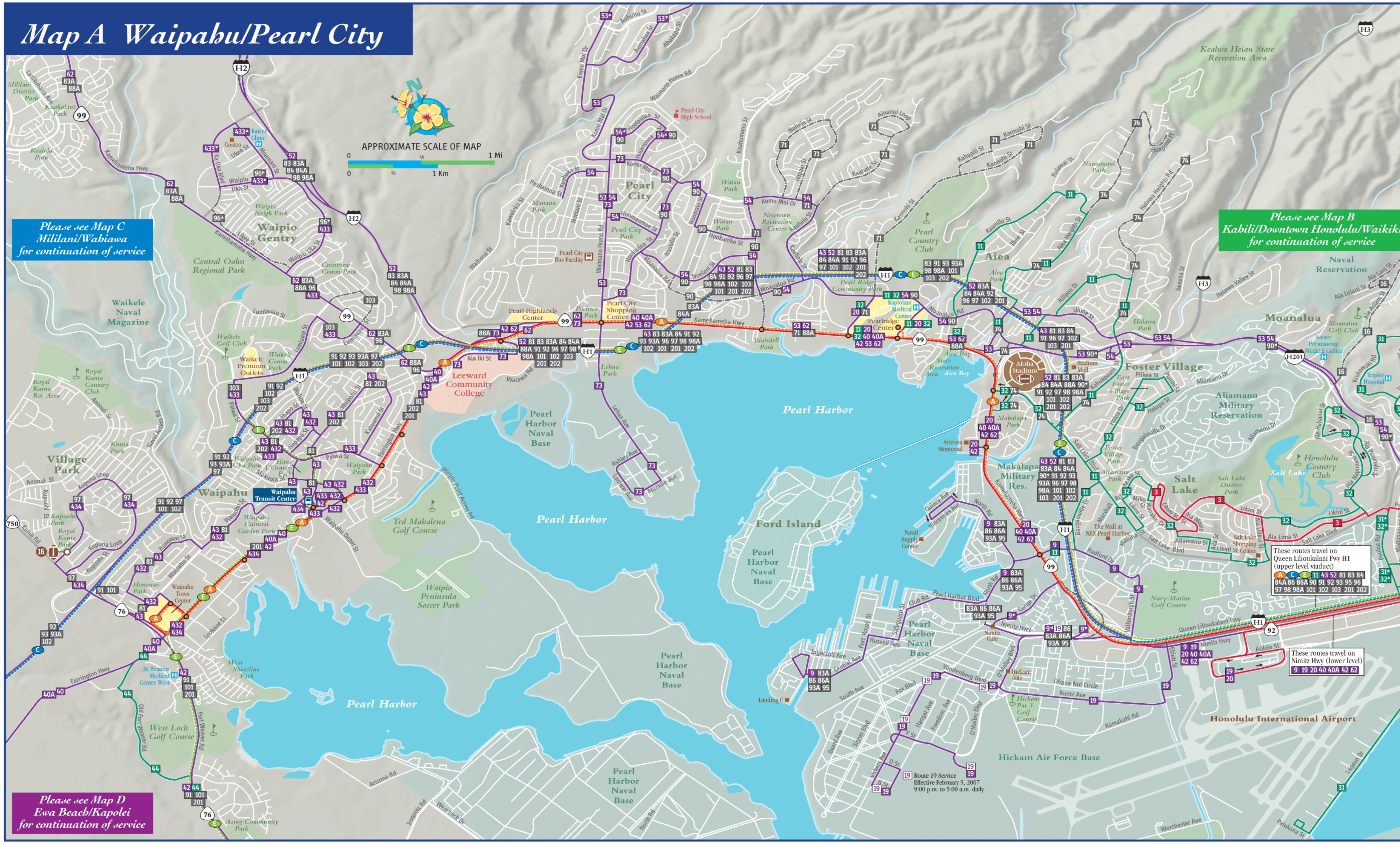


Figure 3-10b: TheBus Map—Waipahu/Pearl City

Source: TheBus, 2008

Figure 3-10c: TheBus Map—Kalihi/Downtown Honolulu/Downtown to Waikīkī

Source: TheBus, 2008

Table 3-10: TheBus Routes Serving Honolulu

Route #	Route Description	Within Study corridor
A	*CityExpress!* Waipahu-UH Mānoa	y
B	*CityExpress!* Kalihi-Waikīkī	y
C	*CountryExpress!* Mākaha-Downtown	y
E	*CountryExpress!* ʻEwa-Waikīkī	y
1	Kaimukī-Kalihi	y
1L	Hawaiʻi Kai-Downtown	y
2	Waikīkī-School-Middle	y
3	Kaimukī-Salt Lake	y
4	Nuʻuanu-Punahou	c
5	Ala Moana-Mānoa	c
6	Pauoa-Woodlawn	c
7	Kalihi Valley	c
8	Waikīkī-Ala Moana	y
9	Pālolo Valley-Pearl Harbor	y
10	Kalihi-ʻĀlewa Heights	c
11	Makalapa-Hālawa-ʻAiea Heights	y
13	Waikīkī-Liliha	y
14	St. Louis-Kāhala-Maunalani	n
15	Makiki-Pacific Heights	c
16	Moanalua Valley	c
17	Makiki-Ala Moana	c
18	University-Ala Moana	y
19	Waikīkī-Airport-Hickam	y
20	Waikīkī-Pearlridge	y
22	Beach Bus	n
23	Hawaiʻi Kai-Sea Life Park	c
31	Tripler-Māpunapuna	c
32	Kalihi-Pearlridge	y
40/40A	Honolulu-Mākaha	y
41	Kapolei-ʻEwa Beach	y
42	ʻEwa Beach-Waikīkī	y
43	Waipahu-Honolulu-Ala Moana	y
44	ʻEwa Beach-Waipahu	c
52	Wahiawā-Circle Isle	y
53	Honolulu-Pacific Palisades	y
54	Honolulu-Pearl City	y
55	Kāneʻohe-Circle Isle	n
56	Honolulu-Kailua-Kāneʻohe	n
57/57A	Kailua-Waimanalo-Sea Life Park	n
62	Honolulu-Wahiawā Heights	y
65	Honolulu-Kahaluʻu	n
70	Lanikai-Maunawili	n
71	Pearlridge-Newtown	c
72	Schofield-Wahiawā-Whitmore	n
73	Leeward Community College	c
74	ʻAiea-Hālawa Heights	c
76	Waialua-Haleiwa	n
77	Waimanalo-Kāneʻohe	n
80	Hawaiʻi Kai Park and Ride Express	n
80A	Hawaiʻi Kai Park and Ride Express-UH	n
80B	Upper ʻĀina Haina Express	n
81	Waipahu Express	y
82	Hawaiʻi Kai Park and Ride Express	n
83	Wahiawā Town Express	n
83A	Wahiawā-Mililani Exp-Schofield/PH	n
84	Mililani Express-North	n
84A	Mililani Express-South	n
85	Windward Express-Kailua	n
85A	Windward Express-Haiku	n
86	Windward-Pearl Harbor Express	n
86A	Kāneʻohe-Kahaluʻu Pearl Harbor Exp.	n
88	Kahaluʻu-ʻĀhuimanu Express	n
88A	North Shore Express	n
89	Waimanalo-Kailua Express	n
90	Pearl City Express	y
91	ʻEwa Beach Express	y
92	Makakilo City Express	y
93	Waiʻanae Coast Express-CBD	y
93A	Waiʻanae Coast Express-PH	y
95	Hawaiʻi Kai-Pearl Harbor Express	n
96	Waipiʻo Gentry Express	y
97	Village Park Express	y
98	Wahiawā-Mililani Park and Ride	n
98A	Kunia Village-Mililani-Waikīkī	n
101	Ewa Gentry Express	y
102	Villages of Kapolei Express	y
103	Paiwa-Waikele Express	y
201	Waipahu via Farrington Express	y
202	Waipahu via Paiwa Express	y
203	Kalihi via School Street Express	y
231	Hawaiʻi Kai-Hahaʻione Valley	n
232	Hawaiʻi Kai-Koko Marina	n
233	Kāhala Mall-ʻĀina Haina	n
234	Kāhala Mall-Waiʻalae Nui	n
235	Kāhala Mall-Waiʻalae Iki	n
236	Kāhala Mall-Hawaiʻi Kai	n
401	Waiʻanae Valley	n
402	Lualualei Homestead	n
403	Nānākuli-Māʻili-Waiʻanae	n
411	Makakilo Heights	y
412	Panana-Kapolei	y
413	Campbell Industrial Park	y
415	Kapolei Transit Center-Kalaeloa	y
432	East-West Waipahu	y
433	Waikele/Waipiʻo	y
434	Village Park	y
Community Access Service (Operated by Paratransit/ TheHandi-Van)		
414	Palahiʻa-Makakilo-Kapolei	y
501	Mililani Mauka-Mililani Transit Center	n
503	Mililani-Launani Valley	n
504	Mililani South-Mililani Transit Center	n
Feeder Service to TheBoat		
F2	Aloha Tower-UH Mānoa	y
F3	Aloha Tower-Waikīkī	y
F11	Kalaeloa-Waiʻanae Coast	c
F12	Kalaeloa-Makakilo	y
F13	Kalaeloa-Villages of Kapolei	y

Source: DTS/TheBus; effective January 15, 2008
c = connect, n = no, y = yes

Types of Bus Service

This section describes service features of TheBus*,* including headways (time between buses by service classifications). Bus routes fall within seven route classifications. These classifications, their function, and service headways are described below.

- Rapid Bus—Rapid Bus includes *CityExpress!, CountryExpress!,* and Route 1L designated routes. The *CityExpress!* and *CountryExpress!* routes provide limited-stop express service in both directions. Service is provided all day on weekdays, as well as on Saturdays and Sundays on heavily traveled corridors. The *CityExpress!* Routes A and B offer 15-minute service headways; *CountyExpress!* routes typically provide 30-minute service headways. Route 1L provides service on weekdays between 7:30 a.m. and 6:00 p.m., and typically provides 15-minute service headways.
- Urban Trunk—Urban Trunk routes provide direct service connecting neighborhoods within the Primary Urban Center and operate along the major ‘Ewa/Koko Head corridors. Urban trunk routes typically have 15-minute or less service frequencies (headways). These routes include the major east-west corridor routes, including 1, 2, 3, and 13.
- Urban Feeder—Urban Feeder routes connect the mauka/makai neighborhoods within the Primary Urban Center. These routes serve the hills and valleys of Honolulu, connect residents to the Urban Trunk and Rapid Bus routes, and provide service to major destinations such as Downtown, the UH Mānoa campus, and Waikīkī. Urban Feeder routes including numbers 4, 5, 6, 7, and 8 typically provide service intervals of 30 minutes or less.
- Suburban Trunk—Suburban Trunk routes provide service through late evening from outlying communities to the urban center. These routes also provide connections between suburban communities that connect with community circulators at transit centers. Routes stop at all local bus stops and operate every day. Suburban trunk routes typically provide 30-minute service headways. Many suburban trunk routes operate along the same major corridors such as Kamehameha Highway, Nimitz Highway, and Dillingham Boulevard. Service levels along these corridors are much higher due to the combined number of trips provided by the routes. Examples include Routes 40, 42, 52, 55, and 56.
- Community Circulators—these routes provide circulation within their established communities. They connect at neighborhood hubs or transit centers after completing their single-cycle trip. Community Circulators provide coordinated connections to other circulators and Suburban Trunk routes. These routes stop at all local bus stops and frequently operate with loops and branches. Community Circulator routes currently fall into three general categories of service provision: (1) higher-demand routes offer 30-minute service headways, (2) lower-demand routes provide 60-minute service headways, and (3) some routes offer intermittent or peak-period-only service

such as those operating in Pearl City/ʻAiea. Community Circulator service includes Routes 231-236 and 401-403.

- Community Access—these routes operate on a standard schedule and demand response, and serve regular bus stops utilizing TheHandi-Van vehicles. Demand response service is provided for registered TheHandi-Van customers with a 24-hour advance notice within 0.5 miles of the service route. These routes provide 60-minute service headways. Time is provided in the schedule to allow for route deviations. Examples include Routes 501, 503, and 504.
- Peak Express—Peak Express serves predominantly home-to-work trips by connecting specific neighborhoods to employment centers. These trips are provided in the peak-period, peak direction only, with minimal scheduled departures. Examples include Routes 81, 85, and 93. Feeder services designed for TheBoat are a subset of Peak Express. These routes operate as peak express routes connecting passengers to TheBoat service during the peak period. Routes predominantly serving TheBoat are designated with an "F" preceding the route number. Examples include Routes F11, F12, and F13.

TheHandi-Van Service

TheHandi-Van is the City's paratransit service for persons who are eligible according to the Americans with Disabilities Act of 1990 (ADA) or persons certified by the City. The service area, days and hours of operation are the same as TheBus. Riders and any companion are charged $2.00 per trip. Trips need to be reserved 24 hours in advance.

TheBoat Service

In September 2007, the City began offering a commuter ferry service between West Oʻahu (Kalaeloa Harbor) and Downtown Honolulu (Aloha Tower Marketplace). TheBoat ferry service is available during weekdays with three trips in the morning and three trips in the evening. Each one-way trip is scheduled to take one hour. Table 3-11 describes scheduled trips for TheBoat. Figure 3-11 illustrates TheBoat route and feeder bus routes associated with TheBoat.

Table 3-11: TheBoat Scheduled Trips

Morning Service	Afternoon Service
Depart Kalaeloa: 5:30, 6:30, 8:00	Depart Aloha Tower: 3:55, 5:00, 6:15
Arrive Aloha Tower: 6:30, 7:30, 9:00	Arrive Kalaeloa: 4:55, 6:00, 7:15

Source: www.trytheboat.com

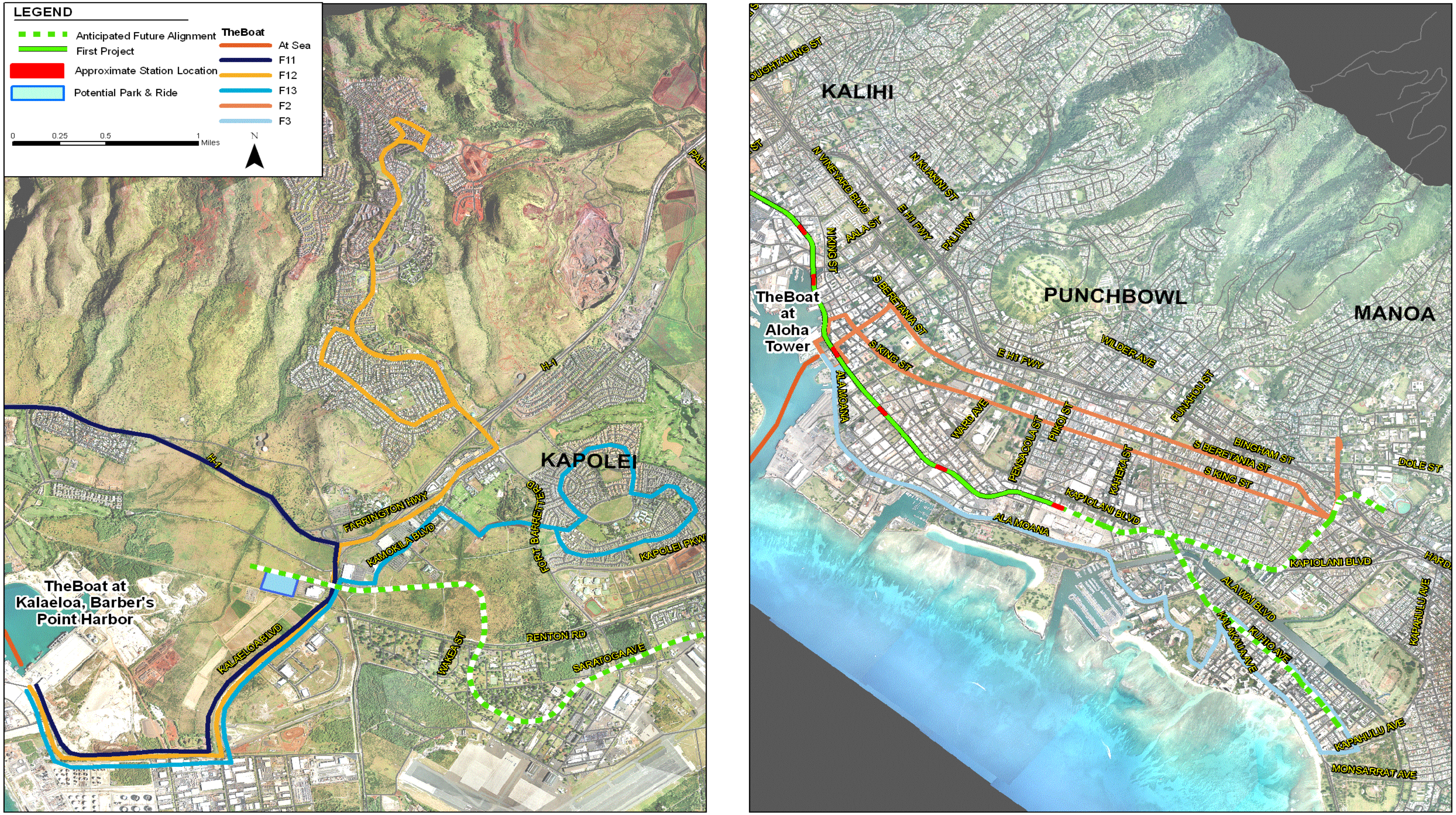


Figure 3-11: *TheBoat* System Map
Source: TheBus 2008

TheBus Vehicle Inventory

TheBus fixed-route fleet consists of 540 buses. This fleet includes 72 vehicles that are 60-foot articulated buses (of which 10 are hybrid); 431 vehicles that are 40-foot buses; and 37 vehicles that are less than 40-foot, as shown in Table 3-12.

The fixed-route service requires 415 vehicles operating in maximum service, which are deployed from two maintenance and storage bases (Pearl City and Kalihi/Middle Street).

Table 3-12: TheBus 2007 Vehicle Inventory

Year	Make	Length (feet)	Bus Number Series	Seats	Quantity
1993	TMC	35'	51–62	35	12
1993	TMC	40'	202–283	43	46
1994/95	Gillig	40'	601–773	45	132
1996	Gillig	40'	774–795	45	22
1997	Gillig	40'	301–347	45	47
1998	Gillig	40'	348–365	45	18
1998	Gillig	40' LF	366–368	40	3
1998	Gillig	30'	40–49	29	10
2000	New Flyer Artic	60' LF	70–99	58	30
2000	Gillig	40'	801–835	45	35
2001/02	Gillig	40'	836–853	45	18
2002	Chance	29' LF	25–34	23	10
2002	Chance	29’ LF	35–39	23	5
2002	New Flyer Artic	60' LF	100–115	58	16
2003	Gillig	40’	854–868	45	15
2004	Gillig	40' LF	501–555	40	55
2003	New Flyer Artic	60' LF	116–131	58	16
2004	Hybrid Elec. Artic	60' LF	132–142	58	10
2006	New Flyer Std. Hybrid	40' LF	901–940	37	40
Total Buses In Inventory					*540*

Source: National Transit Database, 2007.
LF = low floor

TheBoat Vehicle Inventory

TheBoat service is provided by two 149-passenger vessels that are operated by HMS-PAC NAV, Inc. and contracted to the City. They are passenger-only vessels and do not accommodate vehicles.

TheHandi-Van Vehicle Inventory

Table 3-13 shows TheHandi-Van vehicle inventory.

Table 3-13: TheHandi-Van 2007 Vehicle Inventory

Year	Make	Length (feet)	Bus Number Series	Seating Capacity	Quantity
1996	El Dorado E350	25’	1600	14	2
1998	El Dorado E350	25’	1800	18	9
1999	El Dorado E350	22’	1900	7	6
2001	El Dorado Aerotech E450	25’	1100	18	39
2002	El Dorado Aerotech E450	25’	1200	18	26
2002	El Dorado VersaShuttle	20’	1200	6	4
2004	El Dorado Chevy Chasis	26’	1400	18	9
2004	El Dorado VersaShuttle	20’	1400	6	2
2006	El Dorado Aerotech E450	25’	—	10	32
Total Vehicles In Inventory					*129*

Source: FY2007 NTD Reporting July 29, 2008.

Annual Revenue Vehicle Miles and Hours

TheBus service had approximately 18.0 million annual revenue vehicle miles in 2006, while TheHandi-Van service recorded 4.3 million annual revenue vehicle miles in 2006.

TheBus service had 1.3 million annual revenue vehicle hours in 2006—a 1.5-percent decrease from 1.4 million hours in 2005. TheHandi-Van service recorded approximately 300,400 annual revenue vehicle hours in 2006—a 3.5-percent increase from 290,200 in 2005.

TheBus and TheBoat Fare Structure

Public transit fares are set by the City and County of Honolulu City Council. Each service has the same fare structure. The fare structure presented in Table 3-14 applies to TheBus and TheBoat.

By Council’s policy, fares should cover 27 to 33 percent of TheBus operations. Current bus fares are set in the Revised Ordinances of Honolulu. For TheBus, new fares went into effect on October 1, 2003, which increased fares over the prior structure that had been effective since August 15, 2003. For TheBoat, current fares were in effect with inauguration of service in September 2007.

Current transfer policy allows each customer to receive one free transfer upon boarding when paying a cash fare. The transfer is valid for a two-hour period and may only be used once. Passengers paying cash and requiring a third bus to reach their destination need to pay another cash fare. Free transfers are also available between TheBoat and TheBus. A visitor pass offering unlimited use for four consecutive days is available for $20.00 and an adult monthly pass for $40.00.

A University Student Discount Bus Pass (UPASS) program was inaugurated in August 2005, offering college students a semester pass for $100.00. To date, 15 higher education institutions have joined the UPASS program. Additional types of bus passes are shown in Table 3-14.

Table 3-14 also provides information regarding the current breakdown of ridership by fare type. At 41 percent of total ridership, monthly adult pass holders predominate, followed by senior/disabled riders at 27 percent. Considering the various discounts available, the average fare paid is $0.77 per person trip.

Table 3-14: TheBus and TheBoat Fare Structure

Fare Category	Current Fare	Percentage of Riders by Fare
Adult	$2.00	12%
Youth	$1.00	5%
Senior/Disabled	$1.00	27%
Transfer	$0.00	7%
Monthly Adult Pass	$40.00	41%
Monthly Youth Pass	$20.00	6%
Monthly Senior/Disabled Pass	$5.00	(included with Senior/Disabled)
Annual Adult Pass	$440.00	(included with Monthly Adult Pass)
Annual Youth Pass	$220.00	(included with Monthly Youth Pass)
Annual Senior/Disabled Pass	$30.00	(included with Senior/Disabled)

Source: 2007 City and County of Honolulu records

Percentages do not add up to 100% since table does not include minor fare categories such as Visitor Pass and UPASS.

3.2.3 Public Transit Facilities—TheBus

TheBus facilities include maintenance and storage facilities, park-and-ride facilities, transit centers, major transfer points, and two dedicated bus-only roadway segments (Hotel Street between River and Alakea Streets and Kūhiō/Kalākaua Avenue between ‘Ena Road and Kuamo‘o Street).

Maintenance and Storage Facilities

Existing transit facilities include two maintenance and storage facilities:

- Kalihi-Middle Street Bus Facility—This facility includes the O‘ahu Transit Services, Inc. (OTS) administrative offices, a maintenance shop, a unit repair shop, home base for 315 buses of the fixed-route fleet, and the central communication control center and dispatch office. An additional nine acres of adjacent property were purchased for expansion and the future Middle Street Intermodal Center. The paratransit fleet would move to this location in 2008. The paratransit fleet is currently maintained at the Middle Street Facility and parked at a leased lot.

- Pearl City Bus Facility—21 acres (17 are developed) with transportation offices and maintenance shop. This is the home base for 225 fixed-route buses.

Transit Centers, Park-and-Ride Facilities, and Transfer Points

There are six transit centers currently on TheBus system, with varying levels of passenger amenities:

- Alapa‘i Transit Center—an off-street terminal with center-island passenger area, extensive lighting, and large passenger shelters with benches and restrooms (portable). It is used primarily for p.m. express service.
- Hawai‘i Kai Transit Center—six bus positions within the facility are served by two community circulators, two local routes and one limited stop route in addition to five peak period bus routes.
- Kapolei Transit Center—a temporary on-street transit center along Haumea Street between Uluohia and Wākea Streets has replaced the former off-street facility located approximately one block away, to allow construction of a new set of ramps to the H-1 Freeway. This temporary transit center has two bays for 60’ articulated buses and seven bays for 40’ standard buses. The new Kapolei Transit Center is awaiting design of the Kapolei Wākea Transit Station.
- Mililani Transit Center—features include a passenger island platform, kiss-and-ride drop off location, large passenger shelters with benches, restrooms, lighting, community room, and an elevator for ADA accessibility to the nearby shopping center.
- Waipahu Transit Center—features include large passenger shelters with benches and lighting.
- Wai‘anae Transit Center—features include a center passenger island, large passenger shelters with benches, lighting, and land for development of a park-and-ride lot with 100 spaces in a future phase.

In addition to the transit centers described above, there are several major transfer points on O‘ahu. Ala Moana Center is the largest of these transfers points.

There are five park-and-ride facilities served by TheBus with a total capacity of 529 spaces. Table 3-15 describes each park-and-ride facility. There are also 3,800 bus stops, 980 passenger shelters, and 2,400 benches for passenger use.

Table 3-15: TheBus Park-and-Ride Facilities' Location and Size

Location	Parking Spaces	Notes
Hawai'i Kai Park-and-Ride 240 Keāhole Street	134	
Mililani Mauka Park-and-Ride 1605 Ukuwai Street	176	Expandable to 457 spaces.
Royal Kunia Park-and-Ride 94-640 Kupuohi Street	149	
Wahiawā Armory Park-and-Ride Across from Wheeler Air Force Base	50	Executed shared-use agreement with the Hawai'i National Guard Facility. No cost to City.
Hale'iwa Park-and-Ride Located at the Waialua Community Association Facility in Hale'iwa Town	20	Executed shared-use agreement with the Waialua Community Association.

3.2.4 Public Transit Facilities—TheBoat

Operation of TheBoat is supported by two ferry piers as well as park-and-ride facilities in West O'ahu.

Ferry Terminals

The West O'ahu ferry pier is located in Kalaeloa Harbor. The pier is served by TheBus with routes F11, F12, and F13. Schedules for TheBus and TheBoat are coordinated to allow convenient transfers. The Downtown Honolulu pier is located at Aloha Tower Marketplace; schedules are coordinated at this location with TheBus routes F2 and F3.

Park-and-Ride Lots

A park-and-ride lot with 23 stalls is located adjacent to the TheBoat pier in Kalaeloa Harbor. An off-site lot, designated with signs for TheBoat users, is located at the Home Depot parking lot along the Kapolei Parkway frontage road and is served by TheBus route F13, which connects to TheBoat pier.

3.2.5 Public Transit System Performance

This section examines the current performance of TheBus and TheHandi-Van. Transit performance information is summarized and compared to national trends and other transit systems.

Transit Speed

TheBus operates in mixed traffic, without signal priority. Therefore, buses are caught in the same congestion as general-purpose traffic. With increasing traffic congestion over the last 20 years, bus route scheduled trip times have become longer to accommodate the additional time each trip takes. Average operating speeds for TheBus over time are shown in Figure 3-12.

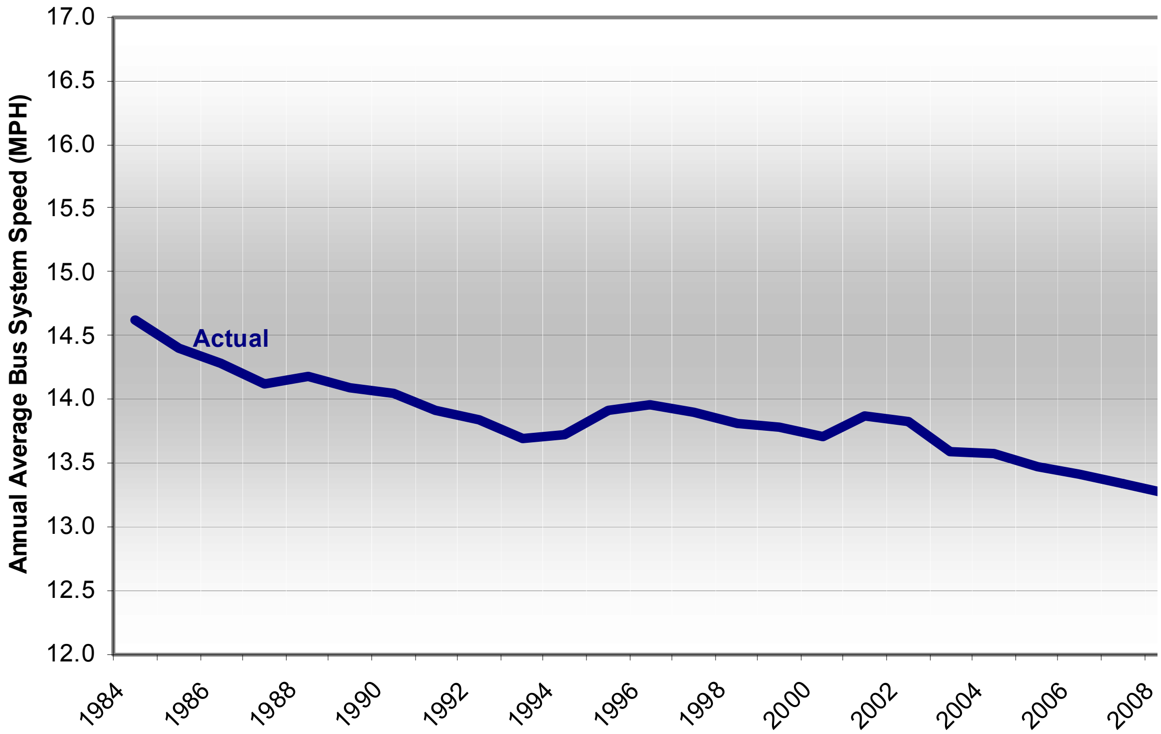


Figure 3-12: TheBus Annual Average Operating Speed in Miles per Hour

As a result of longer bus travel times, systemwide performance statistics indicate that approximately 111,700 additional revenue hours of bus service were needed in 2006 to deliver the same amount of service TheBus provided in 1984. This inefficiency consumed about $11.5 million in additional annual operating budget expenses in 2006 (in 2006 dollars) but without enhancing service quality to the public.

Introducing new service concepts and restructuring the bus transit network in 2001 achieved temporary improvements to TheBus system's operating speed problem. This improvement, known as the "hub-and-spoke" network, created new transit centers ("hubs") and new types of bus routes ("spokes") using rider-friendly features. For example, at a single facility riders can access routes that serve a variety of destinations. However, worsening roadway congestion has further eroded average transit speeds and by 2006, a record low average speed of 13.4 miles per hour (mph) was recorded. Because congestion in the study corridor is greater than in other parts of O'ahu, the decrease in average bus speed in this corridor is greater than the islandwide average.

Additional time is added as necessary to route schedules to offset traffic congestion delays. To account for this congestion, peak-period scheduled trip lengths have increased by 9 to 26 percent for several routes in the study corridor. Figure 3-13 depicts the total trip time required to complete one scheduled p.m. peak-period trip for each of five selected routes (40, 42, 52, 55, and 62) starting in 1992. These five routes travel through at least part of the study corridor and are considered Suburban Trunks. All five routes have had time added to their schedules due to congestion.

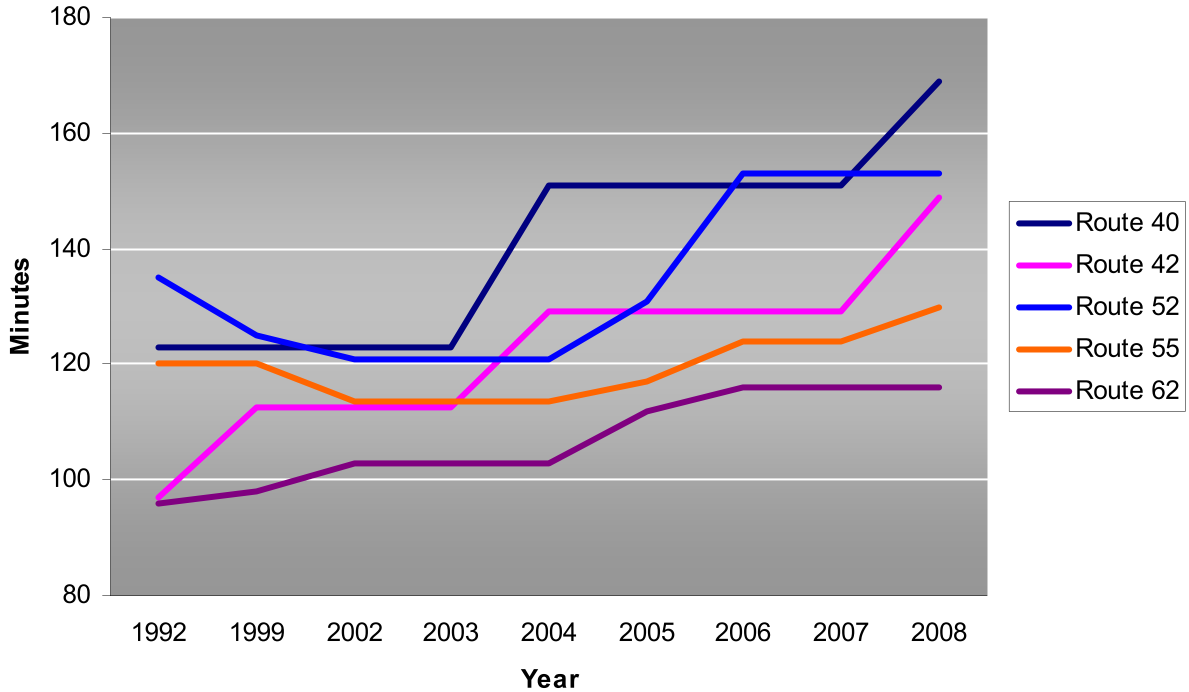


Figure 3-13: TheBus P.M. Peak Period Scheduled Trip Times

Source: TheBus Route Schedules, 1992 to 2008.

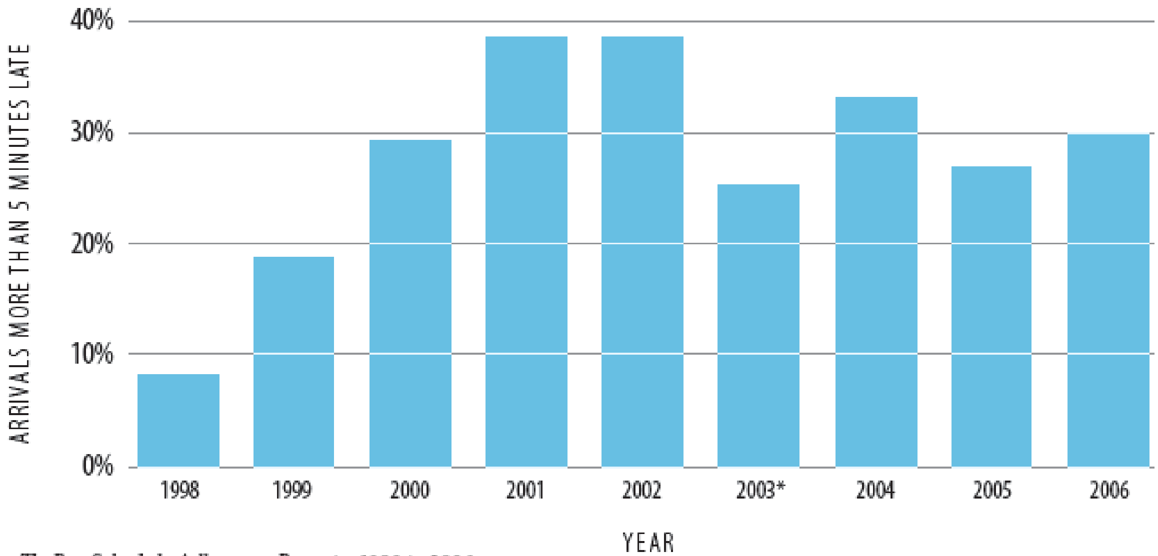
Route 52 is perhaps the most illustrative of the schedule adherence issue. This route was changed in 1999 to operate on the H-1 and H-2 Freeways instead of Kamehameha Highway. This resulted in a drop from 135 to 121 scheduled minutes required to operate the entire trip. This time was adequate from 2002 to 2004, but congestion caught up to this change. Time was added back into the schedule in 2005. By 2008, it is now scheduled to make a trip in 153 minutes, 32 more minutes for the same distance than just four years ago, and more buses have been added to maintain the same LOS.

The scheduling challenge for bus operations on freeways such as the H-1 is that the amount of traffic congestion delay time varies considerably by time of day and direction. When a service such as Route 52 returns to local service after traveling along H-1 and does not encounter routinely anticipated traffic delays, it will arrive too early.

Transit Reliability

On-time performance is a measure of reliability and is based on the following service standard: a bus is considered to be "late" if it arrives at a route timepoint (a location along each route that has an identified schedule time) more than five minutes after the scheduled time. This standard has been used by OTS to monitor service.

Figure 3-14 identifies systemwide schedule adherence results for TheBus for weekdays in a typical month in each year since 1998. During four of the last six years, over 30 percent of bus trips ran late. According to the LOS standards identified in the *Transit Capacity and Quality of Service Manual* (TRB 2003), the extent of late trips by TheBus indicated a grade of "F" on a scale between "A" (best) and "F" (worst).



Source: TheBus Schedule Adherence Reports, 1998 to 2006

* Affected by a 34-day bus operator's strike.

Figure 3-14: TheBus Systemwide Schedule Adherence (Percent of Weekday Systemwide Arrivals more than Five Minutes Late)

Buses are sometimes so far behind schedule that the trip being made does not reach its final destination. In this case, the bus operator is instructed to abandon the trip, off-load all passengers and "turnback" so the next scheduled assignment for the operator and vehicle can be initiated on time. Figure 3-15 includes the total annual service incidents involving turnbacks from 1998 to 2007. The lower number of turnbacks in 2003 reflects a work stoppage due to a 34-day bus operator strike.

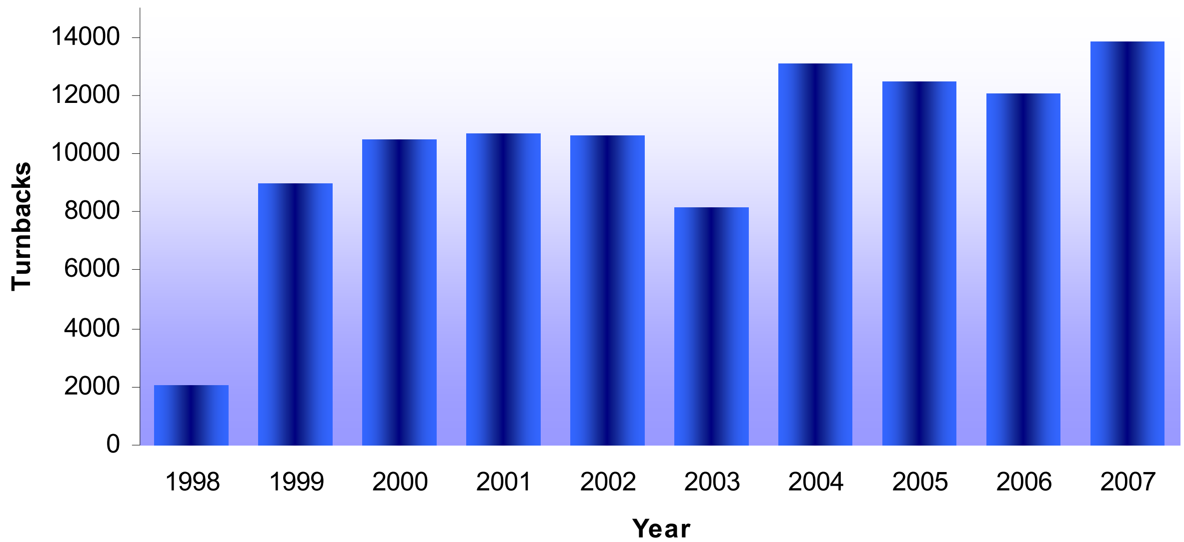


Figure 3-15: TheBus Annual Service Incidents Involving Turnbacks Trends Report National Transit Database

Source: OTS TheBus Operator Service Incident Reports, 1998 to 2007

Note: 2003 was affected by a 34-day bus operator's strike

Performance Data based on National Trends

This section presents transit performance information for TheBus and TheHandi-Van services as reported to NTD, *National Transit Summaries and Trends Report* (FTA 2005). These statistics combine all modes operated by all transit agencies. Therefore, to provide comparison with national information, TheBus and TheHandi-Van statistics are combined to provide systemwide performance data for Honolulu.

Table 3-16 illustrates how these statistics are combined for this analysis. The combined statistics for FY 2006 are used to derive multimodal data for Honolulu that is consistent with and comparable to the FY 2006 national data.

Table 3-16: DTS Productivity Rate Passenger Boardings per Vehicle Revenue Hour by Mode for Fiscal Year 2006

Mode	Annual Passenger Boardings (thousands)	Annual Vehicle Revenue Hours (thousands)	Passenger Boardings per Revenue Hour
TheBus	70,384	1,344	52.4
TheHandi-Van	784	300	2.6
Total	*71,168*	*1,644*	*43.3*

Source: 2006 DTS, National Transit Database

Figure 3-16 presents historical information on system productivity for Honolulu and compares it with the national average for the 2001 to 2006 period. The productivity rate of total passenger boardings per vehicle revenue hour is the primary measurement used to represent service effectiveness. Service effectiveness is the relationship between service outputs (total vehicle revenue hours) and service consumption (total passenger boardings).

The Honolulu productivity rate has remained relatively constant: 43.7 passenger boardings per vehicle revenue hour in 2001 and 43.3 in 2006. The national average declined from 40.4 in 2001 to 38.0 in 2006. Throughout these years, productivity in Honolulu remained above the national average.

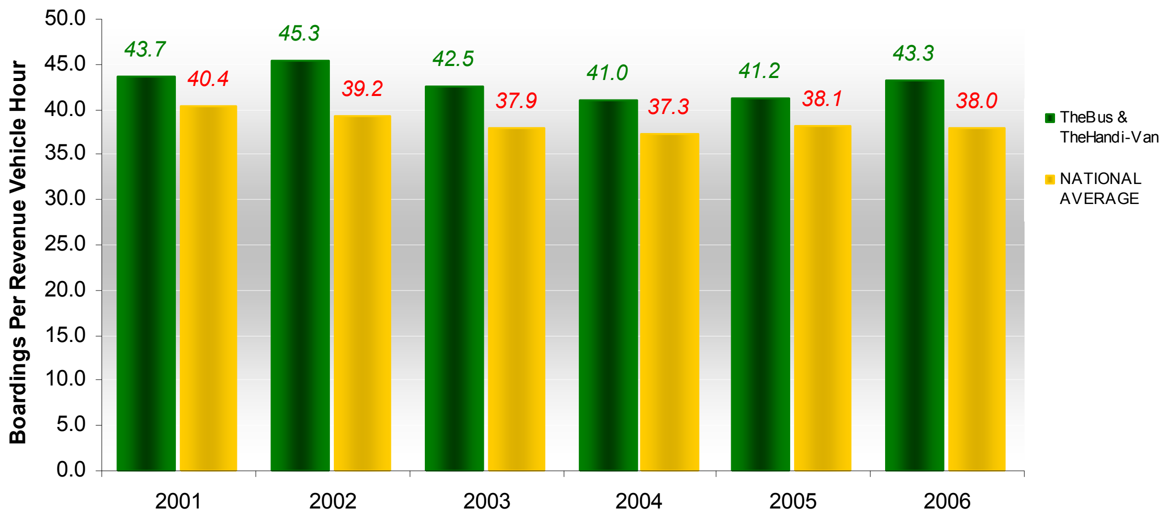


Figure 3-16: Passenger Boardings per Revenue Vehicle Hour

Source: 2005 National Transit Summaries and Trends Report and 2006 DTS NTD reports

It is important to note that the national rate includes heavy rail and light rail systems. These modes have collectively attained productivity rates in excess of 80 passenger trips per vehicle revenue hour, which boosts the national average. The higher performance of rail modes is achieved through higher-capacity vehicles (versus buses) operating in right-of-way treatments designed to give exclusive use or preference to transit. The Honolulu productivity rate, even without a rail transit system, is still above the national average, which includes rail in other cities.

Figure 3-17 presents transit system service effectiveness as a performance measure of total passenger boardings per vehicle revenue mile. The Honolulu rate has remained relatively constant, from 3.1 passenger boardings per vehicle revenue mile in 2001 to 3.2 in 2006. The national average declined from 2.3 in 2001 to 2.1 in 2006. Throughout these years, productivity in Honolulu has remained above the national average.

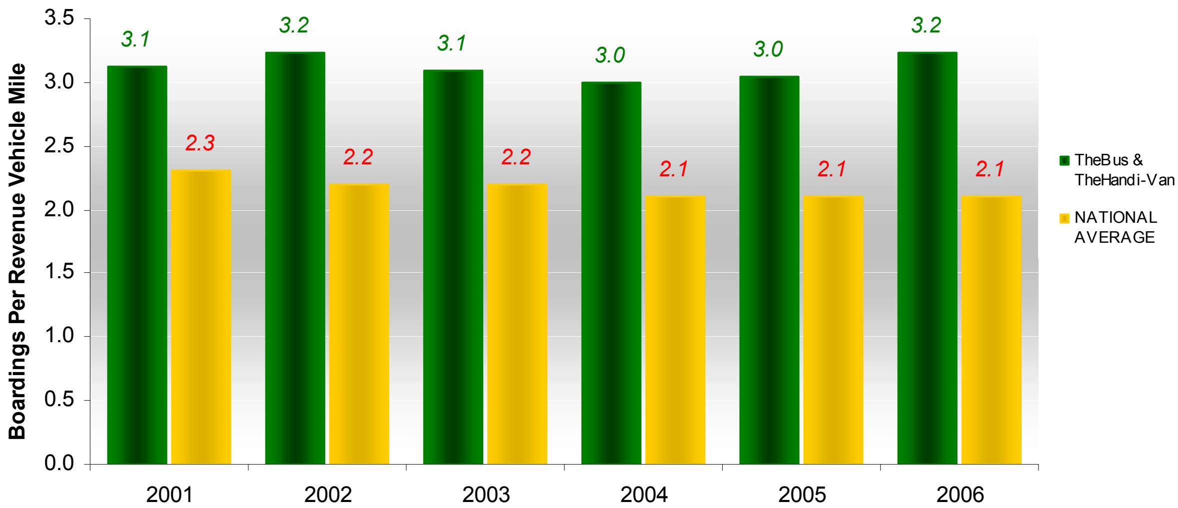


Figure 3-17: Passenger Boardings per Revenue Vehicle Mile

Source: 2005 National Transit Summaries and Trends Report and 2006 DTS NTD reports

Figure 3-18 presents another measure of transit system performance: cost-effectiveness. Cost-effectiveness is the relationship between service inputs (total operating expense) and service consumption (total passenger boardings). This figure compares TheBus and TheHandi-Van with the national average using the most common statistic for cost effectiveness; operating expense per passenger boarding.

Due in part to dramatic increases in fuel costs, the national average operating expense per passenger boarding between 2001 and 2006 increased from $2.39 to $3.09. Service in Honolulu experienced a commensurate operating expense per passenger boarding increase, from $1.60 to $2.25 over the same period. In each year of the reporting period, Honolulu expenses per passenger were below the national average.

A third measure of transit system performance is cost efficiency. Cost efficiency is the relationship between service input and service output. The most common service input measurement is total operating expense. Figure 3-19 presents cost efficiency, with revenue hours used as the service output. Service output is the quantity of service produced, which is expressed in non-monetary terms. Examples include vehicle hours, vehicle miles, capacity miles, service reliability, and safety. The national average operating expense per vehicle revenue hour increased from $96.56 in 2001 to $117.70 in 2006, an increase of 21.9 percent. Honolulu had a 25.9-percent increase over the same time period, from $77.30 to $97.32. In each year of the reporting period, Honolulu expense per revenue vehicle hour was well below the national average.

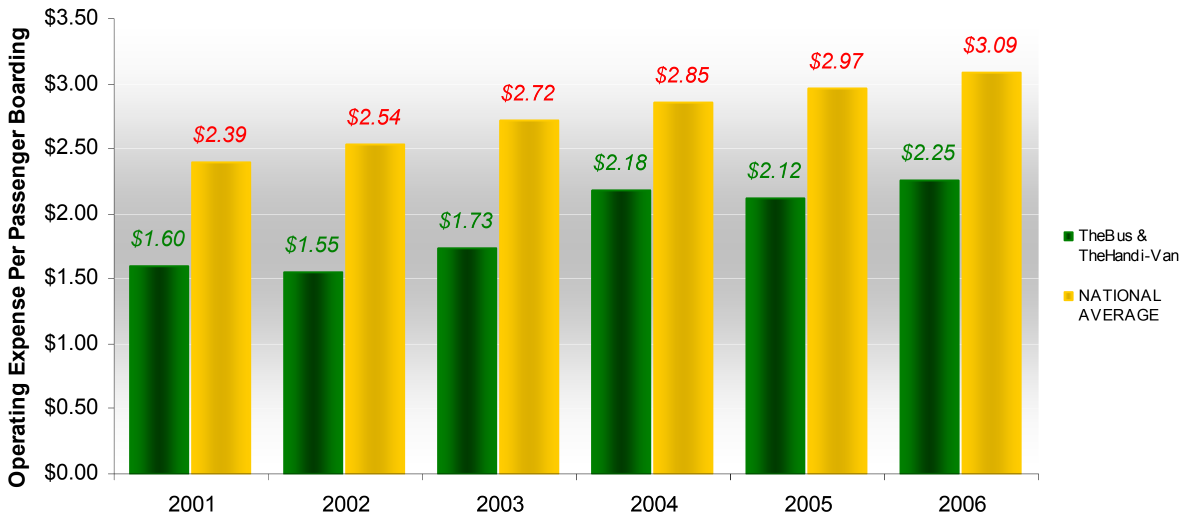


Figure 3-18: Operating Expense per Passenger Boarding

Source: 2005 National Transit Summaries and Trends Report and 2006 DTS NTD reports

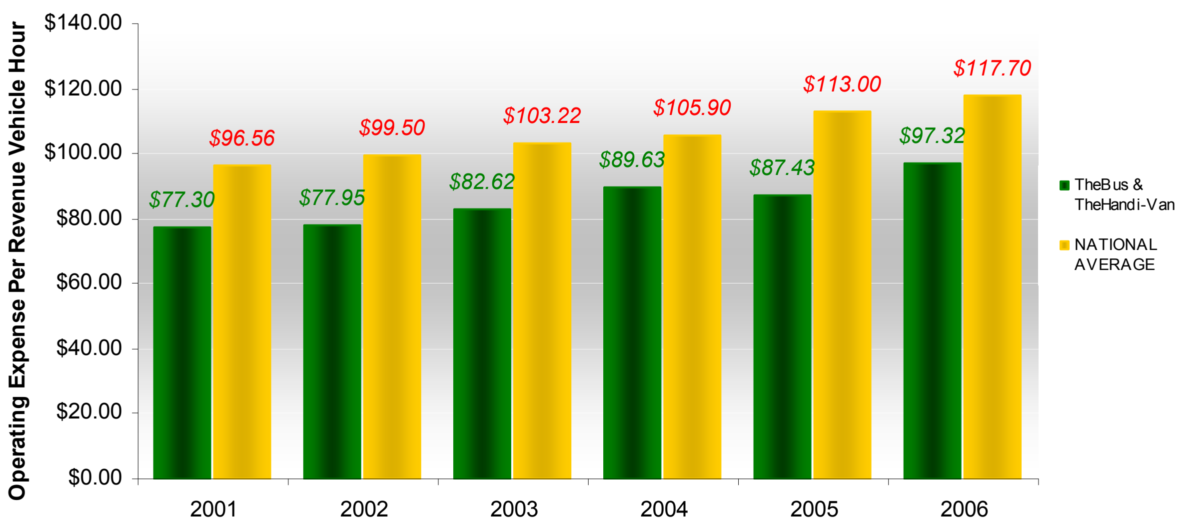


Figure 3-19: Operating Expense per Vehicle Revenue Hour

Source: 2005 National Transit Summaries and Trends Report and 2006 DTS NTD Reports

Service quality can be measured by considering the age and condition of the vehicle fleet, the reliability of the service provided, the number of accidents per hour or mile, and the number of complaints received. The age of the fleet reflects not just the condition of the vehicle, but the opportunity to include recent advances in design and passenger amenities with the purchase of new vehicles.

Figure 3-20 presents the average age of Honolulu's bus vehicle fleet (including all TheBus and TheHandi-Van vehicles) by year, in comparison to the national average over the 2001 to 2006 time period. The gap in age was less than one year, with the national average younger than the Honolulu fleet. However, in 2006 Honolulu's fleet approached a two-year gap.

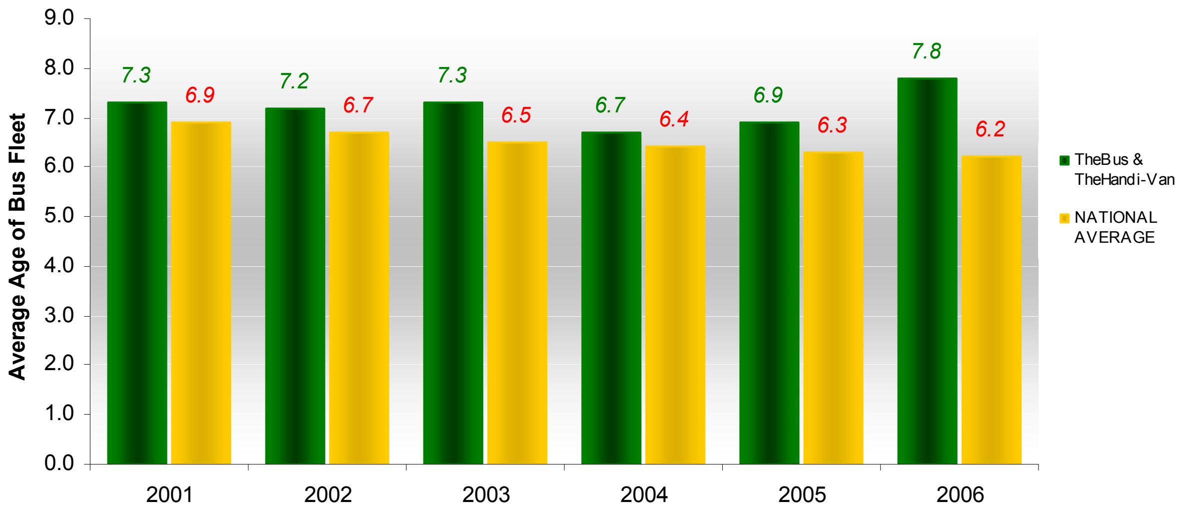


Figure 3-20: Average Fleet Age

Source: 2003 National Transit Summaries and Trends Report and 2006 DTS NTD reports

Comparison of Honolulu's Service Effectiveness with other U.S. Transit Systems

This section discusses how Honolulu's transit service effectiveness compares with other large U.S. transit systems. These systems operate in the largest urbanized areas in the nation. Table 3-17 shows the top 20 transit agencies and ranks these based on the number of bus passenger trips per vehicle revenue hour. The table also identifies the primary or largest city within the urbanized area they serve.

In many cases, multiple transit agencies serve within the same metropolitan area. For example, New York City is represented by three NTD reporting agencies: Metropolitan Transportation Authority–New York City Transit (MTA-NYC), the New Jersey Transit Corporation (NJ Transit), and the New York City Department of Transportation (NYCDOT). Only three other transit agencies—in New York, San Francisco (Municipal Railway or MUNI), and Los Angeles (Los Angeles County Metropolitan Transportation Authority or LACMTA)—had higher productivity (based on bus passenger trips per vehicle revenue hour) than TheBus for 2005, the most recent reporting year.

TheBus is the largest public transportation system in the U.S. that is not either directly or indirectly associated with some form of rail operation. Other than TheBus, only three agencies are listed that do not operate rail services. However, these agencies serve urban areas that have major rail networks operated by other transit agencies in the metropolitan areas.

Table 3-17: Ranked Bus Passenger Trips per Vehicle Revenue Hour for the 20 Largest U.S. Bus Operations —2005

Transit Agency		Urbanized Area Primary City	Annual Bus Passenger Trips (in thousands)	Annual Bus Vehicle Revenue Hours (in thousands)	Bus Passenger Trips per Vehicle Revenue Hour	Transportation Modes Provided by Agency		
Rank	Name					Bus	Rail	Other
1	MTA-NYC	New York, NY	952,418	12,870	74.0	B, DR	HR	–
2	MUNI	San Francisco, CA	163,149	2,495	65.4	B, TB, DR	LR	CC
3	LACMTA	Los Angeles, CA	377,268	7,482	50.4	B	HR, LR, CR	–
4	TheBus	Honolulu, HI	67,407	1,365	49.4	B, DR	–	–
5	SEPTA	Philadelphia, PA	187,960	3,830	49.1	B, TB, DR	HR, LR, CR	–
6	MBTA	Boston, MA	138,557	2,838	48.8	B, TB, DR	HR, LR, CR	FB
7	NYCDOT	New York, NY	71,347	1,559	45.8	B	–	FB
8	CTA	Chicago, IL	303,244	6,748	44.9	B, DR	HR	–
9	WMATA	Washington, DC	153,392	3,423	44.8	B, DR	HR	–
10	MTA	Baltimore, MD	77,806	1,922	40.5	B, DR	HR, LR, CR	–
11	MARTA	Atlanta, GA	71,066	1,798	39.5	B, DR	HR	–
12	TRI-MET	Portland, OR	68,765	1,873	36.7	B, DR	LR	–
13	OCTA	Santa Ana, CA	67,304	1,838	36.6	B, DR	–	–
14	AC Transit	Oakland, CA	64,601	1,800	35.9	B, DR	–	–
15	King County Metro	Seattle, WA	94,608	2,882	32.8	B, TB, DR	LR	VP
16	Metro Transit	Minneapolis, MN	61,797	2,011	30.7	B	LR	–
17	NJ Transit	New York, NY	156,147	5,184	30.1	B, DR	LR, CR	VP
18	MTA of Harris County	Houston, TX	81,547	2,848	28.6	B, DR	LR	VP
19	RTD	Denver, CO	74,683	2,639	28.3	B, DR	LR	VP
20	Miami Dade Transit	Miami, FL	76,753	2,732	28.1	B, DR	HR, AG	–

Source: 2005 Public Transportation Fact Book, APTA, April 2005.
Data includes all bus and trolleybus trips and excludes all demand response trips (small transit vehicles operating in response to calls from passengers or their agents to the transit operator.).
B = Bus, TB = Trolleybus, DR = Demand Response, HR = Heavy Rail, LR = Light Rail, CR = Commuter Rail,
AG = Automated Guideway, FB = Ferry Boat, VP = Van Pool, CC = Cable Car

Table 3-18 shows the 20 largest demand response agencies as measured by passenger trips per vehicle revenue hour. The table includes the transit agencies listed in Table 3-17, ranked by productivity (passenger trips per vehicle revenue hour) for "Demand Response" operations. Only one system has a higher rate (MUNI at 3.0 demand response passenger trips per revenue hour) than TheHandi-Van (2.6 demand response passenger trips per revenue hour).

Table 3-18: Twenty Largest United States Bus Agencies Ranked by Demand Response Passenger Trips per Vehicle Revenue Hour for Fiscal Year 2005

Rank	Transit Agency Name	Primary City	Annual Demand Response Passenger Trips (in thousands)	Annual Demand Response Vehicle Revenue Hours (in thousands)	Demand Response Passenger Trips Per Vehicle Revenue Hour	Bus Passenger Trips Per Vehicle Revenue Hour (in thousands)
1	MUNI	San Francisco, CA	1,287	424	3.0	65.4
2	DTS-TheHandi-Van	Honolulu, HI	757	290	2.6	49.4
3	King Co. DOT	Seattle, WA	1,831	691	2.6	32.8
4	TRI-MET	Portland, OR	1,026	438	2.3	36.7
5	MTA of Harris Co.	Houston, TX	1,505	738	2.0	28.6
6	OCTA	Santa Ana, CA	1,198	607	2.0	36.6
7	CTA	Chicago, IL	2,250	1,153	2.0	44.9
8	Miami Dade Transit	Miami, FL	1,454	797	1.8	28.1
9	SEPTA	Philadelphia, PA	1,654	911	1.8	49.1
10	RTD	Denver, CO	888	495	1.8	28.3
11	AC Transit	Oakland, CA	688	390	1.8	35.9
12	NJ Transit	New York, NY	1,034	592	1.7	30.1
13	WMATA	Washington, DC	1,254	766	1.6	44.8
14	MARTA	Atlanta, GA	336	206	1.6	39.5
15	MBTA	Boston, MA	1,336	878	1.5	48.8
16	MTA	Baltimore, MD	617	426	1.4	40.5
17	MTA-NYC	New York, NY	2,394	2,343	1.0	74.0
-	NYCDOT	New York, NY	-	-	-	45.8
-	LACMTA	Los Angeles, CA	-	-	-	50.4
-	Metro Transit	Minneapolis, MN	-	-	-	30.7

Sources: 2005 Public Transportation Fact Book, APTA, April 2005, Table 84; and, National Transit Database 2005 Reports for each agency.

Three of the top twenty transit agencies ranked by annual boardings do not operate a demand response service.

Access to Stations

Currently, access to existing transit service is dominated by walking to bus stops or transit centers, and transferring from other bus routes. Ninety-five percent of O‘ahu’s urban population lives within one-quarter mile of a bus line. There is currently limited demand for the existing park-and-ride spaces.

Transfers

A major feature of O‘ahu’s existing transit service is reliance on transit centers as major focal points. The network of transit centers and the hub-and-spoke nature of the bus route system result in high use of bus transfers. The current (2007) transfer rate is 37 percent, with an average of 1.4 bus rides or segments per transit trip.

3.2.6 Other Transit Services

In addition to the public transportation services described previously, some transportation programs on O‘ahu provide ridesharing services to the public. This section describes these programs.

Leeward O‘ahu Transportation Management Association

The Leeward O‘ahu Transportation Management Association (LOTMA) is a non-profit organization consisting of public and private landowners and developers serving ‘Ewa and Central O‘ahu. LOTMA is a transportation resource center that provides the following services:

- Carpool Matching Services
- Commuter Express
- Emergency Ride Home Program

Carpool Matching Services

Residents of Leeward, Central, and North Shore O‘ahu are eligible to participate in LOTMA’s carpool matching program. This program is provided free of charge to participants and matches potential carpoolers by residence and work locations. Registered participants are provided a list of potential carpoolers residing and working in the general same locations. Participants are able to contact and set up carpools that work to their best advantage.

Commuter Express

LOTMA contracts with Polynesian Adventure Tours Gray Line Hawai‘i to provide commuter service for Central O‘ahu to Downtown Honolulu and Waikīkī using tour buses. This service is provided weekdays only, on the schedule summarized in Table 3-19 and Table 3-20, according to LOTMA’s website.

Current fares for this commuter service are summarized in Table 3-21, and include unlimited monthly passes ($95.00), 20-trip monthly passes ($55.00) and one-way fares ($3.50). Free transfers to TheBus are available from LOTMA for Commuter Express passengers.

Table 3-19: LOTMA Morning Schedule

Time	Pick-Up/Drop-Off
6:05	Waipi‘o Gentry Shopping Center
6:15	Mililani Mauka Park-and-Ride
7:05	Nimitz-Pier 35
7:10	Dole Cannery
7:15	King and Bishop
7:17	King and Richards
7:19	Punchbowl and King
7:21	Federal Building (Punchbowl and Halekauwila)
7:26*	Ala Moana Hotel
7:31*	Hale Koa Hotel
7:35	Sheraton Waikīkī

*Stops made upon request

Table 3-20: LOTMA Evening Schedule

Time	Pick-Up/Drop-Off
4:30	Sheraton Waikīkī
4:40*	Ala Moana Hotel
5:00-5:05	Queen and Mililani
5:10	Queen and Fort
5:15	Dole Cannery
5:20	Bus stop on Nimitz
5:50	Waipi‘o Gentry
6:05	Mililani Mauka Park-and-Ride

*Stops made upon request

Table 3-21: LOTMA Fares

Pass	Fare
Monthly Pass (unlimited trips)	$95.00
20-Trip Monthly Pass	$55.00
Walk On (One-Way)	$3.50

Emergency Ride Home Program

LOTMA provides an emergency ride home program free of charge to registered commuters living or working in Leeward, Central, or North Shore Oʻahu. This program is available to commuters who carpool or ride LOTMA's Commuter Express at least once a week.

Hawaiʻi Department of Transportation Rideshare Services

HDOT supports a statewide vanpool program and a carpool matching service. HDOT contracts with Vanpool Hawaiʻi to provide a statewide vanpool program. A monthly fee of $55.00 plus sharing gas and parking expenses is available to participants on Oʻahu. Both 7-passenger and 15-passenger vehicles are available.

Vanpool Hawaiʻi also offers a "CoolPool" program for $70.00 a month, providing a sport utility vehicle. The monthly fee covers insurance, maintenance, and road assistance. As of February 2008, there were 240 vanpools on Oʻahu. (Vanpool 2008)

The State provides a matching service for potential carpoolers, similar to LOTMA's program. It uses residence and work locations to provide potential matches for residents islandwide.

Mililani Trolley

Castle and Cooke Homes Hawaiʻi, The Mililani Town Association, and LOTMA contract with the E Noa Corporation to provide community bus services for residents in Mililani and Mililani Mauka. Rubber-tired trolley service is provided weekdays and Saturdays between 7:00 a.m. and 4:55 p.m. One bus is used to provide hourly service to over forty stops throughout Mililani Mauka and Makai.

The Mililani Trolley fare is $1.00 for adults and $0.75 for seniors and students. It also accepts and issues TheBus transfers. It offers adult passes at $25.00 per month and student and senior monthly passes at $15.00. TheBus monthly passes are not accepted on the trolley.

3.3 Streets and Highways

Freeways, highways, and streets are the basic transportation network elements responsible for the movement of people and goods on Oʻahu. All types of vehicles, public and private transit services, bicycles, and pedestrians use this network. Oʻahu's roadway system is maintained by HDOT and the City and County of Honolulu Department of Facility Maintenance (DFM).

3.3.1 State Highway System

The State's existing highway system includes all freeways and major highways connecting various parts of the island. It consists of approximately 280 route miles and 940 lane miles. This section provides background information on the State highways maintained by HDOT. The existing State highway system network is illustrated in Figure 3-21.

O‘ahu’s interstate freeways are dedicated transportation facilities. They are fully grade separated and access controlled. Access to the interstate system is restricted to dedicated ramps, which minimizes disruptions to the flow of traffic. This allows for higher operational speeds and improved capacity compared to surface streets.

The study corridor is served primarily by the H-1 Freeway and the Moanalua Freeway, as indicated in Figure 3-22. The H-2 Freeway provides access to the corridor from Central O‘ahu and the H-3 Freeway provides access from the Windward side.

Highways also facilitate the movement of goods and people to different parts of the island. Unlike the interstate system, highways are not fully grade-separated roadways but consist of major surface streets. Local traffic can access these facilities without using dedicated ramps; accordingly, capacities and operational speeds on highways are not as high as those on the interstate system. The Kamehameha and Nimitz Highways are the primary highways in the study corridor.

Freeway and highway facilities within the study corridor include the following:

- H-1 Freeway—connection with Kalaniana‘ole Highway in Wai‘alae to connection with Farrington Highway in Makakilo
- H-2 Freeway—intersection with the H-1 Freeway at the Waiawa Interchange to Wahiawā
- H-3 Freeway—Marine Corps Base Hawai‘i to the intersection with the H-1 Freeway at the Hālawa Interchange
- Route 61—Pali Highway, Honolulu to Kailua
- Route 64—Sand Island Access Road
- Route 76—Fort Weaver Road, intersection with the H-1 Freeway to ‘Ewa Beach
- Route H201—Moanalua Freeway, Middle Street to Hālawa Interchange
- Route 80—Kamehameha Highway, Wahiawā to intersection with Kamehameha Highway (Route 99)
- Route 92—Nimitz Highway, Pearl Harbor to Honolulu Harbor
- Route 92—Ala Moana Boulevard, Honolulu Harbor to Waikīkī
- Route 93—Farrington Highway, Waiawa Interchange to Mākua
- Route 95—Kalaeloa Boulevard, intersection with the H-1 Freeway, Makakilo Interchange to Barbers Point Harbor
- Route 750—Kunia Road, intersection with the H-1 Freeway to Schofield Barracks

3.3.2 City and County Street System

The City and County of Honolulu's street system consists of arterial facilities that are not part of the State system, as well as local streets (Figure 3-21). Principal 'Ewa/Koko Head arterials in the study corridor include:

- Ala Wai Boulevard
- Beretania Street
- Dillingham Boulevard
- Kalākaua Avenue
- Kapi'olani Boulevard
- King Street
- Kūhiō Avenue
- Moanalua Road
- Salt Lake Boulevard
- School Street

The main mauka/makai roadways in the corridor are:

- Fort Weaver Road
- Houghtailing Street
- Kalihi Street
- Kapahulu Avenue
- Ke'eaumoku Street
- McCully Street
- Middle Street
- Pensacola Street
- Pi'ikoi Street
- Punchbowl Street
- Pu'uloa Road
- South Street
- University Avenue
- Waiakamilo Road
- Ward Avenue

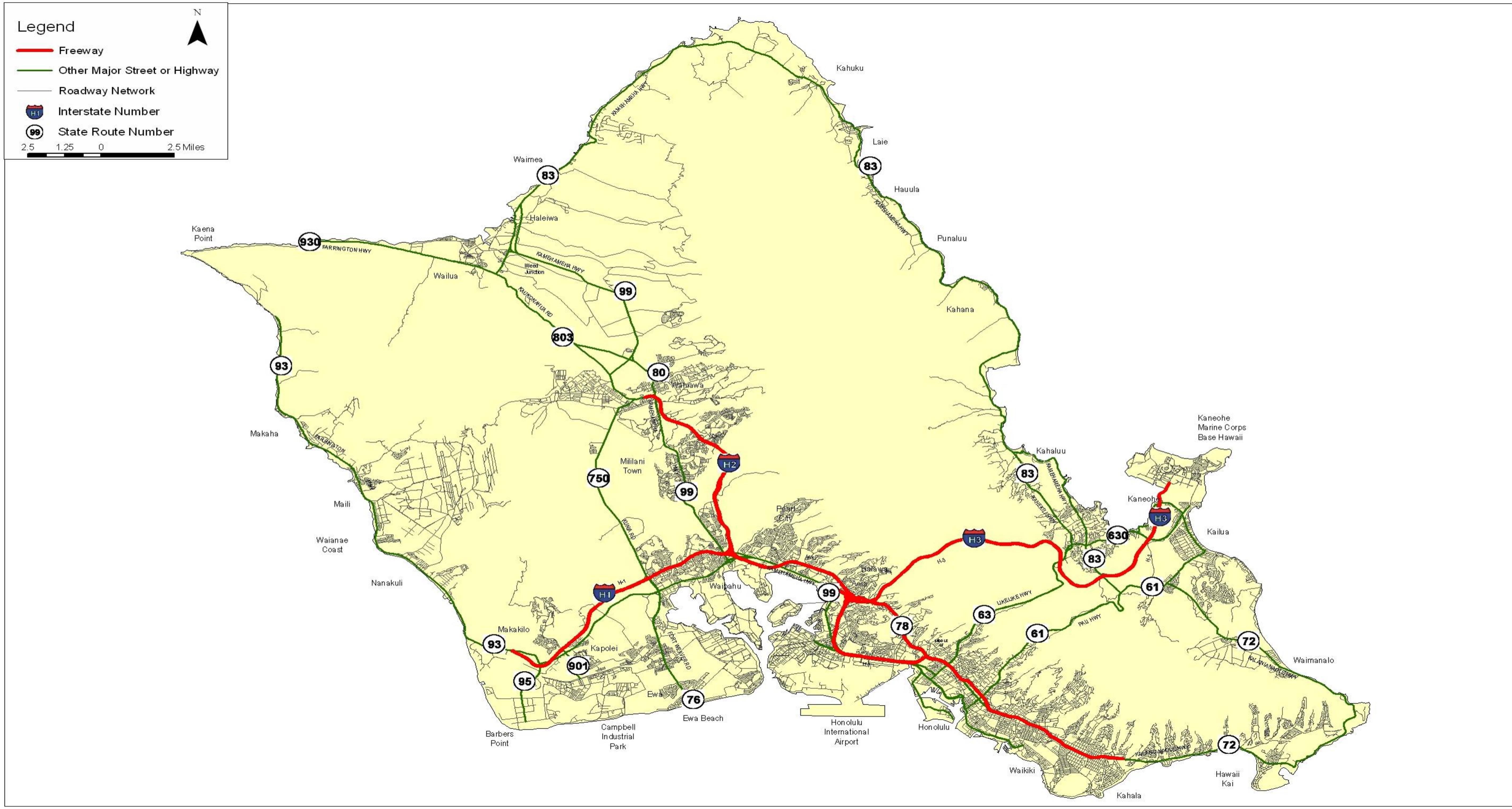


Figure 3-21: Existing State Highway System

Figure 3-22: Existing Roadways in the Study Corridor

Types of roadways within the City and County of Honolulu’s street system include:

- Arterials—the major classification in the surface street network. In terms of capacity arterials rank immediately below highways. They serve traffic between neighborhoods and have connections with collector and local streets.
- Collectors—these streets generally provide connections between local neighborhood-oriented streets and arterials.
- Local—local streets provide neighborhood-level access and do not generally provide a high level of roadway capacity.

3.3.3 Transportation Demand Management

TDM is the application of strategies and policies to influence traveler behavior with the aim of reducing automobile travel demand, or redistributing this demand. Current TDM programs include carpools and vanpools, as well as incentive programs to encourage rideshare. Furthermore, one of many goals of the ORTP is to maintain and further develop aggressive TDM programs such as real-time online carpool matching, outreach promotion and marketing of alternative transportation, emergency rideshare home program, employer based commuter programs, and emerging and innovative strategies like car sharing.

3.3.4 Transportation Systems Management

The basic goal of TSM is to create more efficient use of transportation facilities by improving the operation and management of vehicles and roads.

Examples of TSM measures specific to the island of O‘ahu include contraflow operations, special traffic and high-occupancy vehicle (HOV) lanes, and Intelligent Transportation Systems (ITS). The following sections further describe these programs.

Contraflow Lanes

Contraflow lanes are a TSM strategy where a lane that typically provides vehicle travel in one direction is reversed during peak traffic periods. For example, a lane that serves the off-peak direction can be reversed to provide an additional travel lane in the peak direction, Figure 3-23 identifies contraflow facilities operated by HDOT and the City and County of Honolulu.

Contraflow facilities operated by the State are restricted to buses, vanpools, and vehicles with three or more occupants (as of 2008). HDOT currently provides contraflow operations at the following locations in the study corridor during the a.m. peak period:

- H-1 Zipper Lane—the “zipper” contraflow lane provides an additional Koko Head-direction lane from Managers Drive in Waipahu to the Ke‘ehi interchange. This is open to HOVs only.

- Nimitz Highway (Route 92)—a Koko Head-direction contraflow HOV lane extends near the Ke‘ehi Interchange.

The City and County of Honolulu also operates contraflow lanes along congested corridors during specific peak periods. Unlike HDOT contraflow operations, these facilities do not have occupancy restrictions and operate during both the a.m. and p.m. peak periods. City and County locations with reversible lane operations include:

- Kapi‘olani Boulevard—from the H-1 Freeway near South King Street to ‘Ewa of Ward Avenue in the a.m. peak period, and from Pensacola Street to McCully Street during the p.m. peak period.
- Ward Avenue—from Lunalilo Street to makai of South King Street during the a.m. peak period.
- Atkinson Drive—from Kona Street to Kapi‘olani Boulevard during the a.m. peak period.
- Wai‘alae Avenue—from Kapahulu Avenue to 8th Avenue during the p.m. peak period.

HOV Lanes

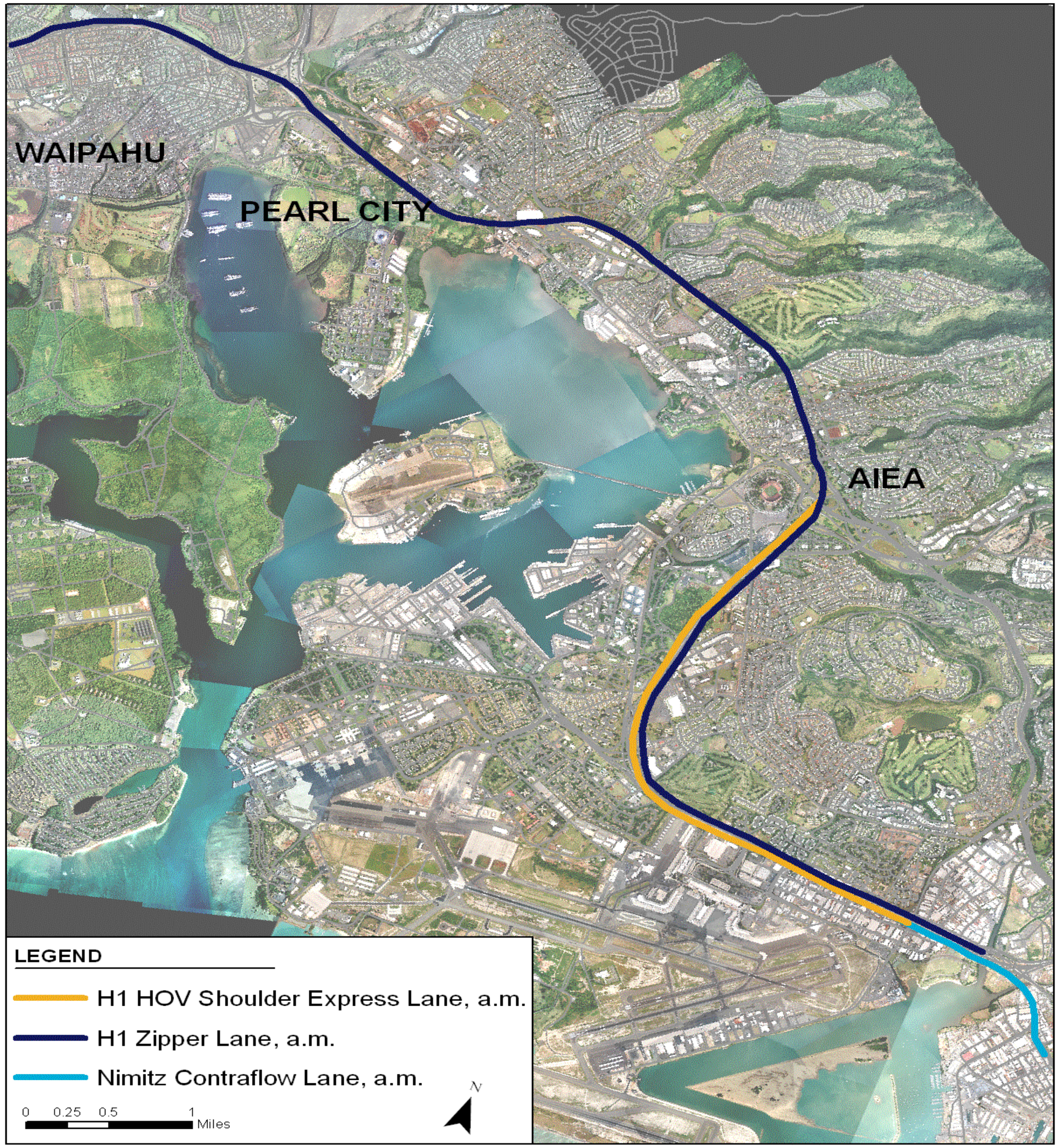
HOV lanes are freeway or surface street lanes designated for exclusive use by buses, carpools, and vanpools. HDOT operates HOV lanes on the following facilities during the a.m. or p.m. peak periods:

- The H-1 Freeway—carpool eligibility three or more occupants.
- The H-2 Freeway—carpool eligibility three or more occupants.
- Moanalua Freeway—carpool eligibility three or more occupants.
- H-1 Zipper Lane and Shoulder Express Lane—carpool eligibility three or more occupants. In the a.m. peak period, ‘Ewa-bound lanes on the H-1 Freeway are temporarily converted to Koko Head-bound lanes to provide added capacity.
- Nimitz Highway (Route 92)—carpool eligibility three or more occupants.

In addition to the contraflow lanes and HOV facilities described, the shoulder along portions of the H-1 Freeway is used to provide an additional travel lane during the a.m. peak period.

ITS/Centralized Signal Control Systems

ITS uses advanced technologies to improve the way transportation is managed and operated, with the goal of improving efficiency and safety. ITS encompasses a range of technologies applied to different elements of the transportation system, such as incident management, transit vehicle tracking, and emergency services.



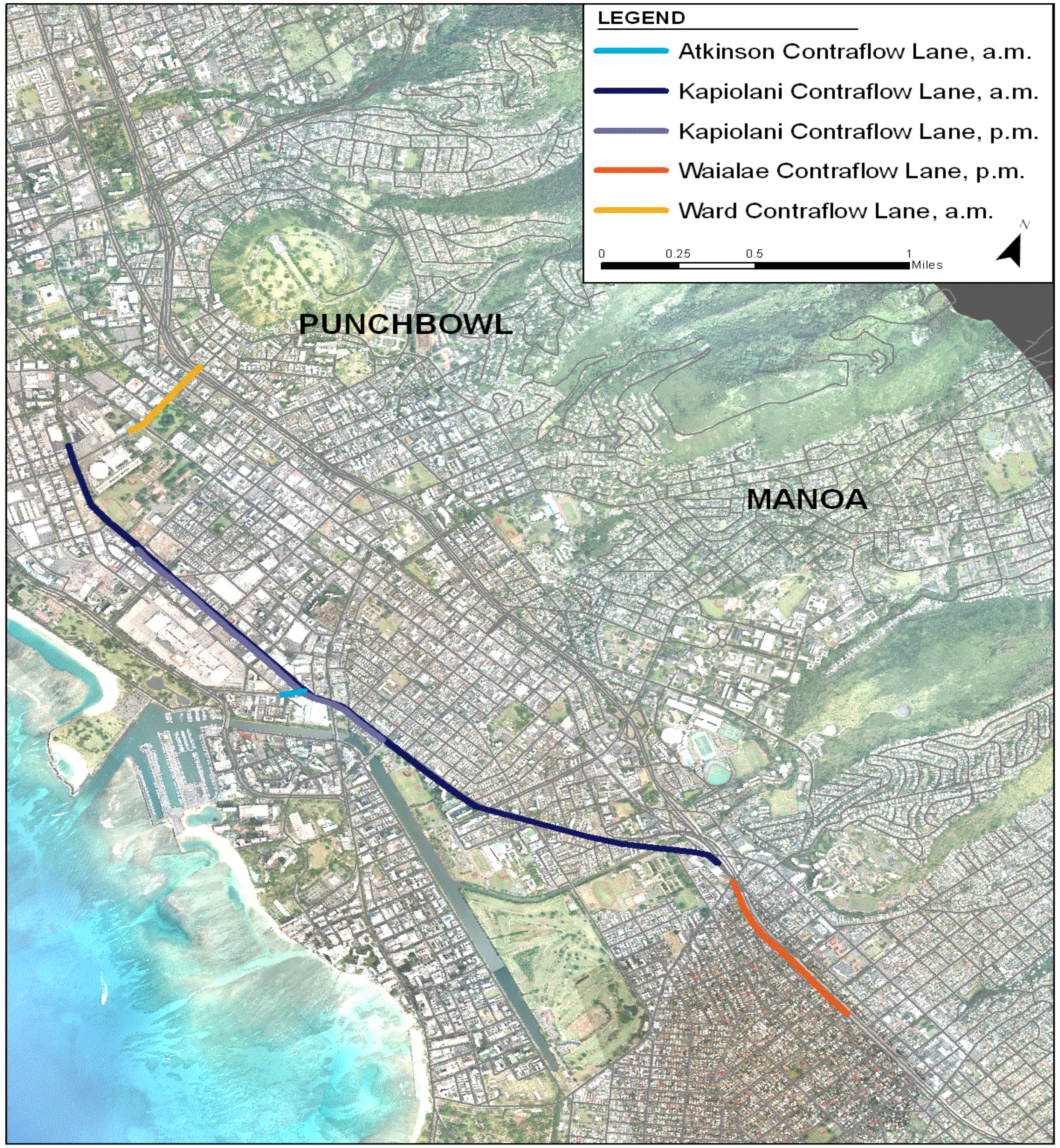


Figure 3-23: Existing Contraflow Lanes State HOV Lanes

Centralized traffic signal control systems are a widely used ITS application. This is a group of technologies and communication protocols that allows multiple agencies to manage an entire transportation network through a centralized network. By tailoring traffic controls to operating conditions, a roadway's efficiency can be improved by networking signalized intersections, traffic surveillance, and centralized traffic signal control.

DTS currently operates a centralized signal control system, referred to as the Traffic Control Center (TCC). The TCC offers signal coordination and preemption through live video surveillance provided by a closed-circuit television system. Live surveillance is available along most major arterial corridors.

HDOT operates a Traffic Management Center (TMC) that provides live surveillance much like DTS's TCC. The difference lies in the facilities monitored by each center: the TMC monitors H-1 and H-3 and TCC monitors everything else.

The following ITS infrastructure is currently available on O'ahu:

- 750 signalized intersections on O'ahu and 400 signalized intersections controlled by the City's TCC
- 202 closed-circuit cameras on O'ahu: 141 controlled by the City's TCC and 61 controlled by the State's TMC.

Long-term ITS initiatives are described in the *O'ahu Regional ITS Plan: Intelligent Transportation Systems Architecture and Integration Strategy—An Element of the O'ahu Regional Transportation Plan* (PB 2003). Initiatives include expanding the ITS infrastructure, and continuing to integrate emergency and non-emergency services with other public agencies. As the infrastructure is expanded and upgraded, system capabilities and interagency coordination would be improved. A joint DTS-HDOT TMC will also be constructed.

3.3.5 Traffic Operating Conditions at Screenline Locations

To analyze traffic operations, traffic volumes and other performance statistics were grouped by screenlines, which are imaginary lines drawn across the road network at selected locations. Existing traffic volumes were extracted from historical State files at points where the lines intersect the road network, and totaled for all individual facilities that cross each screenline. Eight screenlines were used to describe existing conditions in the study corridor during the a.m. and p.m. peak travel hours (as shown in Figure 3-24).

The following roadways were included in the analysis at each screenline:

- Kapolei (Screenline A)—Kalaeloa Boulevard near Malakole Street and Fort Barrette Road mauka of Roosevelt Avenue. In future conditions, North-South Road mauka of Kapolei Parkway was also analyzed at this screenline

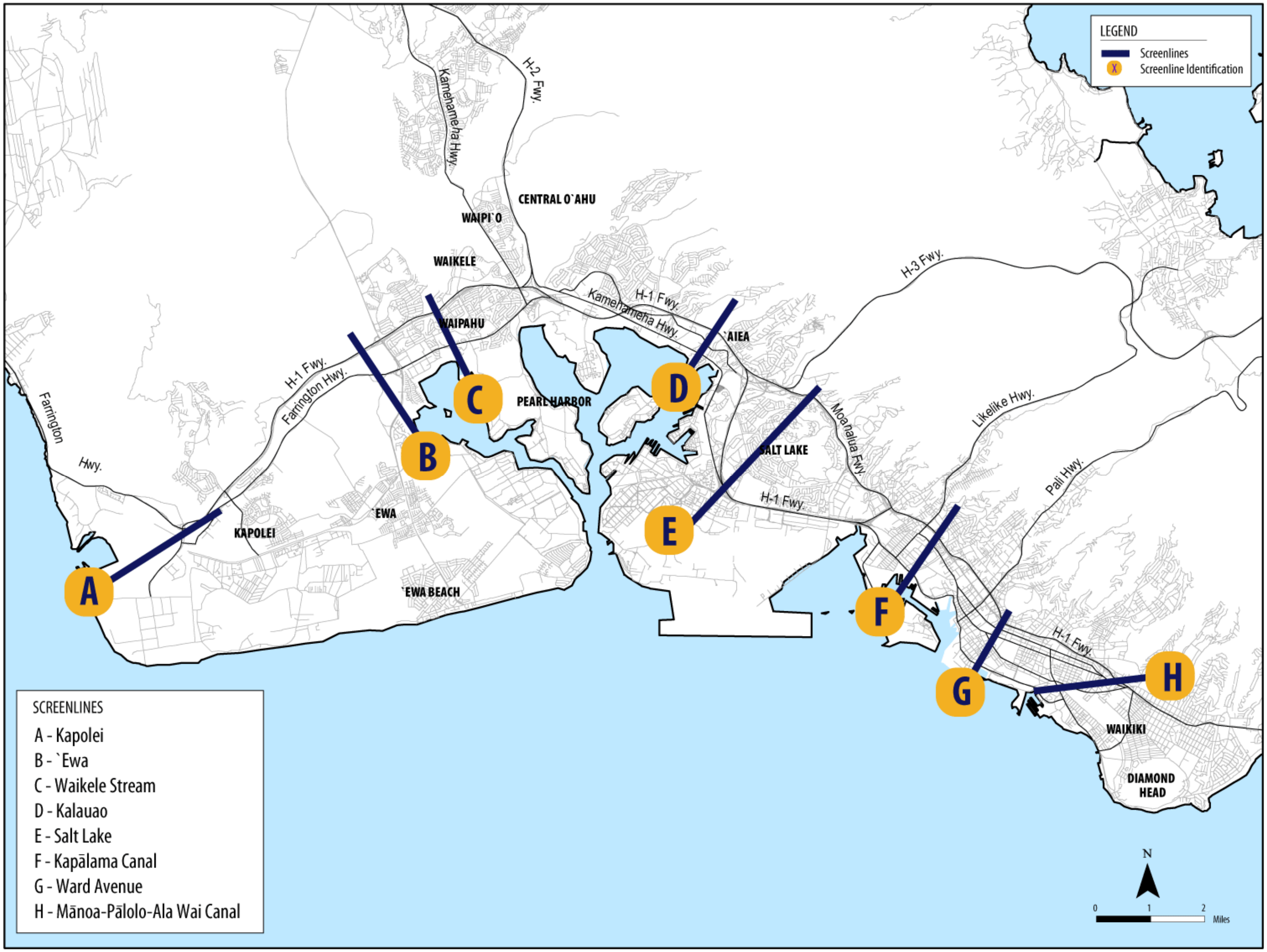


Figure 3-24: Study Corridor Screenline Locations

- ‘Ewa (Screenline B)—H-1 Freeway before the Kunia Interchange, Farrington Highway before Fort Weaver Road/Kunia Road, and Fort Weaver Road before the Farrington Highway overpass
- Waikele Stream (Screenline C)—H-1 Freeway (including H-1 Zipper lane) just ‘Ewa of Managers Drive Overpass, Waipahu Street ‘Ewa of Mokuola, and Farrington Highway ‘Ewa of Mokuola
- Kalauao Stream (Screenline D)—H-1 Freeway (including HOV Lane and Zipper lane) just ‘Ewa of the Kaamilo Overpass, Kamehameha Highway just Koko Head of Pali Momi Street, and Moanalua Road just Koko Head of Pali Momi Street
- Salt Lake (Screenline E)—H-1 Freeway (including HOV Lane and zipper lane) just ‘Ewa of Rodgers Boulevard Underpass, Salt Lake Boulevard between Wanaka Street and Radford Drive, Moanalua Freeway (including HOV Lane) at Red Hill
- Kapālama Canal (Screenline F)—H-1 Freeway at Houghtailing underpass, Nimitz Highway (including HOV Lane) Koko Head of Waiakamilo Road, Dillingham Boulevard between Kohou Street and Kōkea Street, King Street between Kohou Street and Kōkea Street, School Street ‘Ewa of Houghtailing, Olomea Koko Head of Houghtailing, and Hālona Street ‘Ewa of Houghtailing.
- Ward Avenue (Screenline G)—Ala Moana Boulevard between Ward Avenue and Kamake‘e, Kapi‘olani Boulevard between Ward Avenue and Kamake‘e, King Street just Koko Head of Ward Avenue, Beretania just Koko Head of Ward Avenue, Kīna‘u just Koko Head of Ward Avenue, and H-1 Freeway at Ward Avenue Overpass
- Mānoa-Pālolo/Ala Wai Canal (Screenline H)—Ala Moana Boulevard just Koko Head of Atkinson Drive, Kalākaua Avenue makai of Kapi‘olani Blvd, McCully Street makai of Kapi‘olani Boulevard, Date Street just Koko Head of Kapi‘olani Boulevard, Kapi‘olani Boulevard ‘Ewa of Kaimukī, King Street just ‘Ewa of Kapi‘olani, H-1 Freeway at Old Wai‘alae Avenue overpass, Old Wai‘alae Road just ‘Ewa of Saint Louis Drive, and Dole Street just ‘Ewa of Saint Louis Drive

Each screenline was analyzed by direction (mauka, makai, ‘Ewa- or Koko Head-bound) to ensure that the analysis of traffic conditions reflected appropriate peak hour conditions rather than an average condition. The a.m. and p.m. peak hour varies by location. HDOT provides traffic volume data collected at most locations annually. Because the Year 2005 and 2006 count data represent the most recent set of counts, these data were used to analyze existing volume and LOS conditions on roadway segments in the study corridor.

Screenline Operating Conditions

The operation of the roadway segments was calculated by comparing traffic volumes on each roadway to the saturated volume LOS thresholds for each facility. The saturated volume thresholds represent the capacity of a roadway and were developed based on the roadway functional classification and operating characteristics (e.g., number of intersections or interchanges per mile, divided or undivided roadways, number of travel lanes, and one-way or two-way facility).

The LOS across the screenline is reported for each screenline facility and then weighted by volumes to report the overall operating conditions across each screenline. This same methodology was used to analyze the morning and afternoon peak hour traffic volumes across each screenline under Year 2005 conditions.

Table 3-22 summarizes existing traffic count volumes for the a.m. and p.m. peak hours, and the total daily traffic found at the screenline locations. As indicated in the table, the Kapālama Canal screenline (Screenline F), with over 395,800 daily vehicle crossings and over 30,000 vehicle crossing during both the a.m. and p.m. peak hours, is the most traveled of the screenlines analyzed.

Detailed worksheets describing LOS results for these locations are provided in Appendix C.

The Kalauao Stream (Screenline D), Salt Lake (Screenline E), Ward Avenue (Screenline G), and Mānoa-Pālolo/Ala Wai Canal (Screenline H) screenlines also experience high levels of traffic ranging from approximately 263,000 vehicles to over 384,000 vehicles per day. The remaining three screenlines (Kapolei, ‘Ewa, and Waikele Stream) do not exceed 205,000 vehicles per day.

At the facility level, the interstate freeway system carries a considerable amount of the island’s traffic, with the H-1 Freeway being the most heavily traveled freeway on O‘ahu. At the Kalauao Stream screenline (Screenline D), over 20,000 vehicles currently travel on H-1 (both directions combined) during the a.m. and p.m. peak hours. Almost 350,000 vehicles travel through this section of H-1 daily.

Table 3-23 summarizes each facility’s observed volumes and LOS at each screenline, for both directions during the a.m. and p.m. peak hours. This analysis was conducted using the existing year count data obtained from HDOT. In general, congested conditions (e.g., LOS E or F) occur during the a.m. and p.m. peak hours on several of the major roadways. Specifically, this occurs in the peak direction (i.e., toward Downtown in the morning and away from Downtown in the evening) on portions of the H-1 Freeway from the Waiawa Interchange to the UH Mānoa area, where stop-and-go conditions are typical. Signalized routes, such as Fort Weaver Road and Nimitz Highway, often require more than one traffic signal cycle to clear intersections during peak periods.

Table 3-22: Existing Traffic Volumes at Screenlines

ID[1]	Screenline and Direction	A.M. Peak Hour	P.M. Peak Hour	Daily Total
A	Kapolei Mauka bound	1,840	2,550	23,750
	Kapolei Makai bound	2,640	1,680	29,380
	Total			*53,130*
B	‘Ewa Wai‘anae bound	5,360	6,820	83,390
	‘Ewa Koko Head bound	7,460	6,760	95,690
	Total			*179,080*
C	Waikele Stream ‘Ewa bound	7,630	8,520	110,650
	Waikele Stream Koko Head bound	9,170	6,000	93,590
	Total			*204,240*
D	Kalauao ‘Ewa bound	8,940	14,070	175,960
	Kalauao Koko Head bound	17,300	9,470	173,410
	Total			*349,370*
E	Salt Lake ‘Ewa bound	7,540	14,050	159,630
	Salt Lake Koko Head bound	17,420	10,250	150,740
	Total			*310,370*
F	Kapālama Canal ‘Ewa bound	11,870	15,170	204,460
	Kapālama Canal Koko Head bound	18,970	14,940	191,410
	Total			*395,870*
G	Ward Avenue ‘Ewa bound	13,800	12,370	160,210
	Ward Avenue Koko Head bound	11,390	15,350	103,550
	Total			*263,760*
H	Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound	14,940	12,780	191,720
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound	11,130	16,340	192,660
	Total			*384,380*

[1] ID = Screenline Locations in Figure 3-24

Table 3-23: Existing Traffic Volumes and Level of Service at Screenlines

ID[3]	Screenline and direction	A.M. Peak Hour		P.M. Peak Hour	
		Observed volumes (vph)[1]	LOS	Observed volumes (vph)[1]	LOS
A	Kapolei Mauka bound	1,840	D	2,550	D
	Kapolei Makai bound	2,640	D	1,680	D
B	‘Ewa Wai‘anae bound	5,360	C	6,820	E
	‘Ewa Koko Head bound	7,460	E	6,760	D
C	Waikele Stream ‘Ewa bound	7,630	D	8,520	E
	Waikele Stream Koko Head bound	9,170	E	6,000	C
D	Kalauao ‘Ewa bound	8,940	D	12,540	D
	Kalauao ‘Ewa bound (H-1 Freeway HOV)[2]	n/a	n/a	1,530	D
	Kalauao Koko Head bound	14,050	F	8,110	D
	Kalauao Koko Head bound (H-1 Freeway HOV)[2]	1,740	E	1,360	D
	Kalauao Koko Head bound (H-1 Freeway Zipper)	1,510	D	n/a	n/a
E	Salt Lake ‘Ewa bound	7,540	C	12,640	D
	Salt Lake ‘Ewa bound (H-1 Freeway HOV)[2]	n/a	n/a	1,410	D
	Salt Lake Koko Head bound	13,270	D	9,680	D
	Salt Lake Koko Head bound (H-1 Freeway HOV & Moanalua Freeway HOV)[2]	2,640	E	240	A
	Salt Lake Koko Head bound (H-1 Freeway Zipper)[2]	1,510	D	330	A
F	Kapālama Canal ‘Ewa bound	11,870	D	15,170	E
	Kapālama Canal Koko Head bound	18,970	F	14,940	E
G	Ward Avenue ‘Ewa bound	13,800	E	12,370	E
	Ward Avenue Koko Head bound	11,390	E	15,350	D
H	Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound	14,940	D	12,780	D
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound	11,130	D	16,340	E

[1] vph = vehicles per hour
[2] HOV = high-occupancy vehicle
[3] ID = Screenline Locations in Figure 3-24

As shown in Table 3-23, under the existing condition, congested operating conditions (LOS E or F) during the a.m. peak hour are estimated to occur at the following screenlines:

- ‘Ewa Screenline (Koko Head direction)
- Waikele Stream Screenline (Koko Head direction)
- Kalauao Screenline (Koko Head direction)
- Salt Lake (H-1 Freeway HOV and Moanalua Freeway HOV (Koko Head direction)
- Kapālama Canal (Koko Head direction)
- Ward Screenline (both directions)

Table 3-23 also presents a similar analysis for the p.m. peak hour. Congested operating conditions (LOS E or F) during the p.m. peak hour are projected to occur at the following screenlines:

- ‘Ewa Screenline (Wai‘anae direction)
- Waikele Stream (‘Ewa direction)
- Kapālama Canal (both directions)
- Ward Avenue (‘Ewa direction)
- Mānoa Pālolo/Ala Wai Screenline (Koko Head direction)

Under congested conditions, vehicle speeds are slow and vehicles back up in queues. As a result, less traffic passes through the congested location and any traffic counts conducted under these conditions under-represent the true demand for the facility. In this case, travel speeds and roadway “density” is a more accurate reflection of operating LOS. Table 3-24 shows existing travel speeds and associated LOS for the H-1 Freeway at several locations during the a.m. peak hour. Except for Koko Head-bound HOV traffic at the Kalauao Stream screenline, this information indicates a consistent LOS F throughout the corridor.

Congestion on roadways currently affects overall mobility within the study corridor. More specifically, current roadway congestion affects the ability to add bus service in a cost effective and reliable manner. This is because buses are using the same congested roadways as automobiles.

Table 3-24: 2007 A.M. Peak-Period Speeds and Level of Service on the H-1 Freeway

Location	2007 Existing Condition	
	Average Speed (mph)	Level of Service*
Waiawa Interchange—Koko Head-Bound		
General-purpose traffic	18	F
HOV lane traffic	22	F
Zipper lane traffic	33	F
Kalauao Stream—Koko Head-Bound		
General-purpose traffic	30	F
HOV lane traffic	38	E
Zipper lane traffic	39	F
East of Middle Street Merge—Koko Head-Bound		
General-purpose traffic	8	F
Liliha Street—Koko Head-Bound		
General-purpose traffic	23	F
East of Ward Avenue—ʻEwa-Bound		
General-purpose traffic	18	F
West of University Avenue—ʻEwa-Bound		
General-purpose traffic	36	F

Source: 2005 and 2006 HDOT Traffic Counts

*Level of service is calculated based on vehicle density, a function of traffic volume and speed

3.3.6 Existing Traffic Conditions at Intersections

To better understand existing traffic conditions at intersections potentially affected by the proposed fixed guideway, the study corridor was divided into sections: Kapolei (including the planned extension to West Kapolei), West Loch to Aloha Stadium, Aloha Stadium to Middle Street, Middle Street to Iwilei, Iwilei to Ala Moana Center, the University of Hawaiʻi Mānoa planned extension, and the Waikīkī planned extension.

Kapolei

This section of the proposed alignment focuses on the Kapolei area of Oʻahu and includes the planned fixed guideway stations identified in Table 3-25.

The "Second City" of Kapolei is home to City and County of Honolulu and State of Hawaiʻi offices, as well as UH West Oʻahu. Although new residential development is being built in the area, employment destinations are still dominated by Downtown Honolulu and nearby commercial areas. As a result, traffic flow is dominated by traffic going out of this area toward Downtown Honolulu in the a.m. peak period and back from Honolulu in the p.m. peak period.

Table 3-25: Kapolei Planned Fixed Guideway Stations

Planned Fixed Guideway Stations	Cross Streets
West Kapolei (planned extension)	Kapolei Parkway and Hanua Street
Kapolei Transit Center (planned extension)	Kapolei Parkway and Wākea Street
Kalaeloa (planned extension)	Saratoga Avenue and Wākea Street
Fort Barrette Road (planned extension)	Saratoga Avenue and Fort Barrette Road/Enterprise Street
Kapolei Parkway (planned extension)	North-South Road makai of Kapolei Parkway
East Kapolei	North-South Road makai of future UH West Oʻahu campus
UH West Oʻahu	North-South Road mauka of future UH West Oʻahu campus
Hoʻopili	Farrington at Hoʻopili (near future Horton Development)

The Kapolei section contains 29 of the 215 intersections selected for analysis. The LOS analysis results are discussed below for both the planned project and the planned extension towards West Kapolei. As shown in Table 3-26, the following two intersections along the proposed alignment are currently operating at LOS E during the a.m. peak hour:

- Saratoga Avenue and Enterprise Avenue (adjacent to Fort Barrette Road Station) (Intersection #4)
- Farrington Highway and Old Fort Weaver Road (Koko Head of Hoʻopili Station) (Intersection #6)

Situated just off the alignment, 12 intersections are currently operating at poor levels of service (LOS E or F) during one or both peak hours. The most congested areas occur at:

- Kalaeloa Boulevard between the H-1 Freeway on/off ramps and Kapolei Parkway (Intersections #10 and 11)
- The stop-controlled side streets of Kamokila Boulevard (e.g., Uluohia Street and Manawai Street) (Intersections #12 and 13)
- Roosevelt Avenue between Fort Barrette Road and Coral Sea Street (Intersections #16 and #17)
- Roosevelt Avenue at Philippine Sea (Intersection #19)
- Fort Weaver Road between Renton Road and Geiger Road and Fort Weaver Road at Laulaunui Street (Intersections #24–26)
- Farrington Highway at Fort Barrette Road (Intersection #27)
- Old Fort Weaver Road fork makai of Farrington Highway (Intersection #29)

Table 3-26: Existing Intersection Levels of Service—Kapolei

Intersection					Control	Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	**Intersections Along Alignment**								
1	Kalaeloa Boulevard	&	Kapolei Parkway		S	27	C	52	D
2	Roosevelt Avenue	&	Hornet Avenue	[1]	TWSC	9	A	9	A
3	Saratoga Avenue Avenue	&	Hornet Avenue	[1]	AWSC	7	A	7	A
4	Saratoga Avenue	&	Enterprise Avenue	[1]	TWSC	45	**E**	22	C
5	Saratoga Avenue	&	Midway Street	[1]	TWSC	16	C	9	A
6	Farrington Highway	&	Old Fort Weaver Road	[1]	TWSC	45	**E**	25	C
7	Farrington Highway	&	Fort Weaver (Highway 76) SB On-Ramp		S	8	A	5	A
8	Farrington Highway	&	Kunia (Highway 76) NB On-Ramp		S	9	A	6	A
9	Old Fort Weaver Road	&	Farrington IC		S	8	A	10	B
#	**Intersections Off Alignment**								
10	Kalaeloa Boulevard	&	Farrington Highway/H-1 WB On/Off Ramps	[1]	TWSC	31	D	>300	**F**
11	Kalaeloa Boulevard	&	H-1 EB Off-Ramp	[1]	TWSC	220	**F**	15	B
12	Kamokila Boulevard	&	Uluohia Street	[1]	TWSC	18	C	101	**F**
13	Kamokila Boulevard	&	Manawai Street	[1]	TWSC	>300	**F**	>300	**F**
14	Fort Barrette Road	&	Kamaaha Avenue		S	29	C	25	C
15	Farrington Highway	&	Kamokila Boulevard		S	34	C	33	C
16	Roosevelt Avenue	&	Fort Barrette Road	[1]	AWSC	89	**F**	70	**F**
17	Roosevelt Avenue	&	Coral Sea Street	[1]	TWSC	53	**F**	66	**F**
18	Roosevelt Avenue	&	Stout Street	[1]	TWSC	12	B	20	C
19	Roosevelt Avenue	&	Philippine Sea	[1]	TWSC	85	**F**	16	C
20	Saratoga Avenue	&	Franklin Street	[1]	AWSC	7	A	7	A
21	Saratoga Avenue	&	Lexington Street	[1]	AWSC	7	A	7	A
22	Vinson Road	&	Stout Street	[1]	AWSC	6	A	7	A
23	Renton Road	&	Philippine Sea	[1]	TWSC	9	A	9	A
24	Fort Weaver Road	&	Renton Road		S	60	**E**	69	**E**
25	Fort Weaver Road	&	Geiger Road		S	56	**E**	104	**F**
26	Fort Weaver Road	&	Laulaunui Street		S	152	**F**	51	D
27	Farrington Highway	&	Fort Barrette Road		S	79	**E**	94	**F**
28	Farrington Highway	&	Kealanani Avenue		S	36	D	27	C
29	Old Fort Weaver Road	&	Old Fort Weaver Road	[1]	TWSC	11	B	>300	**F**

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For all-way-stop-controlled intersections, average vehicular control delay of all approaches in seconds is reported. For two-way controlled intersections, the LOS and delay in seconds for the worst-case movement (minor streets) are reported.

S = Signal AWSC = All-way stop control TWSC = Two-way stop control

As noted previously, traffic flow in Kapolei is dominated by traffic going out of this area toward Downtown Honolulu in the a.m. peak period and back from Honolulu in the p.m. peak period. For example, the Fort Weaver Road/Geiger Road intersection operates at LOS E during the morning a.m. peak hour, and at LOS F during the p.m. peak hour with similar overall volumes. The difference is the heavy makai-bound left turns from Fort Weaver Road onto Geiger Road during the evening as commuters return to their homes. During the a.m. peak hour, these same motorists are making right turns from Geiger Road onto mauka-bound Fort Weaver Road, a move that requires less overall green time.

Similar traffic patterns are also evident on major east-west highways in this section such as the H-1 Freeway, Farrington Highway, and Kapolei Parkway and on north-south roadways such as Fort Weaver Road, Fort Barrette Road, and North-South Road.

Visual observations in addition to traffic counts indicate that most of the same intersections and roadways that operate at LOS E or F during peak periods operate at LOS A during most off-peak hours because of the lack of substantial midday commercial traffic.

Detailed analysis worksheets are included in Appendix C for the a.m. and p.m. peak hours. Figure 3-25 shows the LOS at the intersections analyzed.

West Loch to Aloha Stadium

This section of the proposed alignment focuses on the West Loch to Aloha Stadium area of O‘ahu. The description includes traffic conditions at the fixed guideway stations identified in Table 3-27.

This section of the proposed alignment contains 32 intersections where traffic conditions may be altered by the Project. Table 3-28 provides the complete LOS analysis for these locations. Figure 3-26 shows the LOS at the intersections analyzed. As shown in the table and figure, eight intersections along the alignment are currently operating at a poor LOS (LOS E or F) during one or both peak hours. Most of the congestion occurs at:

- Farrington Highway at Leokū Street (Intersection #30)
- Farrington Highway between Kahualii Street/Waipi‘o Point Access Road and Kamehameha Highway (Intersection #35)
- Farrington Highway at Waiawa Road (Intersection #36)
- Kamehameha Highway at Waihona Street (Intersection #38)
- Kamehameha Highway at Kuala Street (Intersection #39)
- Kamehameha Highway at Acacia Road (Intersection #40)
- Kamehameha Highway at Waimano Home Road (Intersection #41)
- Kamehameha Highway at Honomanu Street (just ‘Ewa of the Moanalua Freeway Ramps) (Intersection #49)

The following four intersections, which are not located directly on the alignment, currently operate at LOS E or F during the a.m. and the p.m. peak hour:

- Kunia (Highway 76) northbound on-ramp at Waipahu Street (Intersection #51)
- Ala ‘Ike Street at Waiawa Road (entrance to Leeward Community College) (Intersection #52)
- Waipahu Street at Mokuola Street (Intersection #58)
- Moanalua Road at Kaimakani Street (Intersection #61)

Where median openings exist on Farrington Highway, many motorists experience LOS D or worse when entering and exiting the unsignalized minor streets. Some signalized intersections on Farrington Highway and Kamehameha Highway also operate at LOS F. This is a direct result of heavy left-turn movements to and from major commercial shopping centers on the mauka side of Farrington Highway and Kamehameha Highway.

On the segment of Kamehameha Highway between Pu‘u Momi Street and Pali Momi Street (intersection #42 to 48), the acceptable LOS (D or better) shown for the p.m. peak hour may not reflect the actual gridlock conditions for ‘Ewa-bound traffic in this section of the Kamehameha Highway. In the p.m. peak hour, observations taken in the field indicate that the heavy ‘Ewa-bound commute traffic is limited to heavy turning movements from the Pearl City Shopping Center at Waimano Street and the commercial strips between Kaonohi Street and Pali Momi Street. The extended green time for the side streets creates problems for synchronizing signals along the corridor, which results in long queues on Kamehameha Highway between Waimanu Home Road and Honomanu Street. Since the LOS and methodology were based on volumes that traveled through the intersections, the actual vehicle delays may not be reflected in the reported LOS for this section of Kamehameha Highway. However, the Koko Head-bound traffic in this section of Kamehameha Highway was observed to move well and was relatively uncongested during the p.m. peak hour.

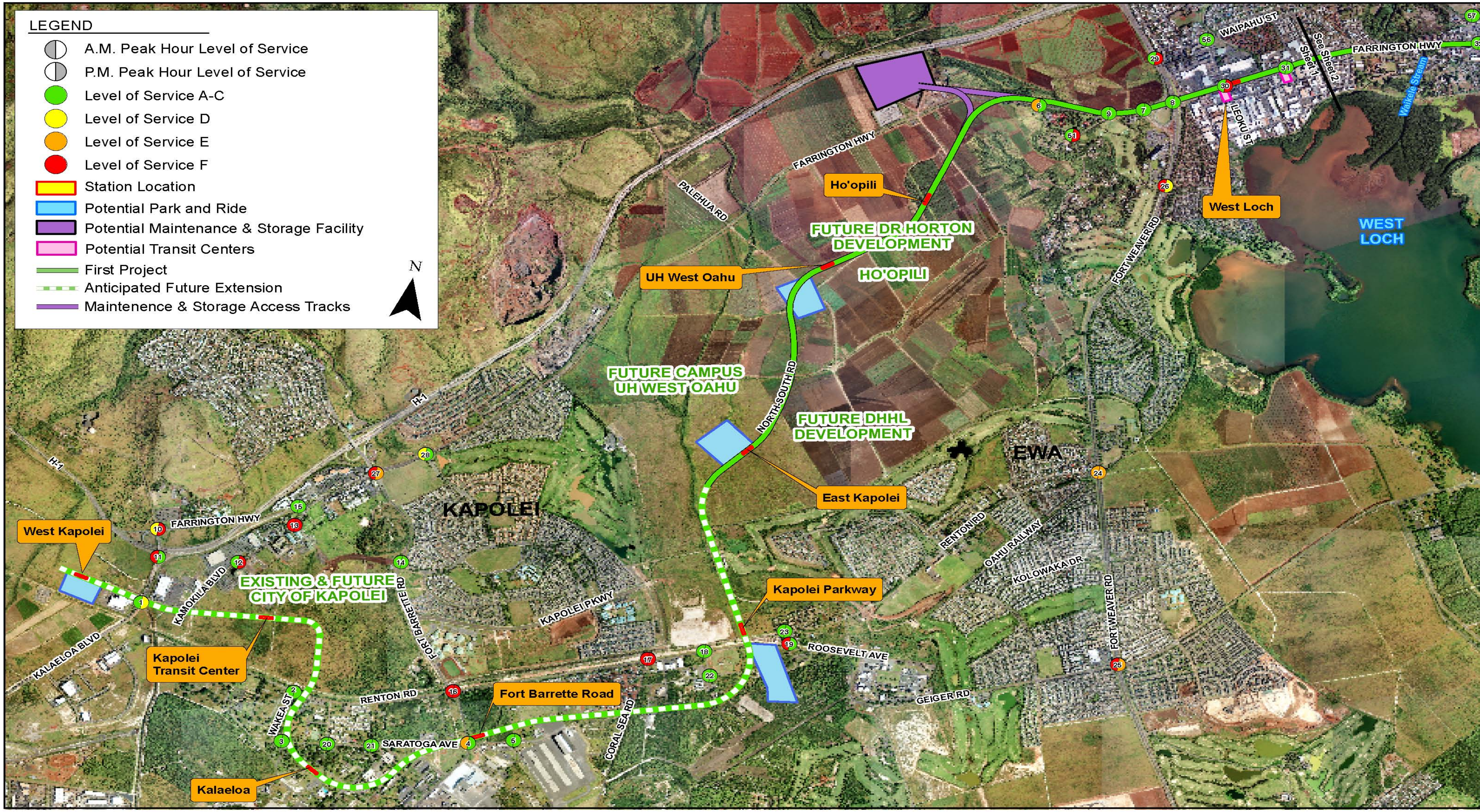


Figure 3-25: Existing Intersection Level-of-Service—Kapolei

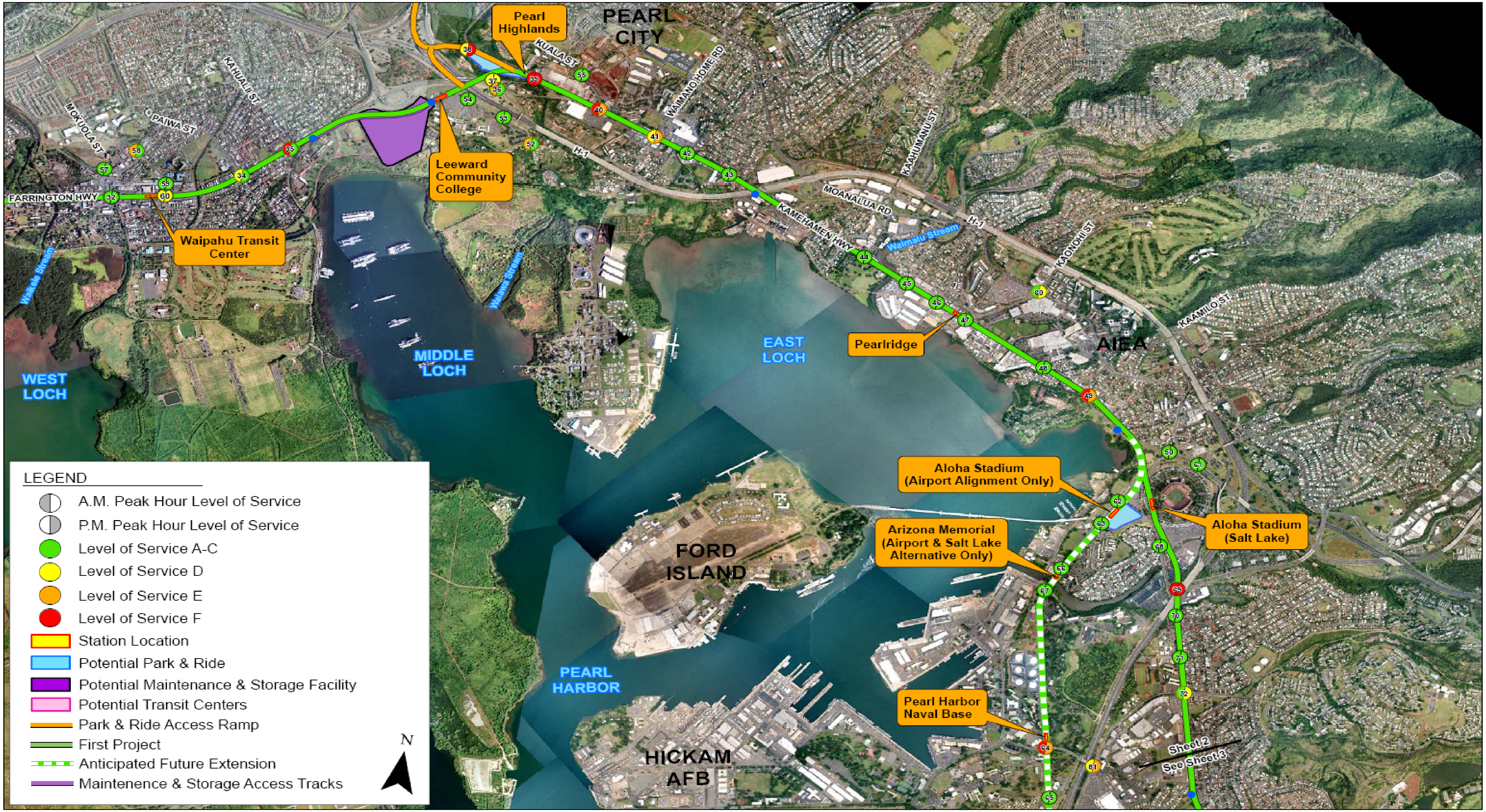


Figure 3-26: Existing Intersection Level-of-Service—Salt Lake and Airport to Iwilei

Table 3-27: West Loch to Aloha Stadium Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
West Loch	Farrington Highway at Leokū Street
Waipahu Transit Center	Farrington Highway at Mokuola Street
Leeward Community College	Leeward Community College
Pearl Highlands	Kamehameha Highway at Kuala Street
Pearlridge	Kamehameha Highway at Kaonohi Street

Table 3-28: Existing Intersection Levels of Service—West Loch to Aloha Stadium

Intersection				Control		Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	Intersections Along Alignment								
30	Farrington Highway	&	Leokū Street		S	34	C	82	**F**
31	Farrington Highway	&	Leokane Street		S	21	C	23	C
32	Farrington Highway	&	Waipahu Depot Road		S	31	C	29	C
33	Farrington Highway	&	Mokuola Street		S	36	D	48	D
34	Farrington Highway	&	Paiwa Street		S	42	D	20	C
35	Farrington Highway	&	Kahualii Street/ Waipiʻo Point Access Road		S	103	**F**	17	B
36	Farrington Highway	&	Waiawa Road (EB)		S	78	**E**	13	B
37	Farrington Highway	&	Waiawa Road (WB)	1	TWSC	30	D	29	D
38	Kamehameha Highway	&	Waihona Street	1	TWSC	26	D	>300	**F**
39	Kamehameha Highway	&	Kuala Street	1	TWSC	70	**F**	136	**F**
40	Kamehameha Highway	&	Acacia Road		S	59	**E**	86	**F**
41	Kamehameha Highway	&	Waimano Home Road		S	36	D	65	**E**
42	Kamehameha Highway	&	Puʻu Momi Street		S	11	B	10	B
43	Kamehameha Highway	&	Puʻu Poni Street		S	7	A	8	A
44	Kamehameha Highway	&	Kaʻahumanu Street		S	27	C	24	C
45	Kamehameha Highway	&	Hekaha Street		S	16	B	22	C
46	Kamehameha Highway	&	Kanuku Street		S	21	C	10	A
47	Kamehameha Highway	&	Kaonohi Street		S	27	C	31	C
48	Kamehameha Highway	&	Pali Momi Street		S	21	C	10	A
49	Kamehameha Highway	&	Honomanu Street		S	74	**E**	87	**F**
50	Moanalua Road	&	Kamehameha Highway Ramps		S	20	C	18	B

Table 3-28: Existing Intersection Levels of Service—West Loch to Aloha Stadium (continued)

Intersection				Control		Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	**Intersections Off Alignment**								
51	Kunia (Highway 76) NB On-Ramp	&	Waipahu Street	1	TWSC	20	C	154	**F**
52	Ala Ike Street	&	Waiawa Road	1	TWSC	45	**E**	19	C
53	Ala Ike Street	&	1st driveway west (‘Ewa) of overpass	1	TWSC	22	C	10	A
54	Ala Ike Street	&	2nd driveway west (‘Ewa) of overpass	1	TWSC	15	B	11	B
55	Kuala Street	&	Acacia Road		S	12	B	14	B
56	Waipahu Street	&	Leokū Street		S	10	A	15	B
57	Waipahu Street	&	Waipahu Depot Road		S	19	B	15	B
58	Waipahu Street	&	Mokuola Street		S	66	**E**	34	C
59	Mokuola Street	&	Hikimoe Street		S	7	A	10	A
60	Moanalua Road	&	Kaonohi Street		S	30	C	52	D
61	Moanalua Road	&	Kaimakani Street	1	TWSC	53	**F**	93	**F**

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For two-way controlled intersections, the LOS and delay in seconds for the worst movement are reported.
S = Signal TWSC = Two-way stop control.

Aloha Stadium to Middle Street

This section of the proposed alignment focuses on the Aloha Stadium to Middle Street area of O‘ahu and includes the fixed guideway stations identified in Table 3-29.

Table 3-29: Aloha Stadium to Middle Street Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
Salt Lake Alternative	
Aloha Stadium (Salt Lake)	Salt Lake Boulevard at Kahuapa‘ani Street
Ala Liliko‘i	Salt Lake Boulevard at Ala Liliko‘I Street
Airport Alternative	
Aloha Stadium (Kamehameha Highway)	Aloha Stadium at Kamehameha Highway
Arizona Memorial	Kamehameha Highway at Hālawa Drive /Arizona Road
Pearl Harbor Naval Base	Kamehameha Highway and Radford Drive
Honolulu International Airport	Honolulu International Airport
Lagoon Drive	Aolele Street and Lagoon Drive

In total, 24 intersections were analyzed in this section. These intersections cover both of the proposed alignment alternatives along Salt Lake Boulevard and the Airport. The results of the analysis can be found in Table 3-30.

Table 3-30: Existing Intersection Levels of Service—Aloha Stadium to Middle Street

#	Intersection				Control	Existing Year 2007 A.M. Peak Hour Delay (sec)	LOS	Existing Year 2007 P.M. Peak Hour Delay (sec)	LOS
#	**Intersections Along Alignment**								
62	Kamehameha Highway	&	Salt Lake Boulevard		S	10	A	14	B
63	Kamehameha Highway	&	Admiral Bernard Chick Clarey Bridge		S	28	C	18	B
64	Kamehameha Highway	&	Radford Drive		S	56	**E**	103	**F**
65	Kamehameha Highway	&	Center Drive		S	25	C	11	B
66	Kamehameha Highway	&	Kalaloa Street/Arizona Memorial Place		S	10	A	8	A
67	Kamehameha Highway	&	Arizona Road/Hālawa Drive		S	11	B	25	C
68	Salt Lake Boulevard	&	Kalaloa Street		S	9	A	7	A
69	Salt Lake Boulevard	&	Kahuapa‘ani Street		S	82	**F**	97	**F**
70	Salt Lake Boulevard	&	Luapele Drive		S	10	A	21	C
71	Salt Lake Boulevard	&	Ala Oli Street		S	22	C	13	B
72	Salt Lake Boulevard	&	Bougainville Drive		S	31	C	41	D
73	Salt Lake Boulevard	&	Ala Liliko‘i Street		S	32	C	26	C
74	Salt Lake Boulevard	&	Arizona Road		S	37	D	27	C
75	Salt Lake Boulevard	&	Peltier Avenue		S	15	B	16	B
76	Salt Lake Boulevard	&	Ala Napunani Street		S	28	C	50	D
77	Salt Lake Boulevard	&	Pu‘uloa Road		S	64	**E**	240	**F**
78	Nimitz Highway	&	Aolele Street		S	23	C	31	C
79	Aolele Street	&	Aolele Street (on the ‘Ewa side of the airport)	1	TWSC	9	A	10	A
80	Lagoon Drive	&	Aolele Street		S	33	C	28	C
#	**Intersections Off Alignment**								
81	Bougainville Drive	&	Radford Drive		S	55	D	76	**E**
82	Ala ‘ilima Street	&	Ala Liliko‘i Street		S	35	C	27	C
83	Pūkōloa Street	&	Māpunapuna Road		S	17	B	28	C
84	Pūkōloa Street	&	Ahua Street		S	11	B	9	A
85	North Nimitz Highway	&	Pu‘uloa Road		S	47	D	77	**E**

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For two-way controlled intersections, the LOS and delay in seconds for the worst movement are reported.
S = Signal TWSC = Two-way stop control.

Salt Lake Alternative

Two intersections along the proposed Salt Lake Boulevard alignment are currently operating at poor levels of service (LOS E or F) during both the a.m. and p.m. peak hours. As shown in Table 3-30, they are:

- Salt Lake Boulevard and Kahuapaʻani Street (Intersection #69)
- Salt Lake Boulevard and Puʻuloa Road (Intersection #77)

The proposed fixed guideway facility along the Salt Lake alignment varies in elevation and width. Salt Lake Boulevard provides four to six travel lanes, except between Lawehana Street and Ala Likikoʻi Street where it acts as a two-lane collector providing access to many residential neighborhoods. Many signalized intersections on Salt Lake Boulevard are currently operating at acceptable conditions, except near the Market Place at Kahuapaʻani Street (where one of the stations is proposed) and at Puʻuloa Road. Traffic operating conditions near the proposed Salt Lake Station at Ala Nioi Place are generally acceptable (LOS D or better).

The H-1 Freeway/Kamehameha Highway/Salt Lake Boulevard interchanges create high travel speeds near Aloha Stadium. Because traffic counts were conducted on a typical weekday (in the absence of a major event at the Aloha Stadium), the Kamehameha Highway and Salt Lake Boulevard intersection is shown in the analysis as operating at an acceptable LOS during both peak hours (LOS A in the a.m. peak hour and LOS B in the p.m. peak hour).

Airport Alternative

Along the Airport alignment, all stations except the Lagoon Drive Station are adjacent to regional destinations (e.g., Pearl Harbor Naval Base, Arizona Memorial, and Honolulu International Airport). Along this proposed alignment, Kamehameha Highway provides substantial vehicle-carrying capacity (up to six travel lanes). The analysis determined that the following three intersections at or near the Airport alignment operate at poor LOS (LOS E or F) during one or both peak hours:

- Kamehameha Highway and Radford Drive (Intersection #64)
- Bougainville Drive and Radford Drive (Intersection #81)
- Nimitz Highway and Puʻuloa Road (Intersection #85)

Radford Drive is a four-lane facility that provides major automobile connection to the Salt Lake communities and the Naval Reservation on the makai side of Kamehameha Highway. The large volume of turning movements results in poor LOS on Radford Drive and at Bougainville Drive where they connect to Kamehameha Highway.

The intersections close to Honolulu International Airport generally operate at LOS D or better on a typical weekday, except where heavy left-turn movements produce long queues on Puʻuloa Road and Nimitz Highway. Puʻuloa Road also acts as a major thoroughfare that connects industrial areas and high-density residential communities to Nimitz Highway and Moanalua Freeway.

Middle Street to Iwilei

This section of the proposed alignment focuses on the Middle Street to Iwilei Station area and includes the fixed guideway stations identified in Table 3-31.

Table 3-31: Middle Street to Iwilei Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
Middle Street	Dillingham Boulevard at Middle Street Transit Center
Kalihi	Dillingham Boulevard at Mokauea Street
Kapālama	Dillingham Boulevard at Kōkea Street

Table 3-32 presents a LOS analysis for 26 intersections on or around the alignment in this section. Figure 3-27 shows the LOS at the intersections analyzed. As shown in the table and figure, the intersections adjacent to the three proposed stations on Dillingham Boulevard are generally operating at acceptable LOS for urban areas. The Dillingham Boulevard/North King Street intersection, located on the alignment, currently operates at a poor LOS E during both the a.m. and p.m. peak hours.

The intersections not directly on the alignment operate at similar LOS. However, the following three locations operate at a poor level of service (LOS E) during both the a.m. or p.m. peak hour:

- North King Street & and North Beretania Street (Intersection #98)
- North King Street and Kalihi Street (Intersection #101)
- North Nimitz Highway and Waiakamilo Road (Intersection #104)

This section of the alignment is within the western edge of Honolulu’s Primary Urban Center (PUC). Although the two primary roadways in the area (Dillingham Boulevard and Nimitz Highway) both carry substantial volumes of traffic into and out of the Downtown area, they also serve a large number of non-residential developments throughout this section of the study area. Land use along Dillingham Boulevard includes a broad range of mixed uses including retail, industrial, and institutional, which generate substantial traffic volumes even during the midday period.

Nimitz Highway serves many industrial uses, including those associated with Honolulu Harbor. The LOS along these two corridors is relatively good, but traffic flow is very uneven given the nature of the land use in the area, the volume of cross-street traffic, and traffic making turns off the main east-west roadways.

Table 3-32: Existing Intersection Levels of Service—Middle Street to Iwilei

Intersection					Control	Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	**Intersections Along Alignment**								
86	Kamehameha Highway	&	Middle Street		S	19	B	17	B
87	Kamehameha Highway	&	Pedestrian Crossing Koko Head of Kalihi Stream/ West of Oʻahu Community Correction Center		S	11	B	11	B
88	Kamehameha Highway	&	Laumaka Street		S	4	A	5	A
89	Kamehameha Highway	&	Puʻuhale Road		S	16	B	19	B
90	Kamehameha Highway	&	Mokauea Street		S	20	B	26	C
91	Kamehameha Highway	&	Kalihi Street		S	27	C	22	C
92	Dillingham Boulevard	&	Waiakamilo Road		S	26	C	29	C
93	Dillingham Boulevard	&	Kohou Street		S	16	B	11	B
94	Dillingham Boulevard	&	Kōkea Street		S	14	B	15	B
95	Dillingham Boulevard	&	Alakawa Street		S	22	C	47	D
96	Dillingham Boulevard	&	Kaʻaahi Street.		S	5	A	4	A
97	Dillingham Boulevard	&	North King Street		S	69	**E**	62	**E**
#	**Intersections Off Alignment**								
98	North King Street	&	N. Beretania Street		S	54	D	111	**F**
99	North King Street	&	Middle Street		S	15	B	11	B
100	North King Street	&	Mokauea Street		S	10	B	34	C
101	North King Street	&	Kalihi Street		S	39	D	62	**E**
102	North Nimitz Highway	&	Sand Island Access Road		S	52	D	36	D
103	North Nimitz Highway	&	Puʻuhale Road		S	21	C	25	C
104	North Nimitz Highway	&	Waiakamilo Road		S	60	**E**	43	D
105	North King Street	&	Kohou Street		S	8	A	9	A
106	North King Street	&	Kōkea Street		S	7	A	11	B
107	Nimitz Highway	&	Mokauea Street		S	18	B	11	B
108	Nimitz Highway	&	Kalihi Street		S	35	D	45	D
109	Nimitz Highway	&	Alakawa Street		S	42	D	50	D
110	North King Street	&	Iwilei Road		S	11	B	18	B
111	Iwilei Road	&	Kūwili Street	1	TWSC	12	B	19	C

1 Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For two-way stop-controlled intersections, the LOS and delay in seconds for the worst movement are reported.
S = Signal TWSC = Two-way stop control

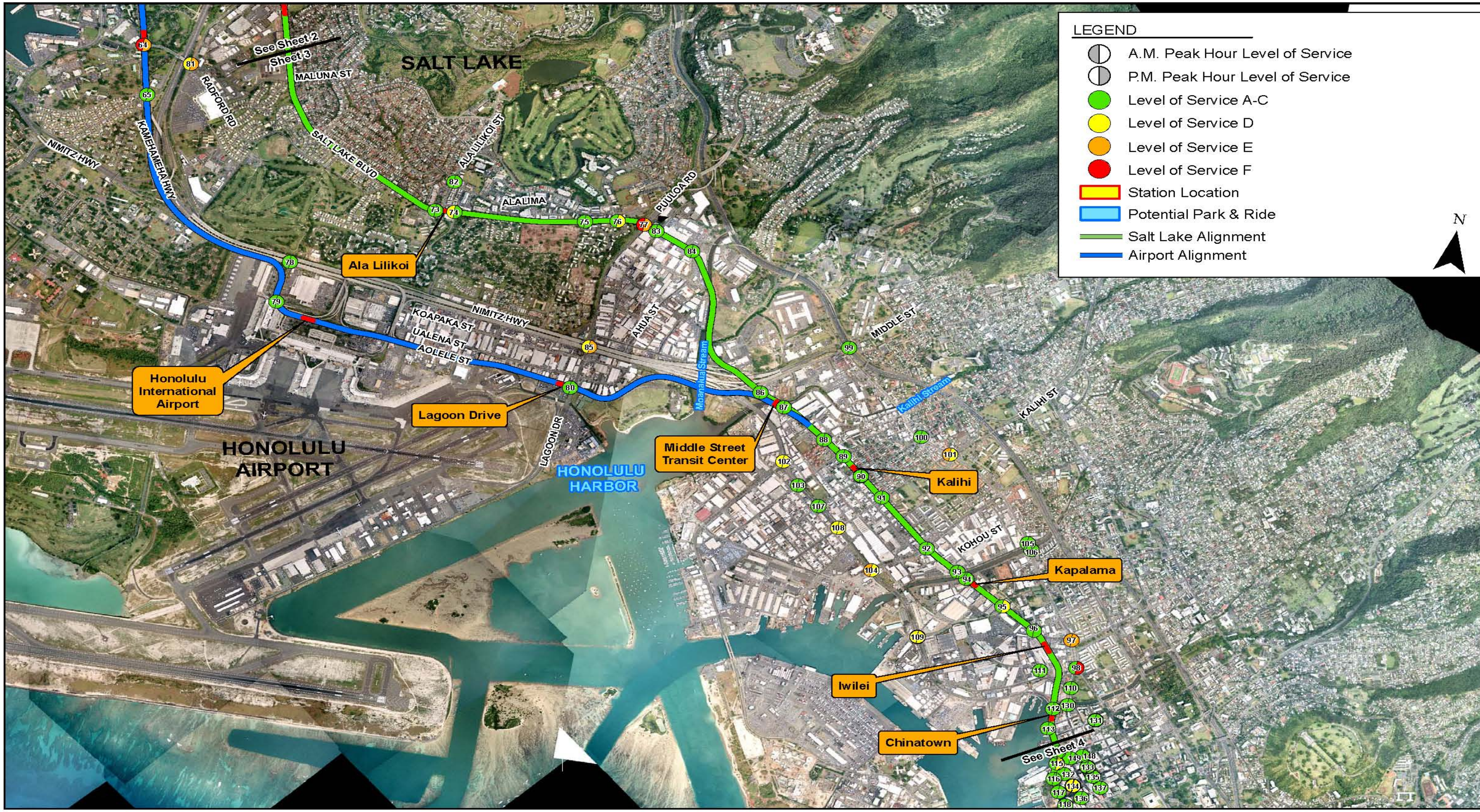


Figure 3-27: Level-of-Service—Salt Lake and Airport to Iwilei

Observations taken in the field indicate that on Dillingham Boulevard, vehicles turning into the access driveways of the Costco retail establishments on the makai side of Dillingham Boulevard create substantial queues that often spill back to Ka‘aahi Street during the p.m. peak hour. This happens on the stretch of Dillingham Boulevard between Alakawa Street and Ka‘aahi Street. A bottleneck is essentially created, which limits through traffic because of the absence of a Koko Head-bound right-turn pocket and the presence of a queue for ‘Ewa-bound left-turn movement, which exceeds the existing turn pocket’s capacity.

Because the intersection delay analysis was performed based on traffic volumes getting through the intersection of Dillingham Boulevard at Ka‘aahi Boulevard, the actual LOS may be worse than the reported LOS A.

Iwilei to Ala Moana Center

This section of the proposed alignment focuses on the Iwilei, Downtown Honolulu, and Ala Moana areas. The fixed guideway stations identified in Table 3-33 are addressed in the analysis.

Table 3-33: Downtown Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
Iwilei	Ka‘aahi Street
Chinatown	Nimitz Highway at Kekaulike Street
Downtown	Nimitz Highway at Fort Street
Civic Center	Halekauwila Street at South Street
Kaka‘ako	Halekauwila Street at Ward Avenue
Ala Moana Center	Kona Street at Ke‘eaumoku Street

In total, 51 intersections were analyzed along the proposed alignment. The South Nimitz Highway and Halekauwila Street intersection (#119) is currently operating at a poor LOS (LOS F), as shown in Table 3-34 and Figure 3-28.

At locations not directly on the alignment, the following two intersections are operating at poor LOS (LOS E or F) during one or both peak hours:

- Ward Avenue and Kapi‘olani Boulevard (Intersection #154)
- Kapi‘olani Boulevard and Ke‘eaumoku Street (Intersection #161)

As a result of their location near Downtown Honolulu, these streets tend to carry relatively high volumes of traffic each day, but volumes are well distributed over the entire day as opposed to concentrating during peak periods, as tends to occur on roadways in the outer areas.

Table 3-34: Existing Intersection Levels of Service—Iwilei to Ala Moana

Intersection					Control	Existing Year 2007 A.M. Peak Hour Delay (sec)	LOS	Existing Year 2007 P.M. Peak Hour Delay (sec)	LOS
#	**Intersections Along Alignment**								
112	N Nimitz Highway	&	River Street		S	8	A	8	A
113	N Nimitz Highway	&	Kekaulike Street	[1]	TWSC	10	A	10	A
114	Nimitz Highway	&	Nuʻuanu Avenue		S	6	A	10	A
115	S Nimitz Highway	&	Bethel Street		S	8	A	9	A
116	S Nimitz Highway	&	Fort Street Mall		S	8	A	4	A
117	S Nimitz Highway	&	Bishop Street		S	10	B	9	A
118	S Nimitz Highway	&	Alakea Street		S	9	A	8	A
119	S Nimitz Highway	&	Halekauwila Street		S	82	**F**	44	D
120	Punchbowl Street	&	Halekauwila Street		S	15	B	18	B
121	South Street	&	Halekauwila Street		S	23	C	28	C
122	Halekauwila Street	&	Keawe Street	[1]	AWSC	11	B	11	B
123	Cooke Street	&	Halekauwila Street	[1]	AWSC	13	B	14	B
124	Ward Avenue	&	Halekauwila Street		S	5	A	11	B
125	Queen Street	&	Cummins Street	[1]	TWSC	11	B	12	B
126	Kamakeʻe Street	&	Queen Street	[1]	AWSC	11	B	18	C
127	Piʻikoi Street	&	Kona Street		S	11	B	15	B
128	Kona Street	&	Keʻeaumoku Street	[12]	AWSC	7	A	13	B
129	Kona Street	&	Kāheka Street	[1]	AWSC	11	B	29	D
#	**Intersections Off Alignment**								
130	North King Street	&	River Street		S	6	A	9	A
131	North King Street	&	Kekaulike Street		S	9	A	5	A
132	Queen Street	&	Fort Street Mall		F/Y	10	A	11	B
133	South King Street	&	Fort Street Mall		S	5	A	2	A
134	Queen Street	&	Bishop Street		S	40	D	36	D
135	South King Street	&	Bishop Street		S	15	B	13	B
136	Queen Street	&	Alakea Street		S	22	C	22	C
137	South King Street	&	Alakea Street		S	10	A	14	B
138	Punchbowl Street	&	Queen Street		S	16	B	21	C
139	Ala Moana Boulevard	&	Punchbowl Street		S	10	A	16	B
140	South Street	&	Queen Street		S	34	C	33	C
141	South Street	&	Pohukaina Street		S	30	C	28	C
142	Ala Moana Boulevard	&	South Street		S	12	B	15	B
143	Pohukaina Street	&	Keawe Street	[1]	AWSC	16	C	14	B
144	Ala Moana Boulevard	&	Keawe Street		S	16	B	34	C

Table 3-34: Existing Intersection Levels of Service—Iwilei to Ala Moana (continued)

Intersection				Control	Existing Year 2007			
					A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
145	Ala Moana Boulevard	&	Coral Street	S	18	B	11	B
146	Ala Moana Boulevard	&	Cooke Street	S	11	B	11	B
147	South King Street	&	Kapi‘olani Boulevard/ South Street	S	21	C	27	C
148	Bethel Street	&	King Street	S	13	B	18	B
149	Bethel Street	&	Merchant Street	S	11	B	11	B
150	Ala Moana Boulevard	&	Queen Street	S	13	B	46	D
151	Ward Avenue	&	Ala Moana Boulevard	S	25	C	33	C
152	Ward Avenue	&	Auahi Street	S	16	B	19	B
153	Ward Avenue	&	Queen Street	S	26	C	42	D
154	Ward Avenue	&	Kapi‘olani Boulevard	S	72	**E**	80	**E**
155	Kamake‘e Street	&	Ala Moana Boulevard	S	16	B	28	C
156	Kamake‘e Street	&	Auahi Street	S	9	A	12	B
157	Kamake‘e Street	&	Kapi‘olani Boulevard	S	8	A	16	B
158	Pi‘ikoi Street	&	Waimanu Street	S	23	C	24	C
159	Pi‘ikoi Street	&	Kapi‘olani Boulevard	S	16	B	20	C
160	Kapi‘olani Boulevard	&	Kona Iki Street	S	5	A	12	B
161	Kapi‘olani Boulevard	&	Ke‘eaumoku Street	S	21	C	113	**F**
162	Kapi‘olani Boulevard	&	Kāheka Street	S	13	B	22	C

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For all-way-stop-controlled intersections, average vehicular control delay over all approaches in seconds is reported. For two-way controlled intersections, the LOS and delay in seconds for the worst movement are reported.
[2] This intersection is under construction. The LOS calculation is based on the current four-way stop control with one EB lane, one 1 WB lane, and two SB lanes.
S = Signal AWSC = All-way stop control TWSC = Two-way stop control F/Y=Free-flow, only yield to pedestrians

Most roadways in this section are used for access to land use and circulation around the area rather than for long-distance commute travel. As a result, traffic flow is very slow and generates many stops and delays for motorists. However, most intersections operate at an acceptable LOS (i.e., LOS D or better) during peak periods. Even heavily congested areas have mostly acceptable LOS despite frequent (although short) stops and delays.

In Downtown Honolulu, the acceptable LOS reported for Nimitz Highway on intersections between River Street and Alakea Street (Intersections #112 through 118) may not represent actual traffic conditions. Field observations indicated that Koko Head-bound traffic on the Nimitz Highway between River and Alakea Streets operates under stop-and-go conditions during the a.m. peak hour and exhibits similar patterns ‘Ewa-bound during the p.m. peak hour.

Traffic congestion appears to occur because of many left-turn movements at Bethel, Alakea, and Bishop Streets, which creates delays for other vehicles on the Nimitz Highway. Because the intersection delay analysis was performed based on traffic volumes that were able to pass through these restricted locations on the Nimitz Highway, rather than on the actual demand volume, the actual LOS may be worse than the reported LOS A.

Heavy congestion was also observed on King Street near the Chinatown area. Substantial pedestrian movements conflict with vehicle traffic at this location on King Street, limiting the number of vehicles traveling Koko Head-bound.

Planned Extension

The Project extends from Kapolei to Ala Moana. In anticipation of possible planned extensions to the Project, traffic analyses were conducted along two additional corridors: a University Avenue Planned Extension to UH Mānoa Lower Campus, and a Waikīkī Planned Extension.

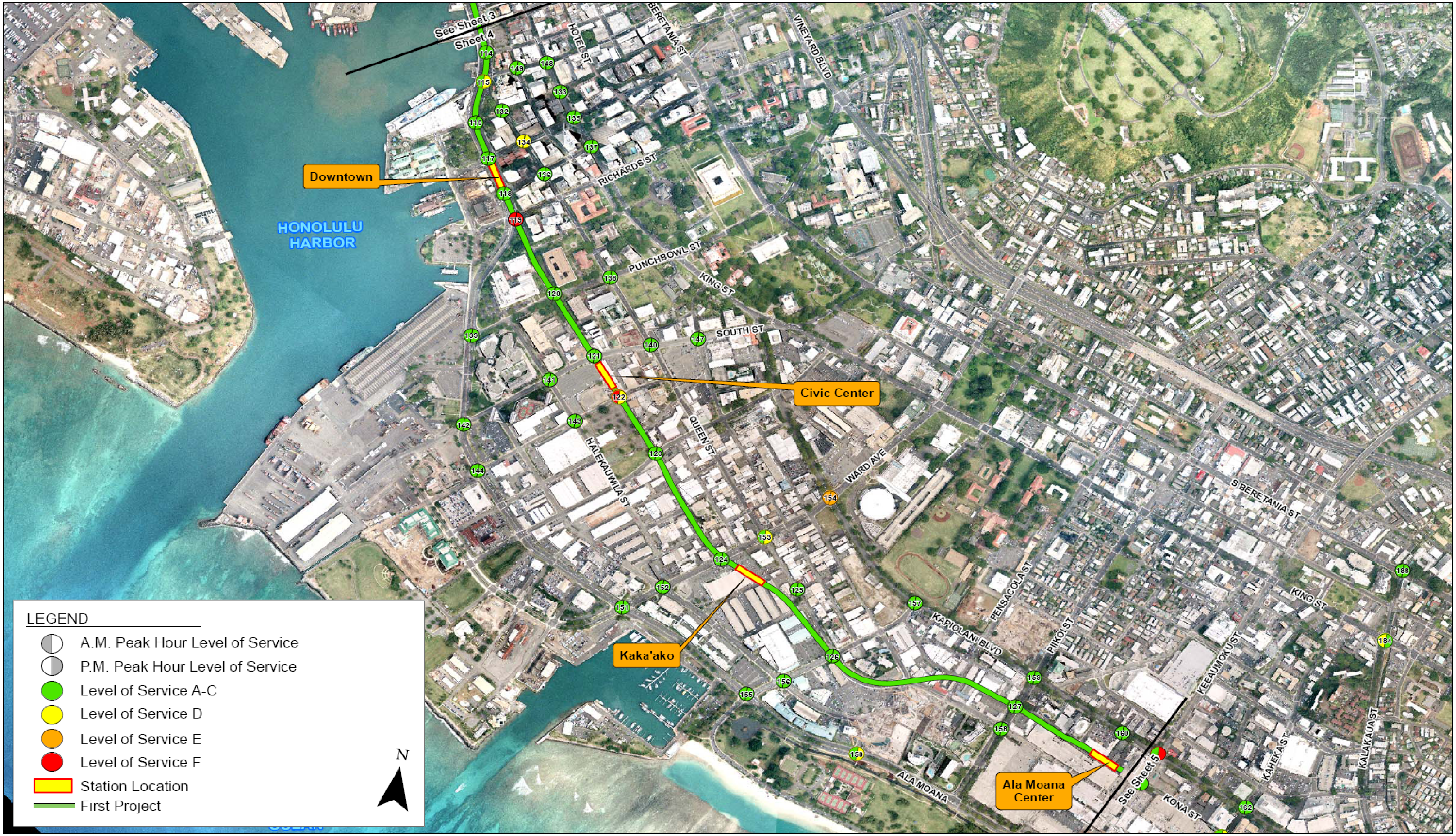


Figure 3-28: Existing Level-of-Service—Downtown to Ala Moana

University Avenue Planned Extension

The University Avenue Planned Extension would begin at Ala Moana Center Station, travel along Kapiʻolani Boulevard to University Avenue, and then terminate at the UH Mānoa Lower Campus. Four fixed guideway stations are proposed along this portion of the alignment as identified in Table 3-35.

Table 3-35: University Avenue Planned Extension Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
McCully (planned extension)	Kapiʻolani Boulevard and McCully Street
Date Street (planned extension)	University Avenue and Date Street
Mōʻiliʻili (planned extension)	University Avenue and South King Street
UH Mānoa (planned extension)	UH Lower Campus

In total, 29 intersections were selected for existing conditions analysis for the segment between the Ala Moana Center and UH Mānoa. Of these intersections, 13 would be located directly on the alignment and the others in close proximity. As shown in Table 3-36 and Figure 3-29, five intersections along the planned extension currently operate at poor LOS (LOS E or F) during one or both peak hours. The primary congestion occurs at the following locations:

- Kapiʻolani Boulevard at Kalākaua Avenue (Intersection #164)
- Kalākaua Avenue at Ala Moana Boulevard/Pau Street (Intersection #170)
- University Avenue at Date Street (Intersection #172)
- University Avenue at Kuʻilei Lane (Intersection #173)
- University Avenue and South King Street (Intersection #174)

At locations not directly on the planned extension, five intersections currently operate at poor LOS (LOS E or F) during either or both peak hours. Major delays occur at the following intersections:

- Ala Moana Boulevard and Atkinson Drive (Intersection #176)
- Kapiʻolani Boulevard and Kamoku Street/Citron Street/ Kaʻaloa Street/ Date Street (Intersection #178)
- McCully Street and Lime Street (Intersection #181)
- South Beretania Street and McCully Street (Intersection #189)
- University Avenue and Dole Street (Intersection #191)

Table 3-36: Existing Intersection Levels of Service—University of Hawai'i Mānoa Planned Extension

Intersection					Control	Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	**INTERSECTIONS ALONG ALIGNMENT**								
163	Kapi'olani Boulevard	&	Atkinson Drive		S	49	D	29	C
164	Kapi'olani Boulevard	&	Kalākaua Avenue		S	55	D	69	**E**
165	Kapi'olani Boulevard	&	Pumehana Street	1	TWSC	22	C	24	C
166	Kapi'olani Boulevard	&	McCully Street		S	54	D	45	D
167	Kapi'olani Boulevard	&	Wiliwili Street	1	TWSC	15	C	11	B
168	Kapi'olani Boulevard	&	Pā'ani Street	1	TWSC	18	C	25	C
169	Kalākaua Avenue	&	Ala Wai Boulevard		S	41	D	18	B
170	Kalākaua Avenue	&	Ala Moana Boulevard/Pau Street		S	31	C	62	**E**
171	University Avenue	&	Kapi'olani Boulevard		S	41	D	34	C
172	University Avenue	&	Date Street		S	71	**E**	101	**F**
173	University Avenue	&	Ku'ilei Lane	1	TWSC	44	**E**	83	**F**
174	University Avenue	&	South King Street		S	96	**F**	95	**F**
175	University Avenue	&	Varsity Place		S	16	B	14	B
#	**INTERSECTIONS OFF ALIGNMENT**								
176	Ala Moana Boulevard	&	Atkinson Drive		S	74	**E**	83	**F**
177	Atkinson Drive	&	Mahukona Street		S	19	B	31	C
178	Kapi'olani Boulevard	&	Kamoku Street/Citron Street/ Ka'aloa Street/ Date Street	2	S	228	**F**	213	**F**
179	Kapi'olani Boulevard	&	Wai'aka Road		S	14	B	18	B
180	Kapi'olani Boulevard	&	Kapahulu Avenue		S	28	C	13	B
181	McCully Street	&	Lime Street	1	TWSC	24	C	43	**E**
182	McCully Street	&	Ala Wai Boulevard		S	19	B	14	B
183	McCully Street	&	Kalākaua Avenue		S	13	B	9	A
184	South King Street	&	Kalākaua Avenue		S	35	D	20	C
185	South King Street	&	McCully Street		S	17	B	15	B
186	South King Street	&	Isenberg Street		S	16	B	16	B
187	S. Beretania Street	&	Isenberg Street		S	28	C	30	C
188	S. Beretania Street	&	Kalākaua Avenue		S	26	C	25	C
189	S. Beretania Street	&	McCully Street		S	59	**E**	16	B
190	University Avenue	&	Kapa'akea Lane	1	TWSC	18	C	15	C
191	University Avenue	&	Dole Street		S	97	**F**	93	**F**

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For two-way stop-controlled intersections, the LOS and delay in seconds for the worst movement are reported.
[2] This is a six-leg intersection. Five of the six legs are controlled by signals, with the exception of a stop control for Kamoku Street north of Kapi'olani Boulevard. The LOS calculation is based on the signalized approaches.
S = Signal TWSC = Two-way stop control

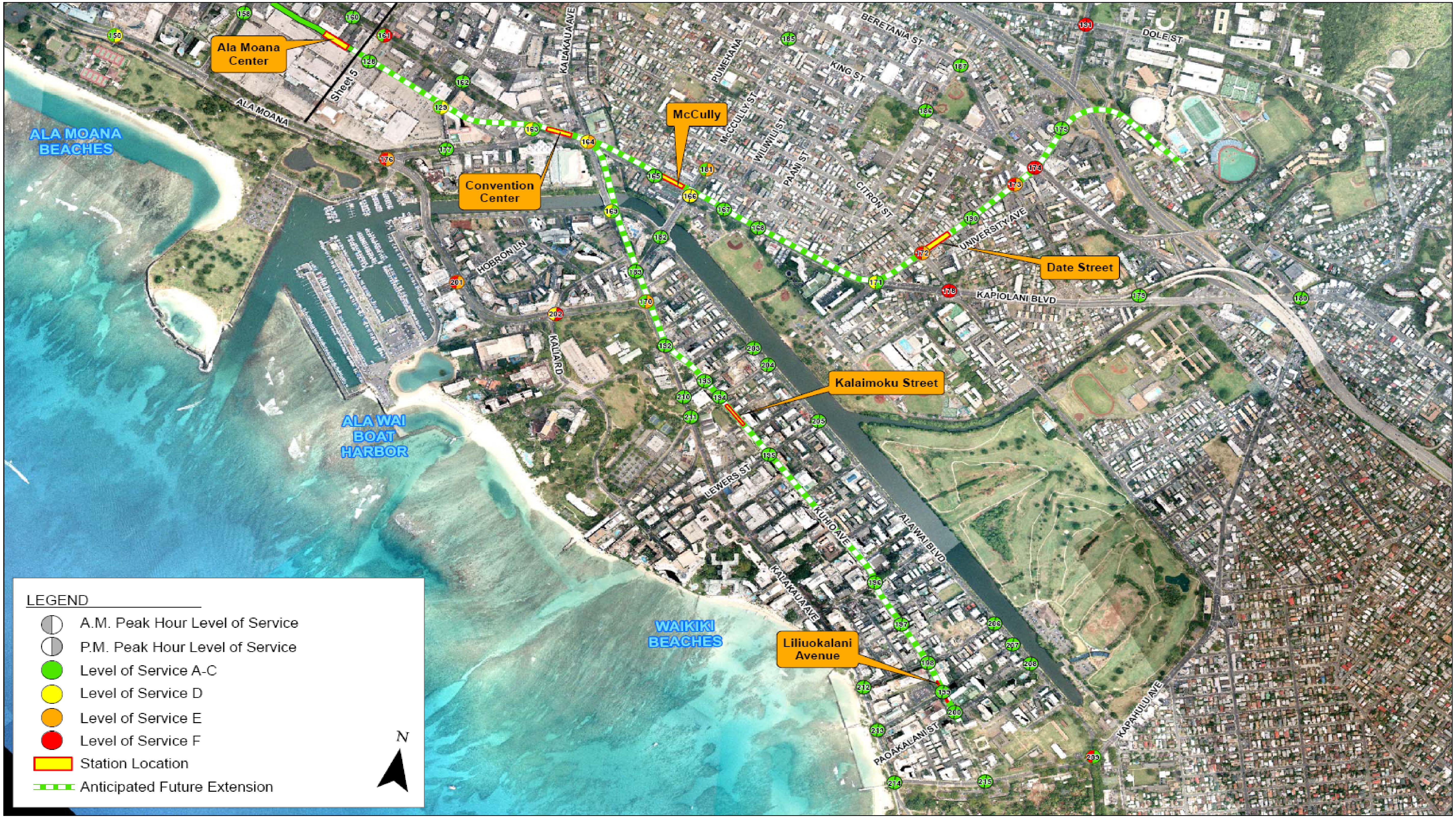


Figure 3-29: Existing Intersection Level-of-Service—Waikīkī and UH Mānoa Planned Extension

Because this section of the study corridor serves several functions, it attracts substantial traffic volumes on all of its major roadways and cross streets. This section is used as a commute route by residents of East Honolulu, which results in heavy peak hour traffic volumes with poor LOS. It also serves as a place of residence for many people in Honolulu, with a substantial number of high-density condominiums and older low-rise but high-density housing areas. This area also has a large number of commercial developments, including a substantial number of retail facilities. In addition, the area serves as the gateway to the UH Mānoa campus. These factors all tend to result in uneven traffic flow with substantial volumes using some of the intersections and roadways, resulting in several locations operating at unacceptable LOS during peak periods.

The traffic on University Avenue was observed to be operating at poor LOS because of the substantial volume of left-turn movements. Frequent transit service and curbside automobile maneuvers on University Avenue interrupt the traffic flow and sometimes result in delays to vehicles.

Waikīkī Planned Extension

The Waikīkī Planned Extension alignment would begin at Ala Moana Center Station, travel in a Koko Head direction to the Kalākaua Avenue/Kapiʻolani Boulevard intersection, proceed along Kalākaua and Kūhiō Avenues, and terminate at Kaʻiulani Avenue. The fixed guideway stations identified in Table 3-37 were addressed by the analysis.

Table 3-37: Waikīkī Planned Extension Fixed Guideway Stations

Fixed Guideway Stations	Cross Streets
Convention Center (planned extension)	Convention Center from Kalākaua Avenue
Kālaimoku Street (planned extension)	Kūhiō Avenue and Kālaimoku Street
Liliʻuokalani Avenue (planned extension)	Kūhiō Avenue and Liliʻuokalani Avenue

In total, 24 intersections were selected along this planned extension. Of these intersections, nine are located along the alignment and the remaining intersections are in close proximity to the proposed transit service. The complete LOS analysis for these 24 locations is shown in Table 3-38 and Figure 3-28.

Results indicate that during peak traffic hours, all intersections along the planned extension are currently operating at LOS C or better during both the a.m. and p.m. peak hours. However, at locations not directly on the alignment, the following three intersections are currently operating at a poor LOS F during one peak hour. Poor operation of these locations can be attributed to the heavy volume of left-turn movements:

Table 3-38: Existing Intersection Levels of Service—Waikīkī Planned Extension

Intersection				Control		Existing Year 2007			
						A.M. Peak Hour Delay (sec) LOS		P.M. Peak Hour Delay (sec) LOS	
#	**Intersections Along Alignment**								
192	Kalākaua Avenue	&	Kuamo'o Street/Kūhiō Avenue	1	F/Y	17	C	16	C
193	Kūhiō Avenue	&	'Ōlohana Street		S	27	C	27	C
194	Kūhiō Avenue	&	Kālaimoku Street		S	13	B	25	C
195	Kūhiō Avenue	&	Lewers Street		S	12	B	18	B
196	Kūhiō Avenue	&	Kanekapolei Street		S	18	B	16	B
197	Kūhiō Avenue	&	Uluniu Avenue		S	0.2	A	9	A
198	Kūhiō Avenue	&	Lili'uokalani Avenue		S	13	B	20	B
199	Kūhiō Avenue	&	'Ōhua Avenue		S	12	B	12	B
200	Kūhiō Avenue	&	Paoakalani Avenue		S	9	A	11	B
#	**Intersections Off Alignment**								
201	Ala Moana Boulevard	&	Hobron Lane		S	74	**E**	136	**F**
202	Ala Moana Boulevard	&	'Ena Road/Kālia Street		S	49	D	96	**F**
203	Ala Wai Boulevard	&	'Ōlohana Street	1	F/Y	1	A	1	A
204	Ala Wai Boulevard	&	Kālaimoku Street		S	6	A	7	A
205	Ala Wai Boulevard	&	Lewers Street		S	19	B	19	B
206	Ala Wai Boulevard	&	Lili'uokalani Avenue		S	10	A	8	A
207	Ala Wai Boulevard	&	'Ōhua Avenue	1	F/Y	1	A	2	A
208	Ala Wai Boulevard	&	Paoakalani Avenue		S	12	B	10	A
209	Ala Wai Boulevard	&	Kapahulu Avenue		S	83	**F**	22	C
210	Kalākaua Avenue	&	'Ōlohana Street		S	4	A	7	A
211	Kalākaua Avenue	&	Kālaimoku Street		S	9	A	17	B
212	Kalākaua Avenue	&	Lili'uokalani Avenue		S	8	A	5	A
213	Kalākaua Avenue	&	'Ōhua Avenue		S	45	D	7	A
214	Kalākaua Avenue	&	Kapahulu Avenue		S	11	B	29	C
215	Kūhiō Avenue	&	Kapahulu Avenue		S	19	B	18	B

[1] Intersection is uncontrolled. Analysis was done using Highway Capacity Manual stop-controlled methodology, assuming traffic yielding to pedestrians on the crosswalks. The LOS and delay in seconds for the worst movement are reported.
S = Signal F/Y=Free-flow, only yield to pedestrians

- Ala Moana Boulevard and Hobron Lane (Intersection #201)
- Ala Moana Boulevard and ‘Ena Road/Kālia Street (Intersection #202)
- Ala Wai Boulevard and Kapahulu Avenue (Intersection #209)

Kūhiō Street is the major two-way corridor between the one-way corridors of Ala Wai Boulevard and Kalākaua Avenue. The hotel and commercial land uses in this area are served by a substantial number of transit/tour buses. Because this area has few designated bus pullouts, frequent bus stops delay the traffic flow in curbside lanes. Closely spaced traffic signals and heavy pedestrian activity limit vehicle speeds on Kūhiō Street.

3.3.7 Traffic Accident History within the Corridor

Statewide accident data for 2003 to 2005 was reviewed to determine the traffic accident history within the study corridor. A total of 20,787 reports were filed over this three-year period and 4,788 accidents (23 percent of the total accidents islandwide) were registered within or in close proximity to the proposed transit alignment. The total number of accidents for each section of the study corridor, by primary collision type, is shown in Table 3-39.

Collisions between motor vehicles contributed 67 percent of corridor-wide accidents, and collisions between vehicles and pedestrians/bicycles (including mopeds) accounted for almost 15 percent. Although the number of accidents involving injuries and fatalities varied across the corridor, 60 percent involved injuries to people and approximately 2 percent of all injuries were fatalities.

A review was also conducted of the locations of the first harmful event, meaning appreciable damage or injury, for accidents in the corridor. The data for this is summarized in Table 3-40 and shows that almost 50 percent of accidents occurred on roadways (e.g., travel lanes, merge/transition lanes/turn lanes, etc.) and 43 percent of the accidents occurred at intersections. The remaining harmful events occurred off the roadway in locations such as shoulders, medians, driveways, private roads, and parking lots.

Table 3-39: Type of Primary Collisions

Proposed Alignment Section	Total Number of Accidents Reported	Type of Primary Collisions									
		Number of Motor Vehicle and Pedestrian Collisions	Percent	Number of Motor Vehicle and Bike/ Moped Collisions	Percent	Number of Motor Vehicle Collisions with other Vehicles	Percent	Number of Motor Vehicle and Object/ Animal Collisions	Percent	Number of Motor Vehicle Non-Collisions	Percent
Kapolei to Fort Weaver	483	19	4%	13	3%	334	69%	83	17%	34	7%
Fort Weaver to Aloha Stadium	609	48	8%	22	4%	426	70%	93	15%	20	3%
Aloha Stadium to Middle Street (Salt Lake)	220	12	6%	5	3%	138	69%	33	17%	12	6%
Aloha Stadium to Middle Street (Airport)	322	8	2%	17	5%	233	72%	52	16%	12	4%
Middle Street to Iwilei	684	58	8%	55	8%	472	69%	76	11%	23	3%
Iwilei to Ala Wai Canal	1,176	148	13%	145	12%	741	63%	108	9%	34	3%
Total	*3,474*	*293*	*8%*	*257*	*7%*	*2,344*	*67%*	*445*	*13%*	*135*	*4%*

Source: 2003-05 Statewide Accident Report, Hawai'i DOT
Totals may not add up to 100 percent due to rounding.

Table 3-40: Location of First Harmful Event

Proposed Alignment Section	Total Number of Accidents Reported	Location of First Harmful Event							
		Intersection/ Junction [1]	Percent	On Roadway—Not at Intersection [2]	Percent	Off-Roadway [3]	Percent	Off-Roadway—Other [4]	Percent
Kapolei to Fort Weaver	483	173	36%	243	50%	56	12%	11	2%
Fort Weaver to Aloha Stadium	609	255	42%	283	46%	53	9%	18	3%
Aloha Stadium to Middle Street (Salt Lake Alignment)	200	62	31%	111	56%	22	11%	5	3%
Aloha Stadium to Middle Street (Airport Alignment)	322	146	45%	145	45%	29	9%	2	1%
Middle Street to Iwilei	684	306	45%	332	49%	22	3%	24	4%
Iwilei to Ala Wai Canal	1,176	550	47%	540	46%	36	3%	50	4%
Total	*3,474*	*1,492*	*43%*	*1,654*	*48%*	*218*	*6%*	*110*	*3%*

Source: 2003-05 Statewide Accident Report, Hawai'i DOT

[1] Includes intersection areas, junction areas, driveway access, alley access

[2] Includes travel lanes, merge/transition lanes, acceleration lanes, deceleration lanes, turn lanes, bikeways, bus/HOV lanes

[3] Includes shoulders, roadsides, medians, median crossovers, outside right-of-way

[4] Includes driveways, private roads, parking lots

3.4 Freight

The movement of goods and products is important to O‘ahu’s economic vitality. Ocean transportation delivers the vast majority of all imported food, building materials, manufactured goods, and energy products. Ocean transportation, shipbuilding and repair, commercial fishing, ocean recreation, and other support industries are the main activities in O‘ahu’s commercial harbors.

The harbors are widely used by a variety of interests, from major cargo carriers to commercial fishermen to charter boat operators with a single vessel. The two major, deep water commercial harbors on O‘ahu are Honolulu Harbor and Kalaeloa Barbers Point Harbor. Honolulu’s central business district and government offices grew around Honolulu Harbor. Freight also enters O‘ahu via Honolulu International Airport, which is located in the study corridor.

Trucks carrying freight enter and exit Honolulu Harbor on Nimitz Highway and use all major highways and freeways on O‘ahu. Heavily used freight routes include Nimitz Highway, the H-1 Freeway, and Ala Moana Boulevard. Transit vehicles also use these major roadways, so delays along major corridors that are experienced by transit are also experienced by truck traffic.

3.5 Parking

Existing parking availability varies widely throughout the study corridor. Parking is relatively accessible in suburban areas such as Pearl City and ‘Aiea, and at most shopping facilities, residences, and along the street. Parking is notably more limited in Downtown Honolulu, Chinatown, Kaka‘ako, and UH Mānoa.

On and off-street parking facilities are heavily used in Downtown Honolulu. Off-street parking structures are used by commercial and employment centers and, although they are available to the general public, the cost is relatively high. Parking garages have an average waiting list of three months for monthly parking. Inadequate parking supply has been a long-term problem in this portion of the study corridor. Permanent on-street parking is not available on Nimitz Highway, Kapi‘olani Boulevard, or Kalākaua Avenue, although metered parking is available and heavily used throughout these areas.

Downtown Honolulu parking rates are high. In 2008, the median daily parking rate in Honolulu was $44, nearly $29 more than the national median of $15.42. This rate exceeds those for major urban areas such as Midtown Manhattan ($40) and Chicago ($30). Monthly parking rates are the ninth highest of the 53 U.S. markets surveyed. Honolulu’s monthly median parking rate for an unreserved space was $216, more than $60 higher than the national median of $153.79 (Colliers 2008).

3.5.1 Analysis of Corridor-Wide Automobile Parking Supply

Parking supply throughout the study corridor varies depending on location. On the Kapolei/‘Ewa side of the corridor, parking has not been an issue because the area is currently developing and mostly residential. However, there is no on-street parking along Farrington Highway because of the limited right-of-way and high travel demand.

Continuing Koko Head-bound in the Waipahu and Pearl City areas, commercial strips along Farrington and Kamehameha Highways generate high parking demand. On-street parking is only available on side streets, and curb spaces are highly utilized directly off these highways near the Waipahu Town Center, the Waipahu Shopping Plaza, and the Pearlridge Shopping Center.

In the Pearl Harbor area of O‘ahu, off-street parking is available at major destinations such as Aloha Stadium and Honolulu International Airport. On-street parking is currently unavailable on Kamehameha Highway or Nimitz Highway because these facilities devote most of their right-of-way to the high travel demand. In the Salt Lake Boulevard corridor, on-street parking is not provided because of limited right-of-way and high traffic demand during peak hours. On-street curbside spaces on the side streets of Salt Lake Boulevard are highly utilized by residential communities.

In the Kalihi (Iwilei) area, on-street parking is generally located on side streets off Dillingham Boulevard near the O‘ahu Community Correction Center and residential communities. Approaching the industrial zone Koko Head of Kōkea Street, on-street parking is less common, and off-street parking is heavily used by commercial and industrial businesses near Alakawa Street.

In Downtown, on-street parking is available and heavily used throughout, although it is not available on Ala Moana Boulevard. In Kaka‘ako and near Ala Moana Center, on-street parking is scattered throughout the area and tends to be well used.

3.6 Bicycle and Pedestrian System

O‘ahu’s bikeway system provides residents and tourists with an inexpensive and convenient way to get around the island for recreation, commuting and general travel. Given continued dependence on the automobile and increasing congestion in the street system, the development and support of alternate travel means is important. The bikeway infrastructure on the island falls into three primary facility categories, as defined by *Bike Plan Hawai‘i Master Plan* (HDOT 2003):

- **Shared Roadway**—any street or highway open to both bikes and motor vehicle travel. Shared roadways may have signs designating their status as a preferred bike route.
- **Bike Lane**—a section of roadway designated by striping, signing, and/or pavement markings for the preferential or exclusive use of bicyclists.
- **Shared-Use Path**—these are physically separated from motorized vehicular traffic by an open space or barrier, and are located either within the highway right-of-way or in an independent right-of-way.

3.6.1 Existing Bikeway System

Figure 3-30 illustrates the locations of existing bikeways on the island. As of 2003, approximately 208 miles of bikeway facilities were available statewide. O‘ahu contains 98 miles (47 percent) of the statewide bikeway system. Although the current system is geared toward recreational users, connections to activity centers are provided for commuter use. The following bikeway facilities are currently available on O‘ahu:

- 30 miles of shared roadways
- 34 miles of bike lanes
- 34 miles of shared-use paths

As indicated in *Bike Plan Hawai‘i*, nearly 24,800 bike and moped registrations were recorded on O‘ahu in 2001. At that time O‘ahu had an average of 28 bicycle or moped registrations per 1,000 residents.

Every bus in TheBus fleet is equipped with a bike rack that holds a maximum of three bikes. As more bikers have become aware of this option, bike loadings on the bus network now exceed 30,000 per month.

3.6.2 Pedestrian System

The pedestrian system provides residents and visitors with access to local shopping, business, residential, recreational, and educational opportunities. It also provides access to public transit services, which in turn expands opportunities for residents and visitors. More than one-third of residents do not have access to a car at any given time. These people are dependent on the pedestrian network to give them access to basic services and/or transportation options.

The quality and extent of Honolulu’s pedestrian system varies depending on location. In certain areas, the City has invested heavily in creating a continuous and accessible pedestrian system while in other neighborhoods the condition of pedestrian facilities is poor or incomplete. As the City develops into new, previously undeveloped areas, a complete and accessible network of sidewalks would most likely be constructed by private developers. In areas already developed but with a poor system in place, additional effort would be needed to bring them up to ADA standards

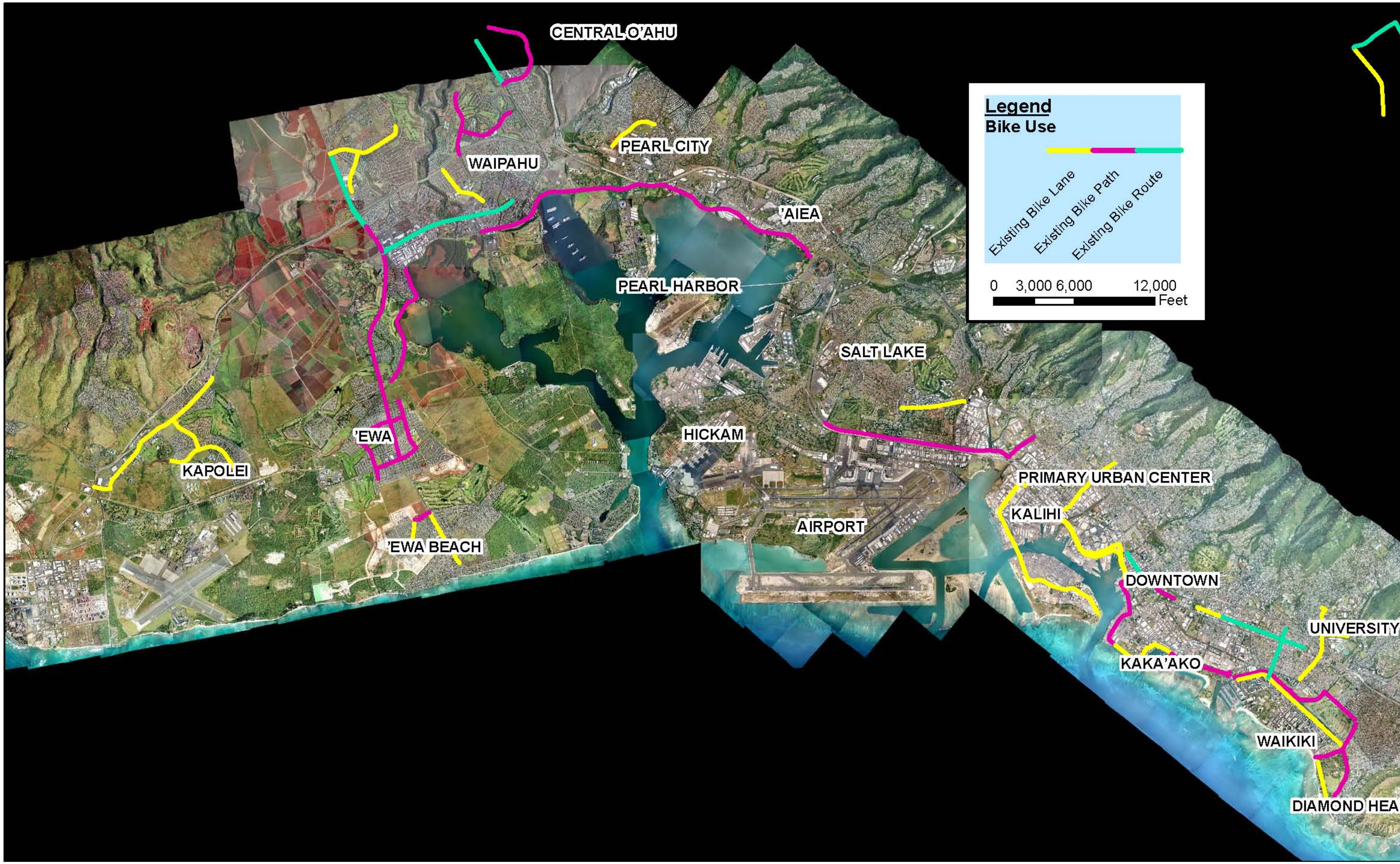


Figure 3-30: Existing Bicycle Network

4 Future Conditions and Effects—No Build Alternative

This chapter discusses future conditions and estimated effects of the No Build Alternative compared to existing 2007 conditions. Unless otherwise noted, the source for information presented in this section is the O‘ahuMPO travel demand forecasting model and the ORTP.

4.1 Transportation Conditions

The No Build Alternative includes all transportation improvements outlined in the ORTP, except for construction of a fixed guideway transit system. Although the ORTP includes the fixed guideway system, it is not included in the No Build Alternative so that a comparison can be made between “with” and “without” the Project.

The ORTP includes additional roadway, bus, and bicycle and pedestrian projects planned within the study corridor. These improvements include congestion relief projects such as widening Farrington Highway and the H-1 Freeway, extending Kapolei Parkway, constructing HOV and zipper lanes on the H-1 Freeway, and widening and extending North-South Road.

Bus improvements are also planned under the No Build Alternative and include service expansion to and within ‘Ewa, Kapolei, and Central O‘ahu. Bus transit centers are also planned at various locations islandwide. The No Build Alternative would include an increase in bus fleet size to accommodate growth, allowing service frequencies to remain the same as today. The projects noted above are included in the analysis of the No Build and the Build Alternatives.

4.1.1 Transit Improvements

Transit services included in the No Build Alternative consist of existing bus routes as well as programmed bus service improvements. These improvements include route alignment and service frequency modifications. The No Build Alternative transit service improvements are summarized in Table 4-1. There would be small increases in Rapid Bus and Trunk routes and a slight decrease in Express routes. The biggest increase in service would involve Feeder service, which would grow from 47 routes in 2007 to 64 in 2030. To accommodate service growth, the bus fleet size would increase from 540 vehicles in 2007 to 601 in 2030 or about a 14 percent increase.

Table 4-1: No Build Alternative Transit Service Improvements

Element	2007	2030 No Build Alternative
Bus Route Service Type [1]	5 Rapid Bus Routes	6 Rapid Bus Routes
	24 Trunk Routes	26 Trunk Routes
	47 Feeder Routes	55 Feeder Routes
	32 Express Routes	30 Express Routes
Bus Fleet Size [2]	540 (including spares)	601 (including spares)
Annual Revenue Vehicle Miles Bus [2]	17,923,700	21,954,500
Annual Revenue Vehicle Hours Bus [2]	1,354,600	1,597,800

[1] Trunk routes include Urban and Suburban routes; Feeder routes include TheBoat, Urban and Suburban Feeder routes, Community Circulator routes, and Community Access routes.
[2] Bus Fleet Size, Annual Revenue Vehicle Bus Miles, and Annual Revenue Vehicle Bus Hours obtained from 2007 National Transit Database. 2030 No Build data is from travel demand forecasting model results.

4.1.2 Transit Capital Improvements

To accommodate the projected growth in service levels, TheBus would expand or increase the number of transit facilities, as indicated in Table 4-2.

Table 4-2: No Build Alternative Transit Capital Improvements

Transit Facility	2007	2030 No Build Alternative
Bus Park and Ride Lots	5	6
Transit Centers	6	11
TheBus Maintenance and Storage Facilities	2	3

4.2 2030 No Build Alternative—Future Travel Patterns

This section discusses effects of the No Build Alternative on 2030 systemwide characteristics (2030 No Build Alternative), including daily person trips; mode of travel; and VMT, VHT, and VHD. Comparisons are made with 2007 characteristics.

4.2.1 Islandwide Person Trips

The O‘ahuMPO travel demand forecasting model estimates about 2.8 million person trips are made daily on O‘ahu, as shown in Table 4-3. The total islandwide person trips are expected to increase by 663,000 trips (24 percent) between Year 2007 and 2030 No Build Alternative conditions with almost 3.5 million person trips in the 2030 No Build Alternative.

Table 4-3: Islandwide Person Trips (Residents)—2007 and 2030 No Build Alternative

Trip Purpose (Residents)	2007		2030 No Build Alternative		Percent Growth from 2007
	Daily Person Trips	Percentage of Total Daily Trips	Daily Person Trips	Percentage of Total Daily Trips	
To and from work	932,600	33%	1,127,000	33%	21%
While at work	173,100	6%	219,000	6%	27%
To and from school/university	287,900	10%	356,000	10%	24%
To and from shopping/other	994,800	36%	1,246,000	36%	25%
Do not end at work or home	401,600	14%	505,000	15%	26%
Total Trips by Residents	*2,790,000*	*100%*	*3,453,000*	*100%*	*24%*

Source: OʻahuMPO Travel Demand Forecasting Model.
Trips rounded to nearest hundred. Percents may not equal 100 due to rounding.

4.2.2 Islandwide Mode of Travel

Table 4-4 presents mode share estimates for Year 2007 and 2030 No Build Alternative conditions. For trips made by residents, there would be virtually no change in shares of the identified travel modes: Private Automobile, Transit, and Bike/Walk. For trips made by visitors, the share of Private Automobile under the 2030 No Build Alternative would increase from 32 percent to 37 percent. The transit share would be unchanged while minor changes are estimated for Taxi and Tour Bus. However, the Bike/Walk share would decrease from 45 percent to 38 percent as more auto-oriented tourist destinations, such as Ko ʻOlina, are developed.

Table 4-4: Daily Person Trips by Mode—2007 and 2030 No Build Alternative

Alternative	2007		2030 No Build Alternative		Percentage Growth (2007 to 2030)
	Number	Percent of Total	Number	Percent of Total	
Trips by Residents					
Private Automobile	2,291,400	82%	2,814,600	82%	23%
Transit	165,900	6%	205,700	6%	24%
Bike/Walk	332,700	12%	432,400	13%	30%
Total Trips by Residents	*2,790,000*		*3,452,700*		*24%*
Trips by Visitors					
Private Automobile	116,400	32%	160,100	37%	37%
Transit	17,600	5%	19,800	5%	13%
Taxi	9,300	3%	9,700	2%	4%
Tour Bus	56,000	15%	77,500	18%	38%
Bike/Walk	165,100	45%	163,600	38%	-1%
Total Trips by Visitors	*364,400*		*430,700*		*18%*
Other Trips					
Trips by Trucks	44,700	43%	51,600	33%	15%
Ground access trips by air passengers	60,000	57%	103,900	67%	73%
Total Other Trips	*104,700*		*155,500*		*49%*
Total Daily Trips (All)	*3,259,100*		*4,038,900*		*22%*

Source: O'ahuMPO Travel Demand Forecasting Model.
Trips rounded to nearest hundred
Percents may not equal 100 due to rounding.

4.2.3 VMT, VHT and VHD

Table 4-5 shows the systemwide VMT, VHT, and VHD in the study corridor in 2007 and the 2030 No Build Alternative. Under 2030 No Build Alternative conditions, approximately 13.6 million VMT per day are projected in the transportation system, including major freeways, highways, arterials, and collectors. This represents an increase of approximately 17 percent (or 2.0 million miles) over 2007 conditions.

VHT is estimated to increase 24 percent by 2030 compared to 2007 levels. Daily VHD is expected to increase by at least 43 percent. VHT and VHD are expected to increase at a higher rate than VMT, because as roadway facilities become oversaturated, travel times through the affected sections increase dramatically.

Table 4-5: Systemwide Daily Travel Statistics—2007 and 2030 No Build Alternative

Facility Type	Daily VMT		Daily VHT		Daily VHD	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
2007 Existing Conditions						
Freeways	5,410,000	47%	120,000	36%	31,000	42%
Highways	1,306,000	11%	25,000	7%	4,000	5%
Arterial	3,345,000	29%	114,000	34%	18,000	24%
Collector	1,281,000	11%	53,000	16%	10,000	14%
Local	239,000	2%	22,000	7%	11,000	15%
Total	*11,581,000*	*100%*	*334,000*	*100%*	*74,000*	*100%*
2030 No Build Alternative						
Freeways	6,255,000	46%	166,000	40%	63,000	59%
Highways	1,407,000	10%	27,000	7%	3,000	3%
Arterial	4,122,000	30%	135,000	33%	17,000	16%
Collector	1,520,000	11%	63,000	15%	12,000	11%
Local	279,000	2%	24,000	6%	11,000	10%
Total	*13,583,000*	*100%*	*415,000*	*100%*	*106,000*	*100%*
Change from Existing Conditions	**2,002,000**	**17%**	**81,000**	**24%**	**32,000**	**43%**

Source: O'ahuMPO Travel Demand Forecasting Model.
Numbers are rounded to nearest thousand
Percents do not equal 100 due to rounding.

4.2.4 Reverse Commute

Reverse commute trips originate in urban areas and are destined for outlying and more suburban locations. Similar to current conditions, the No Build Alternative would have two-way transit service along major travel corridors, thereby providing opportunities for reverse commute bus riders. However, the effectiveness of the service would be compromised by characteristics such as reduced overall bus travel speeds.

4.2.5 Service to Transit Dependent Households

Bus service under the No Build Alternative would provide access to several areas with high concentrations of transit dependent households. As compared to 2007 conditions, some increases in transit travel times are projected for travel markets involving transit-dependent households. One example is between Pearlridge and Downtown Honolulu. Other travel markets would experience small reductions in transit travel times.

4.3 *Effects on Transit*

This section describes transit conditions under the No Build Alternative, including travel times, service reliability, and ridership resulting from anticipated limitations of the roadway network.

4.3.1 Transit Performance

Transit Speed

Transit travel times are presented in Table 4-6 for two possible mode choice options: walk to transit and drive to transit. Walk to transit represents the time needed to complete a transit trip, including time spent walking to the bus stop. Drive to transit represents the time needed to complete a trip by transit, including time spent driving to the bus stop.

Some transit travel times, such as from Wai‘anae to Downtown and Mililani Mauka to Downtown, are projected to improve under the No Build Alternative compared to 2007. This is because these trips can take advantage of extended HOV lanes on the H-1 Freeway, improved operations of the zipper lane (assumed to be limited to vehicles with three or more occupants by the year 2030), and/or the proposed Nimitz Flyover facility (which would give priority to HOVs and transit vehicles). The walk-to-transit travel time from Mililani Mauka to Downtown also improves because it is assumed that bus service would be extended further into the neighborhood, which would shorten walk access time.

Additionally, Figure 4-1 shows 2007 and 2030 No Build travel times between selected locations. The information represents the time required to complete a trip from origin to destination.

In general, transit travel times during the a.m. two-hour peak period (6:00 to 8:00 a.m.) would be longer under the 2030 No Build Alternative when compared to 2007, due to generally slower systemwide transit speeds (Figure 4-2). These slower speeds are attributable to increased traffic along streets and highways on which buses operate. The temporary increase in transit speeds in 2018 is attributable to planned implementation of extended HOV lanes on the H-1 Freeway and improved transit operations in the zipper lane.

Table 4-6: A.M. Peak-Period Travel Times in 2007 and 2030 No Build Alternative (in Minutes)

Travel Time Item	Travel Origin and Destination																		
	From Waiʻanae to Downtown	From Kapolei to Downtown	From ʻEwa to Downtown	From Waipahu to Downtown	From Mililani Mauka to Downtown	From Pearlridge Center to Downtown	From Downtown to Ala Moana Center	From Downtown to Waikīkī	From Downtown to UH Mānoa	From Airport to Waikīkī	From Waipahu to Waikīkī	From Downtown to Kapolei	From Waiʻanae to UH Mānoa	From Kapolei to Ala Moana Center	From ʻEwa to Pearl Harbor	From ʻEwa to Salt Lake	From Salt Lake to Downtown	From ʻEwa to Airport	From Airport to Downtown
2007 Base Year																			
Walk-to-Transit	102	86	88	79	105	52	18	32	29	71	88	67	128	101	105	97	39	114	42
Drive-to-Transit	N/A	N/A	N/A	N/A	83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto Travel Time	100	89	88	58	84	35	14	19	18	35	69	32	109	94	71	76	26	75	25
2030 No Build																			
Walk-to-Transit	92	90	91	66	98	57	20	33	33	72	85	68	121	105	99	109	41	115	43
Drive-to-Transit	N/A	N/A	N/A	N/A	97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto Travel Time	99	91	93	66	89	37	13	20	18	37	77	32	115	102	80	85	25	86	26

Source: Oʻahu MPO Travel Demand Forecasting Model.

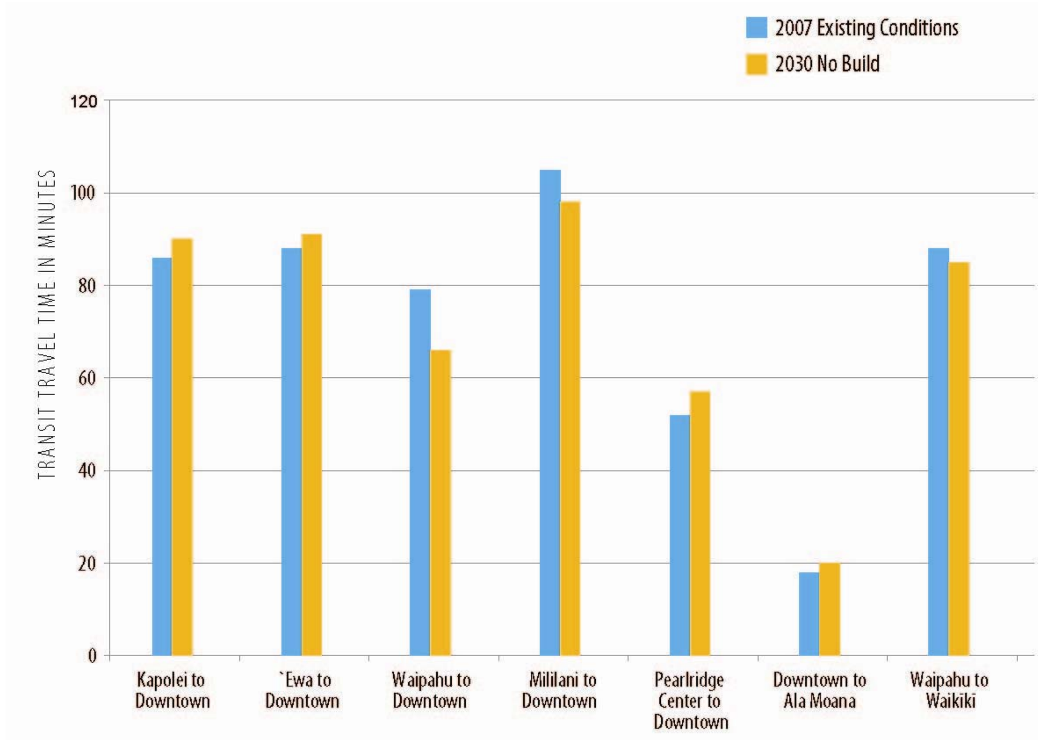


Figure 4-1: A.M. Peak Period Transit Travel Times

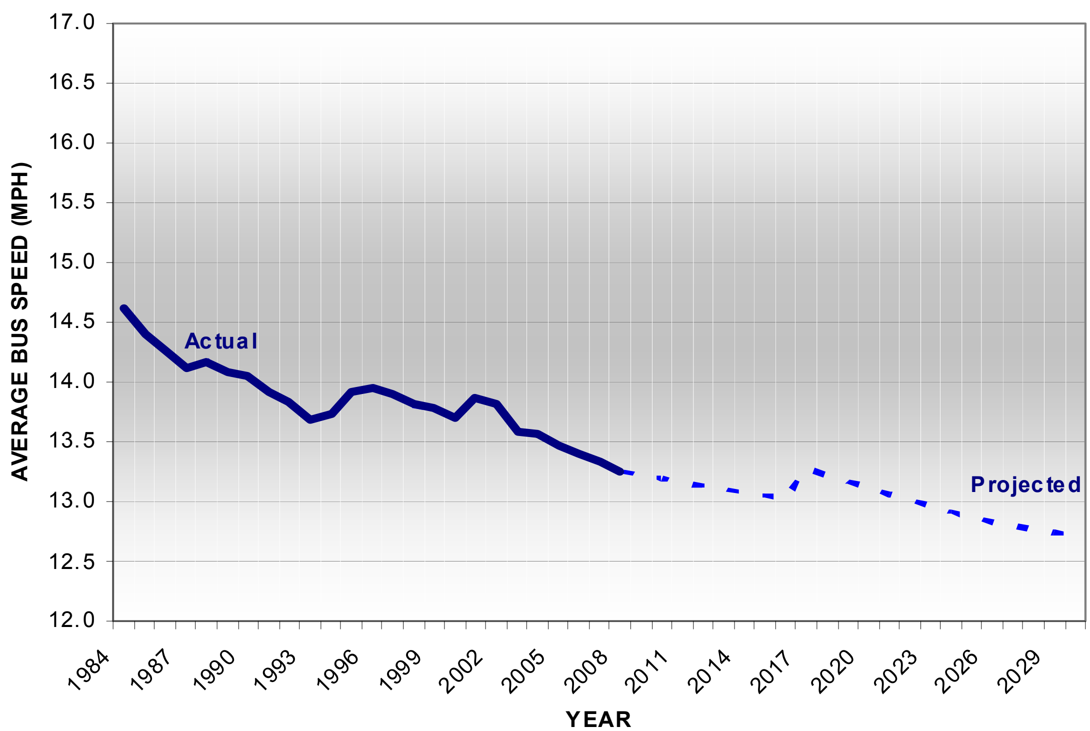


Figure 4-2: 2030 No Build Alternative Bus System Speeds

Table 4-7 shows transit speeds between select origins and destinations for 2007 compared to the 2030 No Build Alternative. Transit speeds for the 2030 No Build Alternative generally remain the same from 2007, though speeds decrease between Mililani Mauka and Downtown, Pearlridge Center to Downtown, and Downtown to Ala Moana Center.

Table 4-7: Transit speeds between select origins and destinations—2007 and 2030 No Build

Alternative	Kapolei to Downtown	‘Ewa to Downtown	Waipahu to Downtown	Mililani Mauka to Downtown	Pearlridge Center to Downtown	Downtown to Ala Moana Center	Waipahu to Waikīkī
2007 Base Year	19	15	19	20	15	13	17
2030 No Build Alternative	19	15	19	18	13	10	17

Auto travel times (as shown in Table 4-6) range from 12 minutes longer to 13 minutes shorter when comparing the 2030 No Build Alternative to the 2007 base year. This reflects the fact that the No Build Alternative does offer some benefits, but not enough to offset the overall growth in traffic. These benefits are minimal considering the 3.4 billion dollars in proposed roadway improvements identified in the ORTP.

Transit Reliability

In addition to the estimated increase in transit travel times, transit reliability under the No Build Alternative would likely worsen compared to existing conditions. This is due to the projected increase in traffic congestion and a longer duration of unstable traffic flow expected during peak periods. Operating characteristics which would occur under these conditions, such as bus turnbacks, would likely worsen in the future. Longer-distance service connecting the emerging population centers in West O‘ahu with major destinations such as Downtown may be less reliable due to an increased likelihood that a disruptive event would occur when longer distances are traveled.

Access to Transit Service

With the No Build Alternative, access to transit services would be generally similar to current characteristics. New transit centers would be built at 5 locations (Wahiawā, Middle Street, Kāne‘ohe, Kailua, and Pearlridge) to allow transfers between TheBus routes. One added park-and-ride facility would be built at the Middle Street Intermodal Transportation Center.

Transfers

The estimated rate of transfers under the 2030 No Build Alternative would be 39 percent (or about 1.4 bus rides or segments per transit trip). This rate is close to the 37 percent transfer rate in 2007 (also 1.4 bus rides or segments per transit trip). The transfer rate would reflect that the bus route structure under the No Build Alternative would be generally similar to that in 2007.

Comfort and Convenience

With the No Build Alternative, additional bus service would be provided on some routes. With the reliance on buses, most of which would continue to operate in mixed traffic, transit riders would be subject to service delays and longer trip times for several travel markets. Those riders who have to stand would be subject to frequent stop-and-go travel.

4.3.2 Transit Ridership

Changes in Transit Ridership

Transit boardings under the No Build Alternative are expected to keep pace with population growth and increase over 2007 existing conditions by approximately 25 percent (Table 4-8). No major increases in the transit share of total travel are expected under the No Build Alternative.

Table 4-8: Changes in Daily Transit Boardings—2007 and 2030 No Build Alternative

Alternative	Total Transit Boardings
2007 Base Year	251,000
2030 No Build	314,000
% Change from 2007	*25%*

Numbers rounded to nearest thousand.

Although some increases in bus services would occur under the No Build Alternative, a review of route-specific demand and service levels for 2030 indicates that bus capacity would be exceeded for several routes. In some cases the demand per bus trip would be more than twice the seating capacity.

Adding substantial passenger capacity with more buses is not feasible in some key locations along the system because of roadway capacity constraints. For example, only certain streets serving Downtown can be used by buses (other streets are either too narrow or do not connect efficiently with other key transit roadway corridors), and those are already at or very near capacity during peak hours. Short blocks, in particular, and narrow rights-of-way Downtown limit the number of new buses that can be added to the system.

Choke points occur in Downtown Honolulu during the a.m. peak period, especially at the merger of North Beretania, North King, and Liliha Streets, and Dillingham Boulevard due to the co-mingling of buses making a variety of turning movements in conflict with heavy pedestrian crossings and general purpose traffic. Pedestrians have been killed at this location. King Street has been used to introduce new service in recent years; however, choke points occur at the Chinatown bus stops and at the Punchbowl Street and King Street stops. Buses often must wait to move into an open and safe boarding position. Continuing to add additional service to King Street without major physical improvements would add to the gridlock in this corridor, deteriorate transit service, and complicate pedestrian and traffic safety issues. Current curb space is not sufficient to achieve more boarding locations due to conflicts with turning and through movements.

Capacity was added when Hotel Street was converted to bus-only operations many decades ago and has been at capacity for several years. No new routes have been added in the past few years and those that operate (Routes 1, 1L, 2, 3, 9, 11, 13, 52, 53, 54, 62, and 88A) have had minimal increases in service during the peak periods. The capacity issues are predominantly caused by limitations relating to intersection traffic signal control, boarding and alighting position, and roadway width.

Beretania, the westbound direction of the couplet, is less of a problem having a wider width and bus pullouts. However, observations during the p.m. peak period, have shown that buses frequently stack up on the turn from Alapai to Beretania. Other choke points include Kona Street at Ala Moana Center, the Atkinson Drive and Ala Moana Boulevard intersection and Kūhiō Avenue in Waikīkī.

Several routes, including CountryExpress! Routes C, D, and E are projected to be overloaded in 2030. Increasing frequency would require headways at five minutes or less. Further, the downtown street network cannot support the number of buses that would be required to meet projected demand.

4.3.3 Ridership Comparisons by Type of Bus Service

Table 4-9 presents annual total weekday boardings data for TheBus by service type or classification for the current year (2007) and for the 2030 No Build Alternative. The data is expressed as transit boardings.

Table 4-9: TheBus Weekday Boardings by Route Classification and Alternative

Route Classification	Weekday Boardings [1] 2007 Existing	Weekday Boardings [1] 2030 No Build	Difference between Existing and No Build 2030
Rapid Bus	24,300	44,100	19,800
Urban Trunk	110,000	106,700	-3,300
Feeder Routes [2]	12,200	22,600	10,400
Suburban Trunk	86,100	102,700	16,600
Community Circulator	11,600	33,000	21,400
Peak Express	7,200	5,000	-2,200
Totals	*251,400*	*314,100*	*62,700*

[1] Existing year and No Build based upon Travel Demand Forecasting Model results
[2] Includes TheBoat, Urban and Suburban Feeder Routes
Numbers rounded to nearest hundred.

Under 2030 No Build Alternative, weekday boardings would increase for all route classifications except for the Peak Express. Improved frequencies on parallel services (mainly the Suburban Trunk and Rapid Bus routes) resulted in competitive travel times, with a corresponding shift in boardings from Peak Express services to other route classifications.

The largest increases in weekday boardings are experienced on the Community Circulator and Feeder route classifications for the No Build Alternative 2030 network. This is mainly due to the increased frequency of current services and the introduction of new routes to serve the growing Leeward and Central communities.

4.3.4 Comparisons by Route

While some increases in bus service would occur under the No Build Alternative, a review of route-specific demand and service levels for 2030 indicated that bus capacity would be exceeded for several routes. In some cases the demand per bus trip would be more than twice seating capacity.

4.4 Effects on Streets and Highways Performance

This section discusses the No Build Alternative's effects on streets and highways and includes future highway volumes using screenline analysis.

4.4.1 Screenline Analysis

The potential effect on the street and highway system's traffic operations was evaluated using a screenline analysis at key locations along the study corridor. The projected LOS was evaluated on the major roadways crossing eight screenlines along the corridor, as illustrated previously in Figure 3-24. The roadway link volumes for the selected screenline locations were obtained from the O‘ahuMPO travel demand forecasting model for the 2030 No Build Alternative.

Daily Screenline Volume Comparisons

The vehicular traffic volumes shown in Table 4-10 indicate that volumes on the major roadway facilities in the study corridor are all expected to increase between 2005 and the 2030 No Build Alternative conditions. The increase in daily traffic (both directions) across these eight screenlines ranges from approximately 10 percent to over 100 percent, with Ward Avenue exhibiting the greatest increase and Mānoa-Pālolo/Ala Wai Canal showing the least.

The daily traffic volumes for screenlines at Kapolei, ‘Ewa, and Waikele indicate that volumes are expected to increase substantially in the ‘Ewa end of the corridor due to the high rate of population and employment growth projected in this area. Growth in traffic volumes is projected to be approximately 35 percent at the Waikele Stream Screenline, and 75 percent at the Kapolei Screenline. As indicated in Table 4-10, under 2030 No Build Alternative conditions the Kapālama Canal screenline would be the most traveled screenline with a daily volume of approximately 460,000 vehicles.

Table 4-10: Comparison of Daily Screenline Volumes between 2005 and 2030 No Build

ID	Screenline	Daily Volumes		
		Year 2005	2030 No Build	% Growth from Existing
A	Kapolei Mauka bound	23,750	44,920	89%
	Kapolei Makai bound	29,380	48,340	65%
	Total	*53,130*	*93,260*	*75%*
B	‘Ewa Wai‘anae bound	83,390	116,250	39%
	‘Ewa Koko Head bound	95,690	139,850	46%
	Total	*179,080*	*256,100*	*43%*
C	Waikele Stream ‘Ewa bound	110,650	148,440	34%
	Waikele Stream Koko Head bound	93,590	125,080	34%
	Total	*204,240*	*273,520*	*34%*
D	Kalauao ‘Ewa bound	175,960	197,870	12%
	Kalauao Koko Head bound	173,410	200,340	16%
	Total	*349,370*	*398,210*	*14%*
E	Salt Lake ‘Ewa bound	159,630	177,540	11%
	Salt Lake Koko Head bound	150,740	170,610	13%
	Total	*310,370*	*348,150*	*12%*
F	Kapālama Canal ‘Ewa bound	204,460	223,790	9%
	Kapālama Canal Koko Head bound	191,410	240,500	26%
	Total	*395,870*	*464,290*	*17%*
G	Ward Avenue ‘Ewa bound	160,210	175,480	10%
	Ward Avenue Koko Head bound	103,550	223,690	116%
	Total	*263,760*	*399,170*	*51%*
H	Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound	191,720	206,420	8%
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound	192,660	208,590	8%
	Total	*384,380*	*415,010*	*8%*

Existing peak-hour and daily volumes were obtained from the Hawai‘i Department of Transportation (2005).
Future 2030 forecast volumes are rounded to the nearest 10.

A.M. and P.M. Peak Hour Screenline Analysis

The post-processed peak-hour link volumes from the O‘ahuMPO travel demand forecasting model were analyzed to determine the projected LOS for the analyzed roadway segments under 2030 No Build Alternative conditions.

Table 4-11 and Table 4-12 summarize LOS results for the a.m. and p.m. peak hours, respectively. Appendix C provides detailed LOS worksheets for the screenline analysis.

As shown in Table 4-11, under the 2030 No Build Alternative condition congested operating conditions (LOS E or F) during the a.m. peak hour are estimated to occur at the following screenlines:

- Kapolei Screenline (Makai bound)
- ‘Ewa Screenline (Koko Head bound)
- Waikele Stream Screenline (both directions)
- Kalauao Screenline (Koko Head bound)
- Kapālama Canal (both directions)
- Ward Screenline (‘Ewa bound)
- Mānoa Pālolo/Ala Wai Canal Screenline (both directions)

Within all the screenlines, the individual facility LOS was also determined and is illustrated in Table 4-11.

Table 4-12 presents a similar analysis for the p.m. peak hour. Under the 2030 No Build Alternative condition, congested operating conditions (LOS E or F) during the p.m. peak hour are projected to occur at the following screenlines:

- ‘Ewa Screenline (Koko Head bound)
- Waikele Stream Screenline (‘Ewa bound)
- Kalauao Screenline (‘Ewa bound)
- Kapālama Canal (‘Ewa bound)
- Ward Avenue (‘Ewa bound)
- Mānoa Pālolo/Ala Wai Canal Screenline (both directions)

For each of the eight screenlines, the individual facility LOS was also determined and is illustrated in Table 4-12.

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	*B*	*C*	*D*	*E*	
A	**Kapolei Mauka bound**											
	Kalaeloa Boulevard	2	500	C*	2	790	**	**	1,020	1,480	1,560	C*
	Fort Barrette Road	2	1,340	D	2	1,170	**	**	1,020	1,480	1,560	D
	North-South Road (future roadway)	NA	NA	NA	3	2,300	**	**	1,590	2,230	2,350	E
	Total		*1,840*	*D*		*4,260*						*D*
	Kapolei Makai bound											
	Kalaeloa Boulevard	2	1,340	D	2	1,130	**	**	1,020	1,480	1,560	D
	Fort Barrette Road	2	1,300	D	2	1,580	**	**	1,020	1,480	1,560	F
	North-South Road (future roadway)	NA	NA	NA	3	2,410	**	**	1,590	2,230	2,350	F
	Total		*2,640*	*D*		*5,120*						*F*
B	**‘Ewa Wai‘anae bound**											
	H-1 Freeway	3	3,330	C	3	4,290	1,620	2,630	3,800	4,920	5,590	D
	H-1 Freeway future HOV	NA	NA	NA	1	1,180	515	839	1,213	1,568	1,783	C
	Farrington Highway	1	590	C	2	500	**	200	1,240	1,560	1,640	C
	Fort Weaver Road (SB)	2	1,440	D	2	2,040	**	200	1,240	1,560	1,640	F
	Total		*5,360*	*C*		*8,010*						*D*
	‘Ewa Koko Head bound											
	H-1 Freeway	3	4,130	D	3	5,080	1,620	2,630	3,800	4,920	5,590	E
	H-1 Freeway future HOV	NA	NA	NA	1	1,530	515	839	1,213	1,568	1,783	D
	Farrington Highway	2	210	A	3	310	**	310	1,920	2,340	2,460	C
	Fort Weaver Road (NB)	2	3,120	F	2	3,090	**	200	1,240	1,560	1,640	F
	Total		*7,460*	*E*		*10,010*						*E*

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	B	C	D	E	
C	**Waikele Stream ‘Ewa bound**											
	H-1 Freeway	4	6,110	D	5	9,280	2,800	4,540	6,570	8,490	9,660	E
	Waipahu Street	1	360	C*	1	330	**	**	440	700	740	C*
	Farrington Highway	3	1,160	C	4	1,040	**	400	2,530	3,030	3,180	C
	Total		*7,630*	*D*		*10,650*						*E*
	Waikele Stream Koko Head bound											
	H-1 Freeway	4	7,380	E	4	7,800	2,210	3,580	5,180	6,710	7,620	F
	H-1 Freeway future HOV	NA	NA	NA	1	1,670	515	839	1,213	1,568	1,783	E
	Waipahu Street	1	580	D	1	700	**	**	440	700	740	E
	Farrington Highway	2	1,210	C	3	1,900	**	310	1,920	2,340	2,460	C
	Total		*9,170*	*E*		*12,070*						*E*
D	**Kalauao ‘Ewa bound**											
	H-1 Freeway	5	6,840	D	5	7,930	2,800	4,540	6,570	8,490	9,660	D
	Moanalua Road	2	1,130	D	2	1,240	**	**	1,020	1,480	1,560	D
	Kamehameha Highway	3	970	C	3	1,080	**	310	1,920	2,340	2,460	C
	Total		*8,940*	*D*		*10,250*						*D*
	Kalauao Koko Head bound											
	H-1 Freeway	5	10,140	F	5	13,160	2,800	4,540	6,570	8,490	9,660	F
	H-1 Freeway HOV	1	1,740	E	1	1,810	515	839	1,213	1,568	1,783	F
	H-1 Freeway Zipper	1	1,510	D	1	1,500	515	839	1,213	1,568	1,783	D
	Moanalua Road	2	1,390	D	2	1,480	**	**	1,020	1,480	1,560	E
	Kamehameha Highway	3	2,520	F	3	2,850	**	310	1,920	2,340	2,460	F
	Total		*17,300*	*F*		*20,800*						*F*

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions: Facility Number of Lanes	Year 2005 Conditions: Observed Volume* (vph)	Year 2005 Conditions: LOS [2]	2030 No Build Conditions: Facility Number of Lanes	2030 No Build Conditions: Forecast Volume (vph) [1]	Maximum Volume Threshold [2]: *A*	Maximum Volume Threshold [2]: *B*	Maximum Volume Threshold [2]: *C*	Maximum Volume Threshold [2]: *D*	Maximum Volume Threshold [2]: *E*	2030 No Build Conditions: LOS [2]
E	**Salt Lake ‘Ewa bound**											
	Moanalua Freeway	4	3,700	C	4	4,260	2,210	3,580	5,180	6,710	7,620	C
	H-1 Freeway	3	2,460	B	4	2,830	2,210	3,580	5,180	6,710	7,620	B
	H-1 Freeway HOV	NA	NA	NA	NA	NA	515	839	1,213	1,568	1,783	NA
	H-1 Freeway Future zipper lane	NA	NA	NA	NA	NA	515	839	1,213	1,568	1,783	NA
	Nimitz Highway	3	1,050	C	3	1,190	**	310	1,920	2,340	2,460	C
	Salt Lake Boulevard	1	330	C*	2	390	**	**	1,020	1,480	1,560	C*
	Total		*7,540*	*C*		*8,670*						*C*
	Salt Lake Koko Head bound											
	Moanalua Freeway	2	3,730	F	2	3,690	1,030	1,680	2,420	3,130	3,560	F
	Moanalua Freeway HOV	1	1,020	C	1	1,750	515	839	1,213	1,568	1,783	E
	H-1 Freeway + Shoulder Express	5	7,600	D	5	8,270	2,800	4,540	6,570	8,490	9,660	D
	H-1 Freeway HOV	1	1,620	E	1	1,660	515	839	1,213	1,568	1,783	E
	H-1 Freeway Zipper	1	1,510	D	1	1,520	515	839	1,213	1,568	1,783	D
	Nimitz Highway	5	1,420	C	5	1,770	**	500	3,160	3,790	3,980	C
	Salt Lake Boulevard	1	520	D	2	860	**	**	1,020	1,480	1,560	C*
	Total		*17,420*	*D*		*19,520*						*D*

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	*B*	*C*	*D*	*E*	
F	**Kapālama Canal ʻEwa bound**											
	Nimitz Highway	2	1,340	D	3	1,570	**	310	1,920	2,340	2,460	C
	Dillingham Boulevard	2	690	C	2	560	**	200	1,240	1,560	1,640	C
	N King Street	2	600	C*	2	790	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	4	7,300	E	4	8,150	2,210	3,580	5,180	6,710	7,620	F
	Hālona Street	2	1,160	C*	2	1,180	**	**	1,220	1,770	1,870	C*
	School Street	2	780	C*	2	960	**	**	1,020	1,480	1,560	C*
	Total		*11,870*	*D*		*13,210*						*E*
	Kapālama Canal Koko Head bound											
	Nimitz Highway	4	3,210	F	3	3,430	**	310	1,920	2,340	2,460	F
	Nimitz Flyover (future facility)	NA	NA	NA	2	1,400	1,030	1,680	2,420	3,130	3,560	B
	Dillingham Boulevard	2	1,400	D	2	1,350	**	200	1,240	1,560	1,640	D
	N King Street	2	1,340	D	2	1,460	**	**	1,020	1,480	1,560	D
	Olomea Street	2	1,950	F	2	1,950	**	**	1,220	1,770	1,870	F
	H-1 Freeway	4	9,490	F	5	10,790	2,800	4,540	6,570	8,490	9,660	F
	School Street	2	1,580	F	2	1,760	**	**	1,020	1,480	1,560	F
	Total		*18,970*	*F*		*22,140*						*E*

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	B	C	D	E	
G	**Ward Avenue ʻEwa bound**											
	H-1 Freeway	3	7,290	F	3	7,380	1,620	2,630	3,800	4,920	5,590	F
	Beretania Street	5	2,790	C*	5	3,250	**	**	3,170	4,450	4,690	D
	Kapiʻolani Boulevard	4	1,920	C*	4	2,220	**	**	2,110	2,970	3,130	D
	Ala Moana Boulevard	3	1,800	C	3	2,150	**	310	1,920	2,340	2,460	D
	Total		*13,800*	*E*		*15,000*						*E*
	Ward Avenue Koko Head bound											
	H-1 Freeway	3	5,740	F	4	6,980	2,210	3,580	5,180	6,710	7,620	E
	Kīnaʻu Street	3	1,250	C*	3	1,070	**	**	1,900	2,670	2,810	C*
	S King Street	5	2,080	C*	5	2,850	**	**	3,170	4,450	4,690	C*
	Kapiʻolani Boulevard	2	710	C*	2	820	**	**	1,020	1,480	1,560	C*
	Ala Moana Boulevard	3	1,610	C	3	1,740	**	310	1,920	2,340	2,460	C
	Total		*11,390*	*E*		*13,460*						*D*

Table 4-11: 2030 No Build Alternative Conditions—A.M. Peak Hour Screenline Volumes and LOS (continued)

		Year 2005 Conditions			2030 No Build Conditions							
							Maximum Volume Threshold [2]					
	Screenline/Facility	Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	A	B	C	D	E	LOS [2]
H	**Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound**											
	Ala Moana Boulevard	3	1,460	C	3	1,580	**	310	1,920	2,340	2,460	C
	Kalākaua Avenue	2	1,220	D	2	1,260	**	**	1,020	1,480	1,560	D
	McCully Street (NB)	2	680	C*	2	680	**	**	1,020	1,480	1,560	C*
	Date Street	2	560	C*	2	620	**	**	1,020	1,480	1,560	C*
	Kapi‘olani Boulevard	3	3,090	F	3	3,340	**	**	1,590	2,230	2,350	F
	Old Wai‘alae Road	3	1,540	C*	3	1,620	**	**	1,900	2,670	2,810	C*
	Dole Street	2	820	C*	2	950	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	3	5,570	E	3	5,740	1,620	2,630	3,800	4,920	5,590	F
	Total		*14,940*	*D*		*15,790*						*E*
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound											
	Ala Moana Boulevard	3	940	C	3	1,010	**	310	1,920	2,340	2,460	C
	Kalākaua Avenue	3	1,110	C*	3	1,190	**	**	1,590	2,230	2,350	C*
	McCully Street (SB)	2	970	C*	2	1,010	**	**	1,020	1,480	1,560	C*
	Date Street	1	320	C*	1	460	**	**	440	700	740	D
	Kapi‘olani Boulevard	2	520	C*	2	600	**	**	1,020	1,480	1,560	C*
	S King Street	2	1,530	D	2	1,770	**	**	1,220	1,770	1,870	D
	Dole Street	2	650	C*	2	660	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	3	5,090	E	3	6,020	1,620	2,630	3,800	4,920	5,590	F
	Total		*11,130*	*D*		*12,720*						*E*

[1] Peak-hour traffic count data was obtained from the Hawai‘i Department of Transportation (2005).
[2] LOS thresholds were adapted from the Quality/Level of Service Handbook (Florida Department of Transportation 2002). The handbook provides generalized peak-hour two-way volumes for Florida's urbanized areas. A directional split of 50% was applied to the two-way volumes to generate the peak-hour direction volume thresholds for the purpose of this analysis.
* The reported LOS "C*" means C or better and "B*" means B or better.
** LOS thresholds not reported due to type of facility.

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS

		Year 2005 Conditions			2030 No Build Conditions							
							Maximum Volume Threshold [2]					
	Screenline/Facility	Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	*A*	*B*	*C*	*D*	*E*	LOS [2]
A	**Kapolei Mauka bound**											
	Kalaeloa Boulevard	2	1,360	D	2	1,260	**	**	1,020	1,480	1,560	D
	Fort Barrette Road	2	1,190	D	2	1,480	**	**	1,020	1,480	1,560	E
	North-South Road (future roadway)	NA	NA	NA	3	1,420	**	**	1,590	2,230	2,350	C*
	Total		2,550	D		4,160						D
	Kapolei Makai bound											
	Kalaeloa Boulevard	2	400	C*	2	400	**	**	1,020	1,480	1,560	C*
	Fort Barrette Road	2	1,280	D	2	1,200	**	**	1,020	1,480	1,560	D
	North-South Road (future roadway)	NA	NA	NA	3	1,410	**	**	1,590	2,230	2,350	C*
	Total		*1,680*	*D*		*3,010*						*C*
B	**‘Ewa Wai‘anae bound**											
	H-1 Freeway	3	4,110	D	3	4,680	1,620	2,630	3,800	4,920	5,590	D
	H-1 Freeway future HOV	NA	NA	NA	1	1,100	515	839	1,213	1,568	1,783	C
	Farrington Highway	1	310	C	2	510	**	200	1,240	1,560	1,640	C
	Fort Weaver Road (SB)	2	2,400	F	2	2,410	**	200	1,240	1,560	1,640	F
	Total		*6,820*	*E*		*8,700*						*D*
	‘Ewa Koko Head bound											
	H-1 Freeway	3	4,080	D	3	6,120	1,620	2,630	3,800	4,920	5,590	F
	H-1 Freeway future HOV	NA	NA	NA	1	990	515	839	1,213	1,568	1,783	C
	Farrington Highway	2	620	B	3	550	**	310	1,920	2,340	2,460	C
	Fort Weaver Road (NB)	2	2,060	F	2	2,620	**	200	1,240	1,560	1,640	F
	Total		*6,760*	*D*		*10,280*						*F*

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	*B*	*C*	*D*	*E*	
C	**Waikele Stream 'Ewa bound**											
	H-1 Freeway	4	6,710	E	4	9,010	2,210	3,580	5,180	6,710	7,620	F
	H-1 Freeway future HOV	NA	NA	NA	1	490	515	839	1,213	1,568	1,783	A
	Waipahu Street	1	530	D	1	180	**	**	440	700	740	C*
	Farrington Highway	3	1,280	C	4	1,450	**	400	2,530	3,030	3,180	C
	Total		*8,520*	*E*		*11,130*						*E*
	Waikele Stream Koko Head bound											
	H-1 Freeway	4	4,790	C	5	6,960	2,800	4,540	6,570	8,490	9,660	D
	Waipahu Street	1	420	C*	1	410	**	**	440	700	740	C*
	Farrington Highway	2	790	C	3	1,010	**	310	1,920	2,340	2,460	C
	Total		*6,000*	*C*		*8,380*						*D*
D	**Kalauao 'Ewa bound**											
	H-1 Freeway	5	8,410	D	4	9,040	2,210	3,580	5,180	6,710	7,620	F
	H-1 Freeway HOV	1	1,530	D	1	1,720	515	839	1,213	1,568	1,783	E
	H-1 Freeway Future Zipper Lane	NA	NA	NA	1	950	515	839	1,213	1,568	1,783	C
	Moanalua Road	2	2,020	F	2	2,250	**	**	1,020	1,480	1,560	F
	Kamehameha Highway	3	2,110	D	3	2,190	**	310	1,920	2,340	2,460	D
	Total		*14,070*	*D*		*16,150*						*E*
	Kalauao Koko Head bound											
	H-1 Freeway	4	5,740	D	5	8,060	2,800	4,540	6,570	8,490	9,660	D
	H-1 Freeway HOV	1	1,360	D	NA	NA	515	839	1,213	1,568	1,783	NA
	Moanalua Road	2	870	C*	2	970	**	**	1,020	1,480	1,560	C*
	Kamehameha Highway	3	1,500	C	3	1,780	**	310	1,920	2,340	2,460	C
	Total		*9,470*	*D*		*10,810*						*D*

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions: Facility Number of Lanes	Year 2005 Conditions: Observed Volume* (vph)	Year 2005 Conditions: LOS [2]	2030 No Build Conditions: Facility Number of Lanes	2030 No Build Conditions: Forecast Volume (vph) [1]	Maximum Volume Threshold [2]: *A*	*B*	*C*	*D*	*E*	LOS [2]
E	**Salt Lake ‘Ewa bound**											
	Moanalua Freeway	4	5,900	D	4	5,990	2,210	3,580	5,180	6,710	7,620	D
	H-1 Freeway	4	3,550	B	4	4,200	2,210	3,580	5,180	6,710	7,620	C
	H-1 Freeway HOV	1	1,410	D	1	1,210	515	839	1,213	1,568	1,783	C
	H-1 Freeway Future zipper lane	NA	NA	NA	1	810	515	839	1,213	1,568	1,783	B
	Nimitz Highway	3	2,460	F	3	2,530	**	310	1,920	2,340	2,460	F
	Salt Lake Boulevard	1	730	E	2	870	**	**	1,020	1,480	1,560	C*
	Total		*14,050*	*D*		*15,610*						*D*
	Salt Lake Koko Head bound											
	Moanalua Freeway	2	3,330	E	2	2,910	1,030	1,680	2,420	3,130	3,560	D
	Moanalua Freeway HOV	1	240	A	1	960	515	839	1,213	1,568	1,783	C
	H-1 Freeway + Shoulder Express	4	4,500	C	4	3,970	2,210	3,580	5,180	6,710	7,620	C
	H-1 Freeway HOV	1	330	A	1	1,070	515	839	1,213	1,568	1,783	C
	Nimitz Highway	5	1,500	C	5	1,600	**	500	3,160	3,790	3,980	C
	Salt Lake Boulevard	1	350	C*	2	410	**	**	1,020	1,480	1,560	C*
	Total		*10,250*	*D*		*10,920*						*C*

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions: Facility Number of Lanes	Year 2005 Conditions: Observed Volume* (vph)	Year 2005 Conditions: LOS [2]	2030 No Build Conditions: Facility Number of Lanes	2030 No Build Conditions: Forecast Volume (vph) [1]	Maximum Volume Threshold [2]: *A*	*B*	*C*	*D*	*E*	LOS [2]
F	**Kapālama Canal ‘Ewa bound**											
	Nimitz Highway	3	1,780	C	3	1,750	**	310	1,920	2,340	2,460	C
	Nimitz Flyover (Future Facility)	NA	NA	NA	2	880	1,030	1,680	2,420	3,130	3,560	A
	Dillingham Boulevard	2	1,460	D	2	1,140	**	200	1,240	1,560	1,640	C
	N King Street	2	1,340	D	2	1,470	**	**	1,020	1,480	1,560	D
	H-1 Freeway	4	7,570	E	4	8,370	2,210	3,580	5,180	6,710	7,620	F
	Hālona Street	2	1,800	E	2	1,740	**	**	1,220	1,770	1,870	D
	School Street	2	1,220	D	2	1,370	**	**	1,020	1,480	1,560	D
	Total		*15,170*	*E*		*16,710*						*E*
	Kapālama Canal Koko Head bound											
	Nimitz Highway	3	2,770	F	3	3,520	**	310	1,920	2,340	2,460	F
	Dillingham Boulevard	2	1,080	C	2	1,020	**	200	1,240	1,560	1,640	C
	N King Street	2	1,110	D	2	1,470	**	**	1,020	1,480	1,560	D
	Olomea Street	2	1,670	D	2	1,670	**	**	1,220	1,770	1,870	D
	H-1 Freeway	4	7,320	E	5	8,050	2,800	4,540	6,570	8,490	9,660	D
	School Street	2	990	C*	2	1,150	**	**	1,020	1,480	1,560	D
	Total		*14,940*	*E*		*16,880*						*D*

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions			2030 No Build Conditions							
		Facility Number of Lanes	Observed Volume* (vph)	LOS [2]	Facility Number of Lanes	Forecast Volume (vph) [1]	Maximum Volume Threshold [2]					LOS [2]
							A	*B*	*C*	*D*	*E*	
G	**Ward Avenue ‘Ewa bound**											
	H-1 Freeway	3	6,790	F	3	6,970	1,620	2,630	3,800	4,920	5,590	F
	Beretania Street	5	2,510	C*	5	3,040	**	**	3,170	4,450	4,690	C*
	Kapiʻolani Boulevard	2	1,420	D	2	1,570	**	**	1,020	1,480	1,560	F
	Ala Moana Boulevard	3	1,650	C	3	2,020	**	310	1,920	2,340	2,460	D
	Total		*12,370*	*E*		*13,600*						*E*
	Ward Avenue Koko Head bound											
	H-1 Freeway	3	6,150	F	4	7,370	2,210	3,580	5,180	6,710	7,620	E
	Kīnaʻu Street	4	1,870	C*	4	1,810	**	**	2,540	3,560	3,750	C*
	S King Street	6	3,370	C*	6	3,450	**	**	3,800	5,340	5,630	C*
	Kapiʻolani Boulevard	4	1,840	C*	4	2,370	**	**	2,110	2,970	3,130	D
	Ala Moana Boulevard	3	2,120	D	3	2,330	**	310	1,920	2,340	2,460	D
	Total		*15,350*	*D*		*17,330*						*D*

Table 4-12: 2030 No Build Alternative Conditions—P.M. Peak Hour Screenline Volumes and LOS (continued)

	Screenline/Facility	Year 2005 Conditions: Facility Number of Lanes	Year 2005 Conditions: Observed Volume* (vph)	Year 2005 Conditions: LOS [2]	2030 No Build Conditions: Facility Number of Lanes	2030 No Build Conditions: Forecast Volume (vph) [1]	Maximum Volume Threshold [2]: A	Maximum Volume Threshold [2]: B	Maximum Volume Threshold [2]: C	Maximum Volume Threshold [2]: D	Maximum Volume Threshold [2]: E	LOS [2]
H	**Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound**											
	Ala Moana Boulevard	3	1,420	C	3	1,730	**	310	1,920	2,340	2,460	C
	Kalākaua Avenue	2	1,050	D	2	1,080	**	**	1,020	1,480	1,560	D
	McCully Street (NB)	2	1,140	D	2	1,160	**	**	1,020	1,480	1,560	D
	Date Street	1	580	D	1	710	**	**	440	700	740	E
	Kapi‘olani Boulevard	3	1,260	C*	3	1,320	**	**	1,590	2,230	2,350	C*
	Old Wai‘alae Road	3	1,160	C*	3	1,230	**	**	1,900	2,670	2,810	C*
	Dole Street	2	670	C*	2	690	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	3	5,500	E	3	5,970	1,620	2,630	3,800	4,920	5,590	F
	Total		*12,780*	*D*		*13,890*						*E*
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound											
	Ala Moana Boulevard	3	1,570	C	3	1,750	**	310	1,920	2,340	2,460	C
	Kalākaua Avenue	3	1,870	D	3	1,990	**	**	1,590	2,230	2,350	D
	McCully Street (SB)	2	870	C*	2	920	**	**	1,020	1,480	1,560	C*
	Date Street	2	640	C*	2	750	**	**	1,020	1,480	1,560	C*
	Kapi‘olani Boulevard	2	2,140	F	2	2,280	**	**	1,020	1,480	1,560	F
	S King Street	2	2,400	F	2	2,370	**	**	1,020	1,480	1,560	F
	Dole Street	2	960	C*	2	1,000	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	3	5,890	F	3	6,550	1,620	2,630	3,800	4,920	5,590	F
	Total		*16,340*	*E*		*17,610*						*E*

[1] Peak-hour traffic count data was obtained from the Hawai‘i Department of Transportation (2005).
[2] LOS thresholds were adapted from the Quality/Level of Service Handbook (FDOT 2002). The handbook provides generalized peak-hour two-way volumes for Florida’s urbanized areas. A directional split of 50% was applied to the two-way volumes to generate the peak-hour direction volume thresholds for the purpose of this analysis.
* The reported LOS "C*" means C or better and "B*" means B or better.
** LOS thresholds not reported due to type of facility.

4.4.2 Highway Traffic Operating Conditions

The operating conditions of a roadway can be represented by a variety of measures, including operating speeds and the density of traffic on the facility. These measures can be used to determine LOS. Speeds are typically a reflection of the amount of congestion on a roadway or its geometric design characteristics. Traffic density is measured in terms of vehicles per mile per lane and is a function of both volumes and speeds. LOS is measured on a grading scale from "A" through "F" for roadway operation; LOS A represents a free flow or excess capacity condition, and LOS F represents more vehicles attempting to use a roadway than its capacity is able to accommodate.

Congested conditions (i.e., LOS E or F) occur during the a.m. and p.m. peak hours on many major roadways, particularly on sections of the H-1 Freeway from the Waiawa Interchange to the UH Mānoa area where stop-and-go conditions are typical. Signalized routes, such as Nimitz Highway, require motorists to wait more than one traffic-signal cycle to clear an intersection during peak periods. To avoid peak-hour congestion, motorists have changed their time of travel, resulting in extended peak traffic conditions. Weekday a.m. and p.m. peak traffic conditions generally last three to four hours each. Weekend traffic during the mid-day also resembles weekday peak-period conditions. Honolulu was recently ranked as having the worst travel time loss due to congestion in the U. S., with peak-period trips taking an average of 47 percent longer as a result of congestion (HSB 2008).

Recent traffic counts for the corridor indicate that existing travel conditions are congested during the a.m. peak period for Koko Head-bound traffic crossing Kalauao Stream in Pearl City (LOS F) and Kapālama Canal near Downtown (LOS F). These conditions are also indicated by estimated travel speeds along the H-1 Freeway in the corridor, as shown in Table 4-13. The table indicates that existing speeds between the Waiawa Interchange and Downtown in the general purpose lanes range from 8 to 39 mph (LOS F). General purpose traffic speeds near Kalauao Stream show a slight improvement in 2030 due to the planned addition of lanes in that area.

Table 4-13: 2007 and 2030 A.M. Peak Period Speeds and Level-of-Service on H-1 Freeway

Location	2007 Existing		2030 No Build[2]	
	Average Speed (mph)	Level-of-Service[1]	Average Speed (mph)	Level-of-Service[1]
Waiawa Interchange—Koko Head-Bound				
General purpose traffic	18	F	20	F
HOV lane traffic	22	F	24	F
Zipper lane traffic	33	F	50[3]	D
Kalauao Stream—Koko Head-Bound				
General purpose traffic	30	F	28	F
HOV lane traffic	38	E	32	F
Zipper lane traffic	39	F	50[3]	D
East of Middle Street Merge—Koko Head-Bound				
General purpose traffic	8	F	19	F
Liliha Street—Koko Head-Bound				
General purpose traffic	23	F	15	F
East of Ward Avenue—‘Ewa-Bound				
General purpose traffic	18	F	16	F
West of University Avenue—‘Ewa-Bound				
General purpose traffic	36	F	33	F

[1]Level-of-service is calculated based on vehicle density, a function of traffic volume and speed.
[2]Assumes completion of ORTP roadway projects.
[3]Zipper lane reflects occupancy requirements of 3 or more in 2030.

4.5 Effects on Parking, Bike, and Pedestrian Facilities and on Freight Movements

Other than improvements identified in the ORTP, the No Build Alternative would not directly affect bicycle, pedestrian, parking, or freight movement. However, these features would be affected by the continued increase in population, background traffic, and roadway delay that is expected with this alternative.

5 Future Build Alternatives Conditions and Performance

This chapter discusses conditions and effects of the Build Alternatives and compares these to the No Build Alternative, as well as transit user benefits by various travel markets and at the geographic level. This assessment of the future transportation effects (year 2030) of the Build Alternatives includes potential phasing of the alternatives, such as an airport spur that could be built as a phase of the Airport & Salt Lake Alternative. The following issues were examined:

- Travel patterns
- Transit effects, including changes affecting mobility, reliability, access, equity, and transit user benefits
- Street and highway effects, including operating conditions that would result from the fixed guideway system and physical effects of the guideway's components
- Parking, including effects of traffic conditions at guideway stations with park-and-ride access, on and off street parking eliminated due to placement of the fixed guideway columns, and spillover parking
- Freight movement
- Bike and pedestrian movement/access
- Park-and-Ride Facility Analysis

5.1 Transportation Conditions

The Build Alternatives include all transportation improvements outlined in the 2030 ORTP including the construction of a fixed guideway transit system that would operate between East Kapolei and Ala Moana Center.

5.2 Travel Patterns

This section identifies general travel patterns resulting from the Build Alternatives compared to the No Build Alternative. The results presented are from the travel demand forecasting model used to assess potential transportation effects.

5.2.1 Daily Person Trips

Table 5-1 identifies daily person trips for 2030 No Build and Build Alternatives. Approximately 4.0 million person trips are projected under each alternative.

Table 5-1: Islandwide Mode Splits—2030 No Build and Build Alternative Conditions

Mode	No Build Alternative		Salt Lake Alternative		Airport Alternative		Airport & Salt Lake Alternative	
	Daily Trips	Percent	Daily Trips	Percent	Daily Trips	Percent	Daily Trips	Percent
Resident Trips								
Private Automobile	2,814,600	82%	2,773,600	80%	2,771,800	80%	2,772,700	80%
Transit	205,700	6%	247,400	7%	249,200	7%	248,200	7%
Bike/Walk	432,400	13%	431,600	13%	431,600	13%	431,600	13%
Total Daily Resident Trips	*3,452,700*		*3,452,600*		*3,452,600*		*3,452,500*	
Visitor Trips								
Private Automobile	160,100	37%	158,500	37%	158,100	37%	158,100	37%
Transit	19,800	5%	22,900	5%	23,700	6%	23,700	6%
Taxi	9,700	2%	9,600	2%	9,600	2%	9,600	2%
Tour Bus	77,500	18%	76,600	18%	76,400	18%	76,400	18%
Bike/Walk	163,600	38%	163,600	38%	163,600	38%	163,600	38%
Total Daily Visitor Trips	*430,700*		*431,200*		*431,400*		*431,400*	
Other Trips								
Trips by Truck	*51,600*	*33%*	*51,600*	*33%*	*51,600*	*33%*	*51,600*	*33%*
Ground access trips by air passengers	*103,900*	*67%*	*103,900*	*67%*	*103,900*	*67%*	*103,900*	*67%*
Total Other Trips	*155,500*		*155,500*		*155,500*		*155,500*	
Total Daily Trips (All)	*4,038,900*		*4,039,300*		*4,039,500*		*4,039,400*	

Source: O'ahuMPO Travel Demand Forecasting Model.
Rounded to nearest hundred
Percentages may not equal 100 due to rounding.

5.2.2 Mode of Travel

Table 5-1 presents systemwide mode share projections for the 2030 No Build Alternative and Build Alternatives for resident and visitor trips. Overall, the introduction of a fixed guideway system would result in a shift in some demand from automobiles to transit. Furthermore, Table 5-1 shows that for the Build Alternatives, automobile use for resident trips would decrease by 2 percent and transit trips would increase by 1 percent. This shift in demand equates to an increase of approximately 43,500 daily transit trips for the Airport Alternative, 41,700 daily transit trips for the Salt Lake Alternative, and 42,500 daily transit trips for the Airport & Salt Lake Alternative.

The increase in daily transit trips between No Build and Build Alternatives also affects traffic volumes. With the Build Alternatives, daily vehicle trips would decrease by approximately 40,000 compared to the No Build Alternative.

Visitor transit trips would increase for all Build Alternatives with the Airport Alternative and Airport & Salt Lake Alternative showing the highest gains over the No Build Alternative.

Section 5.4 further describes changes in transit demand between No Build Alternative and Build Alternatives.

5.2.3 VMT, VHT, and VHD

This section identifies changes in vehicle demand and delay between the No Build and Build Alternatives. Vehicle demand includes VMT, VHT, and (VHD. This information is provided for all types of roadways on O‘ahu. As shown in Table 5-2 the three Build Alternatives would have positive effects on traffic, as measured by a reduction in VMT, VHT and VHD over the 2030 No Build Alternative.

Table 5-2 shows VMT statistics for No Build and Build Alternatives. Under any of the Build Alternatives, VMT would decline by 480,000 to 497,000 daily VMT, depending on the alternative. This decrease represents a 4 percent reduction compared to the No Build Alternative. Freeways and arterials would experience the greatest reductions in VMT.

Table 5-2 also shows VHT for the Build Alternatives. With any of the Build Alternatives, the VHT would decrease systemwide by approximately 30,000 daily hours (7 percent) over the 2030 No Build Alternative.

VHD would decrease systemwide by approximately 23,000 daily hours (22 percent) compared with the 2030 No Build Alternative. The Airport Alternative would experience the greatest decline in VHD, 24,000 daily hours (23 percent). The Airport & Salt Lake Alternative would decrease the VHD by approximately 23,000 daily hours (22 percent), and the Salt Lake Alternative would decrease the VHD by approximately 22,000 daily hours (21 percent) over 2030 No Build Alternative conditions. Freeways and arterials would experience the greatest reductions in daily VHD.

Table 5-2: Systemwide Daily Travel

Alternative	Vehicle Miles Traveled (VMT)	Vehicle Hours Traveled (VHT)	Vehicle Hours of Delay (VHD)
No Build			
Freeways	6,255,000	166,000	63,000
Highways	1,407,000	27,000	3,000
Arterials	4,122,000	135,000	17,000
Collectors	1,520,000	63,000	12,000
Local	279,000	24,000	11,000
Total	**13,583,000**	**415,000**	**106,000**
Salt Lake			
Freeways	6,000,000	151,000	49,000
Highways	1,387,000	26,000	3,000
Arterials	3,960,000	127,000	13,000
Collectors	1,480,000	61,000	11,000
Local	269,000	20,000	8,000
Total	**13,096,000**	**385,000**	**84,000**
Percent Change from No Build	-4%	-7%	-21%
Airport			
Freeways	5,995,000	151,000	47,000
Highways	1,386,000	26,000	3,000
Arterials	3,957,000	127,000	13,000
Collectors	1,479,000	61,000	11,000
Local	269,000	20,000	8,000
Total	**13,086,000**	**385,000**	**82,000**
Percent Change from No Build	**-4%**	**-7%**	**-23%**
Airport & Salt Lake			
Freeways	6,006,000	151,000	47,000
Highways	1,386,000	26,000	3,000
Arterials	3,961,000	127,000	13,000
Collectors	1,481,000	61,000	11,000
Local	269,000	21,000	9,000
Total	**13,103,000**	**386,000**	**83,000**
Percent Change from No Build	**-4%**	**-7%**	**-22%**

Source: O‘ahuMPO Travel Demand Forecasting Model.
Rounded to nearest thousand.

5.2.4 Reverse Commute Markets

Improved access to West Oʻahu communities would also address reverse commute markets and commuting to jobs in other regions. The fixed guideway service provided under the Build Alternatives would support and reinforce land use plans associated with the development of Oʻahu's planned "Second City" in Kapolei. With an almost four-fold increase in employment estimated by 2030 for Kapolei, the quick and direct access provided by the fixed guideway system from PUC Development Plan area locations, such as Downtown and Kakaʻako, would help address the demand of future reverse commute markets. These markets include existing and planned City and County and State administrative offices and the future UH West Oʻahu campus.

Based on transit travel forecasts, about 20 percent of fixed guideway ridership during the a.m. two-hour peak period would be in the ʻEwa-bound direction. The estimated a.m. peak period demand along the fixed guideway is described in Section 5.5. The demand patterns indicate that even with a dominant demand in the Koko Head direction during this period reverse commuting in the ʻEwa direction would be occurring on the guideway service, which demonstrates that the Project supports the goal of improving access to planned development and a second urban center.

Table 5-3 shows transit trips during the a.m. two-hour peak period for the 2030 No Build and Build Alternatives. With quick transit access provided to emerging employment centers, the Build Alternatives support enhanced transportation equity. Of the reverse commute transit trips with destinations in Kapolei and ʻEwa, 54 to 55 percent originate from low-income communities. (See Appendix D for a.m. two-hour peak period district to district transit trips.)

Table 5-3: Reverse Commute Trips to Kapolei and ʻEwa—2030 No Build and Build Alternatives

Alternative	Trips from Low Income Areas	Total Reverse Commute Trips	Percent
Salt Lake Alternative	620	1145	54%
Airport Alternative	610	1135	54%
Salt Lake & Airport Alternative	635	1145	55%

5.2.5 Service to Transit-Dependent Households

Under the Build Alternatives, transit travel time benefits would occur for several communities with high concentrations of transit-dependent households (Figure 5-1). The transit-dependent communities are those with higher than average numbers of households without vehicles or residents who are unable to drive. There would be substantial travel time benefits for transit-dependent communities such as Waipahu, West Loch, Waikīkī, Chinatown, and Makakilo.

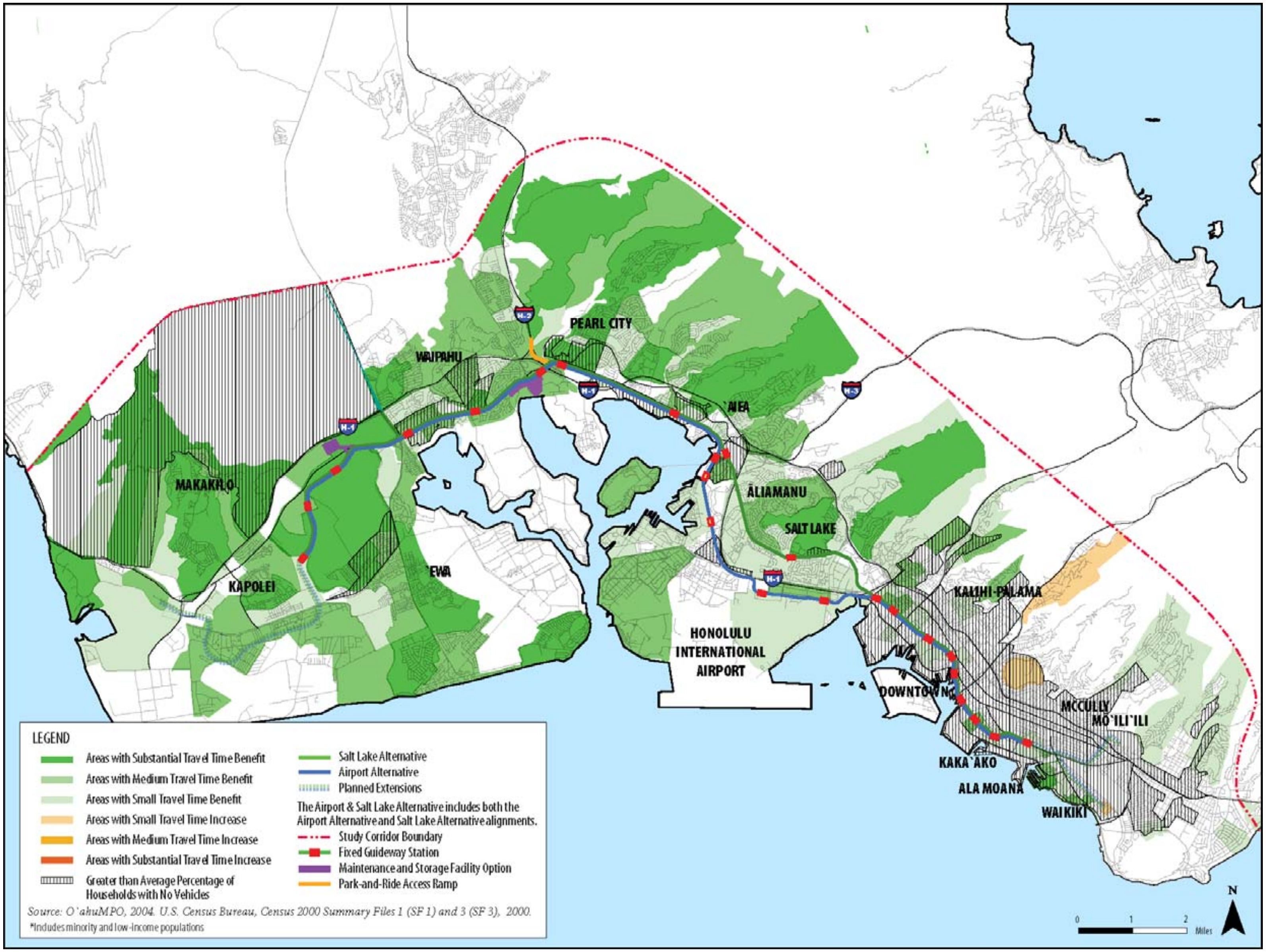


Figure 5-1: Transit-Dependent Households

5.2.6 Effects on Future Auto Travel Times

This section describes the effects of the Build Alternatives on future auto travel times in the study corridor.

Future auto travel times in the corridor would improve under any of the Build Alternatives, both compared to the No Build Alternative and compared to today. Table 5-4 shows projected travel times between common destinations in the corridor, comparing the 2007 Base Year and the 2030 No Build and Build Alternatives.

The improved auto travel times are primarily due to a reduction in traffic volumes along the main east-west highways serving the study corridor, such as H-1. By 2030 more than 40,000 new daily transit riders using the fixed guideway system results in a reduction in daily and two-hour peak-period traffic volumes, which in turn improves auto travel times. Auto travel time reductions during the a.m. two-hour peak period typically range from 6 to 27 percent, depending on the origin and destination. Some locations, such Waipahu to Downtown, would see a reduction in auto travel time from 66 minutes under the No Build Alternative to 52 or 53 minutes under the Build Alternatives. Even compared to today, the Project would result in a 10 percent reduction in average auto travel time (58 minutes today down to 52 or 53 minutes in 2030).

Table 5-4: A.M. Peak-Period Auto Travel Times in 2007, 2030 No Build and Build Alternatives (in minutes)

Alternative	From Wai'anae to Downtown	From Kapolei to Downtown	From 'Ewa to Downtown	From Waipahu to Downtown	From Mililani Mauka to Downtown	From Pearlridge Center to Downtown	From Downtown to Ala Moana Center	From Downtown to Waikīkī	From Downtown to UH Mānoa	From Airport to Waikīkī	From Waipahu to Waikīkī	From Downtown to Kapolei	From Wai'anae to UH Mānoa	From Kapolei to Ala Moana Center	From 'Ewa to Pearl Harbor	From 'Ewa to Salt Lake	From Salt Lake to Downtown	From 'Ewa to Airport	From Airport to Downtown
2007 Base Year																			
Auto Travel Time	100	89	88	58	84	35	14	19	18	35	69	32	109	94	71	76	26	75	25
2030 No Build																			
Auto Travel Time	99	91	93	66	89	37	13	20	18	37	77	32	115	102	80	85	25	86	26
% Change from 2007 Base Year	-1%	2%	6%	14%	6%	5%	-7%	5%	0%	6%	12%	0%	6%	9%	13%	12%	-4%	15%	4%
2030 Salt Lake Alternative																			
Auto Travel Time	91	82	84	53	84	30	13	19	17	33	63	31	100	87	67	75	21	72	20
% Change from 2030 No Build	*-8%*	*-10%*	*-10%*	*-20%*	*-6%*	*-19%*	*0%*	*-5%*	*-6%*	*-11%*	*-18%*	*-3%*	*-13%*	*-15%*	*-16%*	*-12%*	*-16%*	*-16%*	*-23%*
2030 Airport Alternative																			
Auto Travel Time	90	81	83	52	84	30	13	19	17	33	63	31	99	86	66	75	21	72	20
% Change from 2030 No Build	*-9%*	*-11%*	*-11%*	*-21%*	*-6%*	*-19%*	*0%*	*-5%*	*-6%*	*-11%*	*-18%*	*-3%*	*-14%*	*-16%*	*-18%*	*-12%*	*-16%*	*-16%*	*-23%*
2030 Airport & Salt Lake Alternative																			
Auto Travel Time	91	82	84	53	84	30	13	19	17	33	63	31	100	87	67	76	22	72	20
% Change from 2030 No Build	-8%	-10%	-10%	-20%	-6%	-19%	0%	-5%	-6%	-11%	-18%	-3%	-13%	-15%	-16%	-12%	-16%	-16%	-23%

Source: O'ahuMPO Travel Demand Forecasting Model

5.3 Effects on Transit

This section describes the effects of the Build Alternatives on various transit factors including mobility, accessibility, reliability, and equity.

5.3.1 Transit Performance

The following sections describe transit performance characteristics that would occur under the Build Alternatives.

Transit System Speed

Transit riders would experience substantially reduced travel times under the Build Alternatives compared to existing conditions and the No Build Alternative. Shorter travel times reflect faster systemwide transit speeds. Bus speeds have gradually declined over the past several years and would continue to decline under the No Build Alternative as a result of growth in traffic congestion and the lack of exclusive right-of-way for transit vehicles. However, the fixed guideway operations would provide faster service compared to bus-only operations. Figure 5-2 compares system-level transit speeds for the No Build and Build Alternatives. Table 5-5 lists transit speeds for 2007 and the No Build and Build Alternatives at selected locations. As a result of the increased transit speeds, major reductions in transit travel times would occur for several major markets such as between Downtown Honolulu and developing areas in ‘Ewa.

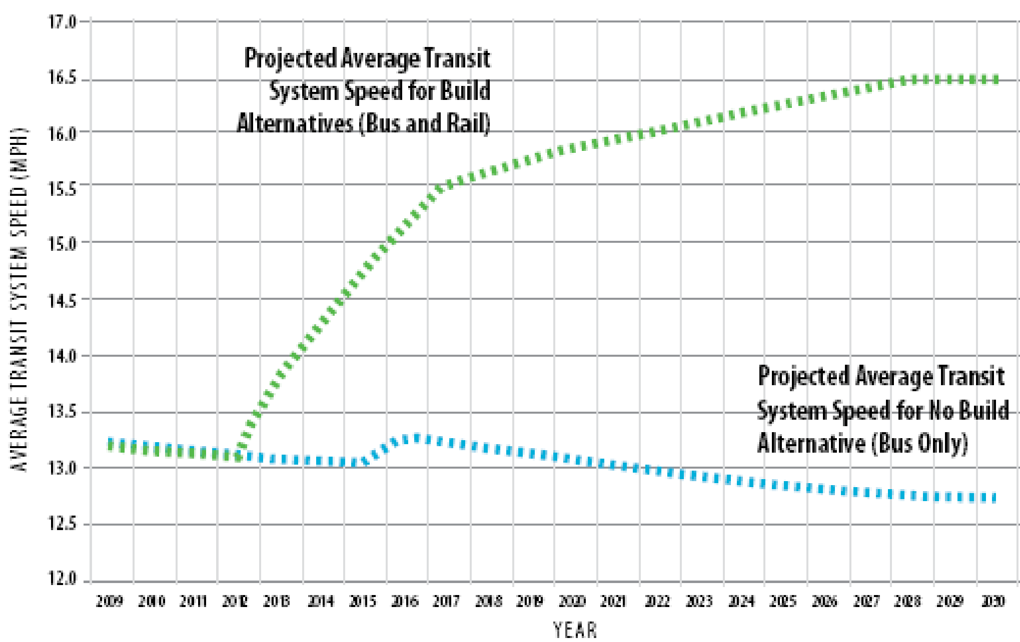


Figure 5-2: Transit Average Operating Speeds in Miles per Hour—2030 No Build and Build Alternatives

Table 5-5: AM Two-Hour Peak Period Transit Vehicle Speeds (in miles per hour)

Alternative	Kapolei to Downtown	‘Ewa to Downtown	Waipahu to Downtown	Mililani Mauka to Downtown	Pearlridge Center to Downtown	Downtown to Ala Moana Center	Waipahu to Waikīkī
2007 Base Year	19	15	19	20	15	13	17
2030 No Build Alternative	19	15	19	18	13	10	17
2030 Salt Lake Alternative	29	23	33	30	31	24	25
2030 Airport Alternative	28	22	32	30	29	24	25
2030 Airport & Salt Lake Alternative	29	23	33	31	31	24	25

Figure 5-3 shows 2007 and 2030 travel times between selected locations. The information represents the time required to complete a trip from its origin to destination, and assumes at least a portion of the trip is made on the fixed guideway system. Travel time information for 2030 is presented for the No Build Alternative and the Build Alternatives.

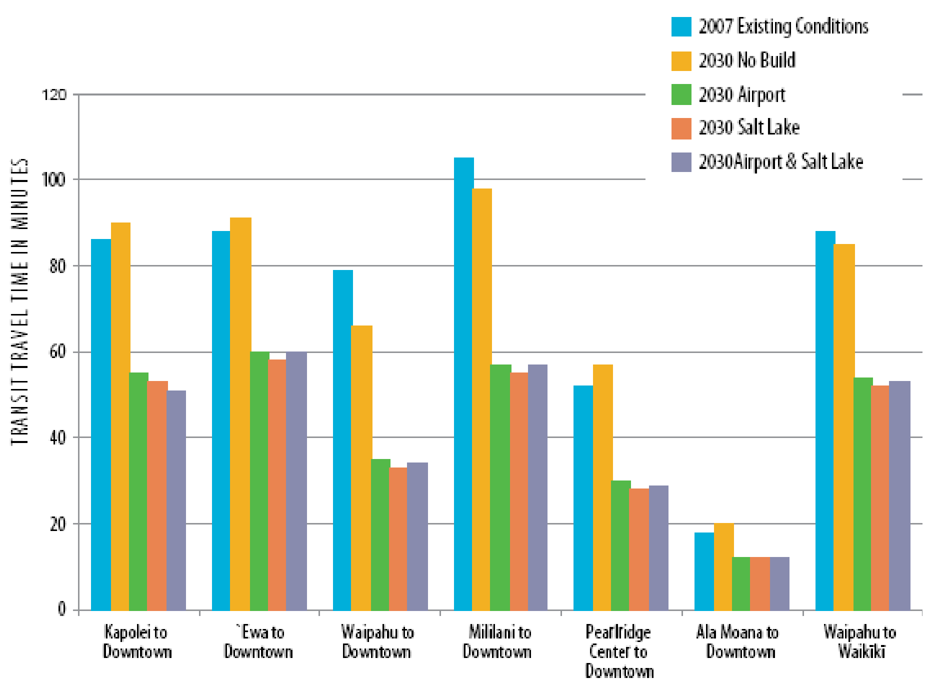


Figure 5-3: A.M. Peak-Period Transit Travel Times

Source: O‘ahuMPO Travel Demand Forecasting Model

As demand increases, once the fixed guideway system is built, service will gradually be expanded with more frequent and longer trains. Therefore, the overall average transit speed will continue to increase. In addition, locations such as Mililani and Waikīkī, which are not along the alignment, would still experience substantial travel time reductions when using the fixed guideway. For example, residents in Mililani and other central O‘ahu communities could use local buses and transfer to the fixed guideway at the Pearl Highlands Station. Even with this transfer, the difference in travel times between the Build Alternatives and No Build Alternative for the Mililani to Downtown trip is the largest for the travel markets identified in Figure 5-3.

Station-to-station travel times are shown in Table 5-6. Since the fixed guideway system operates independently from traffic, these times would remain constant at all times of the day, offering certainty and reliability for riders. For example, the travel time between the East Kapolei Station and UH West O‘ahu Station is only 2 minutes and would not be affected by traffic congestion on roadways. The travel time from East Kapolei to Pearlridge Station is the sum of the travel times in between, or 18 minutes along a heavily traveled corridor.

The estimated improvements in transit travel times with the Build Alternatives address a major issue for bus service on O‘ahu. Bus speeds have gradually declined over the past several years, and would continue to decline under the No Build Alternative as a result of continued growth in traffic congestion and the lack of exclusive right-of-way for transit vehicles.

Table 5-6: Station-to-Station Travel Times

Station to Station		Travel Time Between Stations (in minutes, including dwell time)			
		Salt Lake Alternative	Airport Alternative	Airport & Salt Lake Alternative	
				Salt Lake Segment	Airport Segment
East Kapolei	UH West O'ahu	2	2	2	2
UH West O'ahu	Ho'opili	4	4	4	4
Ho'opili	West Loch	2	2	2	2
West Loch	Waipahu TC	3	3	3	3
Waipahu TC	Leeward CC	2	2	2	2
Leeward CC	Pearl Highlands	1	1	1	1
Pearl Highlands	Pearlridge	4	4	4	4
Pearlridge	Aloha Stadium SL	2	n/a	2	n/a
Aloha Stadium SL	Ala Liliko'i	4	n/a	4	n/a
Ala Liliko'i	Middle Street	4	n/a	4	n/a
Pearlridge	Aloha Stadium KH	n/a	3	n/a	n/a
Pearlridge	Arizona Memorial	n/a	n/a	n/a	3
Aloha Stadium KH	Pearl Harbor	n/a	2	n/a	n/a
Arizona Memorial	Pearl Harbor	n/a	n/a	n/a	2
Pearl Harbor	Airport	n/a	3	n/a	3
Airport	Lagoon Drive	n/a	2	n/a	2
Lagoon Drive	Middle Street	n/a	2	n/a	2
Middle Street	Kalihi	2	2	2	2
Kalihi	Kapālama	2	2	2	2
Kapālama	Iwilei	2	2	2	2
Iwilei	Chinatown	1	1	1	1
Chinatown	Downtown	1	1	1	1
Downtown	Civic Center	1	1	1	1
Civic Center	Kaka'ako	1	1	1	1
Kaka'ako	Ala Moana	2	2	2	2
Total Travel Time		*40*	*42*	*40*	*42*

Source: O'ahuMPO Travel Demand Forecasting Model

TC—Transit Center, CC—Community College, SL—Salt Lake Boulevard, KH—Kamehameha Highway

Transit Service Reliability

Future transit service reliability is highly influenced by the extent of vehicles operating in exclusive right-of-way. Under the No Build Alternative, express bus routes would operate in the a.m. and p.m. roadway zipper lanes and in HOV lanes. However, these lanes are not exclusively reserved for transit operations. Therefore, the No Build Alternative does not provide any additional exclusive right-of-way for transit vehicles along major highways that could enhance transit service reliability.

In contrast, each Build Alternative would be constructed entirely on an exclusive right-of-way facility. Since fixed guideway vehicles would be completely separated from roadway traffic operations, the Build Alternatives would provide substantially higher transit service reliability compared to the No Build Alternative. With this separation of the guideway service from general traffic, its reliability would not deteriorate over time, even with the projected growth in population and employment in the study corridor. Providing separation between the guideway system and general traffic would address the gradual deterioration of service reliability with the No Build Alternative.

The bus network would also be restructured to provide access from surrounding communities to the fixed guideway with more frequent bus service. Bus routes serving guideway stations would typically be shorter and would operate in less congested residential communities. These operations would help maintain service reliability compared to operations of longer-distance routes.

Providing this separation between the guideway system and general traffic would address the gradual deterioration of service reliability. Bus service on O‘ahu has been experiencing a decline in service reliability, and this decline is predicted to continue under 2030 No Build conditions.

5.3.2 Access to Fixed Guideway Stations

With the Build Alternatives, overall accessibility to transit would be enhanced. Results from the travel demand forecasting model indicate that the Build Alternatives would attract substantial ridership via local bus access and from people walking to stations. Table 5-7 summarizes daily trips by mode of access at each fixed guideway station under each Build Alternative.

Although some drive access is projected at outlying stations such as East Kapolei, the predominant forms of access for any of the Build Alternatives would be by local bus and walking. At the terminus stations, bus egress would be the most common mode.

Table 5-7: Mode of Access to Fixed Guideway Stations

Station	Daily Person Trips using Guideway Stations—Volumes and Share by Access Mode (2030)										
	Walk	% Share	Bus	% Share	Kiss & Ride	% Share	Formal Park & Ride	% Share	Spillover Parking	% Share	Total
Salt Lake Alternative											
East Kapolei	595	6%	8,170	76%	300	3%	1,730	16%	-	0%	10,795
UH West O‘ahu	665	7%	7,965	82%	225	2%	843	9%	-	0%	9,698
Ho‘opili	600	22%	1,830	67%	130	5%	-	0%	155	6%	2,715
West Loch	980	13%	5,535	74%	305	4%	-	0%	680	9%	7,500
Waipahu Transit Center	690	18%	2,770	72%	115	3%	-	0%	255	7%	3,830
Leeward Community College	445	88%	-	0%	25	5%	-	0%	35	7%	505
Pearl Highlands	2,475	16%	9,635	60%	560	4%	3,263	20%	-	0%	15,933
Pearlridge	305	5%	5,275	86%	190	3%	-	0%	330	5%	6,100
Aloha Stadium (Salt Lake)	270	14%	800	40%	10	1%	897	45%	-	0%	1,977
Ala Liliko‘i	655	12%	4,200	78%	205	4%	-	0%	320	6%	5,380
Middle Street	155	6%	2,480	88%	80	3%	-	0%	100	4%	2,815
Kalihi	1,060	26%	2,735	68%	105	3%	-	0%	115	3%	4,015
Kapālama	455	69%	-	0%	75	11%	-	0%	130	20%	660
Iwilei	275	10%	1,690	64%	285	11%	-	0%	400	15%	2,650
Chinatown	765	99%	-	0%	10	1%	-	0%	-	0%	775
Downtown	580	21%	2,130	77%	40	1%	-	0%	-	0%	2,750
Civic Center	1,230	98%	-	0%	30	2%	-	0%	-	0%	1,260
Kaka‘ako	955	94%	45	4%	20	2%	-	0%	-	0%	1,020
Ala Moana Center	740	9%	5,930	74%	500	6%	-	0%	830	10%	8,000
Total	*13,895*	*16%*	*61,190*	*69%*	*3,210*	*4%*	*6,733*	*8%*	*3,350*	*4%*	*88,378*

Table 5-7: Mode of Access to Fixed Guideway Station (continued)

Station	Walk	% Share	Bus	% Share	Kiss & Ride	% Share	Formal Park & Ride	% Share	Spillover Parking	% Share	Total
	Daily Person Trips using Guideway Stations—Volumes and Share by Access Mode (2030)										
Airport Alternative											
East Kapolei	600	5%	8,290	76%	295	3%	1,730	16%	-	0%	10,915
UH West O‘ahu	675	7%	8,110	82%	230	2%	840	9%	-	0%	9,855
Ho‘opili	310	12%	1,920	76%	130	5%	-	0%	155	6%	2,515
West Loch	980	13%	5,550	74%	300	4%	-	0%	670	9%	7,500
Waipahu Transit Center	700	18%	2,825	72%	115	3%	-	0%	260	7%	3,900
Leeward Community College	450	87%	-	0%	25	5%	-	0%	40	8%	515
Pearl Highlands	2,530	16%	9,780	61%	560	3%	3,185	20%	-	0%	16,055
Pearlridge	350	5%	5,600	88%	160	3%	-	0%	265	4%	6,375
Aloha Stadium (Kamehameha Highway)	490	16%	885	28%	85	3%	1,650	53%	-	0%	3,110
Pearl Harbor	910	34%	1,515	57%	100	4%	-	0%	145	5%	2,670
Airport	810	39%	1,165	57%	30	1%	-	0%	50	2%	2,055
Lagoon Drive	420	16%	2,010	77%	70	3%	-	0%	100	4%	2,600
Middle Street	190	6%	2,565	87%	80	3%	-	0%	115	4%	2,950
Kalihi	1,240	25%	3,415	70%	115	2%	-	0%	120	2%	4,890
Kapālama	540	72%	-	0%	75	10%	-	0%	135	18%	750
Iwilei	600	18%	1,950	60%	285	9%	-	0%	420	13%	3,255
Chinatown	910	99%	-	0%	10	1%	-	0%	-	0%	920
Downtown	635	20%	2,465	78%	45	1%	-	0%	-	0%	3,145
Civic Center	1,310	97%	-	0%	35	3%	-	0%	-	0%	1,345
Kaka‘ako	1,040	89%	100	9%	25	2%	-	0%	-	0%	1,165
Ala Moana Center	785	9%	7,045	77%	515	6%	-	0%	855	9%	9,200
Total	*16,475*	*17%*	*65,190*	*68%*	*3,285*	*3%*	*7,405*	*8%*	*3,330*	*3%*	*95,685*

Table 5-7: Mode of Access to Fixed Guideway Station (continued)

Station	Daily Person Trips using Guideway Stations—Volumes and Share by Access Mode (2030)										
	Walk	% Share	Bus	% Share	Kiss & Ride	% Share	Formal Park & Ride	% Share	Spillover Parking	% Share	Total
Airport & Salt Lake Alternative											
East Kapolei	595	6%	8,105	76%	300	3%	1,725	16%	-	0%	10,725
UH West O‘ahu	665	7%	7,965	82%	225	2%	850	9%	-	0%	9,705
Ho‘opili	605	22%	1,875	68%	125	5%	-	0%	155	6%	2,760
West Loch	965	13%	5,455	74%	290	4%	-	0%	660	9%	7,370
Waipahu	690	18%	2,760	73%	110	3%	-	0%	245	6%	3,805
LCC	445	88%	-	0%	25	5%	-	0%	35	7%	505
Pearl Highlands	2,490	16%	9,530	60%	545	3%	3,325	21%	-	0%	15,890
Pearlridge	340	6%	5,275	86%	185	3%	-	0%	340	6%	6,140
Aloha Stadium (Salt Lake)	5	1%	330	33%	-	0%	660	66%	-	0%	995
Ala Liliko‘i	580	15%	3,030	78%	100	3%	-	0%	175	5%	3,885
Arizona Memorial	440	58%	125	16%	-	0%	195	26%	-	0%	760
Pearl Harbor	1,150	49%	870	37%	125	5%	-	0%	185	8%	2,330
Airport	705	96%	10	1%	10	1%	-	0%	10	1%	735
Lagoon	325	77%	85	20%	5	1%	-	0%	5	1%	420
Middle Street	180	6%	2,680	87%	80	3%	-	0%	125	4%	3,065
Kalihi	1,210	25%	3,375	70%	115	2%	-	0%	130	3%	4,830
Kapālama	525	71%	-	0%	75	10%	-	0%	135	18%	735
Iwilei	325	11%	2,035	66%	305	10%	-	0%	425	14%	3,090
Chinatown	365	99%	-	0%	5	1%	-	0%	-	0%	370
Downtown	625	21%	2,370	78%	40	1%	-	0%	-	0%	3,035
Civic Center	1,290	98%	-	0%	30	2%	-	0%	-	0%	1,320
Kaka‘ako	1,030	89%	100	9%	25	2%	-	0%	-	0%	1,155
Ala Moana Center	785	8%	7,155	77%	500	5%	-	0%	850	9%	9,290
Total	*16,335*	*18%*	*63,130*	*68%*	*3,220*	*3%*	*6,755*	*7%*	*3,475*	*4%*	*92,915*

Escalators and elevators would be available at each station. Access to stations would also be enhanced by accommodating bicyclists and pedestrians. The guideway system would encourage access by bicycles since several stations would be located at or near existing or planned bike facilities (see Section 5.10). Also, each station would have facilities for parking bikes, and each guideway transit vehicle would be designed to accommodate bikes during off peak hours. Sidewalks and crosswalks are available in stations areas or would become available as streets and sidewalks are built in developing areas.

The dominance of local buses and walking to access the fixed guideway system indicates that overall accessibility would be broad. This would be especially beneficial for those who do not have access to an automobile.

5.3.3 Transfers

A major feature of O‘ahu’s existing transit service is reliance on transit centers as major transfer points. The transfer rate in 2007 was 37 percent and the estimated rate for the 2030 No Build Alternative would be 39 percent (or about 1.4 bus rides or segments per transit trip).

With any of the Build Alternatives, the rate of transfers would be higher than with the No Build Alternative due to proposed changes in local bus service to provide access to the fixed guideway system. Some existing routes, including peak-period express service, would be altered to avoid duplication with the fixed guideway system. Some local routes would also be rerouted or reclassified as feeder buses to provide better service to the nearest fixed guideway station. The estimated rate of transfer would range from 64 percent (the Airport & Salt Lake Alternative) to 66 percent (the Salt Lake Alternative), or about 1.6-1.7 transfers per linked trip. Section 5.5.5 provides further information on the effects of Build Alternatives on local bus service.

For some transit trips, single-seat service would be replaced by one requiring a transfer under the Build Alternatives. However, because of the high frequency proposed for the fixed guideway service (3-minute headways during peak periods), those transferring from bus to fixed guideway would experience minimal wait times. Also, overall transit travel times under the Build Alternatives would be less than those under the No Build Alternative. Riders transferring from the guideway service to buses would benefit from improved frequencies on existing bus routes serving stations. Also, several new routes with high frequencies would be provided as feeders to the guideway system. Since these routes would primarily operate in residential areas, they would provide greater reliability versus routes operating along congested arterials. Riders transferring from rail-to-bus would also benefit from coordinated transfers between trains and buses, thereby minimizing wait times.

The use of local feeder service also reflects a high level of accessibility to the fixed guideway system, particularly for those dependent on transit and those who prefer not to use their automobiles to access stations. The fixed guideway system would facilitate the reorientation of the bus system and improve transit service beyond the immediate vicinity of the fixed guideway system.

To facilitate transfers, fixed guideway stations and other major transit hubs would provide such conveniences as covered waiting areas while off-vehicle fare collection would reduce travel and waiting time.

5.3.4 Comfort and Convenience

Frequent service (every 3 to 10 minutes) and long hours of operation (4:00 a.m. to midnight) of the fixed guideway system would minimize wait times and thus provide major conveniences to riders. Also, the service frequency and train *consists* (the number of cars per train) would be designed to better accommodate peak-period/peak-direction rider demand. Comfort for riders would be enhanced by station amenities including covered waiting areas and seats.

For guideway riders, convenience would improve due to enhanced service conditions resulting from the fixed guideway's exclusive right-of-way. Also, for riders who have to stand, the guideway service would provide increased safety as compared to frequent stop-and-go travel that occurs on buses, traveling on uneven roadway surfaces. Because the station platforms are at the same level as the vehicles, it would accommodate quick and easy boardings for all patrons, including those in wheelchairs or with strollers.

5.3.5 Farebox Revenues

The topic of farebox revenues is discussed in Chapter 6, Cost and Financial Analysis, of the Environmental Impact Statement for the Project.

5.3.6 Transit User Benefits

Transit user benefits represent the amount of transit travel time savings that a user would experience with a given Build Alternative compared to the No Build Alternative. This section discusses transit user benefits for the Build Alternatives, compared to what would occur with the No Build Alternative. This includes transit user benefits estimated for various travel markets and at the geographic level.

The main factor in determining benefits is travel time. The user benefits measure is presented in minutes saved, but it is a summary measure that incorporates travel-time changes for all modes. Transit user benefits is an effective way to quantify the four key goals of the Project (improving corridor mobility, improving transportation reliability, improving access to planned development and developing a second urban center, and improving transportation equity).

The system level summary of user benefits is captured by using thematic maps to graphically illustrate the travel time benefits of each alternative for analysis zones islandwide.

Positive Attributes of a Fixed Guideway System

Research indicates there are positive attributes, both perceived and real, associated with the use of a fixed guideway system that make the system more attractive than general bus transit. These benefits include such things as improved safety, security, visibility, ease of use, comfort, and reliability. These factors or attributes are not captured by the standard travel demand forecasting process. To account for these attributes in this user benefit analysis, FTA has approved an additional factor equivalent to a 14.5-minute savings of in-vehicle time (IVT). The factor was incorporated for riders taking the fixed guideway only. A 5.5-minute savings of IVT was incorporated for riders taking feeder buses to the fixed guideway.

This factor is based on information from several regions where existing rail transit service has been a part of the transit system and where these systems have been recently surveyed.

For Build Alternatives, using the travel demand forecasting model, it is estimated that approximately 50,000 hours per weekday would be saved. The reduced travel time for the Build Alternatives as well as other factors would result in higher levels of transit ridership compared to the No Build Alternative. The greater use of the transit system and reduced systemwide vehicle delays compared to the No Build Alternative would result in travel savings for transit users and non-users as well.

Corridor Mobility

The Build Alternatives would increase average transit speeds by approximately 25 percent compared to 2007, leading to higher transit ridership and travel time savings for existing and new transit users. Transit travel times between major destinations would drop by nearly 50 percent compared to the No Build Alternative (Table 5-8). As transit becomes a faster and thus more attractive travel choice, ridership would increase. As shown in Table 5-8, transit ridership would increase by approximately 45,000 trips per day (20 percent) by 2030 with the Build Alternatives compared to the No Build Alternative, and transit users would save up to 16 million or more equivalent hours of travel time per year by 2030.

The transit mobility benefits of the three Build Alternatives would differ. Because it would serve more employment areas, the Airport Alternative is projected to attract more riders and to have higher user benefits than the other two Build Alternatives. Fewer riders would use the Airport & Salt Lake Alternative than the Airport Alternative, because of less frequent service on the Airport alignment under the Airport & Salt Lake Alternative. For travelers from ‘Ewa to Downtown and points farther Koko Head, travel time for the Airport Alternative would be two minutes longer than the Salt Lake Alternative.

Increases in transit ridership would benefit highway users as well, by removing drivers from the roadways through better transit service. The Build Alternatives would reduce traffic congestion and improve mobility compared to the No Build Alternative (Table 5-8). Daily VMT would decrease by 4 percent; VHT would decrease by about 7 percent; and VHD would decrease by 21 to 23 percent, depending on the alternative.

Table 5-8: Transit Travel Time, Transit and Highway Performance—Existing Conditions, No Build and Build Alternatives

Objective	2007 Existing Conditions	Alternative			
		2030 No Build Alternative	2030 Salt Lake Alternative	2030 Airport Alternative	2030 Airport & Salt Lake Alternative
Transit Travel Time (minutes)					
Wai'anae to UH Mānoa	128 minutes	121 minutes (1 transfer)	91 minutes (2 transfers)	93 minutes (2 transfers)	92 minutes (2 transfers)
Kapolei to Ala Moana Center	101 minutes	105 minutes	57 minutes	59 minutes	58 minutes
Transit Performance					
Transit ridership (daily linked trips)	183,500	225,500	270,300	272,800	271,900
Transit user benefits (hours per year)	n/a	n/a	15,239,000	16,081,000	15,704,000
Highway Performance					
Daily islandwide VMT	11,581,000	13,583,000	13,097,000	13,086,000	13,104,000
Daily islandwide VHT	334,000	415,000	386,000	385,000	385,000
Daily islandwide VHD	74,000	106,000	85,000	84,000	83,000

Source: O'ahuMPO Travel Demand Forecasting Model

Transit User Benefits—Selected Major Travel Markets

User benefits, expressed in terms of saved hours per day, can be identified for specific transit travel markets. Table 5-9 shows estimated daily savings for several markets on O'ahu. These savings range from approximately 240 to 340 hours per day for home-based other trips destined to Downtown Honolulu, to almost 3,590 to 3,840 hours per day for home-based work trips to Downtown Honolulu. In addition, there are transit travel time benefits for work trips from 'Ewa and Kapolei, both planned development areas. The cumulative savings of approximately 22,320 to 22,780 hours per day represents just under one-half of the approximately 50,000 estimated total daily user benefits, in hours, resulting from the Project.

As shown in Figure 5-1, there would be substantial travel time savings for communities with high concentrations of transit dependent households. In addition, several markets estimated to experience major user benefits are not located along the guideway route. These include Waikīkī, UH Mānoa, and 'Ewa. The Build Alternatives would still result in savings to users, because residents in these areas could access the guideway via local bus service or park-and-ride facilities. With travel time savings between planned population and employment areas and for transit dependent households, the Project supports each of the four goals.

Table 5-9: Estimated User Benefits Resulting from 2030 Build Alternatives (in Hours per Day Saved)

Key Transit Market*	Salt Lake Alternative	Airport Alternative	Airport & Salt Lake Alternative
Work Trips to Downtown Honolulu	3,840	3,680	3,590
Visitor Trips from Waikīkī	1,050	1,450	1,490
Other Trips to Downtown	340	310	240
Work Trips to Waikīkī	2,830	2,760	2,730
Work Trips to Kalihi	1,640	1,570	1,540
School Trips to UH Mānoa	2,980	2,900	2,900
Work Trips to Kaka‘ako	1,400	1,360	1,330
Work Trips to Mō‘ili‘ili	1,290	1,250	1,220
Work Trips from ‘Ewa	2,620	2,680	2,610
Work Trips from Kapolei	1,420	1,460	1,400
Work Trips from Waipahu	1,860	1,910	1,860
Work Trips from Mililani	1,380	1,450	1,410
Subtotal	*22,650*	*22,780*	*22,320*
Other	26,330	29,120	27,850
Total	*48,980*	*51,900*	*50,170*

Source: O‘ahuMPO Travel Demand Forecasting Model
*Except for *Visitor from Waikīkī*, the markets involve home-based travel.

Corridor Travel Reliability

With the No Build Alternative, travel reliability for both drivers and transit riders would decrease by 2030. Because delay on the system is not predictable from one day to another, reliability for drivers would worsen. The large increase (44 percent) in VHD that would occur with the No Build Alternative includes an element of unpredictability that requires special accommodations in travel planning. Average travel times would increase somewhat under the No Build Alternative, but the impact on reliability would be more dramatic, especially in the morning. Morning drivers will need to allocate more time to account for the possibility that delays would occur. These unknowns make it difficult to estimate a trip’s duration when scheduling appointments.

Transit riders would experience similar decreases in reliability under the No Build Alternative. Problems with turnbacks and schedule adherence already affect the transit system. These reliability factors are expected to get worse in the future as the highway system becomes more congested.

Under the Build Alternatives, reliability for transit riders would increase substantially as trips shift from buses operating on streets in mixed traffic and congested freeways to the fixed guideway, which would provide a predictable travel time. Between 31 and 33 percent of transit trips and between 63 and 65 percent of transit passenger miles would be carried on an exclusive fixed guideway that is not subject to traffic delay (Table 5-10).

With the Build Alternatives, bus passengers would also realize service reliability as a result of route restructuring that replaces long-haul bus routes with shorter local routes integrated with the fixed guideway system. Driver and bus transit reliability would also improve as a result of reduced congestion and delay on the highway.

The transit reliability benefits of the three Build Alternatives differ slightly. The percentage of transit trips carried on the fixed guideway would be slightly greater for the Airport Alternative than for the other Build Alternatives.

Table 5-10: Effectiveness of Alternatives in Improving Corridor Travel Reliability

Objective	2007 Existing Conditions	2030 No Build Alternative	2030 Salt Lake Alternative	2030 Airport Alternative	2030 Airport & Salt Lake Alternative
Percent of transit trips carried on fixed guideway	0%	0%	31%	33%	32%
Percent of transit passenger miles in exclusive right-of-way	3%	4%	63%	65%	64%

Source: O'ahuMPO Travel Demand Forecasting Model

Transit User Benefits—Geographic Areas

System-level user benefits were analyzed using travel time benefits and islandwide analysis zones for each Build Alternative. The user benefits were the same across all Build Alternatives when compared to No Build as shown in Figure 5-4. Each analysis zone was treated as an origin and destination.

The main factor in determining benefits is transit trip travel time. The user-benefits measure is presented in minutes, but is a summary measure that incorporates travel-time changes for all modes. Areas that would experience improved transit trip travel time (e.g., a decrease in estimated travel time) as a result of the Build Alternative considered are shown in green.

Three shades of green are presented to illustrate benefits: (1) small benefits (light green); (2) medium benefits (medium green); and substantial benefits (dark green).

Areas that would experience a disadvantage in travel time are shaded light orange for small increase in time, medium orange for medium increase in time, and red for substantial increases in time.

Areas shaded white would not experience either a benefit or disadvantage as a result of the Build Alternative evaluated, or are not part of the analyzed area (e.g., Ko'olau and Wai'anae Mountains).

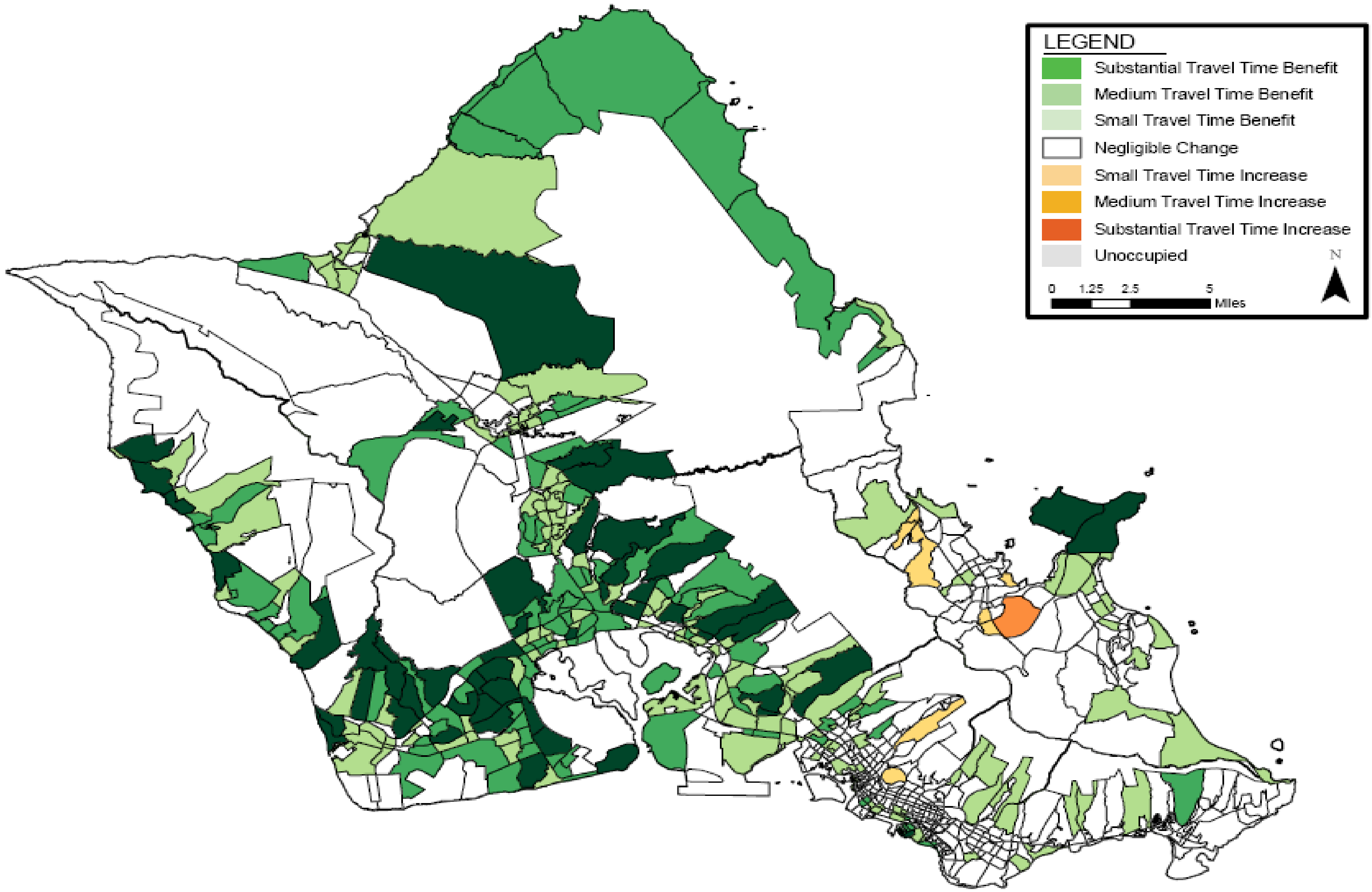


Figure 5-4: Positive User Benefits of the Build Alternatives Compared to No Build Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

Although the difference of positive user benefits between the Build Alternatives was not enough to cause variation in an analysis map, the vast majority of islandwide zones would experience some benefit from each of the Build Alternatives. Concentrations of zones experiencing moderate or major benefits are located in West Oʻahu, ʻAiea/Pearl City, and North Shore/Koʻolauloa.

Exceptions to the islandwide positive benefits of the Build Alternatives are as follows:

- Relatively small zones on Windward Oʻahu in the general vicinity of Kāneʻohe would require more transfers than a similar trip within the corridor under No Build conditions.
- Relatively small areas located mauka of Downtown would be outside easy walking distance to the fixed guideway and not within ready access to frequent bus service.

These disadvantages would occur where there would be a greater need to transfer from these locations, compared to conditions under the No Build Alternative.

Transit Equity

Equity relates to the fair distribution of a project's benefits and effects, so that no group would carry an unfair burden of a project's negative environmental, social, or economic effects or receive less than a fair share of a project's benefits. This section focuses on considering the following evaluation criteria:

- Population segments benefiting from alternative investments
- Population segments paying for alternative investments
- Net benefits by population segment, compared to needs
- Travel-time savings for transit-dependent populations

Approximately 35 percent of Oʻahu's population currently lives in areas that have concentrations of communities of concern. This includes minority, low-income, transit-dependent, and linguistically isolated households (Figure 5-5).

A majority of these areas containing communities of concern are concentrated within the study corridor (Figure 5-5). Some of these areas are adjacent to the study corridor. The Project would provide service where the transit need is greatest, connecting areas that have the highest transit dependency, which includes communities of concern. The percentage of the population within communities of concern that would be located within one-half mile of a transit station is shown in Table 5-11.

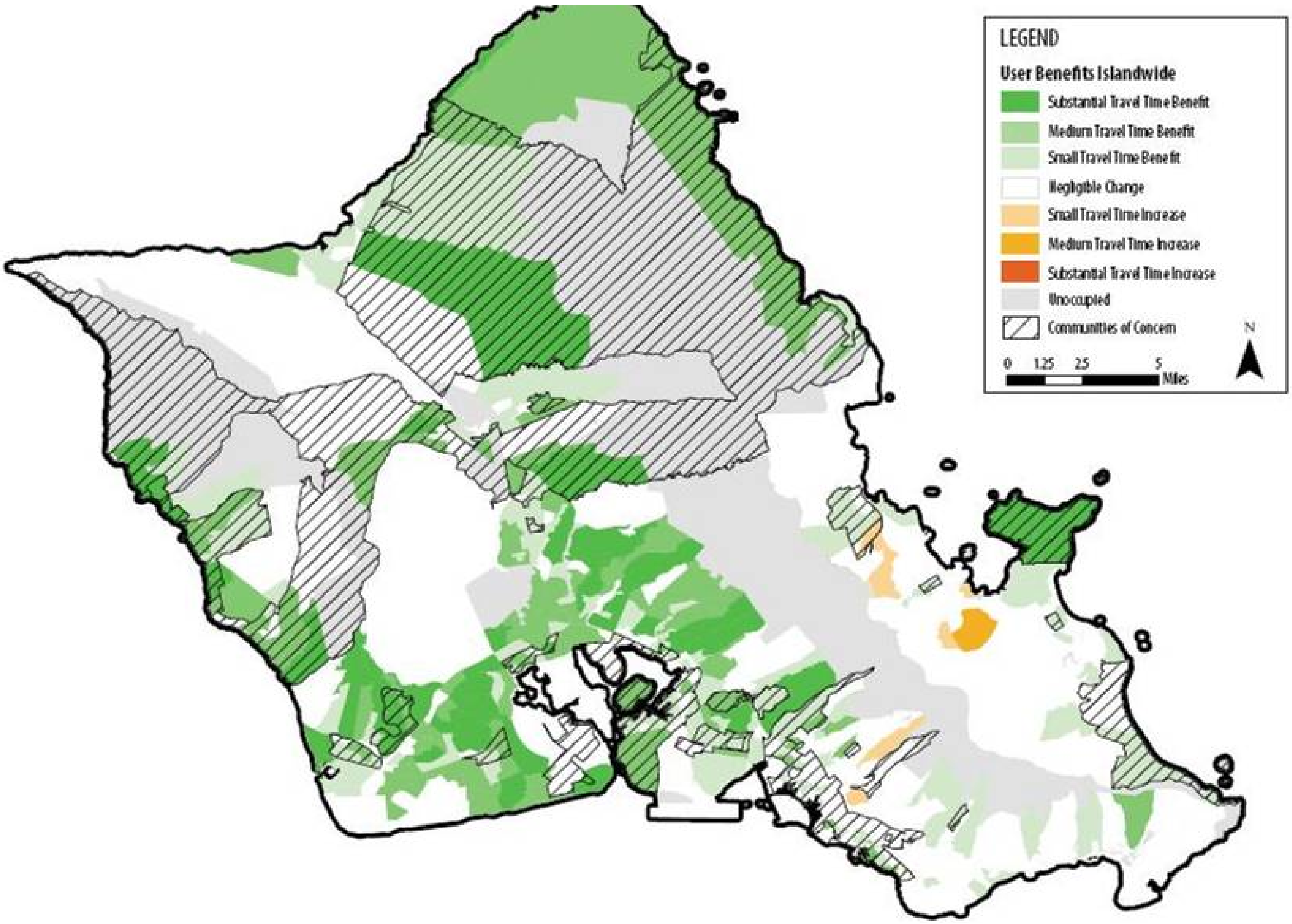


Figure 5-5: Communities of Concern and User Benefits for the Build Alternatives compared to the No Build Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

Table 5-11: Population of Communities of Concern within Easy Walking Distance of Stations in 2030

Alternative	Percentage of Communities of Concern within One-Half Mile of Fixed Guideway Stations
No Build	n/a
Salt Lake	37%
Airport	36%
Airport & Salt Lake	38%

Source: O‘ahuMPO Travel Demand Forecasting Model

The Project would provide transit travel-time savings to approximately 65 percent of the islandwide population in 2030 (Table 5-12). Of the 35 percent of the island's population that resides in areas containing concentrations of communities of concern, over half would realize a substantial transit travel-time savings. The rest of the island's population that resides in areas with concentrations of communities of concern would experience little change in transit travel time as a result of the Project. Approximately 2 percent of the total population would experience an increase in travel times, and less than 0.5 percent of the areas of communities of concern would experience a substantial increase in transit travel times.

Table 5-12: Equity Comparison of 2030 Transit Travel-Time Savings for Build Alternatives Compared to the No Build Alternative

Effect on Transit Travel Time	Within Communities of Concern	Outside Communities of Concern	Total
Travel-time savings compared to the No Build Alternative	23%	42%	65%
Negligible travel-time change compared to the No Build Alternative	12%	21%	33%
Travel-time increase compared to the No Build Alternative	0%	2%	2%
Total	35%	65%	100%

Source: O‘ahuMPO Travel Demand Forecasting Model

Tourists pay approximately 30 percent of the general excise and use tax surcharge collected, which is the Project's local funding source. The remaining local transit investment costs are distributed evenly throughout the island.

Although adverse effects would occur with each Build Alternative, these effects would be similar for each. Based on demographics within the study corridor, the need for public transit is greatest within the areas served by the Project.

5.4 Transit Ridership

5.4.1 Transit Ridership—Systemwide

Table 5-13 shows projected daily transit ridership for the No Build Alternative and Build Alternatives. The projected ridership was identified by the travel demand forecasting model.

Ridership numbers are presented in terms of fixed guideway boardings and total transit boardings. Daily transit ridership for the Build Alternatives would increase over the No Build Alternative by between 42 to 43 percent, depending on the alternative. Service frequency would be lower on the Airport & Salt Lake Alternative; thus there are slightly fewer fixed guideway boardings for this alternative.

Table 5-13: Daily Transit Boardings for No Build Alternative and Build Alternatives

Alternative	Fixed Guideway Boardings	Total Transit Boardings
No Build	n/a	314,000
Salt Lake	88,000	449,000
Percent Change from No Build		*43%*
Airport	95,000	450,000
Percent Change from No Build		*43%*
Airport & Salt Lake	93,000	446,000
Percent Change from No Build		*42%*

Source: O‘ahuMPO Travel Demand Forecasting Model
Rounded to nearest thousand.

5.4.2 Station and Link Volumes

Figure 5-6 through Figure 5-8 show, for each Build Alternative, the number of fixed guideway boardings (passengers getting on), alightings (passengers getting off), and link volumes (passengers on guideway trains) at each station during the a.m. two-hour peak period in each direction. For all alternatives, the highest number of boardings during the a.m. two-hour peak period/peak direction (Koko Head bound) occurs at the Pearl Highlands Station followed by the UH West O‘ahu Station. The highest number of alightings occurs at the Ala Moana Center Station, followed by Downtown.

The location of the highest passenger volume for each alternative in the peak direction is as follows:

- Salt Lake Alternative—between Ala Liliko‘i and Middle Street
- Airport Alternative—between Aloha Stadium and Pearl Harbor
- Airport & Salt Lake Alternative—between Middle Street and Kalihi

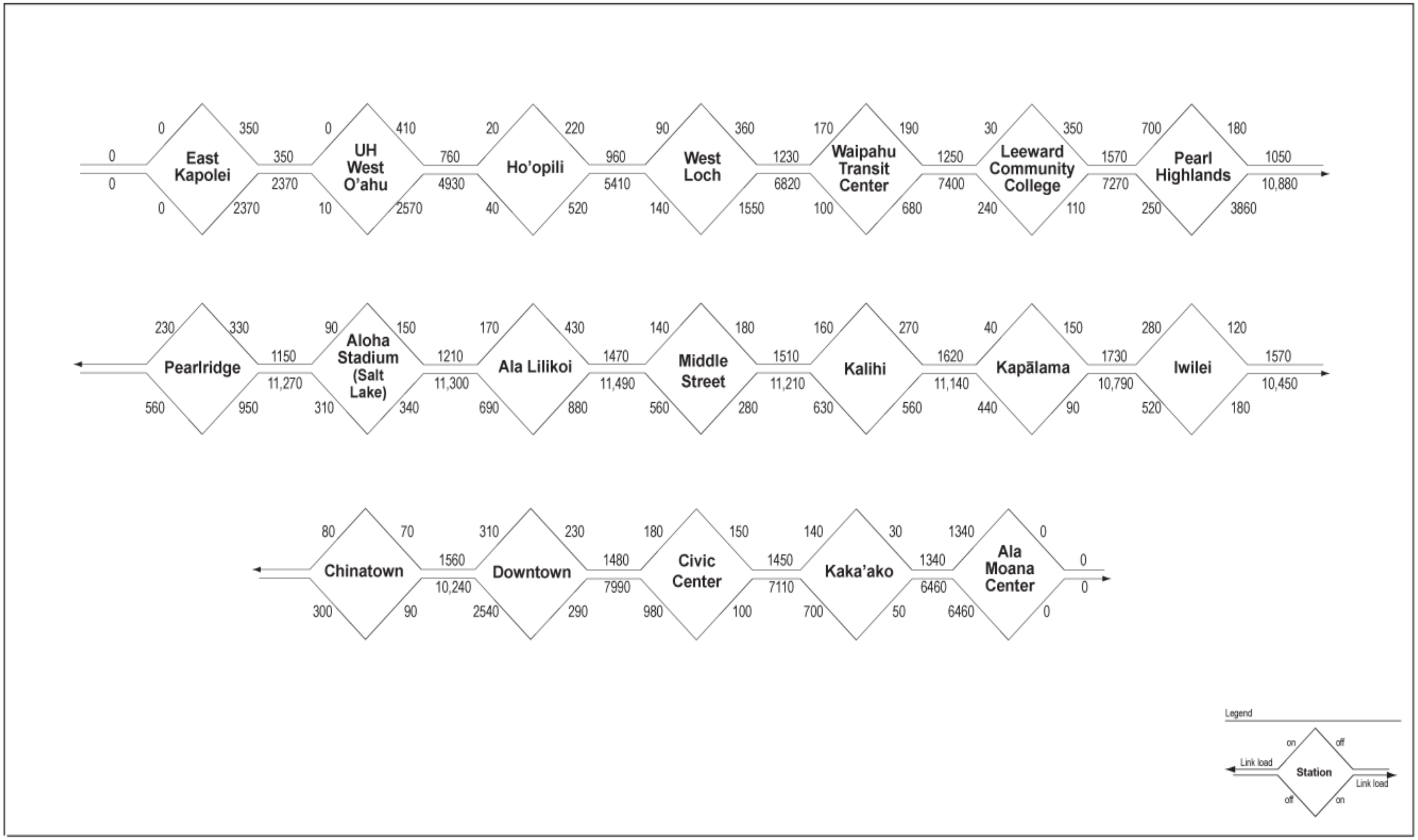


Figure 5-6: 2030 A.M. 2-Hour Peak Period Ridership—Salt Lake Alternative
Source: O'ahuMPO Travel Demand Forecasting Model

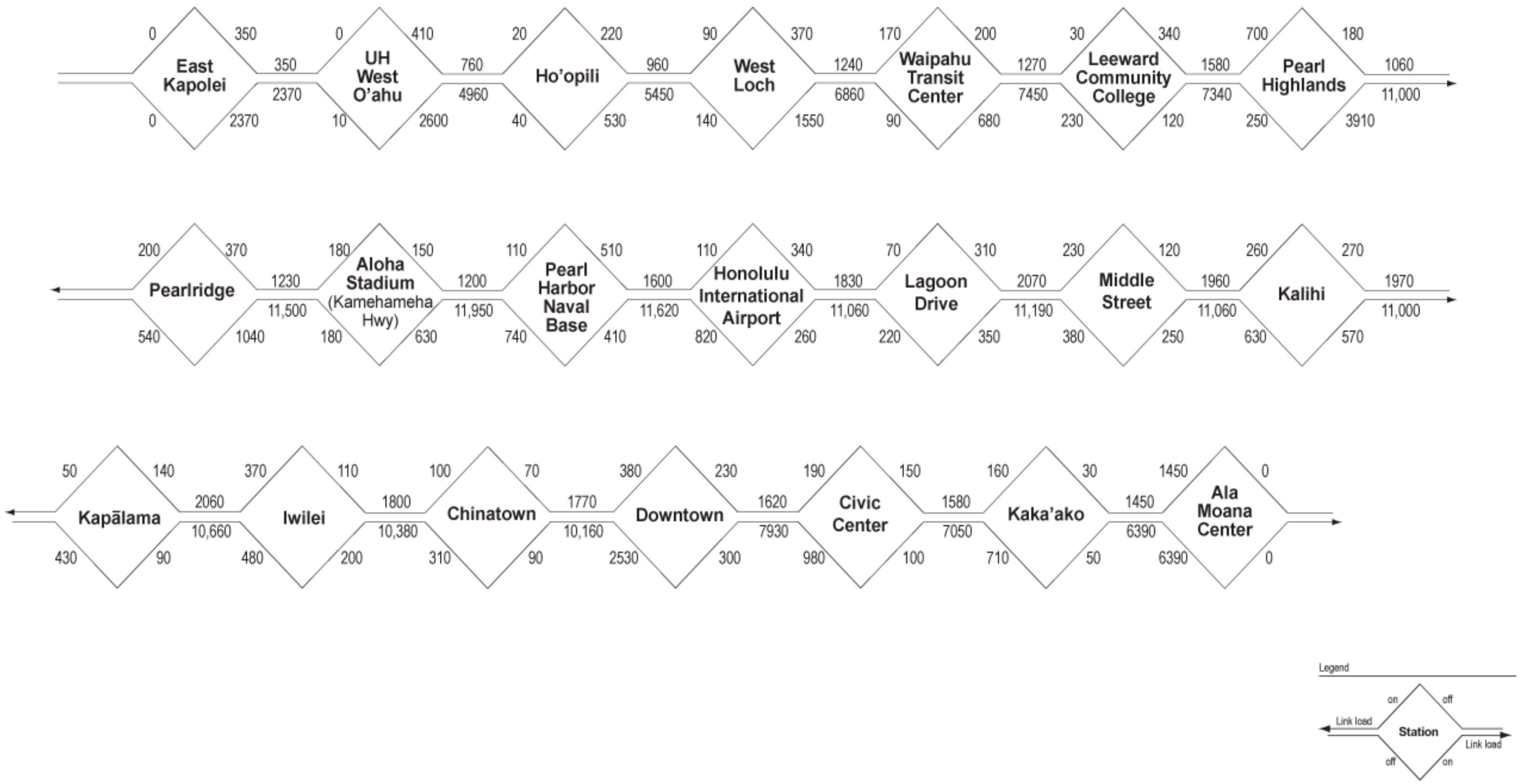


Figure 5-7: 2030 A.M. 2-Hour Peak Period Ridership—Airport Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

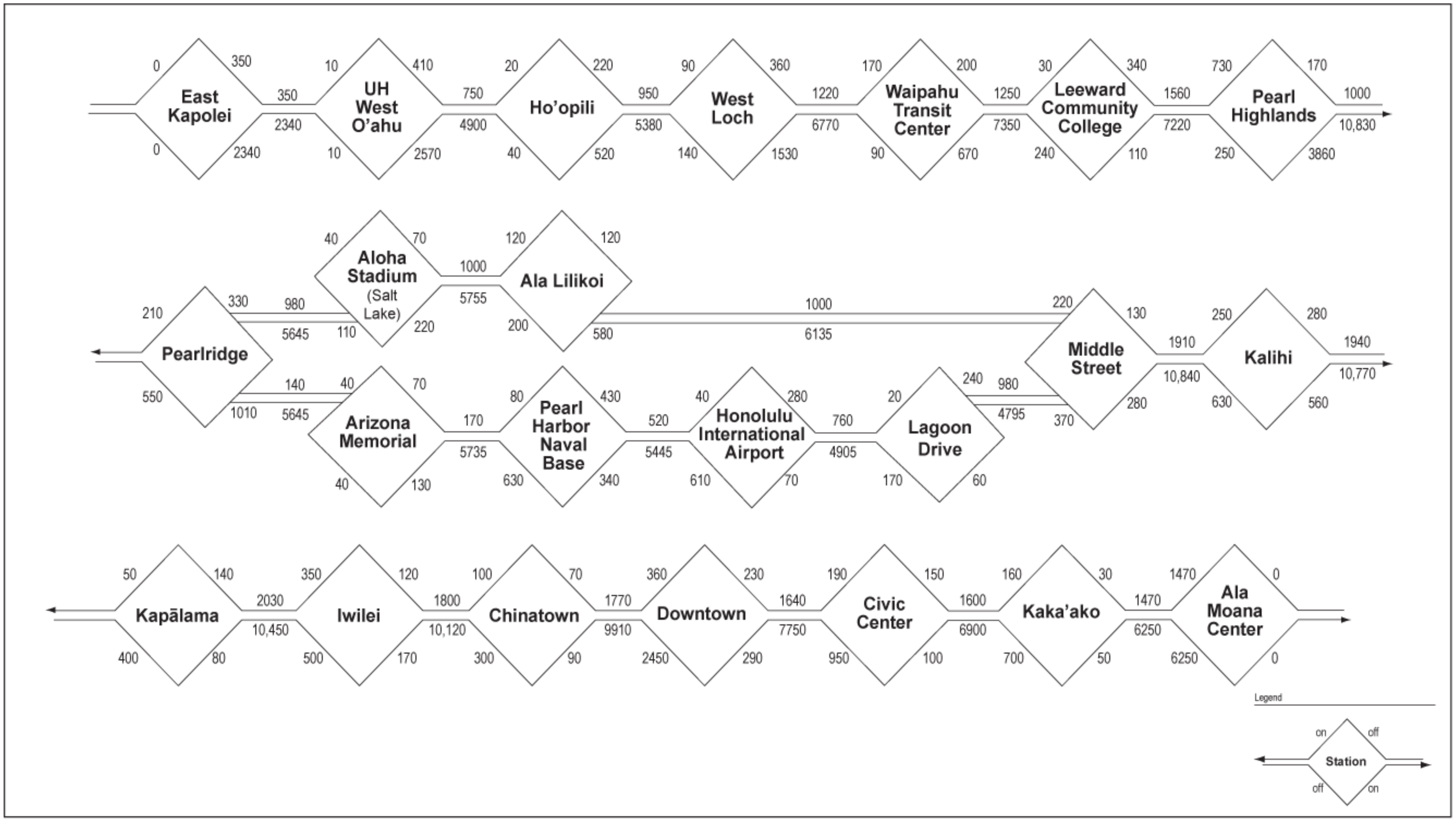


Figure 5-8: 2030 A.M. 2-Hour Peak Period Ridership—Airport & Salt Lake Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

In the ‘Ewa bound direction, the Ala Moana Center Station and the Pearl Highlands station have the highest number of boardings. The stations with the highest number of alightings vary by alternative:

- Salt Lake Alternative—Ala Liliko‘i and UH West O‘ahu
- Airport Alternative—Pearl Harbor Naval Base and UH West O‘ahu
- Airport & Salt Lake Alternative—Pearl Harbor Naval Base and UH West O‘ahu

For the Salt Lake Alternative and Airport & Salt Lake Alternative, the highest passenger volume in the ‘Ewa bound direction occurs between Iwilei and Kapālama Stations. For the Airport Alternative, the highest passenger volume occurs between Lagoon Drive and Middle Street.

The figures highlight the importance of the Pearl Highlands Station, as evidenced by the consistently high number of boardings that occur at this station in both directions during the a.m. two-hour peak period.

The maximum peak direction (Koko Head) volume during the a.m. two-hour peak period would be about 11,950 passengers in 2030. This is close to the fixed guideway system’s currently planned minimum capacity of 13,000 passengers per direction for a two-hour period. Should higher passenger volumes be realized, the system will be designed to be able to provide higher capacity by adding vehicles or reducing headways. Such operational adjustments would be evaluated as the system approaches the planned capacity toward 2030.

Figure 5-9 through Figure 5-11 show, for each Build Alternative, the number of daily fixed guideway boardings, alightings, and passenger volumes for each station. For all-day travel, the Ala Moana Center Station and Pearl Highlands Station would experience the highest boardings and alightings. These stations remain the most active under all three alternatives. However, the highest passenger volume varies by alternative: between the Kalihi and Kapālama Stations (Salt Lake Alternative); between Middle Street and Lagoon Drive and between Kalihi and Kapālama Stations (Airport Alternative; both links are projected to carry 29,380 passengers); and between Kalihi and Kapālama Stations (Airport & Salt Lake Alternative).

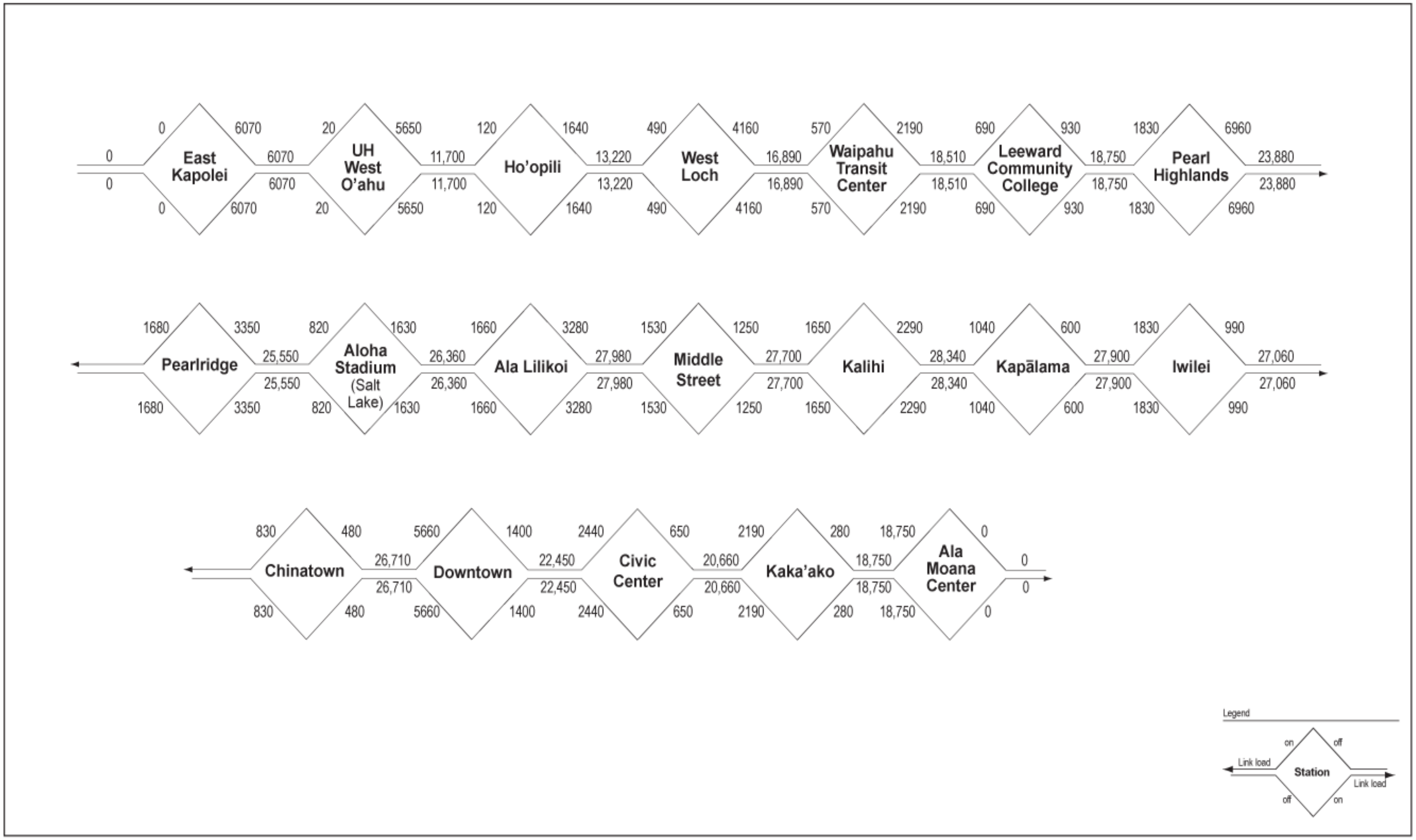


Figure 5-9: 2030 Daily Ridership—Salt Lake Alternative
Source: O'ahuMPO Travel Demand Forecasting Model

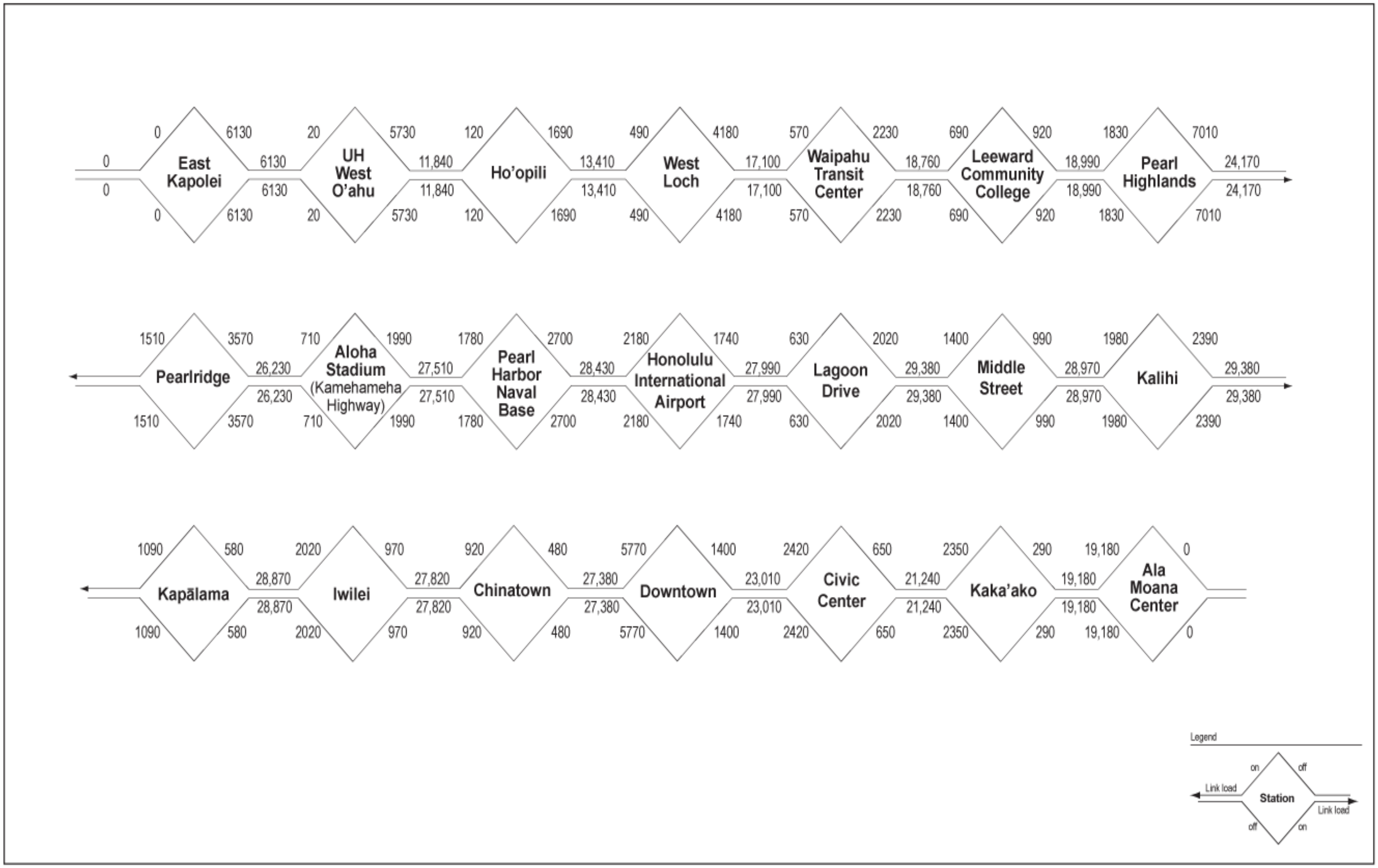


Figure 5-10: 2030 Daily Ridership—Airport Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

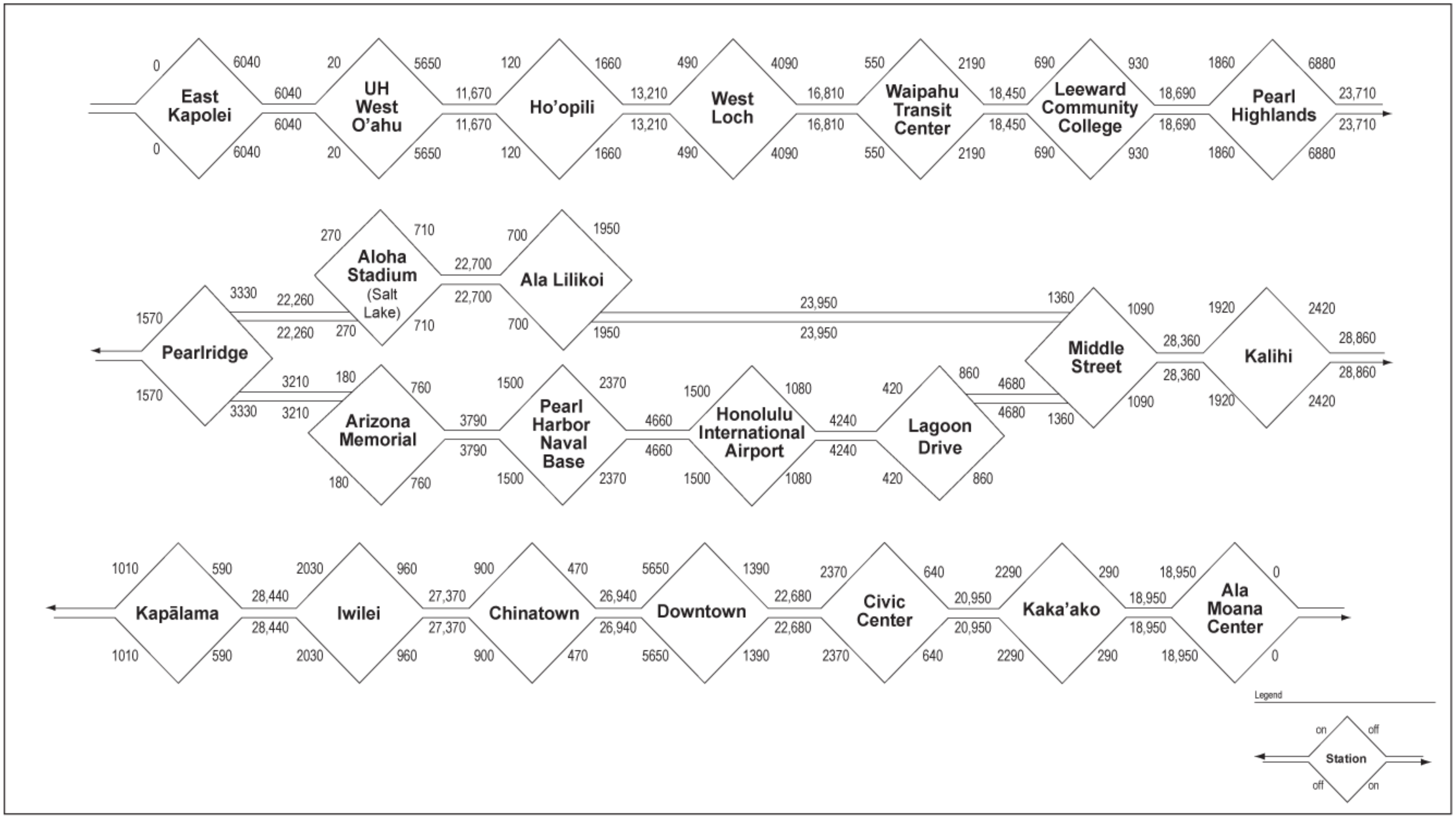


Figure 5-11: 2030 Daily Ridership—Airport & Salt Lake Alternative

Source: O'ahuMPO Travel Demand Forecasting Model

5.4.3 Ridership by Type of Service

Table 5-14 summarizes the projected breakdown of transit ridership by service type for the No Build Alternative and Build Alternatives. Under the No Build Alternative, local bus predominates with 98 percent of total boardings. For the Build Alternatives, a major shift would occur between local bus ridership and fixed guideway modes of service with fixed guideway accounting for an approximate 20 percent share. Local bus service shares of total transit ridership would decline from 98 percent with the No Build Alternative to between 73 and 80 percent, depending on the Build Alternative. This decrease in share of local service indicates that a smaller portion of total system ridership would be relying on bus service primarily operating in mixed traffic.

With any of the Build Alternatives, transit ridership would benefit from less travel delays and improved service reliability. The daily ridership for local bus service under all Build Alternatives would increase as compared to demand under the No Build Alternative. While some decreases would occur under Express Bus, the total demand for bus services, Local plus Express, would increase under each Build Alternative as compared to the No Build Alternative.

Table 5-14: Shares of Total Daily Boardings by Transit Service Type (residents and visitors)—2030 No Build and Build Alternatives

Alternative	Local Bus		Express Bus		Fixed Guideway		Total
	Number of Boardings	Percent Share	Number of Boardings	Percent Share	Number of Boardings	Percent Share	
No Build	308,720	98.3%	5,360	1.7%	N/A	N/A	314,080
Salt Lake	360,580	80.2%	1,190	0.3%	87,570	19.5%	449,340
Airport	353,090	78.5%	1,240	0.3%	95,310	21.2%	449,640
Airport & Salt Lake	352,130	78.9%	1,230	0.3%	92,710	20.8%	446,070

Source: O'ahuMPO Travel Demand Forecasting Model
Numbers rounded to nearest 10.

As indicated by Table 5-15, the extent of annual revenue hours and miles for the bus system with the Build Alternatives would be virtually the same as the amount of revenue hours under the No Build Alternative. Service miles for the Build Alternative would be approximately 23.2 million and service hours would be about 1.8 million.

Table 5-15: Changes in Bus Service Supply

Service Element	No Build Alternative	Build Alternatives
Annual Revenue Vehicles Miles	21,954,457	23,269,064
Annual Revenue Vehicles Hours	1,731,943	1,779,414

Source: O'ahuMPO Travel Demand Forecasting Model
Numbers rounded to nearest 100

Although ridership on local bus routes would be higher with the Build Alternatives versus the No Build Alternative, sufficient service capacity would be provided. If demand exceeds a load factor of 1.2 times seating for more than 20 minutes on any route, that route would be considered to be over capacity. Using this guideline, a review of estimated route-specific demand and service levels under the Build Alternatives indicated that bus service capacity would be sufficient to accommodate estimated ridership levels. Therefore the introduction of fixed guideway system would not adversely affect the local bus service supply.

In some areas, local bus frequencies in the peak periods would decrease below No Build conditions. This is likely due to shifts in ridership from bus to the fixed guideway and the resulting reduction in service in response to lower demand.

5.4.4 Changes in Transit and Private Vehicle Demand

Table 5-16 identifies estimated total daily person trips under No Build and Build Alternatives by three modes: transit, private vehicles, and bike/walk. When fixed guideway ridership is excluded from total transit boardings (as shown in Table 5-14) the resulting bus-related ridership would exceed levels under the No Build Alternative. Therefore, bus-related demand would grow under the Build Alternatives compared to the No Build Alternative.

Table 5-16: Total Daily Person Trips by Mode

Alternative	Transit	Private Vehicle	Bike/Walk	Total
No Build	225,500	2,974,700	596,000	3,796,200
Percent of Total	*6%*	*78%*	*16%*	
Salt Lake	270,300	2,932,000	595,200	3,797,500
Percent of Total	*7%*	*77%*	*16%*	
Airport	272,800	2,929,900	595,200	3,798,000
Percent of Total	*7%*	*77%*	*16%*	
Airport & Salt Lake	271,900	2,930,900	595,200	3,797,900
Percent of Total	*7%*	*77%*	*16%*	

Source: O‘ahuMPO Travel Demand Forecasting Model
Numbers rounded to nearest 100

Total daily transit trips would increase substantially under the Build Alternatives compared to the No Build Alternative to the point that islandwide transit mode share would also grow. Although the transit mode share would still be modest (7 percent) when measured on a daily islandwide basis, transit share would grow substantially where it is most effective in meeting riders' needs. These circumstances include the following:

- During peak travel periods when the roadway system is at capacity
- Along key travel corridors
- Between large/dense employment and retail areas

Figure 5-12 identifies the estimated transit share of home based work trips under existing conditions and the 2030 No Build and Build Alternatives during the a.m. two-hour peak period. The information is provided for selected travel pairs in the study corridor. As indicated by the figure, there would be little difference between existing conditions and the No Build Alternative. In most cases the change in transit share would be less than 10 percent.

Under the Build Alternatives, transit mode shares for home based trips during the a.m. two-hour peak period would substantially increase for most travel pairs compared to No Build Alternative. For many travel markets, the transit share of trips under Build Alternatives would double and, in one case triple the share occurring under the No Build Alternative. For example, the transit share of the ‘Ewa to Downtown Honolulu travel market would increase from 23 percent under No Build to between 54 percent and 56 percent under the Build Alternatives. In other words, more than half of the people going from ‘Ewa to Downtown to work in the morning would use transit with the Build Alternative, compared to only a quarter without the Project.

Substantial increases in transit share would occur for travel markets not directly served by the fixed guideway. For example, the transit share of the Waipahu to Waikīkī market would increase from 8 percent under No Build Alternative to between 25 percent and 26 percent under Build Alternatives.

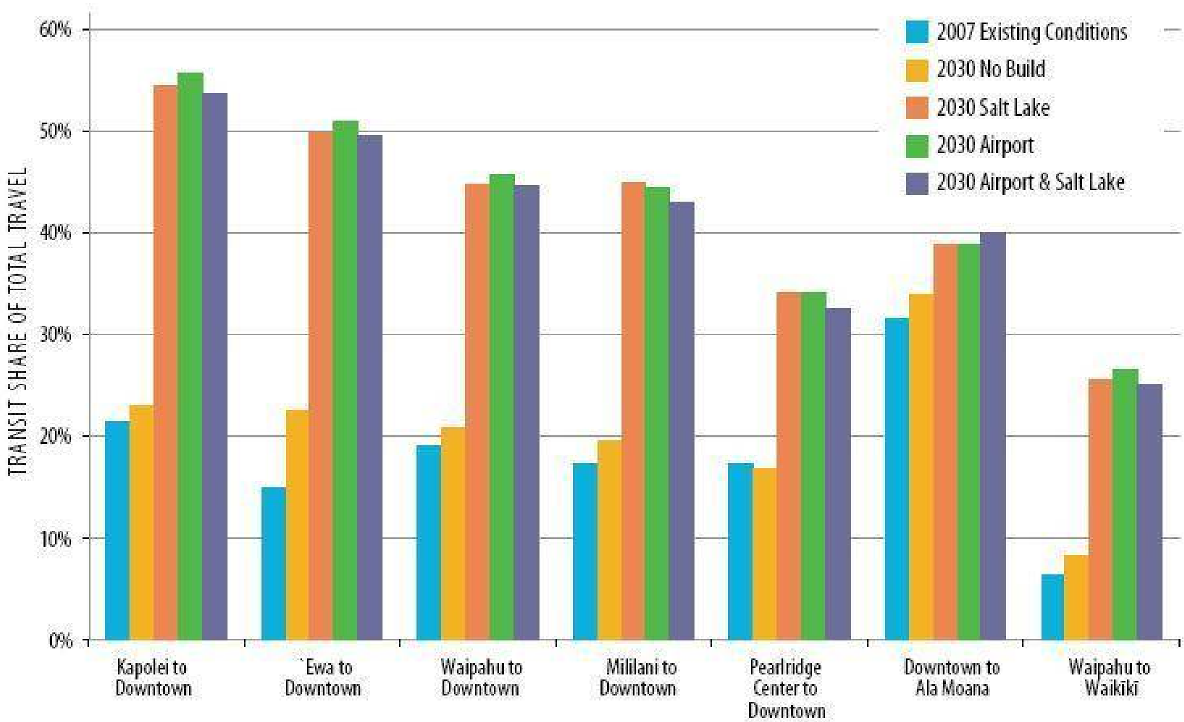


Figure 5-12: Transit Shares of Home-Based Work Trips in Two-Hour A.M. Peak Period

Source: O‘ahuMPO Travel Demand Forecasting Model

5.4.5 Bus Access at Fixed Guideway Stations

This section discusses bus access at each station location. Existing bus routes would be rerouted to provide feeder access to fixed guideway stations; in some cases new routes would be added to provide this access. Demand on some routes along the affected corridor would decrease with implementation of the guideway compared to the No Build Alternative. This decrease in demand would result in rerouting or eliminating some bus routes.

Overall transit coverage would be maintained with the various bus service changes. Also, in some cases, service frequencies would be improved to provide high quality local bus access to guideway stations. The overall outcome of the fixed guideway system, the feeder bus service, and other bus services would be to provide quicker and more convenient access to O‘ahu communities.

The following sections describe bus service changes for each of the proposed guideway stations. Current routes are as of December 2007.

Kapolei Stations

Table 5-17 provides an overview of the bus feeder services in each station area in Kapolei. The Leeward bus network was restructured with distinct route functions in 2000. Routes were scheduled to operate on easily identified headways (e.g. service operating every 30 minutes at 15 and 45 minutes past the hour) to make timed connections at transit centers. The fixed guideway operations would benefit from these previous improvements, which will be retained and substantially expanded to serve growth.

Table 5-17: TheBus Routes Serving Station Locations—Kapolei

Station Areas	2007 Bus Routes	Salt Lake Alternative Bus Routes	Airport Alternative Bus Routes
East Kapolei	No current routes	C, 416, 417, 418, 419, 421, 422	C, 416, 417, 418, 419, 421, 422
UH West O‘ahu	No current routes	C, 41, 93, 417, 421	C, 41, 93, 417, 421
Ho‘opili	No current routes	421	421

Sources: For current bus routes, TheBus public schedules in effect December 2007; for future bus routes, Bus Service Network developed for the Build Alternatives.

New services proposed at the East Kapolei, UH West O‘ahu, and Ho‘opili Stations are expected to work well with the fixed guideway operation.

Rapid Bus and Trunk routes that now connect transit centers and some neighborhoods with Downtown Honolulu would be replaced by the fixed guideway, as specified in the following descriptions.

East Kapolei

The East Kapolei Station area is currently not served by local bus routes; however station connections would include:

- Route C would provide service en route between the UH West Oʻahu Station, Kapolei Transit Center, and Waiʻanae neighborhoods.
- New Route 416 would provide connecting service to the East Kapolei Station (the planned extensions wouldn't provide this service). The route would be extended from Kapolei Transit Center to avoid a bus-bus-fixed guideway transfer.
- New Route 417 would connect Makakilo, UH West Oʻahu, and the City of Kapolei via North-South Road
- New Route 418 would provide connecting service to the East Kapolei Station (the planned extensions would not provide this service). This would help avoid the potential of the bus-bus-fixed guideway transfer.
- New Route 419 would provide connecting service to the East Kapolei Station (the planned extensions would not provide this service).
- New Route 421 would serve the East Kapolei Station from the Hoʻopili Development via the future Hoʻopili Main Road and East-West Road.
- New Route 422 would serve the East Kapolei Station from the Hoʻopili Development via the future East-West Road.

UH West Oʻahu

This station location is currently not served by local bus routes; however new services would include:

- Route C would terminate its service at the UH West Oʻahu Station.
- Route 41 would serve UH West Oʻahu via Farrington Highway from Kapolei Transit Center en route to ʻEwa Beach.
- Route 93 would provide frequent 10-minute, peak-period only trips from Waiʻanae to UH West Oʻahu via Farrington Highway and the H-1 Freeway to the North-South interchange.
- New Route 417 would continue Route 411 service from Makakilo to the station via the extension of Makakilo Drive to the North-South Road.
- New Route 421 would serve the new Hoʻopili development via new roads connecting residential, educational, retail and business.

Hoʻopili

This station location is currently not served by local bus routes. However Route 421 would serve the Hoʻopili Station connecting West Loch in Waipahu with the new development, UH West Oʻahu, a regional mall, and ʻEwa.

West Loch to Pearlridge

Table 5-18 provides an overview of proposed feeder services at each station. Bus feeder services at stations would be provided along the West Loch to Pearlridge section, except for the Leeward Community College Station.

The following sections describe proposed bus access to station areas in the West Loch to Pearlridge segment of the guideway system.

Table 5-18: TheBus Routes Serving Station Locations—West Loch to Pearlridge

Station Areas	2007 Bus Routes	Salt Lake Alternative Bus Routes	Airport Alternative Bus Routes
West Loch	A, E, 40, 40A, 42, 44, 201, 432, 434	40, 40A, 42, 98A, 415, 421, 422, 432, 434	40, 40A, 42, 98A, 415, 421, 422, 432, 434
Waipahu Transit Center	A, E, 40, 40A, 42, 43, 201, 432, 433, 434	40, 40A, 42, 50, 432, 433, 434	40, 40A, 42, 50, 432, 433, 434
Leeward Community College	73 on limited schedule (7:36 AM to 2:35 PM)	No bus routes Replaced by Fixed Guideway System	No bus routes Replaced by Fixed Guideway System
Pearl Highlands	A, 40, 40A, 42, 62, 73	D, 40, 40A, 51, 83, 83A, 84, 84A, 98, 440, 441	D, 40, 40A, 51, 83, 83A, 84, 84A, 98, 440, 441
Pearlridge	A, 11, 20, 32, 40, 40A, 42, 53, 54, 62, 71, 90	40, 40A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548, 549	40, 40A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548

Sources: For current bus routes, TheBus public schedules in effect December 2007; for future bus routes, Bus Service Network developed for the Build Alternatives.

West Loch Station

This station area is currently served by a number of routes (Routes A, E, 40, 40A, 42, 44, 201, 432 and 434). Service provided by Routes A, E, 44, and 201 in the station area would be replaced by fixed guideway service and reoriented community services. The West Loch Station would become a major access point to the fixed guideway for ‘Ewa, Waipahu, Village Park and Royal Kunia residents. New or modified services would include:

- New Route 415 would connect West Loch with ‘Ewa communities, Ocean Pointe Marina, Kalaeloa development and the Kapolei Transit Center.
- New Route 421 would connect West Loch with the Ho‘opili, East Kapolei, and ‘Ewa communities.
- New Route 422 would provide additional connections through Ho‘opili to regional shopping and employment opportunities in developing East Kapolei.
- Route 98A would provide peak-period connecting services to the communities of Village Park, Royal Kunia, and Kunia Village terminating at the station.

Waipahu Transit Center

Waipahu Transit Center is currently served by Routes A, E, 40, 40A, 42, 43, 201, 432, 433 and 434. Circulator services in Waipahu would continue to connect various geographic areas of the community at the Waipahu Transit Center. Routes 40, 40A and 432 would operate along their current alignments. Routes 433 and 434 would have minor adjustments to their alignments, Route 433 would extend to the Ka Uka transfer point in Waipi‘o and Route 434 would extend further into the Royal Kunia development. Service by Routes A, E, 43 and 201 in the station area would be replaced by fixed guideway service. New or changed services would include:

- Route 42 would connect services from ‘Ewa Beach, providing enhanced peak-period headways and would terminate at the Waipahu Transit Center instead of Waikīkī.
- New Route 50 would provide service between Mililani, Waipi‘o, Waikele and Waipahu and would terminate at the Waipahu Transit Center.

Leeward Community College

This college is currently served by Route 73 on a limited schedule operating between 7:36 a.m. and 2:35 p.m. Several routes that operate on Farrington Highway serve a bus stop that is a distance away from the college campus and not a pleasant walk for passengers. This route would be replaced by fixed guideway service and no bus routes would be added.

Pearl Highlands

Routes A, 40, 40A, 42, 62 and 73 currently pass by the Pearl Highlands Station location on Kamehameha Highway. Routes A, 42 and 73 would be replaced by fixed guideway service. Major new connections would be provided to Central O‘ahu, and this station would be the main access point to the fixed guideway for residents of the Central and North Shore communities. Services would include:

- New Route D would provide limited-stop all-day connections to Waipi‘o, Mililani and Wahiawā.
- New Route 51 would replace Route 62 connecting Wahiawā, Mililani, and Waipi‘o with the station via Kamehameha Highway.
- Routes 83 and 83A would offer peak-period service between the fixed guideway at Pearl Highlands and Wahiawā, and Waialua and Haleiwa in the North Shore.
- Routes 84 and 84A would offer peak-period service between Mililani Town and the Pearl Highlands Station.
- Route 98 would provide peak-period service for Mililani Mauka residents and the station.
- New Route 440 would continue from the future Koa Ridge development in the peak periods providing service to the station.

- New Route 441 would provide connections for the Waiawa development to the fixed guideway via the new Central Mauka Road.

Pearlridge

A number of bus routes currently serve Pearlridge Shopping Center, including Routes A, 11, 20, 32, 40, 40A, 42, 53, 54, 62, 71 and 90. With the fixed guideway, Routes A, 11, 20, 32, 53, 71 and 90 would be discontinued. Route 42 would be truncated at the Waipahu Transit Center and Route 62 would be replaced with Route 51. Route 40/40A would continue to operate as will Route 54 (although Route 54 would have its terminus at the Pearlridge Transit Center).

Pearl City and ‘Aiea bus routes would be redesigned to provide all-day service into the neighborhoods, replacing current peak-period-only services. The Pearl City/‘Aiea bus transit restructure service area extends from Aloha Stadium and the Makalapa Park neighborhoods in the east to Pearl Highlands in the west. Connecting bus routes would include:

- Route 51 would provide service from Wahiawā terminating at the station.
- Route 66 would provide new service connecting Kāne‘ohe with ‘Aiea via H-3 terminating at Pearlridge.
- Route 541 would provide all-day service between Aloha Stadium, Hālawa Heights, and the Pearlridge Station.
- Route 542 would replace shuttle Route 72 and provide all-day service between Pearlridge and ‘Aiea Heights.
- Route 543 would replace shuttle Route 74 and provide all-day service for residents along Kaonohi Street connecting to Pearlridge.
- Route 544 would provide new community access service for neighborhoods along Kilinoe Street connecting to the Pearlridge Station and Transit Center.
- Route 545 would replace portions of shuttle Route 71 with all-day service to Newtown.
- Route 546 a new route would connect Pearlridge with growing residential areas along Kaahumanu Street.
- Route 547 would replace Route 53’s Pacific Palisades service.
- Route 548 would provide service currently available on the ends of Route 54 in a two-way loop configuration.
- Route 549 would provide additional local bus service between Pearlridge and Salt Lake along Kamehameha and Nimitz Highways. This route would only operate with the Salt Lake Boulevard Alternative.

Pearlridge to Middle Street

The majority of current TheBus service along this section of the fixed guideway for both the Salt Lake and Airport Alternatives is provided by predominantly through-routes. The fixed guideway would relieve TheBus system of many vehicle revenue hours of service that would be redeployed to provide effective connections to guideway stations and within the communities being served.

Table 5-19 provides an overview of proposed feeder services at each station. Circulator bus services would connect stations with the Arizona Memorial/Ford Island/Aloha Stadium area, the high-density Salt Lake residential community, Pearl Harbor, Hickam Air Force Base and the Honolulu International Airport area. The Airport Station would be located on airport property, and pedestrian connections to the airport bus feeder services would be provided at each station along this section.

The following sections describe proposed bus access at station areas in the Pearlridge to Middle Street segment of the guideway system.

Table 5-19: TheBus Routes Serving Station Location—Pearlridge to Middle Street

Station Area	2007 Bus Routes	Salt Lake Alternative Bus Routes	Airport Alternative Bus Routes
Aloha Stadium	A, 11, 20, 32, 40, 40A, 42, 62, 74	40, 40A, 301, 312, 314, 541, 549	40, 40A, 301, 312, 314, 541
Arizona Memorial	A, 20, 40, 40A, 42, 62	N/S; 40, 40A, 314, 549	40, 40A, 314
Pearl Harbor Naval Base	9, 11, 20, 40, 40A, 42, 62, 86, 86/A, 95	N/S; 40, 40A, 312, 313, 314, 549	40, 40A, 312, 313, 314
Honolulu International Airport	19, 20, 31	N/S 19, 302, 311	19, 302, 311
Lagoon Drive	No current service, routes operate on Nimitz Highway	N/S; 306 (19 and 40A on Nimitz Highway)	31, 306 (19 and 40A on Nimitz Highway)
Ala Liliko‘i	3 (one long block away) 32	301, 311, 313, 549 plus 31 one long block away	N/S; 301, 311 plus 31 one long block away

Sources: For current bus routes, TheBus public schedules in effect December 2007; for future bus routes, Bus Service Network developed for the Build Alternatives.
N/S = No Station. However, routes are identified that would serve the location.

Aloha Stadium

Currently, Routes A, 11, 20, 32, 40, 40A, 42, 62 and 74 serve the Aloha Stadium Area. Routes A, 11, 20, 32, 42, 62 and 74 would in large part be replaced by fixed guideway service. In addition to Route 40/40A the following routes would serve the Aloha Stadium Station:

- Route 301 would replace Route 32 and offer a similar alignment with enhanced service frequencies. This route would operate between Middle Street Transit Center and Aloha Stadium via the Salt Lake, Foster Village, and Makalapa neighborhoods.
- Route 312 would provide all-day connections between Aloha Stadium and Pearl Harbor destinations and replace Route 9 service.

- Route 314 would connect Ford Island, Aloha Stadium, and the Arizona Memorial.
- Route 541 would connect Makalapa and Hālawa Heights with the Aloha Stadium and Pearlridge Stations.
- Route 549 would only operate if the fixed guideway follows the Salt Lake Boulevard alignment. This route would provide additional local bus service along Kamehameha and Nimitz Highways.

Arizona Memorial

Currently, Routes A, 20, 40, 40A, 42 and 62 serve this location. Routes A, 20, 42 and 62 would not operate in the station area with implementation of the fixed guideway system. In addition to Route 40/40A, the following routes would serve the Arizona Memorial Station site:

- Route 314 would connect Ford Island, Aloha Stadium and the Arizona Memorial Station and would provide all-day 15-minute service.
- Route 549 would only operate if the fixed guideway follows the Salt Lake Boulevard alignment. This route would provide additional local bus service along Kamehameha and Nimitz Highways.

Pearl Harbor Naval Base

This station site located near Radford Drive and Kamehameha Highway is currently served by Routes 9, 11, 20, 40, 40A, 42 and 62. A number of peak-period express routes traveling to Pearl Harbor offer a limited number of trips. This express service, including Routes 86, 86A, and 95, would operate near this fixed guideway station. The peak-period express routes would be discontinued with implementation of fixed guideway service and frequent 8-minute, peak-period, connections would be provided with new Route 312. Service provided by Routes 9, 11, 20, 42 and 62 in the station area would also be discontinued. In addition to Routes 40/40A, connecting services would be provided by:

- Route 312 would connect to Pearl Harbor destinations.
- Route 313 would provide connections to Hickam Air Force Base and replace Route 19 service.
- Route 314 would connect Ford Island, Aloha Stadium, Āliamanu and the Arizona Memorial.
- Route 549 would only operate if the fixed guideway follows the Salt Lake Boulevard alignment. This route would provide additional local bus service along Kamehameha and Nimitz Highways.

Honolulu International Airport

The Honolulu International Airport Station area is served by Routes 19, 20 and 31. Route 19 would continue to operate, Route 31 is renamed Route 302 and Route 20 would be terminated with the implementation of the fixed guideway service. Added service would be provided by:

- Route 311 connecting Moanalua with Salt Lake neighborhoods and the Airport.

Lagoon Drive

Current Routes 19, 20, 40, 40A, 42 and 62 would pass near this station site on Nimitz Highway. Routes 19, 40, and 40A would continue to operate. Added service would be provided by:

- Route 31 connecting Salt Lake neighborhoods with the station (the Airport Alternative only).
- Route 306 connecting Lagoon Drive with the Middle Street Transit Center.

Ala Liliko‘i

Currently, Route 32 serves this site and Route 3 is one long block from the proposed station location. Both of these routes would be realigned. New service would be provided by:

- Route 31 would serve the Salt Lake neighborhood portion of current Route 3. This route would operate between the Middle Street Transit Center and Salt Lake.
- Route 301 would connect the Middle Street Transit Center, Salt Lake, Foster Village, Makalapa, and Aloha Stadium.
- Route 311 would provide a connection between Moanalua and the Airport serving Salt Lake.
- Route 313 would provide a connection between the station and Hickam Air Force Base.
- Route 549 would provide additional local bus service along Kamehameha and Nimitz Highways (only with the Salt Lake Boulevard alignments).

Middle Street to Kapālama

Bus feeder services would be provided at each station along the Project’s Middle Street Transit Center to Kapālama section. Table 5-20 provides an overview of proposed feeder services at each station as well as current service.

The following sections describe proposed bus access at station areas in the Middle Street to Kapālama segment of the guideway system:

Middle Street Transit Center

Currently, Routes A, B, 1, 2, 16, 31 and 32 directly serve the transit center. Routes C, 9, 40, 40A, 42, 43, 52 and 62 operate nearby on Kamehameha Highway. Route A would continue to serve the transit center (as its terminus) with the Build

Alternatives, but not with future planned extensions. Routes 1, 2, 40, 40A, and 52 would continue to operate either to the transit center or nearby on Kamehameha Highway.

Table 5-20: TheBus Routes Serving Station Locations—Middle Street to Kapālama

Station Area	2007 Bus Routes	Salt Lake Alternative Bus Routes	Airport Alternative Bus Routes
Middle Street Transit Center	A, B, 1, 2, 16, 31, 32, 203 (plus C, 9, 40, 40A, 42, 43, 52, 62 on Kamehameha)	A, 1, 2, 31, 40, 40A, 52, 301, 302, 303, 304, 305, 306	A, 1, 2, 40, 40A, 52, 301, 302, 303, 304, 305, 306
Kalihi	C, 9, 10, 40, 40A, 42, 43, 52, 62	40, 40A, 52, 62, 305	40, 40A, 52, 62, 305
Kapālama	C, 9, 40, 40A, 42, 43, 52, 62	40, 40A, 52	40, 40A, 52

Sources: For current bus routes, TheBus public schedules in effect December 2007; for future bus routes, Bus Service Network developed for the Build Alternatives.

Additional connecting services at the Middle Street Transit Center would include the following:

- Route 31 would provide the Salt Lake neighborhood portion of current Route 3. The route would operate between the Middle Street Transit Center and Salt Lake for the Salt Lake alignments.
- Route 301 would connect the Middle Street Transit Center, Salt Lake, Foster Village, Makalapa, and Aloha Stadium.
- Route 302 would serve the Airport, Middle Street Transit Center, Fort Shafter, Moanalua Gardens, and Tripler Medical Center.
- Route 303 would provide a direct connection for Kalihi Valley Homes to the Middle Street Transit Center.
- Route 304 would be a revision of current Route 10 connecting Kalihi, Liliha, and ‘Ālewa with the Middle Street Transit Center.
- Route 305 would provide all-day, predictable scheduled service to Sand Island, Kalihi Kai, and Kalihi Uka.
- Route 306 would provide connecting service from the Middle Street Transit Center through Māpunapuna and continuing along Lagoon Drive.

Kalihi

Currently, Routes C, 9, 10, 40, 40A 42, 43, 52 and 62 serve this location. Service provided by Routes C, 9, 10 42, 43, and 62 in the station area would be replaced by fixed guideway service. In addition to Routes 40, 40A and 52, feeder bus service would be provided by:

- Route 305 would provide all-day service to Sand Island, Kalihi Kai, and Kalihi Uka.
- Route 62 would provide all-day service connecting Kāneʻohe with the fixed guideway at the Kalihi Station via Likelike Highway.

Kapālama

Routes C, 9, 40, 40A. 42, 43, 52 and 62 currently provide service to the Kapālama Station site. Routes 40, 40A and 52 would continue to provide local bus service along Dillingham Boulevard.

Iwilei to Ala Moana Center

Bus feeder services would be provided at each station along the Iwilei to Ala Moana Center section of the Project. Table 5-21 provides an overview of proposed feeder services at each station as well as current service (effective December 2007).

The following sections describe proposed bus access at station areas in the Iwilei to Ala Moana Center segment of the guideway system:

Table 5-21: TheBus Routes Serving Station Locations—Iwilei to Ala Moana Center

Station Areas	2007 Bus Routes	Salt Lake Alternative Bus Routes	Airport Alternative Bus Routes
Iwilei	No routes directly serve this location. Routes on King and Iwilei	40, 40A, 52, 61 (plus others on King Street or Iwilei Road)	40, 40A, 52, 61 (plus others on King Street or Iwilei Road)
Chinatown	This station location is two blocks from the main transit streets of Hotel and King.		
Downtown	E, F2, F3, 88A, 19, 20, 55, 56, 57, 65	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A
Civic Center	6, 42, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89
Kakaʻako	6	6	6
Ala Moana Center	C, 5, 6, 8, 17, 18, 19, 20, 23, 40, 40A, 43, 52, 53, 55, 56, 57/A, 62, 65, 88A (A, 3, 9 on Kapiʻolani; E, F3, 42, 98A on Ala Moana Boulevard.)	5, 6, 7, 8, 9, 17, 18, 23, 40, 40A, 52, 88A (A, 3 on Kapiʻolani; F3 and 19 on Ala Moana Boulevard.)	5, 6, 7, 8, 9, 17, 18, 23, 40, 40A, 52, 88A (A, 3 on Kapiʻolani; F3 and 19 on Ala Moana Boulevard.)

Sources: For current bus routes, TheBus public schedules in effect December 2007; for future bus routes, Bus Service Network developed for the Build Alternatives.
"F" route provide local bus access to TheBoat facilities and operate on a demonstration basis.

Iwilei

Local bus access is not currently provided to this station site. A number of bus routes pass nearby on Dillingham Boulevard and King Street. For the Build Alternatives, Routes A, 1, 2 and 13 would continue to operate on King Street, providing a connection to the station. Routes 40, 40A and 52 would serve the station via Dillingham and would continue on to Hotel Street via a new road. Route 61 would provide all-day service connecting Kāneʻohe residents with the Iwilei Station. Routes 4 and 19 would provide the connection from Iwilei Road.

Chinatown

Direct local bus access is not currently provided at this station location. Several existing routes are within two blocks of this station location, operating along King and Hotel Streets.

Downtown

Current Routes E, 19, 20, 55, 56, 57,57A, and 65 serve the Downtown Station area at Aloha Tower. This site is currently served by peak-period Routes F2, F3 and 88A. Routes E and 20 would be replaced by the fixed guideway service (Routes F2 and F3 serve TheBoat facility and operate on a demonstration basis). Current Routes 55, 56, 57, 57A, and 65 would be restructured into Routes 60, 61, 62, and 63. Routes 60 and 63 would terminate at the Downtown Station. Routes 61 and 62 would be realigned to serve stations along Dillingham Boulevard.

- Route 17 would be a restructured route providing service from Nuʻuanu Avenue through Downtown to the station site, continuing on to serve Kakaʻako, Ala Moana Center, and Makiki.

Civic Center

This site is currently served by Route 42 in the mauka-bound direction only on South Street. Route 42, currently provides 24-hour service, but would not operate while the fixed guideway is operating. It would continue to operate in the off-hours when fixed guideway service would not be available. Current Routes 6 and 13 would serve the station. Current peak period Routes 85, 85A, 88 and 89 serve the location one-block away at Queen and South Streets. Peak period Routes 85, 85A, 88, and 89 would continue to serve the location at Queen and South Streets.

Kakaʻako

Route 6 would continue to serve this station location. Several other routes are located two short blocks away on Kapiʻolani Boulevard or Auahi Street.

Ala Moana Center

Although bus operations at Ala Moana Center would transition from being the primary transfer point for TheBus system to one of many throughout Oʻahu, it would continue to be a dominant transfer location on the island for buses and fixed guideway activity.

Ala Moana Center is currently served by Routes C, E, F3, 5, 6, 8, 17, 18, 19, 20, 23, 40, 40A, 42, 43, 52, 53, 55, 56, 57A, 62, 65 and 88A. Routes A, 3 and 9 also serve Ala Moana Center along Kapiʻolani Boulevard. Routes E, F3 and 42 serve Ala Moana Center from Ala Moana Boulevard.

With the fixed guideway system, the Ala Moana Center Station would be served by Routes F2, 5, 6, 8, 17, 18, 19, 23, 40, 40A, 52 and 88A. Routes A and 3 would continue to operate on Kapiʻolani Boulevard. Route 9 would terminate at the station, continuing to provide service to Pālolo Valley. Route 7, a new weekday feeder service, would provide 4-minute, peak-period connections between Ala Moana Center and UH Mānoa. Routes F3 and 19 would serve Ala Moana Center from Ala Moana Boulevard.

5.5 Effects on Streets and Highways

This section presents the potential effects of the Build Alternatives on traffic. It focuses on the following:

- Changes in peak hour traffic volumes at selected screenlines
- Effects on traffic from placing columns to support the fixed guideway structure
- Effects on traffic and parking near fixed guideway stations and the potential maintenance and storage facility
- Park-and-Ride Facility Analysis

5.5.1 Analysis of Daily Screenline Volumes

To determine the Project's effects, street and highway system volumes were evaluated using a screenline analysis at key locations along the study corridor. Results for the Build Alternatives are compared with estimated results for the No Build Alternative. The projected LOS was evaluated on the major roadways crossing eight screenlines along the corridor. The screenlines are the same as those discussed in Chapter 3 and shown in Figure 3-24.

Table 5-22 identifies estimated screenline volumes for 2030 No Build Alternative and Build Alternatives. The table is limited to screenlines B through G as screenlines A and H are external to the proposed transit corridor.

Salt Lake Alternative Daily Screenline Analysis

The Salt Lake Alternative demonstrates a general reduction in traffic volume across all the screenlines analyzed. The Kalauao Screenline (D) would experience a 6 percent decline (or approximately 22,500 vehicles). Reductions across the other screenlines range from 3 to 6 percent.

Table 5-22: Comparison of Daily Screenline Volumes between 2030 No Build Alternative and Build Alternatives

ID	Screenline/Facility	2030 No Build Conditions	2030 Salt Lake Alternative	Percent Change from No Build	2030 Airport Alternative	Percent Change from No Build	2030 Airport & Salt Lake Alternative	Percent Change from No Build
B	‘Ewa Wai‘anae bound	116,250	111,470	-4%	111,690	-4%	108,860	-6%
	‘Ewa Koko Head bound	139,850	134,520	-4%	134,380	-4%	128,930	-8%
	Total	*256,100*	*245,990*	*-4%*	*246,070*	*-4%*	*237,790*	*-7%*
C	Waikele Stream ‘Ewa bound	148,440	142,210	-4%	142,040	-4%	139,280	-6%
	Waikele Stream Koko Head bound	125,080	119,360	-5%	119,230	-5%	113,590	-9%
	Total	*273,520*	*261,570*	*-4%*	*261,270*	*-4%*	*252,870*	*-8%*
D	Kalauao ‘Ewa bound	197,870	187,200	-5%	186,970	-6%	181,220	-8%
	Kalauao Koko Head bound	200,340	188,500	-6%	188,030	-6%	174,900	-13%
	Total	*398,210*	*375,700*	*-6%*	*375,000*	*-6%*	*356,120*	*-11%*
E	Salt Lake ‘Ewa bound	177,540	167,330	-6%	167,260	-6%	162,110	-9%
	Salt Lake Koko Head bound	170,610	159,840	-6%	159,330	-7%	151,620	-11%
	Total	*348,150*	*327,170*	*-6%*	*326,590*	*-6%*	*313,730*	*-10%*
F	Kapālama Canal ‘Ewa bound	223,790	215,500	-4%	215,120	-4%	211,600	-5%
	Kapālama Canal Koko Head bound	240,500	228,880	-5%	228,780	-5%	222,710	-7%
	Total	*464,290*	*444,380*	*-4%*	*443,900*	*-4%*	*434,310*	*-6%*
G	Ward Avenue ‘Ewa bound	175,480	170,610	-3%	170,140	-3%	168,960	-4%
	Ward Avenue Koko Head bound	223,690	217,480	-3%	217,430	-3%	215,390	-4%
	Total	*399,170*	*388,090*	*-3%*	*387,570*	*-3%*	*384,350*	*-4%*

Volumes are rounded to the nearest 10

Airport Alternative Daily Screenline Analysis

With the Airport Alternative, the Kalauao Screenline (D) would experience the greatest reduction in traffic volumes by approximately 23,200 trips. However, the greatest percentage reduction in daily traffic volume would occur for the Salt Lake Screenline (E) (7 percent), and the smallest percentage reduction would occur across the Ward Avenue Screenline (G) (3 percent).

Airport & Salt Lake Alternative Daily Screenline Analysis

With the Airport & Salt Lake Alternative, the Kalauao Screenline (D) would experience the greatest reduction in traffic volumes by approximately 42,100 trips. The greatest percentage reduction in daily traffic volume would occur for the Kalauao Screenline (D) (10 percent), and the smallest percentage reduction would occur across the Ward Avenue Screenline (G) (4 percent).

5.5.2 Peak Period LOS Analysis at Screenlines

Salt Lake Alternative LOS Analysis

Table 5-23 and Table 5-24 summarize the results of the LOS analysis for the a.m. peak hour and p.m. peak hour, respectively. Appendix C provides detailed LOS worksheets for the screenline impact analysis

The projected peak hour link volumes from the travel demand forecasting model (after post-processing) were analyzed to determine the projected operating conditions and LOS for the key roadway segments under the Salt Lake Alternative. A condensed version of the screenline analysis was conducted. The analysis for this Build Alternative was limited to evaluating screenlines B through G, because screenlines A and H are external to the proposed transit corridor.

As shown in Table 5-23, projected operating conditions (LOS E or F) during the a.m. peak hour are projected at the following screenlines:

- ‘Ewa Screenline (Koko Head direction)
- Waikele Stream Screenline (both directions)
- Kalauao Screenline (Koko Head direction)
- Kapālama Canal Screenline (both directions)
- Ward Screenline (‘Ewa direction)

Table 5-23: Salt Lake Alternative—A.M. Peak Hour Screenline Volumes and LOS

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
B	**'Ewa Wai'anae bound**										
	H-1 Freeway	3	4,290	D	4,180	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D
	H-1 Freeway future HOV	1	1,180	C	1,190	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Farrington Highway	2	500	C	500	**	*200*	*1,240*	*1,560*	*1,640*	C
	Fort Weaver Road (SB)	2	2,040	F	1,990	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*8,010*	*D*	*7,860*						*D*
	'Ewa Koko Head bound										
	H-1 Freeway	3	5,080	E	4,590	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	E
	H-1 Freeway future HOV	1	1,530	D	1,490	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	Farrington Highway	3	310	C	280	**	*310*	*1,920*	*2,340*	*2,460*	B*
	Fort Weaver Road (NB)	2	3,090	F	2,920	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*10,010*	*E*	*9,280*						*E*
C	**Waikele Stream 'Ewa bound**										
	H-1 Freeway	5	9,280	E	9,160	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	E
	Waipahu Street	1	330	C*	330	**	**	*440*	*700*	*740*	C*
	Farrington Highway	4	1,040	C	990	**	*400*	*2,530*	*3,030*	*3,180*	C
	Total		*10,650*	*E*	*10,480*						*E*
	Waikele Stream Koko Head bound										
	H-1 Freeway	4	7,800	F	7,360	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E
	H-1 Freeway future HOV	1	1,670	E	1,520	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	Waipahu Street	1	700	E	460	**	**	*440*	*700*	*740*	D
	Farrington Highway	3	1,900	C	1,700	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*12,070*	*E*	*11,040*						*E*

Table 5-23: Salt Lake Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
D	**Kalauao ‘Ewa bound**										
	H-1 Freeway	5	7,930	D	7,850	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	Moanalua Road	2	1,240	D	1,150	**	**	*1,020*	*1,480*	*1,560*	D
	Kamehameha Highway	3	1,080	C	*1,040*	**	*310*	*1,920*	*2,340*	*2,460*	*C*
	Total		*10,250*	*D*	*10,030*						*D*
	Kalauao Koko Head bound										
	H-1 Freeway	5	13,160	F	12,170	*515*	*839*	*1,213*	*1,568*	*1,783*	F
	H-1 Freeway HOV	1	1,810	F	1,640	*515*	*839*	*1,213*	*1,568*	*1,783*	E
	H-1 Freeway Zipper	1	1,500	D	1,460	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	Moanalua Road	2	1,480	E	1,290	**	**	*1,020*	*1,480*	*1,560*	D
	Kamehameha Highway	3	2,850	F	2,350	**	*310*	*1,920*	*2,340*	*2,460*	E
	Total		*20,800*	*F*	*18,910*						*F*

Table 5-23: Salt Lake Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2] *A*	*B*	*C*	*D*	*E*	LOS [2]
E	**Salt Lake 'Ewa bound**										
	Moanalua Freeway	4	4,260	C	4,140	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C
	H-1 Freeway	4	2,830	B	2,730	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	B
	H-1 Freeway HOV	NA	NA	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA
	H-1 Freeway Future zipper lane	NA	NA	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA
	Nimitz Highway	3	1,190	C	1,160	**	*310*	*1,920*	*2,340*	*2,460*	C
	Salt Lake Boulevard	2	390	C*	360	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*8,670*	*C*	*8,390*						*C*
	Salt Lake Koko Head bound										
	Moanalua Freeway	2	3,690	F	3,420	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	E
	Moanalua Freeway HOV	1	1,750	E	1,630	*515*	*839*	*1,213*	*1,568*	*1,783*	E
	H-1 Freeway + Shoulder Express (1 lane)	5	8,270	D	7,800	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	H-1 Freeway HOV (1 lane)	1	1,660	E	1,550	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	H-1 Freeway Zipper	1	1,520	D	1,430	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	Nimitz Highway	5	1,770	C	1,400	**	*500*	*3,160*	*3,790*	*3,980*	C
	Salt Lake Boulevard	2	860	C*	690	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*19,520*	*D*	*17,920*						*D*

Table 5-23: Salt Lake Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
F	**Kapālama Canal ʻEwa bound**										
	Nimitz Highway	3	1,570	C	1,580	**	*310*	*1,920*	*2,340*	*2,460*	C
	Dillingham Boulevard	2	560	C	550	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	790	C*	770	**	**	*1,020*	*1,480*	*1,560*	C*
	H-1 Freeway	4	8,150	F	8,090	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	Hālona Street	2	1,180	C*	1,180	**	**	*1,220*	*1,770*	*1,870*	C*
	School Street	2	960	C*	920	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*13,210*	*E*	*13,090*						*E*
	Kapālama Canal Koko Head bound										
	Nimitz Highway	3	3,430	F	3,150	**	*310*	*1,920*	*2,340*	*2,460*	F
	Nimitz Flyover (future facility)	2	1,400	B	1,310	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	B
	Dillingham Boulevard	2	1,350	D	1,220	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	1,460	D	1,320	**	**	*1,020*	*1,480*	*1,560*	D
	Olomea Street	2	1,950	F	1,950	**	**	*1,220*	*1,770*	*1,870*	F
	H-1 Freeway	5	10,790	F	10,260	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	F
	School Street	2	1,760	F	1,550	**	**	*1,020*	*1,480*	*1,560*	E
	Total		*22,140*	*E*	*20,760*						*E*

Table 5-23: Salt Lake Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2] *A*	*B*	*C*	*D*	*E*	LOS [2]
G	**Ward Avenue ʻEwa bound**										
	H-1 Freeway	3	7,380	F	7,380	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F
	Beretania Street	5	3,250	D	3,160	**	**	*3,170*	*4,450*	*4,690*	C*
	Kapiʻolani Boulevard	4	2,220	D	2,200	**	**	*2,110*	*2,970*	*3,130*	D
	Ala Moana Boulevard	3	2,150	D	2,150	**	*310*	*1,920*	*2,340*	*2,460*	D
	Total		*15,000*	*E*	*14,890*						*E*
	Ward Avenue Koko Head bound										
	H-1 Freeway	4	6,980	E	6,800	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E
	Kīnaʻu Street	3	1,070	C*	1,080	**	**	*1,900*	*2,670*	*2,810*	C*
	S King Street	5	2,850	C*	2,340	**	**	*3,170*	*4,450*	*4,690*	C*
	Kapiʻolani Boulevard	2	820	C*	780	**	**	*1,020*	*1,480*	*1,560*	C*
	Ala Moana Boulevard	3	*1,740*	C	*1,560*	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*13,460*	*D*	*12,560*						*D*

[1] Peak hour traffic count data was obtained from the State of Hawaiʻi Department of Transportation (2005) and OʻahuMPO Travel Demand Forecasting Model.
[2] LOS thresholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directional split of 50% was applied to the two-way volumes to generate the peak hour direction volume thresholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table 5-24 presents a similar analysis for the p.m. peak hour. Congested operating conditions (LOS E or F) are projected to occur during the p.m. peak hour at the following screenlines:

- ‘Ewa Screenline (Koko Head direction)
- Waikele Stream (‘Ewa direction)
- Kalauao Screenline (‘Ewa direction)
- Kapālama Canal (‘Ewa direction)
- Ward Avenue (‘Ewa direction)

The results of the analysis, summarized in Table 5-23 and Table 5-24, indicate a reduction in peak hour vehicular volumes with the Salt Lake Alternative. No effects from the Project were identified during either the a.m. or p.m. peak travel hours with the Salt Lake Alternative.

Airport Alternative LOS Analysis

The peak hour link volumes from the O‘ahuMPO travel demand forecasting model were analyzed to determine projected operating conditions and LOS for each roadway segment under the Airport Alternative. The screenline analysis was conducted for screenlines B through G. Tables 5-25 and Table 5-26 summarize LOS results for the a.m. peak hour and p.m. peak hour, respectively. Appendix C provides detailed LOS worksheets for the screenline impact analysis.

As shown in Table 5-25, congested operating conditions (LOS E or F) are projected to occur during the a.m. peak hour at the following screenlines:

- ‘Ewa Screenline (Koko Head direction)
- Waikele Stream Screenline (both directions)
- Kalauao Screenline (Koko Head direction)
- Kapālama Canal Screenline (both directions)
- Ward Avenue Screenline (‘Ewa direction)

As with the other analyses, the individual facility LOS was also determined and is shown in Table 5-25.

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecas t Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
B	**'Ewa Wai'anae bound**										
	H-1 Freeway	3	4,680	D	4,270	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D
	H-1 Freeway future HOV	1	1,100	C	1,110	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Farrington Highway	2	510	C	450	**	*200*	*1,240*	*1,560*	*1,640*	C
	Fort Weaver Road (SB)	2	2,410	F	2,310	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*8,700*	*D*	*8,140*						D
	'Ewa Koko Head bound										
	H-1 Freeway	3	6,120	F	6,060	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F
	H-1 Freeway future HOV	1	990	C	930	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Farrington Highway	3	550	C	510	**	*310*	*1,920*	*2,340*	*2,460*	C
	Fort Weaver Road (NB)	2	2,620	F	2,540	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*10,280*	*F*	*10,040*						*F*

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
C	**Waikele Stream ‘Ewa bound**										
	H-1 Freeway	4	9,010	F	8,550	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	H-1 Freeway future HOV	1	490	A	440	*515*	*839*	*1,213*	*1,568*	*1,783*	A
	Waipahu Street	1	180	C*	150	**	**	*440*	*700*	*740*	C*
	Farrington Highway	4	1,450	C	1,250	**	*400*	*2,530*	*3,030*	*3,180*	C
	Total		*11,130*	*E*	*10,390*						*E*
	Waikele Stream Koko Head bound										
	H-1 Freeway	5	6,960	D	7,030	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	Waipahu Street	1	410	C*	390	**	**	*440*	*700*	*740*	C*
	Farrington Highway	3	1,010	C	860	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*8,380*	*D*	*8,280*						*D*

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
D	**Kalauao ʻEwa bound**										
	H-1 Freeway	4	9,040	F	8,610	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	H-1 Freeway HOV	1	1,720	E	1,490	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	H-1 Freeway Zipper	1	950	C	810	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Moanalua Road	2	2,250	F	1,860	**	**	*1,020*	*1,480*	*1,560*	F
	Kamehameha Highway	3	2,190	D	2,000	**	*310*	*1,920*	*2,340*	*2,460*	D
	Total		*16,150*	*E*	*14,770*						*E*
	Kalauao Koko Head bound										
	H-1 Freeway	5	8,060	D	7,870	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	H-1 Freeway HOV (existing only)	NA	NA	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA
	Moanalua Road	2	970	C*	900	**	**	*1,020*	*1,480*	*1,560*	C*
	Kamehameha Highway	3	1,780	C	1,720	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*10,810*	*D*	*10,490*						*D*

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
E	**Salt Lake 'Ewa bound**										
	Moanalua Freeway	4	5,990	D	5,790	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D
	H-1 Freeway	4	4,200	C	3,660	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C
	H-1 Freeway HOV	1	1,210	C	1,040	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	H-1 Freeway Future zipper lane	1	810	B	660	*515*	*839*	*1,213*	*1,568*	*1,783*	B
	Nimitz Highway	3	2,530	F	2,430	**	*310*	*1,920*	*2,340*	*2,460*	E
	Salt Lake Boulevard	2	870	C*	800	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*15,610*	*D*	14,380						D
	Salt Lake Koko Head bound										
	Moanalua Freeway	2	2,910	D	2,670	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D
	Moanalua Freeway HOV	1	960	C	1,000	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	H-1 Freeway + Shoulder Express (1 lane)	4	3,970	C	4,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C
	H-1 Freeway HOV (1 lane)	1	1,070	C	1,020	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Nimitz Highway	5	1,600	C	1,560	**	*500*	*3,160*	*3,790*	*3,980*	C
	Salt Lake Boulevard	2	410	C*	410	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*10,920*	*C*	10,990						C

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Salt Lake Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
F	**Kapālama Canal ‘Ewa bound**										
	Nimitz Highway	3	1,750	C	1,520	**	*310*	*1,920*	*2,340*	*2,460*	C
	Nimitz Flyover (future facility)	2	880	A	810	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A
	Dillingham Boulevard	2	1,140	C	900	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	1,470	D	1,310	**	**	*1,020*	*1,480*	*1,560*	D
	H-1 Freeway	4	8,370	F	8,180	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	Hālona Street	2	1,740	D	1,730	**	**	*1,220*	*1,770*	*1,870*	D
	School Street	2	1,370	D	1,240	**	**	*1,020*	*1,480*	*1,560*	D
	Total		*16,710*	*E*	*15,690*						*E*
	Kapālama Canal Koko Head bound										
	Nimitz Highway	3	3,520	F	3,280	**	*310*	*1,920*	*2,340*	*2,460*	F
	Dillingham Boulevard	2	1,020	C	1,020	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	1,470	D	1,420	**	**	*1,020*	*1,480*	*1,560*	D
	Olomea Street	2	1,670	D	1,670	**	**	*1,220*	*1,770*	*1,870*	D
	H-1 Freeway	5	8,050	D	7,980	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	School Street	2	1,150	D	1,160	**	**	*1,020*	*1,480*	*1,560*	D
	Total		*16,880*	*D*	*16,530*						*D*

Table 5-24: Salt Lake Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

		2030 No Build Conditions			2030 Salt Lake Alternative						
					Forecas t Volume (vph)	Maximum Volume Threshold [2]					
ID	Screenline/Facility	Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]		*A*	*B*	*C*	*D*	*E*	LOS [2]
G	**Ward Avenue ‘Ewa bound**										
	H-1 Freeway	3	6,970	F	6,920	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F
	Beretania Street	5	3,040	C*	2,800	**	**	*3,170*	*4,450*	*4,690*	C*
	Kapi‘olani Boulevard	2	1,570	F	1,460	**	**	*1,020*	*1,480*	*1,560*	D
	Ala Moana Boulevard	3	2,020	D	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*13,600*	*E*	*12,960*						*E*
	Ward Avenue Koko Head bound										
	H-1 Freeway	4	7,370	E	7,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E
	Kīna‘u Street	4	1,810	C*	1,770	**	**	*2,540*	*3,560*	*3,750*	C*
	S King Street	6	3,450	C*	3,370	**	**	*3,800*	*5,340*	*5,630*	C*
	Kapi‘olani Boulevard	4	2,370	D	2,280	**	**	*2,110*	*2,970*	*3,130*	D
	Ala Moana Boulevard	*3*	*2,330*	*D*	*2,270*	**	*310*	*1,920*	*2,340*	*2,460*	D
	Total		*17,330*	*D*	*17,020*						*D*

[1] Peak hour traffic count data was obtained from the State of Hawai‘i Department of Transportation (2005) and O‘ahuMPO Travel Demand Forecasting Mode
[2] LOS thresholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida’s Department of Transportation (FDOT). The Handbook provides the Generalized Peak Hour Two-Way Volumes for Florida’s Urbanized Areas (2002). A directional split of 50% was applied to the two-way volumes to generate the peak hour direction volume thresholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table 5-25: Airport Alternative—A.M. Peak Hour Screenline Volumes and LOS

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
B	**'Ewa Wai'anae bound**										
	H-1 Freeway	3	4,290	D	4,180	1,620	2,630	3,800	4,920	5,590	D
	H-1 Freeway future HOV	1	1,180	C	1,180	515	839	1,213	1,568	1,783	C
	Farrington Highway	2	500	C	500	**	200	1,240	1,560	1,640	C
	Fort Weaver Road (SB)	2	2,040	F	2,010	**	200	1,240	1,560	1,640	F
	Total		*8,010*	*D*	*7,880*						*D*
	'Ewa Koko Head bound										
	H-1 Freeway	3	5,080	E	4,400	1,620	2,630	3,800	4,920	5,590	D
	H-1 Freeway future HOV	1	1,530	D	1,440	515	839	1,213	1,568	1,783	D
	Farrington Highway	3	310	C	290	**	310	1,920	2,340	2,460	B*
	Fort Weaver Road (NB)	2	3,090	F	2,860	**	200	1,240	1,560	1,640	F
	Total		*10,010*	*E*	*8,990*						*E*
C	**Waikele Stream 'Ewa bound**										
	H-1 Freeway	5	9,280	E	9,130	2,800	4,540	6,570	8,490	9,660	E
	Waipahu Street	1	330	C*	320	**	**	440	700	740	C*
	Farrington Highway	4	1,040	C	1,000	**	400	2,530	3,030	3,180	C
	Total		*10,650*	*E*	*10,450*						*E*
	Waikele Stream Koko Head bound										
	H-1 Freeway	4	7,800	F	7,230	2,210	3,580	5,180	6,710	7,620	E
	H-1 Freeway future HOV	1	1,670	E	1,570	515	839	1,213	1,568	1,783	E
	Waipahu Street	1	700	E	460	**	**	440	700	740	D
	Farrington Highway	3	1,900	C	1,710	**	310	1,920	2,340	2,460	C
	Total		*12,070*	*E*	*10,970*						*E*

Table 5-25: Airport Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
D	**Kalauao ‘Ewa bound**										
	H-1 Freeway	5	7,930	D	7,800	2,800	4,540	6,570	8,490	9,660	D
	Moanalua Road	2	1,240	D	1,130	**	**	1,020	1,480	1,560	D
	Kamehameha Highway	3	1,080	C	1,080	**	310	1,920	2,340	2,460	C
	Total		*10,250*	*D*	*10,010*						*D*
	Kalauao Koko Head bound										
	H-1 Freeway	5	13,160	F	12,190	5,600	9,080	13,140	16,980	19,320	F
	H-1 Freeway HOV	1	1,810	F	1,690	515	839	1,213	1,568	1,783	E
	H-1 Freeway Zipper	1	1,500	D	1,450	515	839	1,213	1,568	1,783	D
	Moanalua Road	2	1,480	E	1,270	**	**	1,020	1,480	1,560	D
	Kamehameha Highway	3	2,850	F	2,230	**	310	1,920	2,340	2,460	D
	Total		*20,800*	*F*	*18,830*						*E*

Table 5-25: Airport Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2] *A*	*B*	*C*	*D*	*E*	LOS [2]
E	**Salt Lake 'Ewa bound**										
	Moanalua Freeway	4	4,260	C	4,160	2,210	3,580	5,180	6,710	7,620	C
	H-1 Freeway	4	2,830	B	2,740	2,210	3,580	5,180	6,710	7,620	B
	H-1 Freeway HOV	NA	NA	NA	NA	515	839	1,213	1,568	1,783	NA
	H-1 Freeway Future zipper lane	NA	NA	NA	NA	515	839	1,213	1,568	1,783	NA
	Nimitz Highway	3	1,190	C	1,160	**	310	1,920	2,340	2,460	C
	Salt Lake Boulevard	2	390	C*	360	**	**	1,020	1,480	1,560	C*
	Total		*8,670*	*C*	*8,420*						*C*
	Salt Lake Koko Head bound										
	Moanalua Freeway	2	3,690	F	3,430	1,030	1,680	2,420	3,130	3,560	E
	Moanalua Freeway HOV	1	1,750	E	1,590	515	839	1,213	1,568	1,783	E
	H-1 Freeway + Shoulder Express (1 lane)	5	8,270	D	7,740	2,800	4,540	6,570	8,490	9,660	D
	H-1 Freeway HOV (1 lane)	1	1,660	E	1,520	515	839	1,213	1,568	1,783	D
	H-1 Freeway Zipper	1	1,520	D	1,460	515	839	1,213	1,568	1,783	D
	Nimitz Highway	5	1,770	C	1,380	**	500	3,160	3,790	3,980	C
	Salt Lake Boulevard	2	860	C*	700	**	**	1,020	1,480	1,560	C*
	Total		*19,520*	*D*	*17,820*						*D*

Table 5-25: Airport Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
F	**Kapālama Canal ‘Ewa bound**										
	Nimitz Highway	3	1,570	C	1,550	**	310	1,920	2,340	2,460	C
	Dillingham Boulevard	2	560	C	560	**	200	1,240	1,560	1,640	C
	N King Street	2	790	C*	770	**	**	1,020	1,480	1,560	C*
	H-1 Freeway	4	8,150	F	8,080	2,210	3,580	5,180	6,710	7,620	F
	Hālona Street	2	1,180	C*	1,170	**	**	1,220	1,770	1,870	C*
	School Street	2	960	C*	920	**	**	1,020	1,480	1,560	C*
	Total		*13,210*	*E*	*13,050*						*E*
	Kapālama Canal Koko Head bound										
	Nimitz Highway	3	3,430	F	3,120	**	310	1,920	2,340	2,460	F
	Nimitz Flyover (future facility)	2	1,400	B	1,280	1,030	1,680	2,420	3,130	3,560	B
	Dillingham Boulevard	2	1,350	D	1,220	**	200	1,240	1,560	1,640	C
	N King Street	2	1,460	D	1,320	**	**	1,020	1,480	1,560	D
	Olomea Street	2	1,950	F	1,950	**	**	1,220	1,770	1,870	F
	H-1 Freeway	5	10,790	F	10,310	2,800	4,540	6,570	8,490	9,660	F
	School Street	2	1,760	F	1,570	**	**	1,020	1,480	1,560	F
	Total		*22,140*	*E*	*20,770*						*E*

Table 5-25: Airport Alternative—A.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2] *A*	*B*	*C*	*D*	*E*	LOS [2]
G	**Ward Avenue ‘Ewa bound**										
	H-1 Freeway	3	7,380	F	7,380	1,620	2,630	3,800	4,920	5,590	F
	Beretania Street	5	3,250	D	3,100	**	**	3,170	4,450	4,690	C*
	Kapi‘olani Boulevard	4	2,220	D	2,200	**	**	2,110	2,970	3,130	D
	Ala Moana Boulevard	3	2,150	D	2,140	**	310	1,920	2,340	2,460	D
	Total		*15,000*	*E*	*14,820*						*E*
	Ward Avenue Koko Head bound										
	H-1 Freeway	4	6,980	E	6,840	2,210	3,580	5,180	6,710	7,620	E
	Kīna‘u Street	3	1,070	C*	1,080	**	**	1,900	2,670	2,810	C*
	S King Street	5	2,850	C*	2,300	**	**	3,170	4,450	4,690	C*
	Kapi‘olani Boulevard	2	820	C*	770	**	**	1,020	1,480	1,560	C*
	Ala Moana Boulevard	3	*1,740*	*C*	1,510	**	310	1,920	2,340	2,460	C
	Total		*13,460*	*D*	*12,500*						*D*

[1] Peak hour traffic count data was obtained from the State of Hawai‘i Department of Transportation (2005) and O‘ahuMPO Travel Demand Forecasting Model
[2] LOS thresholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida’s Department of Transportation (FDOT). The Handbook provides the Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directional split of 50% was applied to the two-way volumes to generate the peak hour direction volume thresholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table 5-26: Airport Alternative—P.M. Peak Hour Screenline Volumes and LOS

ID	Screenline/Facility	2030 No Build Conditions: Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	2030 Airport Alternative: Forecast Volume (vph)	Maximum Volume Threshold [2]: *A*	*B*	*C*	*D*	*E*	LOS [2]
B	**'Ewa Wai'anae bound**										
	H-1 Freeway	3	4,680	D	4,220	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D
	H-1 Freeway future HOV	1	1,100	C	1,130	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Farrington Highway	2	510	C	450	**	*200*	*1,240*	*1,560*	*1,640*	C
	Fort Weaver Road (SB)	2	2,410	F	2,350	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*8,700*	*D*	*8,150*						*D*
	'Ewa Koko Head bound										
	H-1 Freeway	3	6,120	F	6,040	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F
	H-1 Freeway future HOV	1	990	C	940	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Farrington Highway	3	550	C	510	**	*310*	*1,920*	*2,340*	*2,460*	C
	Fort Weaver Road (NB)	2	2,620	F	2,550	**	*200*	*1,240*	*1,560*	*1,640*	F
	Total		*10,280*	*F*	*10,040*						*F*
C	**Waikele Stream 'Ewa bound**										
	H-1 Freeway	4	9,010	F	8,490	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	H-1 Freeway future HOV	1	490	A	440	*515*	*839*	*1,213*	*1,568*	*1,783*	A
	Waipahu Street	1	180	C*	140	**	**	*440*	*700*	*740*	C*
	Farrington Highway	4	1,450	C	1,290	**	*400*	*2,530*	*3,030*	*3,180*	C
	Total		*11,130*	*E*	*10,360*						*E*
	Waikele Stream Koko Head bound										
	H-1 Freeway	5	6,960	D	7,080	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	Waipahu Street	1	410	C*	380	**	**	*440*	*700*	*740*	C*
	Farrington Highway	3	1,010	C	810	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*8,380*	*D*	*8,270*						*D*

Table 5-26: Airport Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
D	**Kalauao ‘Ewa bound**										
	H-1 Freeway	4	9,040	F	8,560	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	H-1 Freeway HOV	1	1,720	E	1,520	*515*	*839*	*1,213*	*1,568*	*1,783*	D
	H-1 Freeway Zipper	1	950	C	800	*515*	*839*	*1,213*	*1,568*	*1,783*	B
	Moanalua Road	2	2,250	F	1,860	**	**	*1,020*	*1,480*	*1,560*	F
	Kamehameha Highway	3	2,190	D	2,000	**	*310*	*1,920*	*2,340*	*2,460*	D
	Total		*16,150*	*E*	*14,740*						*E*
	Kalauao Koko Head bound										
	H-1 Freeway	5	8,060	D	7,860	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	H-1 Freeway HOV (existing only)	NA	NA	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA
	Moanalua Road	2	970	C*	920	**	**	*1,020*	*1,480*	*1,560*	C*
	Kamehameha Highway	3	1,780	C	1,710	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total	5	8,060	D	7,860	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D

Table 5-26: Airport Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
E	**Salt Lake ʻEwa bound**										
	Moanalua Freeway	4	5,990	D	5,780	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D
	H-1 Freeway	4	4,200	C	3,640	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C
	H-1 Freeway HOV	1	1,210	C	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	H-1 Freeway Future zipper lane	1	810	B	660	*515*	*839*	*1,213*	*1,568*	*1,783*	B
	Nimitz Highway	3	2,530	F	2,380	**	*310*	*1,920*	*2,340*	*2,460*	E
	Salt Lake Boulevard	2	870	C*	830	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*15,610*	*D*	*14,360*						*D*
	Salt Lake Koko Head bound										
	Moanalua Freeway	2	2,910	D	2,700	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D
	Moanalua Freeway HOV	1	960	C	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	H-1 Freeway + Shoulder Express (1 lane)	4	3,970	C	4,200	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C
	H-1 Freeway HOV (1 lane)	1	1,070	C	990	*515*	*839*	*1,213*	*1,568*	*1,783*	C
	Nimitz Highway	5	1,600	C	1,590	**	*500*	*3,160*	*3,790*	*3,980*	C
	Salt Lake Boulevard	2	410	C*	400	**	**	*1,020*	*1,480*	*1,560*	C*
	Total		*10,920*	*C*	*10,950*						*C*

Table 5-26: Airport Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
F	**Kapālama Canal ʻEwa bound**										
	Nimitz Highway	3	1,750	C	1,510	**	*310*	*1,920*	*2,340*	*2,460*	C
	Nimitz Flyover (future facility)	2	880	A	810	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A
	Dillingham Boulevard	2	1,140	C	900	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	1,470	D	1,310	**	**	*1,020*	*1,480*	*1,560*	D
	H-1 Freeway	4	8,370	F	8,170	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F
	Hālona Street	2	1,740	D	1,730	**	**	*1,220*	*1,770*	*1,870*	D
	School Street	2	1,370	D	1,250	**	**	*1,020*	*1,480*	*1,560*	D
	Total		*16,710*	*E*	*15,680*						*E*
	Kapālama Canal Koko Head bound										
	Nimitz Highway	3	3,520	F	3,270	**	*310*	*1,920*	*2,340*	*2,460*	F
	Dillingham Boulevard	2	1,020	C	1,010	**	*200*	*1,240*	*1,560*	*1,640*	C
	N King Street	2	1,470	D	1,430	**	**	*1,020*	*1,480*	*1,560*	D
	Olomea Street	2	1,670	D	1,670	**	**	*1,220*	*1,770*	*1,870*	D
	H-1 Freeway	5	8,050	D	7,990	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D
	School Street	2	1,150	D	1,150	**	**	*1,020*	*1,480*	*1,560*	D
	Total		*16,880*	*D*	*16,520*						*D*

Table 5-26: Airport Alternative—P.M. Peak Hour Screenline Volumes and LOS (continued)

ID	Screenline/Facility	2030 No Build Conditions			2030 Airport Alternative						
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	Maximum Volume Threshold [2]					LOS [2]
						A	*B*	*C*	*D*	*E*	
G	**Ward Avenue ʻEwa bound**										
	H-1 Freeway	3	6,970	F	6,930	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F
	Beretania Street	5	3,040	C*	2,760	**	**	*3,170*	*4,450*	*4,690*	C*
	Kapiʻolani Boulevard	2	1,570	F	1,440	**	**	*1,020*	*1,480*	*1,560*	D
	Ala Moana Boulevard	3	2,020	D	1,810	**	*310*	*1,920*	*2,340*	*2,460*	C
	Total		*13,600*	*E*	*12,940*						*E*
	Ward Avenue Koko Head bound										
	H-1 Freeway	4	7,370	E	7,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E
	Kīnaʻu Street	4	1,810	C*	1,780	**	**	*2,540*	*3,560*	*3,750*	C*
	S King Street	6	3,450	C*	3,370	**	**	*3,800*	*5,340*	*5,630*	C*
	Kapiʻolani Boulevard	4	2,370	D	2,280	**	**	*2,110*	*2,970*	*3,130*	D
	Ala Moana Boulevard	*3*	*2,330*	*D*	*2,270*	**	*310*	*1,920*	*2,340*	*2,460*	*D*
	Total		*17,330*	*D*	*17,030*						*D*

[1] Peak hour traffic count data was obtained from the State of Hawaiʻi Department of Transportation (2005) and Oʻahu MPO Travel Demand Forecasting Model
[2] LOS thresholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directional split of 50% was applied to the two-way volumes to generate the peak hour direction volume thresholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table 5-26 presents a similar analysis for the p.m. peak hour. The following screenlines are projected to operate at LOS E or F during the p.m. peak hour with this Build Alternative:

- ‘Ewa Screenline (Koko Head direction)
- Waikele Stream Screenline (‘Ewa direction)
- Kalauao Screenline (‘Ewa direction)
- Kapālama Canal Screenline (‘Ewa direction)
- Ward Avenue Screenline (‘Ewa direction)

Table 5-26 also illustrates the individual facility LOS.

The data in Table 5-25 and Table 5-26 indicate a general reduction in a.m. peak hour volumes with the Airport Alternative. No project effects were identified under the Airport Alternative in either the a.m. or p.m. peak travel hours.

5.5.3 Intersection LOS Analysis Relating to Guideway Column Placement

In addition to the screenline analysis, an evaluation was conducted for the Build Alternatives’ potential effect at selected intersections along the study corridor. The specific intersections to be analyzed were determined by identifying areas where the addition of the guideway would result in a loss of roadway capacity and influence traffic patterns and operating conditions.

There is only one location in the study corridor, along Salt Lake Boulevard, where a loss of roadway capacity could occur due to the placement of guideway support columns. This would only occur under the Salt Lake Alternative and the Airport & Salt Lake Alternative.

The addition of the guideway along this corridor is expected to result in a loss of capacity on Salt Lake Boulevard between Marshall Road/Pakini Street and Luapele Drive in the ‘Ewa-bound direction. Salt Lake Boulevard is a major two-way corridor that serves mostly residential and some commercial land uses.

Four intersections on Salt Lake Boulevard were selected for analysis:

- Salt Lake Boulevard and Kahuapa‘ani Street
- Salt Lake Boulevard and Luapele Drive
- Salt Lake Boulevard and Ala Oli Street
- Salt Lake Boulevard and Bougainville Drive

The O‘ahuMPO travel demand forecasting model peak hour traffic volumes were analyzed to determine projected LOS at the four intersections selected for analysis in the Salt Lake area. The results of the analysis, summarized in Table 5-27, indicate projected LOS for each intersection.

Table 5-27: Salt Lake Boulevard Intersection Analysis

Intersection			Control	Peak Hour	Year 2007		2030 No Build		Salt Lake Alternative			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Salt Lake Boulevard	&	Kahuapa‘ani Street	Signal	A.M.	82	F	152	F	78	E	-74	NO
				P.M.	97	F	323	F	126	F	-197	NO
Salt Lake Boulevard	&	Luapele Drive	Signal	A.M.	10	A	9	A	10	A	1	NO
				P.M.	21	C	20	C	9	A	-11	NO
Salt Lake Boulevard	&	Ala Oli Street	Signal	A.M.	22	C	23	C	23	C	0	NO
				P.M.	13	B	14	B	15	B	1	NO
Salt Lake Boulevard	&	Bougainville Drive	Signal	A.M.	31	C	29	C	26	C	-3	NO
				P.M.	41	D	41	D	36	D	-5	NO

The results indicate that three of the four intersections are projected to operate at LOS D or better, which is considered an acceptable LOS for O‘ahu under 2030 No Build traffic conditions. The Salt Lake Boulevard and Kahuapa‘ani Street intersection is projected to operate at LOS F.

The reduced number of lanes on Salt Lake Boulevard would not cause any of the intersections currently operating at LOS D to deteriorate to LOS E or F. The intersection already operating at LOS F would also not experience an increase in average vehicle delays. Therefore, this proposed alternative would not have a substantial project effect at any intersection analyzed in the study corridor.

5.6 Localized Traffic Effects in Station Areas

This section discusses potential effects of the Build Alternatives on local traffic in the vicinity of guideway stations including an analysis of the effects of column placements on traffic. In addition, intersection analyses were conducted near stations with park-and-ride facilities, anticipated high volumes of local bus access, and near the maintenance and storage facility for guideway vehicles.

5.6.1 Effects of Guideway Placements on Roadway and Sidewalk Capacity

This section presents an evaluation of potential effects on the physical roadway resulting from guideway column placements. The columns proposed for the fixed guideway would be typically 6 to 8 feet in diameter and generally spaced 120 to 150 feet apart. At locations where a station is proposed, three columns would be used to support the guideway and would be typically placed 90 feet apart. It has been assumed that 2 feet of clearance would be required on either side of a column, resulting in 6-foot diameter columns needing a 10-foot diameter footprint and an 8-foot diameter column would require a 12-foot diameter footprint.

Kapolei

This section of the proposed alignment would generally travel from Farrington Highway and end at Fort Weaver Road. Three stations are planned along this alignment. Table 5-28 summarizes the column placement for the rail alignment at key locations along this segment including the facility’s potential effects.

Table 5-28: Column Placement Effects—Kapolei

Street/Intersection	Column Placement	Summary of Potential Effects
North-South Road/ East-West Road	Roadside	Changes in lane widths are not anticipated.
Old Fort Weaver Road/ Farrington Highway	Roadside	The proposed guideway would fit in the existing median.

Waipahu to Aloha Stadium

The proposed alignment would travel from Farrington Highway and the Leokū Street Station to the vicinity of Aloha Stadium. Potential transportation effects from column placement along this section include:

- Farrington Highway at Leokū Street and Waipahu Depot Road: this location does not have a median wide enough for the fixed guideway columns. To expand the median by 6 to 7 feet and subsequently fit the columns, the existing through travel lanes would need to be reduced to 11 feet and left-turn lanes reduced to 10 feet.
- At the unsignalized intersection of Farrington Highway and Moloalo Street, the left-turn pockets on both approaches may need to be removed.
- Farrington Highway at Paiwa Street and Kahualii Street does not have a median wide enough to support columns. May need to remove eastbound left-turn pocket. Intersection currently not signalized.
- The existing roadway configuration at the Farrington Highway and the H-1/H-2 Freeway interchange may require spans exceeding the maximum design length of 150 feet.
- Columns would not fit in the median along Kamehameha Highway between Acacia Road and Waimanu Road/Lehua Avenue. To expand the median by 8 feet, the through lanes would be reduced to 11 feet and the left-turn lanes reduced to 10 feet.
- At Kamehameha Highway and Pu‘u Momi Street, through lanes and left-turn lanes would be reduced to 11 feet and 10 feet, respectively.
- The median between Kuleana Road and the entrance to the Boat House (just Koko Head of Honomanu Street) would not be wide enough to fit columns. To expand the median, through lanes and left-turn lanes would be reduced to 11 and 10 feet, respectively.

Table 5-29 summarizes column placement and potential effects at key locations along this segment.

Table 5-29: Column Placement Effects—Waipahu to Aloha Stadium

Street/Intersection ID	Column Placement	Summary of Potential Effects
Fort Weaver Highway and Kunia Road	Roadside/ Median	Median would need to be expanded by 9 ft to fit fixed guideway. Existing through lanes would be reduced to 11 ft and left-turn lanes to 10 ft.
Farrington Highway and Leokū Street	Median	Median would not be wide enough on eastbound approach (needs to be expanded by 7 ft). Existing left-turn lanes would be reduced to 10 ft and through lanes to 11 ft.
Farrington Highway and Waipahu Depot Road	Median	Median would need to be expanded by 6 ft to accommodate columns (both eastbound and westbound approaches). Existing left-turn lanes would be preserved. Existing through lanes would be reduced to 11 ft and left-turn lanes to 10 ft.
Farrington Highway and Moloalo Street	Median	Median may not be wide enough on either approach. May remove left-turn pockets on both approaches. Intersection currently not signalized.
Farrington Highway and Kamoku Street	Median	Median would fit fixed guideway. Intersection currently unsignalized.
Farrington Highway and Paiwa Street	Median	Median width would not fit columns. Would need to decrease all lane widths to widen median.
Farrington Highway ~ Left turn midblock between Paiwa Street and Kahualii Street	Median	Median not wide enough on eastbound approach. May need to remove eastbound left-turn pocket. Intersection currently not signalized.
Farrington Highway and Kahualii Street	Median	Median would need to be expanded by 10 ft (both eastbound and westbound approaches). Would need to reduce existing through lanes to 11 ft and left-turn lanes to 10 ft.
Farrington Highway and H-1/H-2 Freeway Crossing	Roadside	Will require 230-ft span and some short spans
Kamehameha Highway and Waihona Street	Roadside	New access ramp to park-and-ride
Kamehameha Highway and Kuala Road	Median	Sufficient space on the makai side of the roadway to support columns.
Kamehameha Highway and Acacia Road	Median	Columns would not fit in existing roadway. Median would need to be expanded by 8 ft. Would need to reduce through lanes to 11 ft and left-turn lanes to 10 ft, preserve left-turn lanes.
Kamehameha Highway and Waimanu Home Road/ Lehua Avenue	Median	Columns would not fit in existing roadway. Median would need to be expanded by 8 ft. Would need to reduce through lanes to 11 ft and left-turn lanes to 10 ft, preserve left-turn lanes.
Kamehameha Highway and Pu‘u Momi Street	Median	Columns would fit in existing median. Plan to reduce existing through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway ~ Left turns on Kamehameha Highway midblock between Pu‘u Momi Street and Pu‘u Poni Street	Median	May eliminate left turn

Table 5-29: Column Placement Effects—Waipahu to Aloha Stadium (continued)

Street/Intersection ID	Column Placement	Summary of Potential Effects
Kamehameha Highway and Pu'u Poni Street	Median	Columns would fit in existing median. Plan to reduce existing through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway ~ Left turn on Kamehameha Highway midblock between Pu'u Poni Street and Kuleana Road	Median	May eliminate left turn
Kamehameha Highway and Kuleana Road	Median	Columns would not fit in existing median. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway ~ Left turn on Kamehameha Highway midblock between Kuleana Road and Kaluamoi Drive	Median	May eliminate left turn
Kamehameha Highway and Kaluamoi Drive	Median	Columns would not fit in existing median. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Ka'ahumanu Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Hekaha Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Kanuku Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Kaonohi Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Lipoa Place	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Pali Momi Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and 'Aiea Kai Place	Median	Columns would not fit in existing median. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and McGrew Loop—Honomanu Street	Median	Columns would not fit in existing median. Median would need to be expanded. Reduce through lanes to 11 ft and left-turn lanes to 10 ft.
Kamehameha Highway and Entrance to Boathouse	Median	May eliminate left turn

Aloha Stadium to Middle Street (Salt Lake)

This section of the alignment would generally travel from Aloha Stadium along Salt Lake Boulevard to Pūkōloa Street, run adjacent to the Moanalua Stream, and end at Middle Street. Two station locations are proposed within this section. The following describes potential effects along this alignment:

- At Kahuapaʻani Street and Salt Lake Boulevard, the median would need to be expanded by 4 feet. Through lanes would be reduced to a minimum of 10 feet with 14-foot outside lanes for buses and bikes. Sidewalks would be narrowed from 8 to 6 feet.
- Between Luapele Drive and Maluna Street/Namur Road along Salt Lake Boulevard, the median would need to be expanded from 10 to 12 feet. Through lanes would be reduced to 10 feet with 14-foot outside lanes for buses and bikes. Sidewalks would be reduced from 8 to 5 feet.
- The alignment would be in the median between Ala Likikoʻi Street and Ala Napunani Street along Salt Lake Boulevard. To expand the median, lanes and sidewalks would be narrowed.

Table 5-30 summarizes the column placement and potential effects at key locations along this segment.

Aloha Stadium to Middle Street (Airport)

This alignment would generally travel from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continue makai of the Airport Viaduct to Aolele Street, turning toward the Airport along Aolele Street, through Keʻehi Lagoon Beach Park and continuing to Dillingham Boulevard via Lagoon Drive over Keʻehi Interchange to Kamehameha Highway at Middle Street. Four station locations are proposed along this alignment. The following describes potential effects along this alignment option:

- A wide median would be constructed in portions of Kamehameha Highway from Salt Lake Boulevard to the H-1 Freeway where the medians are narrow. To fit columns, lane widths would be reduced.
- The median at intersections between Radford Drive/Makalapa Gate and Center Drive along Kamehameha Highway would not be wide enough to fit columns. Through lanes and left-turn lanes would be reduced to 11 and 10 feet, respectively.

Table 5-30: Column Placement Effects—Aloha Stadium to Middle Street (Salt Lake)

Street/Intersection ID	Column Placement	Summary of Potential Effects
Salt Lake Boulevard and Kahuapa'ani Street	Median	Median would need to be expanded by 4 ft. Lanes would be changed to minimum 10-ft lanes with a 14-ft outside lane for buses and bikes. Additional reduction of sidewalks from 8 ft to 6 ft
Salt Lake Boulevard and Luapele Drive	Median	Median would need to be expanded by 10 to 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Ala Oli Street	Median	Median would need to be expanded by 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Bougainville Drive	Median	Median would need to be expanded by 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Lawehana Street	Median	Median would need to be expanded by 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Pakini Street/Marshall Road	Median	Median would need to be expanded by 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Maluna Street/Namur Road	Median	Median would need to be expanded by 12 ft. Reduce travel lanes to 10 ft, with 14-ft outside lanes for bus and bike. Reduce sidewalk from 8 ft to 5 ft
Salt Lake Boulevard and Ala Liliko'i Street	Median	Median would need to be expanded by 10 to 14 ft. Reduce lane widths and sidewalks to create a wide enough median.
Salt Lake Boulevard and Arizona Road	Median	Median would need to be expanded by 10 to 14 ft. Reduce lane widths and sidewalks to create a wide enough median.
Salt Lake Boulevard and Peltier Avenue	Median	Median would need to be expanded by 10 ft. Reduce lane widths and sidewalks to create a wide enough median.
Salt Lake Boulevard and Ala Napunani Street	Median	Median would need to be expanded by 10 to 13 ft. Reduce lane widths and sidewalks to create a wide enough median.

Table 5-31 summarizes the column placement for the rail alignment at key locations along this segment. It describes each intersection and the column placement, and summarizes the facility's potential effect.

Table 5-31: Column Placement Effects—Aloha Stadium to Middle Street (Airport)

Street/Intersection ID	Column Placement	Summary of Potential Effects
Kamehameha Highway and Salt Lake Boulevard	Roadside	Due to roadside location, effects are expected to be minimal
Kamehameha Highway and Kohomua Street	Roadside/ Median	Effects expected to be minimal
Kamehameha Highway and Radford Drive/Makalapa Gate	Median	Columns would not fit in existing median. Plan to reduce existing through lanes to 11 ft and left-turn lanes to 10 ft
Kamehameha Highway and Center Drive	Median	Columns would not fit in existing median. Plan to reduce existing through lanes to 11 ft and left-turn lanes to 10 ft
Aolele Street	Roadside	Due to roadside location, effects are expected to be minimal, although some additional right-of-way may be needed

Middle Street to Iwilei

This alignment would generally travel from the Keʻehi Interchange to Iwilei via Kamehameha Highway and Dillingham Boulevard. Three station locations are proposed along this alignment. The following describes potential effects along this alignment option:

- At Kamehameha Highway and Middle Street, the fixed guideway would travel along the mauka side of the roadway. Eastbound lanes would be reduced from 14 to 12 feet and westbound lanes (currently 12 feet) would be maintained.
- Column placement along the section of Kamehameha Highway and Laumaka Street and Dillingham Boulevard between Puʻuahale Street and Waiakamilo Road would require the addition of a new median. On the makai side of the roadway, 10 feet of additional right-of-way would be acquired to preserve all through and left-turn lanes.
- On Dillingham Boulevard between the intersections with Kaʻaahi Street and King Street, one makai-bound lane would be added for buses to turn left into Kamaʻaha. This would require acquiring additional right-of-way.

Table 5-32 summarizes the column placement for the rail alignment and potential effects at key locations along this segment.

Table 5-32: Column Placement Effects—Middle Street to Iwilei

Intersection(s)	Column Placement	Summary of Potential Effects
Kamehameha Highway and Middle Street	Mauka side of roadway	Fixed guideway on mauka side of roadway. Eastbound lanes would be reduced from 14 to 12 ft. Westbound lanes (currently 12 ft) would be maintained.
Kamehameha Highway at Gaspro	Transitions from roadside to median	Existing median would need to be expanded by 6 ft. Eastbound roadway would be reduced from 42 to 36 ft (three 12-ft lanes). No lane removal.
Kamehameha Highway and Laumaka	On future median	No median exists, need 10 ft for median. All lanes would be maintained by acquiring right-of-way on the makai side of the roadway.
Dillingham Boulevard, from Pu‘uhale to Waiakamilo	On future median	All through and left-turn lanes would be preserved by acquiring 10 ft of additional right-of-way on the makai side of the roadway. Signal modification may be necessary to account for left-turn phasing.
Dillingham Boulevard, from Kohou to Costco Rear Parking	Mauka side of roadway	All through and left-turn lanes would be preserved by acquiring 10 ft of additional right-of-way on the makai side of the roadway.
Dillingham Boulevard, from Ka‘aahi Street to King Street	Crosses to Ka‘aahi at Dillingham	Plan to add makai-bound lane for buses to turn left into Kamaaha. This would require acquiring right-of-way.

Iwilei (Downtown Honolulu) to Ala Moana Center

This part of the alignment would generally travel from Downtown Honolulu to Ala Moana Shopping Center via Ka‘aahi Street, Nimitz Highway, Halekauwila Street, and Kona Street. Six station locations are proposed along this alignment, including the Iwilei Station. The following describes potential effects along this alignment option:

- On Nimitz Highway at Maunakea, Smith, Nu‘uanu, Bethel, Fort, Bishop, Alakea, and Halekauwila Streets, the existing median would need to be widened to accommodate columns. Travel and turn-lane widths would be reduced but all lanes would be preserved by acquisition of right-of-way.
- Column placement on Halekauwila Street from Nimitz Highway to Ward Avenue would generally be in the center of the street, resulting in the loss of most on-street parking spaces.
- The columns along Kona Street from Pensacola to Pi‘ikoi Street would be on both sides of the roadway. This would result in a loss of all on-street parking spaces.
- Between Pi‘ikoi Street and Ke‘eaumoku Street three tracks are proposed on the guideway. This will require columns to be placed on both sides of the street and in the median.

Table 5-33 summarizes the column placement for the rail alignment and potential effects at key locations along this segment.

Table 5-33: Column Placement Effects—Iwilei (Downtown Honolulu) to Ala Moana Center

Intersection(s)	Column Placement	Summary of Potential Effects
Nimitz Highway from Maunakea Street to Halekauwila Street	Median	Lane widths would be reduced, all lanes would be preserved. Median would be expanded by acquiring additional right-of-way.
Halekauwila Street from Nimitz Highway to Ward Avenue	Median	All travel and turn lanes would be preserved. Most of the existing on-street parking would be removed.
Queen Street from Kamakeʻe Street to Waimanu Street	Median	Columns would fit on existing median and mauka side of street. Parking on the mauka side of the street would be removed.
Kona Street from Pensacola Street to Piʻikoi Street	Roadside	All travel lanes would be preserved. All parking would be removed.
Kona Street and Kona Iki Street	Median	Existing lane widths would be maintained. Median location would be shifted.

5.6.2 Traffic Effects in Station Areas with Park-and-Ride Facilities

Four park-and-ride facilities are proposed (Table 5-34). The table includes the station location, proposed number of parking spaces, and total number of feeder buses in the a.m. and p.m. peak hour. Potential effects would be from auto traffic accessing the park-and-ride facilities (parking or dropping passengers) as well as buses serving the station.

Table 5-34: Park-and-Ride Stations

Park-and-Ride Station Location	Proposed Number of Parking Spaces	Total Number of Buses in A.M. Peak hour	Total Number of Buses in P.M. Peak hour
East Kapolei	900	42	42
UH West Oʻahu	1,000	20	20
Pearl Highlands	1,600	62	62
Aloha Stadium	600	42-46*	42-46*

*Varies between the Build Alternatives

Park-and-ride facilities are generally located in areas containing vacant or undeveloped land. For modeling purposes, it was assumed that fixed guideway riders would not be charged for using these park-and-ride facilities.

The following sections discuss estimated effects of additional traffic generated by park-and-ride facilities, including the operational effect at key intersections in each station area.

East Kapolei and University of Hawai'i West O'ahu Stations

Table 5-35 summarizes the a.m. and p.m. peak hour trips at the East Kapolei and UH West O'ahu Stations with park-and-ride facilities. These stations are proposed along the future North-South Road between Farrington Highway and Franklin D. Roosevelt (Roosevelt) Avenue:

- <u>East Kapolei Station</u>—the East Kapolei Station would be the terminus station for all three Build Alternatives. This station would have an elevated platform and is proposed on the 'Ewa side of North-South Road near a new East-West Road for the Ho'opili area. Approximately 900 parking spaces are proposed. Access to this park-and-ride facility is proposed via the Ho'opili East-West Road. Seven bus routes with 42 transit vehicles would serve the station during each a.m. and p.m. peak hour. This station is estimated to generate approximately 420 park-and-ride and kiss-and-ride vehicular trips in the a.m. peak hour.
- <u>UH West O'ahu Station</u>—this station would be near North-South Road on the UH West O'ahu campus and has been proposed for all the three Build Alternatives. Approximately 1,000 parking spaces would be provided. Five bus routes with 21 transit vehicles would serve the station during a.m. and p.m. peak hours. This station is estimated to generate approximately 240 park-and-ride and kiss-and-ride vehicular trips during the a.m. peak hour.

Table 5-35: Peak Hour Trip Generation—East Kapolei and UH West O'ahu Stations

Type	Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips			
Peak Hour	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
Stations/Alternatives	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Salt Lake												
East Kapolei Station	298	0	0	298	60	60	60	60	21	21	21	21
UH West O'ahu	145	0	0	145	45	45	45	45	21	21	21	21
Airport												
East Kapolei Station	299	0	0	299	59	59	59	59	21	21	21	21
UH West O'ahu	144	0	0	144	46	46	46	46	21	21	21	21

As part of the ORTP and Ho'opili Development Plan, several access roadways or connectors would be constructed in anticipation of UH West O'ahu's development and new commercial and residential development in the East Kapolei area. Traffic analyses were conducted for both proposed park-and-ride stations. The following future or reconfigured intersections were selected for analysis and are adjacent to the two stations:

- North-South Road and Roosevelt Avenue (future intersection)
- North-South Road and Kapolei Parkway (future intersection)
- North-South Road and Road B (future intersection)
- North-South Road and East-West Road (future intersection)
- Old Fort Weaver Road and Fort Weaver/‘A‘awa Drive (reconfigured intersection)
- Farrington Highway and ‘Ewa Road (future intersection)
- Farrington Highway and North-South Road (future intersection)
- Farrington Highway and Old Fort Weaver Road (existing intersection)
- Farrington Highway and Kunia (Highway 76) northbound on-ramp (existing intersection)
- Farrington Highway and Kunia Laulaunui Street (existing intersection)

Under 2030 No Build conditions, four of the seven intersections on Farrington Highway and on Fort Weaver Road would operate at unacceptable LOS E or F during one or both peak hours. The results for the 2030 No Build Alternative and Build Alternatives are shown in Table 5-36. The Airport & Salt Lake Build Alternative effects would be similar to the other Build Alternatives. No substantial traffic effects are projected for intersections in the vicinity of the East Kapolei and UH West O‘ahu stations.

Table 5-36: East Kapolei and UH West O'ahu Stations Intersection Analysis

Intersection			Control*	Peak Hour	No Build Delay (sec)	No Build LOS	Build Alternatives Delay (sec)	Build Alternatives LOS	Project Delay Change	Effect?
Salt Lake Alternative										
Roosevelt Avenue	&	North-South Road [1]	S	A.M.	33	C	43	D	10	NO
				P.M.	19	B	21	C	2	NO
Kapolei Parkway	&	North-South Road [2]	S	A.M.	35	C	48	D	13	NO
				P.M.	33	C	35	D	2	NO
North-South Road	&	Road B [3]	S	A.M.	44	D	45	D	1	NO
				P.M.	37	D	35	C	-2	NO
North-South Road	&	East-West Road [4]	S	A.M.	27	C	32	C	5	NO
				P.M.	33	C	28	C	-5	NO
Old Fort Weaver Road	&	Fort Weaver Road/'A'awa Drive	S	A.M.	114	F	91	F	-23	NO
				P.M.	68	E	58	E	-10	NO
Farrington Highway	&	New 'Ewa Road [5]	S	A.M.	49	D	38	D	-11	NO
				P.M.	44	D	34	C	-10	NO
Farrington Highway	&	North-South Road [4]	S	AM	105	F	29	C	-76	NO
				PM	39	D	41	D	2	NO
Farrington Highway	&	Old Fort Weaver Road	TWSC	A.M.	>400	F	>400	F	<0 [6]	NO
				P.M.	>400	F	>400	F	<0 [6]	NO
Farrington Highway	&	Kunia (Hwy 76) NB On-Ramp	S	AM	5	A	5	A	0	NO
				PM	2	A	2	A	0	NO
Fort Weaver Road	&	Laulaunui Street	S	AM	131	F	115	F	-16	NO
				PM	66	E	64	E	-2	NO
Airport Alternative										
Roosevelt Avenue	&	North-South Road [1]	S	A.M.	33	C	43	D	10	NO
				P.M.	19	B	31	C	12	NO
Kapolei Parkway	&	North-South Road [2]	S	A.M.	35	C	44	D	9	NO
				P.M.	33	C	33	C	0	NO
North-South Road	&	Road B [3]	S	A.M.	44	D	46	D	2	NO
				P.M.	37	D	29	C	-8	NO

Table 5-36: East Kapolei and UH West O'ahu Stations Intersection Analysis (continued)

Intersection			Control*	Peak Hour	No Build		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
North-South Road	&	East-West Road [4]	S	A.M.	27	C	29	C	2	NO
				P.M.	33	C	25	C	-8	NO
Old Fort Weaver Road	&	Fort Weaver Road/'A'awa Drive	S	A.M.	114	F	93	F	-21	NO
				P.M.	68	E	58	E	-10	NO
Farrington Highway	&	New 'Ewa Road [5]	S	A.M.	49	D	36	C	-13	NO
				P.M.	44	D	42	D	-2	NO
Farrington Highway	&	North-South Road [4]	S	AM	105	F	28	C	-77	NO
				PM	39	D	45	D	6	NO
Farrington Highway	&	Old Fort Weaver Road	TWSC	A.M.	>400	F	>400	F	<0 [6]	NO
				P.M.	>400	F	>400	F	<0 [6]	NO
Farrington Highway	&	Kunia (Hwy 76) NB On-Ramp	S	AM	5	A	5	A	0	NO
				PM	2	A	2	A	0	NO
Fort Weaver Road	&	Laulaunui Street	S	AM	131	F	131	F	-8	NO
				PM	66	E	61	E	-5	NO

Note: All intersections are new or modified.
* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled
[1] Lane geometry assumed—NB: one left-turn lane, one through lane, one right-turn lane; SB: one left-turn lane, one through lane, one right-turn lane; EB: one left-turn lane, two through lanes, one right-turn lane; westbound (WB): one left-turn lane, two through lanes, one right-turn lane.
[2] Lane geometry assumed—NB: one left-turn lane, three through lanes, one right-turn lane; SB: one left-turn lane, three through lanes, one right-turn lane; EB: one left-turn lane, two through lanes, one right-turn lane; WB: one left-turn lane, two through lanes, two right-turn lanes.
[3] Future base lane configuration assumed for North-South Road at Road B: NB: single left-turn lane, three through lanes, single right turn lane; Southbound: dual left-turn lanes, three through lanes, single right-turn lane; Westbound: single left-turn lane, one through lane, dual right-turn lanes; EB: single left turn lane, one through lane, single right-turn lane.
[4] Future base lane configuration assumed for North-South Road at East-West Connector Road: NB: one left-turn lane, three through lanes, one right-turn lane; SB: one left-turn lane, three through lanes, one right-turn lane; EB: one left-turn lane, one through lane, one right-turn lane; WB: two left-turn lanes, one through lane, one right-turn lane.
[5] Future base lane configuration assumed for Farrington Highway at New 'Ewa Road: NB: single left-turn lane, one shared through/right-turn lane, single right-turn lane; SB: single left-turn lane, one through lane, single right-turn lane; WB: dual left-turn lanes, two through lanes, single right-turn lane; EB: single left-turn lane, two through lanes, single right-turn lane.
[6] Delay cannot be calculated. However, total volumes reduced with the build alternatives.

Pearl Highlands Station

The Pearl Highlands Station would be on Kamehameha Highway at the Kuala Street intersection adjacent to the shopping center. The proposed park-and-ride facility would be in the vacant 9-acre area near the Waipahu Interchange and Leeward Community College. Approximately 1,600 parking spaces are proposed for the park-and-ride structure, with the following multiple access points planned for this facility:

- An inbound-access-only ramp with direct connection from the H-2 Freeway
- A ramp with direct connection from Koko Head-bound lanes on Farrington Highway
- A signalized intersection on Kamehameha Highway with full access provided by reconfiguration of the existing stop-controlled intersection of Kamehameha Highway and Waihona Street
- A driveway with limited right-in and right-out access for ‘Ewa-bound lanes on Farrington Highway (westbound) at Waiawa Road

Table 5-37 presents the estimated peak hour trips that may access this station. Eleven bus routes with approximately 62 transit vehicles are projected to serve this station area during both peak hours. It is estimated that this station may generate up to 740 park-and-ride and kiss-and-ride vehicular trips during the a.m. peak hour.

Table 5-37: Peak Hour Trip Generation—Pearl Highland Station

Type	Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake												
Pearl Highlands Station	563	0	0	563	112	112	112	112	47	15	15	47
Airport												
Pearl Highlands Station	549	0	0	549	112	112	112	112	47	15	15	47

Five intersections immediately adjacent to this station were selected for analysis:

- Farrington Highway and Waiawa Road eastbound (existing)
- Farrington Highway and Waiawa Road westbound (existing, to be reconfigured to add the Pearl Highlands Station park-and-ride driveway)
- Kamehameha Highway and Waihona Street (existing, to be reconfigured to add the Pearl Highlands Station park-and-ride driveway)
- Kamehameha Highway and Kuala Street
- Ala Ike Street and Waiawa Road (existing)

According to the ORTP, a future planned four-lane roadway, Central Mauka Road, would be constructed to provide access to future residential and commercial development in the Central O‘ahu area. As this new road is a conceptual project, assumptions regarding its connection to Kamehameha Highway have been made for the purpose of the 2030 analysis. It has been assumed that, under the 2030 No Build conditions, the Central Mauka Road would provide a direct connection to eastbound Kamehameha Highway via a grade separation or an alternative means of connection rather than linking directly to the intersection of Waihona Street and Kamehameha Highway. The intersection of Waihona Street and Kamehameha Highway is also expected to be signalized to serve future 2030 traffic conditions before the introduction of the Project.

As indicated by Table 5-38, the traffic analysis conducted for the No Build Alternative shows that the LOS at all five study intersections is projected to deteriorate to LOS F during one or both peak hours.

The traffic analysis indicates that the addition of the Project, together with the projected park-and-ride and kiss-and-ride services, would result in increased traffic and have an effect at the following intersections:

- Kamehameha Highway and Waihona Street/Pearl Highlands Station park-and-ride driveway
- Kamehameha Highway and Kuala Street
- Farrington Highway (WB) and Waiawa Road/Pearl Highlands Station park-and-ride driveway

The effects of the Airport & Salt Lake Alternative would be similar to those of the other Build Alternatives.

Table 5-38: Pearl Highlands Station Intersection Analysis

Intersection			Control*	Peak Hour	No Build Delay (sec)	No Build LOS	Build Alternatives Delay (sec)	Build Alternatives LOS	Project Delay Change	Effect?
Salt Lake Boulevard Alternative										
Farrington Highway (EB)	&	Waiawa Road	S	A.M.	149	F	45	D	-104	NO
				P.M.	162	F	120	F	-42	NO
Farrington Highway (WB)	&	Waiawa Rd/Pearl Highlands Station Park-and-Ride Driveway [1]	TWSC	AM	76	F	316	F	240	**YES**
				PM	30	D	125	F	95	**YES**
Kamehameha Highway	&	Waihona St/Pearl Highlands Station Park-and-Ride Driveway [2]	TWSC/S[3]	AM	36	F	45	D	9	NO
				PM	122	F	138	F	16	**YES**
Kamehameha Highway	&	Kuala Street	TWSC	AM	71	F	205	F	134	**YES**
				PM	>400	F	>400	F	>0 [4]	**YES**
Ala Ike Street	&	Waiawa Road	TWSC	AM	376	F	296	F	-80	NO
				PM	27	D	6	B	-21	NO
Airport Alternative										
Farrington Highway (EB)	&	Waiawa Road	S	AM	149	F	45	D	-104	NO
				PM	162	F	106	F	-56	NO
Farrington Highway (WB)	&	Waiawa Rd/Pearl Highlands Station Park-and-Ride Driveway [1]	TWSC	AM	76	F	299	F	223	**YES**
				PM	30	D	122	F	92	**YES**
Kamehameha Highway	&	Waihona St/Pearl Highlands Station Park-and-Ride Driveway [2]	TWSC/S[3]	AM	36	D	45	D	9	NO
				PM	122	F	137	F	15	**YES**
Kamehameha Highway	&	Kuala Street	TWSC	AM	71	F	205	F	134	**YES**
				PM	>400	F	>400	F	>0 [4]	**YES**
Ala Ike Street	&	Waiawa Road	TWSC	AM	376	F	296	F	-80	NO
				PM	27	D	14	B	-13	NO

S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

[1] With the build alternatives, this park-and-ride driveway would be limited to right-in and right-out access only.

[2] With the build alternatives, lane configuration assumed for park-and-ride driveway: dual left-turn lane, single through lane, single right-turn lane.

[3] Waihona Street currently provides a single left-turn lane and a right-turn lane and is controlled by stop signs. Traffic on Kamehameha Highway is currently uncontrolled. Under future 2030 No Build conditions and 2030 Build conditions, the T-intersection of Waihona Street & Kamehameha Highway is assumed to be signalized under 2030 No Build conditions and 2030 Build alternatives. It is also assumed future planned Central Mauka Road would provide a direct connection to Kamehameha Highway eastbound through a grade-separation project rather than a direct connection to the intersection of Waihona Street & Kamehameha Highway.

[4] Delay cannot be calculated. However, total volumes are estimated to increase with the build alternatives.

Aloha Stadium Station

A park-and-ride facility is proposed to be constructed on seven acres of land near Aloha Stadium, across from Ford Island Boulevard, that would provide 600 parking spaces and bus transfer opportunities. Vehicular access to the facility would be via Salt Lake Boulevard.

Table 5-39 indicates traffic from the park-and-ride and kiss-and-ride peak hour vehicular trips. Six to seven bus routes with approximately 42 to 46 transit vehicles are projected to serve this station area during the a.m. peak period. The Salt Lake and Airport Alternatives are estimated to generate approximately 160 and 320 a.m. peak hour vehicular trips, depending on the Build Alternative. The Airport & Salt Lake Alternative effects would be similar to the other Build Alternatives.

Table 5-39: Peak Hour Trip Generation—Aloha Stadium Station

Type	Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake Alternative												
Aloha Stadium (Salt Lake) Station	155	0	0	155	2	2	2	2	24	22	22	24
Airport Alternative												
Aloha Stadium (Kamehameha Highway) Station	285	0	0	285	17	17	17	17	22	20	20	22

Nine existing intersections immediately adjacent to the Aloha Stadium Station were selected for analysis:

- Kamehameha Highway and Honomanu Street
- Moanalua Road and Kamehameha Highway Ramps
- Kamehameha Highway and Salt Lake Boulevard (makai-bound)
- Kamehameha Highway and Salt Lake Boulevard (mauka-bound)
- Moanalua Road and Kaimakani Street
- Salt Lake Boulevard and Kahuapa‘ani Street
- Salt Lake Boulevard and Luapele Drive
- Salt Lake Boulevard and Ala Oli Street
- Salt Lake Boulevard and Bougainville Drive

As mentioned previously, the Salt Lake Alternatives would reduce capacity on Salt Lake Boulevard by one lane between Marshall Road/Pakini Street and Luapele Drive in the ‘Ewa-bound direction. This capacity loss would affect three intersections on Salt Lake Boulevard at Luapele Drive, Ala Oli Street and Bougainville Drive.

The results of the analysis shown in Table 5-40 indicate that six of the nine intersections selected for analysis are projected to operate at LOS D or better under No Build Alternative conditions. The three intersections operating at an unacceptable LOS (LOS E or F) are:

- Kamehameha Highway and Honomanu Street
- Kamehameha Highway and Salt Lake Boulevard (mauka-bound)
- Salt Lake Boulevard and Kahuapa‘ani Street

With the Build Alternatives, none of the study intersections are projected to experience a substantial increase in vehicular delays. The three intersections projected to operate at LOS E or F under the No Build Alternative would continue to do so with all the Build Alternatives. Therefore, none of the Build Alternatives would create a substantial effect at the analyzed intersections in the immediate vicinity of the Aloha Stadium Station.

5.6.3 Effects of Buses on Traffic near Stations

With the Build Alternatives, the proposed fixed guideway stations would require modifying bus transit service and/or making improvements to accommodate potential fixed guideway riders who access the system by bus. In some cases, the increase in bus-related traffic volumes would be large enough to warrant analysis of local intersections near stations.

Stations that are expected to accommodate a large number of buses were analyzed. The total number of buses serving each station can be found in Appendix B, along with more detailed information on specific routes.

Five stations on the fixed guideway alignment were selected for bus-related traffic analysis:

- West Loch Station
- Pearlridge Station
- Middle Street Transit Center
- Downtown Station
- Ala Moana Center

Table 5-40: Aloha Stadium Station Intersection Analysis

Intersection			No Build				Build Alternatives			
			Control*	Peak Hour	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Salt Lake Alternative										
Kamehameha Highway	&	Honomanu Street	S	A.M.	143	F	55	E	-88	NO
				P.M.	161	F	84	F	-77	NO
Moanalua Road	&	Kamehameha Highway Ramps	S	A.M.	18	B	22	C	4	NO
				P.M.	22	C	19	B	-3	NO
Kamehameha Highway	&	Salt Lake Boulevard (Makai-Bound)	S	A.M.	15	B	10	A	-5	NO
				P.M.	47	D	18	B	-29	NO
Kamehameha Highway	&	Salt Lake Boulevard (Mauka-Bound)	S	A.M.	145	F	107	F	-38	NO
				P.M.	24	C	19	B	-5	NO
Moanalua Road	&	Kaimakani Street	TWSC	A.M.	27	D	16	C	-11	NO
				P.M.	20	C	15	C	-5	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	152	F	78	E	-74	NO
				P.M.	323	F	126	F	-197	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	9	A	10	A	1	NO
				P.M.	20	C	9	A	-11	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	23	C	23	C	0	NO
				P.M.	14	B	15	B	1	NO
Airport Alternative										
Kamehameha Highway	&	Honomanu Street	S	A.M.	143	F	59	E	-84	NO
				P.M.	161	F	89	F	-72	NO
Moanalua Road	&	Kamehameha Highway Ramps	S	A.M.	18	B	24	C	6	NO
				P.M.	22	C	19	B	-3	NO

Table 5-40: Aloha Stadium Station Intersection Analysis (continued)

Intersection				No Build			Build Alternatives			
			Control*	Peak Hour	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Kamehameha Highway	&	Salt Lake Boulevard (Makai-Bound)	S	A.M.	15	B	10	A	-5	NO
				P.M.	47	D	20	B	-27	NO
Kamehameha Highway	&	Salt Lake Boulevard (Mauka-Bound)	S	A.M.	145	F	73	E	-72	NO
				P.M.	24	C	20	B	-4	NO
Moanalua Road	&	Kaimakani Street	TWSC	A.M.	27	D	16	C	-11	NO
				P.M.	20	C	15	C	-5	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	152	F	74	E	-78	NO
				P.M.	323	F	131	F	-192	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	9	A	6	A	-3	NO
				P.M.	20	C	4	A	-16	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	23	C	22	C	-1	NO
				P.M.	14	B	13	B	-1	NO

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

The size and nature of bus operations on the street system would have a much greater effect on traffic operations than typical passenger vehicles. This feature has been taken into account as part of the bus operations analysis. The assessment of potential bus-related effects at selected station areas also recognized the possible effects of kiss-and-ride (passenger drop offs) and spillover parking.

The following sections present the LOS analysis for intersections around these stations.

West Loch Station

The West Loch Station would be on Farrington Highway in the Waipahu area, just Koko Head of the Kunia Road and Fort Weaver Road interchange. The guideway alignment would run down the center of Farrington Highway. The station itself would be elevated and would have a mezzanine level.

Estimated bus volumes as well as spillover parking and kiss-and-ride traffic volumes are shown in Table 5-41. Nine bus routes supporting approximately 40 transit vehicle trips are projected to serve this station during a.m. and p.m. peak hours. Although this station would not have a park-and-ride facility, it is expected to have a high amount of spillover parking demand.

Table 5-41: Peak Hour Trip Generation—West Loch Station

Type	Bus Transit Vehicle Trips				Spillover Parking				Kiss-and-Ride			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake Alternative												
West Loch Station	28	12	12	28	117	0	0	117	60	60	60	60
Airport Alternative												
West Loch Station	28	12	12	28	115	0	0	115	60	60	60	60

Six adjacent intersections around this station are expected to experience a large increase in bus activity, spillover parking demand, and kiss-and-ride activity:

- Farrington Highway and Leokū Street
- Farrington Highway and Leokane Street
- Kunia (Highway 76) Northbound On-Ramp and Waipahu Street
- Leokū Street and Waipahu Street
- Kunia (Highway 76) Northbound On-Ramp and Farrington Highway
- Fort Weaver Road and Laulaunui Street

Table 5-42 presents the intersection analysis results for West Loch station under the No Build Alternative and Build Alternatives. These results show that even with the

Table 5-42: West Loch Station Intersection Analysis

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Farrington Highway	&	Leokū Street	S	A.M.	34	C	35	D	40	D	5	NO
				P.M.	82	F	145	F	113	F	-32	NO
Farrington Highway	&	Leokane Street	S	A.M.	21	C	24	C	24	C	0	NO
				P.M.	23	C	27	C	26	C	-1	NO
Kunia (Highway 76) NB On-Ramp	&	Waipahu Street	OWSC	A.M.	19.7	C	65	F	47	E	-18	NO
				P.M.	153.9	F	38	E	29	D	-9	NO
Leokū Street	&	Waipahu Street	S	A.M.	9.9	A	9	A	8	A	-1	NO
				P.M.	14.8	B	8	A	8	A	0	NO
Kunia (Highway 76) NB On-Ramp	&	Farrington Highway	S	A.M.	9.2	A	5	A	5	A	0	NO
				P.M.	5.7	A	2	A	2	A	0	NO
Fort Weaver Road	&	Laulaunui Street	S	A.M.	152	F	131	F	115	F	-16	NO
				P.M.	50.6	D	66	E	64	E	-2	NO
Airport Alternative												
Farrington Highway	&	Leokū Street	S	A.M.	34	C	35	D	42	D	7	NO
				P.M.	82	F	145	F	109	F	-36	NO
Farrington Highway	&	Leokane Street	S	A.M.	21	C	24	C	24	C	0	NO
				P.M.	23	C	27	C	22	C	-5	NO
Kunia (Highway 76) NB On-Ramp	&	Waipahu Street	OWSC	A.M.	19.7	C	65	F	45	E	-20	NO
				P.M.	153.9	F	38	E	35	D	-3	NO
Leokū Street	&	Waipahu Street	S	A.M.	9.9	A	9	A	8	A	-1	NO
				P.M.	14.8	B	8	A	8	A	0	NO
Kunia (Highway 76) NB On-Ramp	&	Farrington Highway	S	A.M.	9.2	A	5	A	5	A	0	NO
				P.M.	5.7	A	2	A	2	A	0	NO
Fort Weaver Road	&	Laulaunui Street	S	A.M.	152	F	131	F	123	F	-8	NO
				P.M.	50.6	D	66	E	61	E	-5	NO

* S = Signal-Controlled, OWSC=One-Way-Stop-Control.

additional transit service and spillover parking and kiss-and-ride activities expected at this location, no substantial traffic effects are expected for the Build Alternatives. The Airport & Salt Lake Alternative effects would be similar to the other Build Alternatives.

Pearlridge Station

The Pearlridge Station would be on Kamehameha Highway in the East Loch area. Estimated bus volumes as well as spillover parking and kiss-and-ride traffic volumes are shown in Table 5-43. Thirteen to fourteen bus routes with approximately 70 to 74 transit vehicles are projected to serve the station during the a.m. and p.m. peak hours. This station is also expected to experience high spillover park-and-ride demand. The effects of all the Build Alternatives, including the Airport & Salt Lake Alternative, would be similar.

Table 5-43: Peak Hour Trip Generation —Pearlridge Station

Type	Bus Transit Vehicle Trips				Spillover Parking				Kiss-and-Ride			
Peak Hour	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
Stations/Alternatives	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Salt Lake												
Pearlridge Station	37	37	37	37	57	0	0	57	38	38	38	38
Airport												
Pearlridge Station	35	35	35	35	46	0	0	46	32	32	32	32

Three intersections around this station are expected to experience a large increase in bus activity, spillover parking demand, and kiss-and-ride activity:

- Kamehameha Highway and Kanuku Street
- Kamehameha Highway and Kaonohi Street
- Kamehameha Highway and Pali Momi Street

Table 5-44 presents the results for the No Build Alternative and Build Alternatives at Pearlridge Station. The Kamehameha Highway and Kanuku Street intersection would continue operating at an acceptable peak hour LOS. The impact analysis results show that even with the additional transit service expected at this location, the LOS would improve. With the No Build Alternative, the Kamehameha Highway and Kaonohi Street and Kamehameha Highway and Pali Momi Street intersections are projected to operate at poor LOS during one or both peak hours. The Build Alternatives, including the Airport & Salt Lake Alternative effects would improve the LOS substantially at these intersections.

Table 5-44: Pearlridge Station Intersection Analysis

Intersection			Control*	Peak Hour	Year 2007		No Build		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Kamehameha Highway	&	Kanuku Street	S	A.M.	21	C	29	C	20	B	-9	NO
				P.M.	10	A	12	B	11	B	-1	NO
Kamehameha Highway	&	Kaonohi Street	S	A.M.	27	C	59	E	28	C	-31	NO
				P.M.	31	C	76	E	30	C	-46	NO
Kamehameha Highway	&	Pali Momi Street	S	A.M.	21	C	47	D	23	C	-24	NO
				P.M.	10	A	59	E	24	C	-35	NO
Airport Alternative												
Kamehameha Highway	&	Kanuku Street	S	A.M.	21	C	29	C	20	B	-9	NO
				P.M.	10	A	12	B	12	B	0	NO
Kamehameha Highway	&	Kaonohi Street	S	A.M.	27	C	59	E	28	C	-31	NO
				P.M.	31	C	76	E	30	C	-46	NO
Kamehameha Highway	&	Pali Momi Street	S	A.M.	21	C	47	D	20	B	-27	NO
				P.M.	10	A	59	E	27	C	-32	NO

* S = Signal-Controlled

Middle Street Transit Center Station

The Middle Street Transit Center Station would be on Kamehameha Highway in the Kalihi area. The fixed guideway alignment would run above the H-1 Freeway and down the mauka side of Kamehameha Highway, just east of Middle Street and the freeway. This location is designed to facilitate intermodal transfers between bus and rail service. The station would be elevated and have a mezzanine level.

Estimated bus volumes as well as spillover parking and kiss-and-ride traffic volumes are shown in Table 5-45. Twelve to thirteen bus routes, ranging from approximately 61 to 79 transit vehicles, are projected to serve this station during the a.m. peak hours depending on the Build Alternative.

Table 5-45: Peak Hour Trip Generation—Middle Street Transit Center Station

Type	Bus Transit Vehicle Trips				Spillover Parking				Kiss-and-Ride			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake Alternative												
Middle Street Transit Center Station	49	30	30	49	17	0	0	17	16	16	16	16
Airport Alternative												
Middle Street Transit Center Station	37	24	24	37	20	0	0	20	16	16	16	16

Three intersections in the Pearlridge Station area are expected to experience a large increase in bus activity:

- Middle Street and King Street
- Kamehameha Highway and Middle Street
- Kamehameha Highway and Laumaka Street

Table 5-46 presents the results for the No Build Alternative and Build Alternatives. With the No Build Alternative, one of the three study intersections is projected to operate at LOS F in the a.m. peak hour:

- Kamehameha Highway and Middle Street

With the fixed guideway and additional bus operations, the intersection LOS for Kamehameha Highway and Middle Street would improve from LOS F to LOS D in the a.m. peak hour for the Build Alternatives.

In summary, these intersection LOS results demonstrate that even with the additional bus transit service and vehicle trips expected at this location, LOS would improve or remain constant with the addition of the fixed guideway. In general, there would be an improvement in delay over the No Build Alternative that is consistent across all the Build Alternatives.

Table 5-46: Middle Street Transit Center Intersection Analysis

Intersection			Control*	Peak Hour	Year 2007		No Build		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Middle Street	&	King Street	S	A.M.	15	B	19	B	16	B	-3	NO
				P.M.	11	B	15	B	14	B	-1	NO
Middle Street	&	Kamehameha Highway	S	A.M.	19	B	169	F	45	D	-124	NO
				P.M.	17	B	21	C	20	C	-1	NO
Laumaka Street	&	Kamehameha Highway	S	A.M.	4	A	24	C	21	C	-3	NO
				P.M.	5	A	23	C	17	B	-6	NO
Airport Alternative												
Middle Street	&	King Street	S	A.M.	15	B	19	B	15	B	-4	NO
				P.M.	11	B	15	B	15	B	0	NO
Middle Street	&	Kamehameha Highway	S	A.M.	19	B	169	F	45	D	-124	NO
				P.M.	17	B	21	C	21	C	0	NO
Laumaka Street	&	Kamehameha Highway	S	A.M.	4	A	24	C	19	C	-5	NO
				P.M.	5	A	23	C	14	B	-9	NO

* S = Signal-Controlled

Downtown/Aloha Tower Station

The Downtown/Aloha Tower Station would be on Nimitz Highway. The station would be elevated and have a mezzanine level. Estimated bus volumes as well as spillover parking and kiss-and-ride traffic volumes are shown in Table 5-47. Seven bus routes generating 41 transit vehicle trips are projected to serve this station during each a.m. and p.m. peak hour for the Build Alternatives.

Table 5-47: Peak Hour Trip Generation—Downtown/Aloha Tower Station

Type	Bus Transit Vehicle Trips				Spillover Parking				Kiss-and-Ride			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake Alternative												
Downtown/Aloha Tower Station	27	14	27	14	negligible				8	8	8	8
Airport Alternative												
Downtown/Aloha Tower Station	27	14	27	14	negligible				9	9	9	9

Four intersections in the vicinity of this station are expected to experience a large increase in bus activity:

- Nimitz Highway and Bishop Street
- Bishop Street and Queen Street
- Nimitz Highway and Alakea Street
- Nimitz Highway and Halekauwila Street/Richards Street

Table 5-48 presents the results for the No Build Alternative and Build Alternatives. With the No Build Alternative, the following intersections are projected to operate at LOS E or F in either the a.m. or p.m. peak hours (or both):

- Nimitz Highway and Alakea Street
- Nimitz Highway and Halekauwila Street/Richards Street

With the introduction of the Build Alternatives and additional bus services, these intersections would experience a substantial reduction in delay in the a.m. peak hour and a lesser reduction in delay in the p.m. peak hour. The intersection LOS results demonstrate that, even with the additional bus transit service expected at this location, LOS would improve or remain the same with the addition of the fixed guideway. All four analyzed locations show improvements over 2030 No Build conditions for all Build Alternatives. Although at the intersection of Nimitz Highway and Halekauwila Street/Richards Street, LOS F conditions would still exist.

Table 5-48: Downtown/Aloha Tower Station Intersection Analysis

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Nimitz Highway	&	Bishop Street	S	A.M.	10	B	13	B	12	B	-1	NO
				P.M.	9	A	14	B	12	B	-2	NO
Bishop Street	&	Queen Street	S	A.M.	40	D	41	D	37	D	-4	NO
				P.M.	36	D	37	D	37	D	0	NO
Nimitz Highway	&	Alakea Street	S	A.M.	29.1	C	93	F	58	E	-35	NO
				P.M.	24.6	C	25	C	23	C	-2	NO
Nimitz Highway	&	Halekauwila Street/Richards Street	S	A.M.	175.3	F	140	F	119	F	-21	NO
				P.M.	100.2	F	105	F	99	F	-6	NO
Airport Alternative												
Nimitz Highway	&	Bishop Street	S	A.M.	10	B	13	B	12	B	-1	NO
				P.M.	9	A	14	B	12	B	-2	NO
Bishop Street	&	Queen Street	S	A.M.	40	D	41	D	37	D	-4	NO
				P.M.	36	D	37	D	37	D	0	NO
Nimitz Highway	&	Alakea Street	S	A.M.	29.1	C	93	F	64	E	-29	NO
				P.M.	24.6	C	25	C	26	C	1	NO
Nimitz Highway	&	Halekauwila Street/Richards Street	S	A.M.	175.3	F	140	F	89	F	-51	NO
				P.M.	100.2	F	105	F	92	F	-13	NO

* S = Signal-Controlled

Ala Moana Center Station

The Ala Moana Center Station would be on Kona Street. Estimated bus volumes as well as spillover parking and kiss-and-ride traffic volumes are shown in Table 5-49. Sixteen bus feeder routes with approximately 102 transit vehicles are expected to serve this station during the a.m. and the p.m. peak hours. This station is also expected to have a high spillover parking and kiss-and-ride demand.

Table 5-49: Peak Hour Trip Generation—Ala Moana Center Station

Type	Bus Transit Vehicle Trips				Spillover Parking				Kiss-and-Ride			
Peak Hour	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
Stations/Alternatives	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Salt Lake Alternative												
Ala Moana Center Station	87	15	87	15	143	0	0	143	100	100	100	100
Airport Alternative												
Ala Moana Center Station	87	15	87	15	148	0	0	148	103	103	103	103

Four intersections in the vicinity of this station are expected to experience large increases in bus activity, spillover parking, and kiss-and-ride activities:

- Ala Moana Boulevard and Atkinson Drive
- Kona Street and Ke‘eaumoku Street
- Kona Street and Pi‘ikoi Street
- Kapi‘olani Boulevard and Ke‘eaumoku Street

Table 5-50 presents the results for the No Build Alternative and Build Alternatives. With the No Build Alternative, the following intersections are projected to operate at LOS F in either the a.m. and p.m. peak hours (or both):

- Ala Moana Boulevard and Atkinson Drive
- Kona Street and Ke‘eaumoku Street
- Kapi‘olani Boulevard and Ke‘eaumoku Street

Table 5-50: Ala Moana Center Station Intersection Analysis

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Ala Moana Boulevard	&	Atkinson Drive	S	A.M.	74	E	83	F	77	E	-6	NO
				P.M.	83	F	109	F	107	F	-2	NO
Kona Street	&	Keʻeaumoku Street	AWSC	A.M.	7	A	185	F	212	F	27	YES
				P.M.	13	B	255	F	>300	F	45	YES
Kona Street	&	Piʻikoi Street	S	A.M.	11	B	25	C	33	C	8	NO
				P.M.	15	B	24	C	38	D	14	NO
Kapiʻolani Boulevard	&	Keʻeaumoku Street	S	A.M.	21	C	25	C	26	C	1	NO
				P.M.	113	F	166	F	163	F	-3	NO
Airport Alternative												
Ala Moana Boulevard	&	Atkinson Drive	S	A.M.	74	E	83	F	75	E	-8	NO
				P.M.	83	F	109	F	109	F	0	NO
Kona Street	&	Keʻeaumoku Street	AWSC	A.M.	7	A	185	F	245	F	60	YES
				P.M.	13	B	255	F	>300	F	45	YES
Kona Street	&	Piʻikoi Street	S	A.M.	11	B	25	C	31	C	6	NO
				P.M.	15	B	24	C	39	D	15	NO
Kapiʻolani Boulevard	&	Keʻeaumoku Street	S	A.M.	21	C	25	C	25	C	0	NO
				P.M.	113	F	166	F	143	F	-23	NO

S = Signalized AWSC = All-way stop-control
[1] Mitigation measure involves signalizing intersection.

With the Build Alternatives, the Ala Moana Boulevard and Atkinson Drive and Kapiʻolani Boulevard and Keʻeaumoku Street intersections would experience a reduction in vehicle delay. The LOS at these locations would remain at LOS E or F for the Build Alternatives. The LOS at the Kona Street and Piʻikoi Street intersection would be LOS D or better with the Build Alternatives.

The stop-controlled intersection of Kona Street and Keʻeaumoku Street would worsen considerably in the a.m. peak hour. The introduction of additional bus feeder services and spillover parking and kiss-and-ride vehicle trips would trigger an effect at this intersection. With mitigation, LOS at this location would improve to D in the a.m. peak under the Salt Lake Alternative. LOS F would still occur for other time periods under each Build Alternative.

5.6.4 Maintenance and Storage Facility Effects on Traffic

This section summarizes the potential localized traffic effects associated with the maintenance and storage facility proposed for the 2030 Build Alternatives. These effects were analyzed since the maintenance and storage facility would generate added traffic beyond what would occur under No Build conditions.

This facility would be capable of maintaining and storing up to 100 vehicles for the guideway system. There are two locations being considered for the maintenance and storage facility:

- Near Hoʻopili Facility Option
- Near Leeward Community College (LCC) Facility Option

Only one of the sites would ultimately be selected. Either location would include a number of buildings, maintenance facilities, vehicle wash area, storage tracks, and employee parking. It is proposed that the guideway structure would be constructed to transfer trains directly in and out of the proposed maintenance and storage facility. This type of facility is expected to generate primarily employee vehicle trips.

For the purpose of the traffic impact analysis, it was estimated that 30 percent of the employees working the daylight shift (approximately 63 employees) would arrive at the facility during the typical morning peak hour and same number of employees would leave the facility during the typical afternoon peak hour. A large percentage of the employee commute trips are expected to be made by single occupant vehicles. The traffic analysis assumed that the maintenance facility would generate approximately 63 vehicle trips that would be distributed on the local roadway system (based on the regional travel patterns) during the typical morning and afternoon traffic peak hours.

Hoʻopili Option

The Hoʻopili maintenance and storage facility would be located between the proposed UH West Oʻahu Station on North-South Road and the West Loch Station on Farrington Highway east of the Kunia Interchange. This facility is estimated to generate approximately 63 peak hour trips during both the morning and afternoon peak hours.

Traffic accessing this facility would utilize the same roads used to access the UH West O‘ahu Station and the West Loch Station under all Build Alternatives. Trip generation for modes of access, in addition to that generated by the maintenance and storage, is shown in Table 5-51.

Table 5-51: Peak Hour Trip Generation for UH West O‘ahu Station and West Loch Station

Type	Bus Transit Vehicle Trips				Formal Park-and-Ride				Kiss-and-Ride			
Peak Hour	AM		PM		AM		PM		AM		PM	
Stations/Alternatives	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Salt Lake Alternative												
UH West O‘ahu Station	21	21	21	21	145	0	0	145	45	45	45	45
West Loch Station	28	12	12	28	117	0	0	117	60	60	60	60
Airport Alternative												
UH West O‘ahu Station	21	21	21	21	144	0	0	144	46	46	46	46
West Loch Station	28	12	12	28	115	0	0	115	60	60	60	60

As part of the ORTP, several access roadways or connectors would be constructed in anticipation of the UH West O‘ahu development and the new commercial/ residential development in the East Kapolei area. Nine existing or future intersections adjacent to the proposed Ho‘opili maintenance and storage facility were selected for analysis:

- Kunia (Highway 76) Northbound On-ramp and Farrington Highway (existing intersection)
- Fort Weaver Road and Laulaunui Street (existing intersection)
- North-South Road and Road B (future intersection)
- North-South Road and East-West Road (future intersection)
- Old Fort Weaver Road and Fort Weaver/‘A‘awa Drive (existing intersection)
- Farrington Highway and ‘Ewa Road (future intersection)
- Farrington Highway and North-South Road
- Farrington Highway and Proposed Ho‘opili Maintenance and Storage Facility Access Road
- Farrington Highway and Old Fort Weaver Road

Analysis of the 2030 No Build Alternative conditions shown in Table 5-52 indicates that five intersections would operate at LOS E or F during one or both peak hours:

- Fort Weaver Road and Laulaunui Street
- Old Fort Weaver Road and Fort Weaver Road/‘A‘awa Drive
- Farrington Highway and North-South Road
- Farrington Highway and New ‘Ewa Road/Proposed Ho‘opili Maintenance and Storage Facility Access Road
- Farrington Highway and Old Fort Weaver Road

However, the traffic analysis conducted for the 2030 with Build Alternatives indicates that combined estimated traffic traveling to the UH West O‘ahu and West Loch Stations would not result in substantial traffic delays at any of the analyzed intersections.

Near Leeward Community College Option

The LCC maintenance and storage facility option would be in the immediate vicinity of the proposed Pearl Highlands Station. This facility is estimated to generate approximate 63 peak hour trips during both the morning and afternoon peak hours. Table 5-37 shows trip generation for park-and-ride and kiss-and-ride access to the Pearl Highlands Station.

Five intersections immediately adjacent to the proposed facility and the Pearl Highlands station were selected for analysis:

- Farrington Highway and Waiawa Road eastbound (existing)
- Farrington Highway and Waiawa Road westbound (existing to be reconfigured to add Pearl Highlands Station park-and-ride driveway for right-in and right-out access)
- Kamehameha Highway and Waihona Street (existing to be reconfigured to add Pearl Highlands Station park-and-ride driveway)
- Kamehameha Highway and Kuala Street (existing)
- Ala Ike Street and Waiawa Road (existing)

Table 5-53 presents the full traffic analysis for this option. Under the Build Alternatives, the traffic analysis indicates that the proposed LCC maintenance and storage facility would not result in any additional traffic delays. However, traffic projected from the park-and-ride, kiss-and-ride and bus feeder services would result in traffic increases leading to traffic effects at the following locations under each Build Alternative:

- Farrington Highway westbound and Waiawa Road/Proposed Pearl Highlands Station access driveway (right-in and right-out only)

Table 5-52: Ho'opili Maintenance and Storage Facility Option Intersection Analysis

Intersection	Control	Peak Hour	2030 No Build Delay (sec)	2030 No Build LOS	2030 Build Alternatives Delay (sec)	2030 Build Alternatives LOS	2030 Build Alternatives Project Delay Change Compared to No Build	2030 Build Alternatives Effect?	2030 Build Alternatives + Proposed Ho'opili Maintenance and Storage Facility Delay (sec)	2030 Build Alternatives + Proposed Ho'opili Maintenance and Storage Facility LOS	2030 Build Alternatives + Proposed Ho'opili Maintenance and Storage Facility Project Delay Change Compared to No Build	2030 Build Alternatives + Proposed Ho'opili Maintenance and Storage Facility Effect?
Salt Lake Alternative												
Hwy 76 NB On-Ramp & Farrington Highway	S	A.M.	5	A	5	A	0	NO	5	A	0	NO
		P.M.	2	A	2	A	0	NO	2	A	0	NO
Fort Weaver Road & Laulaunui Street	S	A.M.	131	F	115	F	-16	NO	115	F	-16	NO
		P.M.	66	E	64	E	-2	NO	64	E	-2	NO
North-South Road & Road B [1]	S	A.M.	44	D	45	D	1	NO	46	D	2	NO
		P.M.	37	D	35	C	-2	NO	35	D	-2	NO
North-South Road & East-West Road [2]	S	A.M.	27	C	32	C	5	NO	32	D	5	NO
		P.M.	33	C	28	C	-5	NO	28	C	-5	NO
Old Fort Weaver Road & Fort Weaver Road /'A'awa Drive	S	A.M.	114	F	91	F	-23	NO	91	F	-23	NO
		P.M.	68	E	58	E	-10	NO	58	E	-10	NO
Farrington Highway & New 'Ewa Road [3]	S	A.M.	49	D	38	D	-11	NO	38	D	-11	NO
		P.M.	44	D	34	C	-10	NO	33	D	-11	NO
Farrington Highway & North-South Road [4]	S	A.M.	105	F	29	C	-76	NO	29	D	-76	NO
		P.M.	39	D	41	D	2	NO	41	D	2	NO
Farrington Highway & Proposed Maintenance and Storage Facility Access Road [5]	S	A.M.	377	F	331	F	-46	NO	332	F	-45	NO
		P.M.	57	E	44	D	-13	NO	44	D	-13	NO
Farrington Highway & Old Fort Weaver Road	TWSC	A.M.	>400	F	>400	F	<0 [6]	NO	>400	F	<0 [6]	NO
		P.M.	>400	F	>400	F	<0 [6]	NO	>400	F	<0 [6]	NO
Airport Alternative												
Hwy 76 NB On-Ramp & Farrington Highway	S	A.M.	5	A	5	A	0	NO	6	A	1	NO
		P.M.	2	A	2	A	0	NO	2	A	0	NO
Fort Weaver Road & Laulaunui Street	S	A.M.	131	F	123	F	-8	NO	123	F	-8	NO
		P.M.	66	E	61	E	-5	NO	61	E	-5	NO
North-South Road & Road B [1]	S	A.M.	44	D	46	D	2	NO	46	D	2	NO
		P.M.	37	D	29	C	-8	NO	29	C	-8	NO
North-South Road & East-West Road [2]	S	A.M.	27	C	29	C	2	NO	29	E	2	NO
		P.M.	33	C	25	C	-8	NO	25	D	-8	NO
Old Fort Weaver Road & Fort Weaver Road /'A'awa Drive	S	A.M.	114	F	93	F	-21	NO	93	F	-21	NO
		P.M.	68	E	58	E	-10	NO	58	E	-10	NO
Farrington Highway & New 'Ewa Road [3]	S	A.M.	49	D	36	C	-13	NO	36	D	-13	NO
		P.M.	44	D	42	D	-2	NO	42	D	-2	NO
Farrington Highway & North-South Road [4]	S	A.M.	105	F	28	C	-77	NO	28	C	-77	NO
		P.M.	39	D	45	D	6	NO	45	D	6	NO
Farrington Highway & Proposed Maintenance & Storage Facility Access Road [5]	S	A.M.	377	F	328	F	-49	NO	330	F	-47	NO
		P.M.	57	E	43	D	-14	NO	44	D	-13	NO
Farrington Highway & Old Fort Weaver Road	TWSC	A.M.	>400	F	>400	F	<0 [6]	NO	>400	F	<0 [6]	NO
		P.M.	>400	F	>400	F	<0 [6]	NO	>400	F	<0 [6]	NO

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

[1] Future base lane configuration assumed for North-South Road at Road B: northbound: single left-turn lane, three through lanes, single right-turn lane; southbound: dual left-turn lanes, three through lanes, single right-turn lane; westbound: single left-turn lane, one through lane, dual right-turn lanes; eastbound: single left-turn lane, one through, single right-turn lane.

[2] Future base lane configuration assumed for North-South Road at East-West Connector Road: northbound: one left-turn lane, three through lanes, one right-turn lane; southbound: one left-turn lane, three through lanes, one right-turn lane; eastbound: one left-turn lane, one through lane, one right-turn lane; westbound: two left-turn lanes, one through lane, one right-turn lane.

[3] Future base lane configuration assumed for Farrington Highway at New 'Ewa Road: Northbound: single left-turn lane, one shared through/right-turn lane, single right-turn lane; Southbound: single left-turn lane, one through lane, single right-turn lane; Westbound: dual left-turn lanes, two through lanes, single right-turn lane; eastbound: single left turn lane, two through lanes, single right-turn lane.

[4] Future base lane configuration assumed for Farrington Highway at North-South Road: northbound and southbound: single left-turn lane, three through lanes, single right-turn lane; eastbound and westbound: single left-turn lane, two through lanes, single right-turn lane

[5] Future base lane configuration assumed for Farrington Highway at New 'Ewa Road/Proposed Maintenance and Storage Facility Driveway: northbound and southbound: single left-turn lane, one through lane, single right-turn lane; eastbound and westbound: single left-turn lane, two through lanes, single right-turn lane

[6] Delay cannot be calculated. However, total peak hour volumes are estimated to decrease with the build alternatives.

Table 5-53: Leeward Community College Option Maintenance and Storage Facility Intersection Analysis

Intersection	Control*	2030 No Build			2030 Build Alternatives				2030 Build Alternatives + Proposed LCC Maintenance and Storage Facility Option			
		Peak Hour	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change Compared to No Build	Effect?	Delay (sec)	LOS	Project Delay Change Compared to No Build	Effect?
Salt Lake Alternative												
Farrington Highway (EB) & Waiawa Road	S	AM	149	F	45	D	-104	NO	51	F	-98	NO
		PM	162	F	120	F	-42	NO	120	F	-42	NO
Farrington Highway (WB) & Waiawa Road/Pearl Highlands Station Park-and-Ride Driveway [1]	TWSC	AM	76	F	316	F	240	YES	>400	F	>0 [8]	**YES**
		PM	30	D	125	F	95	YES	144	F	114	**YES**
Kamehameha Highway & Waihona Street/Pearl Highlands Station Park-and-Ride Driveway [2]	TWSC/S[3]	AM	36	D	45	D	9	NO	45	D	9	NO
		PM	122	F	138	F	16	YES	138	F	16	**YES**
Kamehameha Highway & Kuala Street	TWSC	AM	71	F	205	F	134	YES	205	F	134	**YES**
		PM	>400	F	>400	F	>0 [8]	YES	>400	F	>0 [8]	**YES**
Ala Ike Street & Waiawa Road	TWSC	AM	376	F	296	F	-80	NO	342	F	-34	NO
		PM	27	D	6	B	-21	NO	15	C	-12	NO
Airport Alternative												
Farrington Highway (EB) & Waiawa Road	S	AM	149	F	45	D	-104	NO	51	E	-98	NO
		PM	162	F	106	F	-56	NO	120	F	-42	NO
Farrington Highway (WB) & Waiawa Road/Pearl Highlands Station Park-and-Ride Driveway [1]	TWSC	AM	76	F	299	F	223	YES	>400	F	>0 [8]	**YES**
		PM	30	D	122	F	92	YES	139	E	109	**YES**
Kamehameha Highway & Waihona Street/Pearl Highlands Station Park-and-Ride Driveway [2]	TWSC/S[3]	AM	36	D	45	D	9	NO	45	D	9	NO
		PM	122	F	137	F	15	YES	137	F	15	**YES**
Kamehameha Highway & Kuala Street	TWSC	AM	71	F	205	F	134	YES	205	F	134	**YES**
		PM	>400	F	>400	F	>0 [8]	YES	>400	F	>0 [8]	**YES**
Ala Ike Street & Waiawa Road	TWSC	AM	376	F	296	F	-80	NO	342	F	-34	NO
		PM	27	D	14	B	-13	NO	15	C	-12	NO

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

1 With the build alternatives, this park-and-ride driveway would be limited to right-in and right-out access only.

2 With the build alternatives, lane configuration assumed for park-and-ride driveway: dual left-turn lane, single through lane, single right-turn lane.

3 Waihona Street currently provides a single left-turn lane and a right-turn lane and is controlled by stop signs. Traffic on Kamehameha Highway is currently uncontrolled. Under future 2030 No Build conditions and 2030 Build conditions, the T-intersection of Waihona Street at Kamehameha Highway is assumed to be signalized. It is also assumed that the future planned Central Mauka Road would provide a direct connection to Kamehameha Highway eastbound through a grade separation project or an alternative means of connection, instead of linking directly to the intersection of Waihona Street and Kamehameha Highway.

4 At Farrington Highway westbound and Waiawa Road/Proposed Pearl Highlands Station Park-and-ride driveway (right-in and right-out access only), the proposed mitigation measures would require installation of signals. The new signals would require synchronization with the adjacent signals at Farrington Highway eastbound and Waiawa Road.

5 At Kamehameha Highway and Waihona Street, the proposed Option 1 mitigation measure would involve widening the 'Ewa-bound direction of Kamehameha Highway from two through lanes and one right-turn lane to three through lanes and one right-turn lane at Waihona Street. Necessary signs and traffic lane guidance (dotted lines are required to allow safe merging and weaving maneuvers for traffic intending to use H-2 and H-1 Freeways). Widening of Kamehameha Highway westbound would fully mitigate the traffic impact at this location under all build alternatives.

6 At Kamehameha Highway and Waihona Street, the proposed Option 2 mitigation measure would involve construction direct outbound access ramp to facilitate the park-and-ride traffic intending to travel on H-2 Freeway. The traffic impact at this location would be fully mitigated all build alternatives with the additional exiting capacity for the park-and-ride structure.

7 At Kamehameha Highway and Kuala Street, mitigation includes (1) signalizing 'Ewa-bound Kamehameha Highway at Kuala Street and (2) widening Koko Head-bound Kamehameha Highway from one to two lanes.

8 Delay cannot be calculated. However, total volumes are estimated to increase with the build alternatives.

- Kamehameha Highway and Waihona Street/Proposed Pearl Highlands Station park-and-ride driveway (full access)
- Kamehameha Highway and Kuala Street (existing)

5.7 Effects on Freight Movement

The Build Alternatives would generally have little direct effect on freight movement in the study corridor. Honolulu Harbor, Barbers Point Harbor, and Honolulu International Airport are the principal ports for importing and exporting goods to and from Oʻahu and the primary sources of freight-related traffic. Cargo is delivered from these ports by truck to a wide array of destinations across Oʻahu. Sections of the elevated fixed guideway structure and several stations would be near these facilities.

In some areas along the fixed guideway alignment, left turns in and out of driveways could be restricted due to column placements. In other locations such as Kakaʻako, column placement could interfere with existing truck traffic patterns along certain blocks and streets. This interference would vary by Build Alternative. For example, the Airport Alternative would likely have greater effects given the extent of freight traffic along this corridor. There are no other expected adverse effects on freight movement. However, reduced roadway congestion would have a positive effect on freight movement.

5.8 Effects on Parking

Effects on parking include two categories: (1) the estimated loss of existing parking due to placement of the guideway; and (2) effects relating to spillover parking demand in station areas.

5.8.1 Removal of Existing Parking Capacity

It is estimated that approximately 820-960 off-street and 230-250 on-street parking spaces would be removed as a result of the Build Alternatives depending on the alternative selected. Parking spaces would be removed primarily to accommodate guideway column placement or station entrance locations. The Salt Lake Alternative and Airport & Salt Lake Alternative would result in greater parking effects than the Airport Alternative, due to a high volume of off-street parking spaces removed at Aloha Stadium (Salt Lake) and Ala Lilikoʻi Stations. Potential locations where parking would be removed are identified in Table 5-54.

To analyze effects on parking capacity, a field survey of existing parking spaces along the study corridor was carried out in June 2008. This survey examined the current turnover of parking spaces during weekdays and on Saturday.

The results of the field survey indicated that most parking spaces that would be affected by the guideway are currently occupied at least part of the day. However at several locations, the extent of parking demand varies; the most dominant demand generally occurs on weekdays in the mid-afternoon.

Table 5-54: Potential Effects on Parking due to Fixed Guideway Column Placements

Alternative and Street/Intersection			Column Placement	Parking Spaces Lost		
Roadway or Station Name	Cross Street From	Cross Street To		On-Street Mauka	On-Street Makai	Off-Street
Common to All Build Alternatives						
West Loch Station	—	—	Median			21
Waipahu Transit Center Station	—	—	Median			13
Ala Ike Street/LCC Station	—	—	Side			180
Kamehameha Highway	H-1/H-2 Interchange	Moanalua Freeway Interchange	Median			43
Dillingham Boulevard	Laumaka Street	Pu'uhale Road	Median			13
	Pu'uhale Road	Mokauea Street	Median			19
	Mokauea Street	Kalihi Street	Median			20
	Kalihi Street	McNeill Street	Median			6
	McNeill Street	Waiakamilo Road	Median			26
	Waiakamilo Road	Kohou Street	Side			10
	Kohou Street	Alakawa Street	Side			15
	Alakawa Street	Ka'aahi Street	Varies (Median/ Side)			130
Ka'aahi Street	Dillingham Boulevard	End of existing road	Side	8	9	
Halekauwila Street	Punchbowl Street	South Street	Side	8	13	
	South Street	Keawe Street	Side	9	6	
Civic Center Station	—	—	Off-Street			35
Halekauwila Street	Keawe Street	Coral Street	Side	16	22	
	Cooke Street	Kamani Street	Side	17	27	12
Kaka'ako Station	Ward Entertainment Center & Ward Gateway Center	—	Off-Street			183
Kona Street	Pensacola Street	Pi'ikoi Street	Median	53	39	
Ala Moana Center	—	—	Median			75
Salt Lake Alternative						
Salt Lake Boulevard	Kamehameha Hwy	Luapele Drive	Roadside			89
Ala Liliko'i Station	—	—	Median			56
Airport Alternative						
Aloha Stadium Overflow Parking Lot	—	—	Side			20
Kamehameha Highway	Salt Lake Boulevard	Kohomua Street	Roadside	20		
Airport & Salt Lake Alternative						
Salt Lake Boulevard	Kamehameha Hwy	Luapele Drive	Roadside			89
Ala Liliko'i Station	—	—	Median			56
Arizona Memorial Station	—	—	Median			14
Kamehameha Highway	Salt Lake Boulevard	Kohomua Street	Roadside	20		

In most cases, parking is available on nearby side streets to accommodate people currently using parking spaces that may be lost to guideway construction. If parking capacity is not available along nearby streets, other approaches could be considered to replace lost parking, including added off-street capacity.

Before identifying necessary parking replacement approaches, detailed surveys of the affected areas would be carried out. The evaluation would include updated information on available parking use and on existing and planned land uses in affected areas. These surveys would occur prior to construction of guideway segments, to allow identification of any mitigation measures and necessary follow-up action.

5.8.2 Spillover Parking Effects on Station Areas

Traffic Effects

A review of patronage forecasts at each station indicates that only a small number of guideway transit passengers are expected to park near stations that do not have designated park-and-ride facilities. This effect is known as *spillover* parking. The following four locations warranted further analysis based on the model forecasts: West Loch, Pearlridge, Iwilei, and Ala Moana Center.

These stations are expected to generate additional peak hour trips (from 100 to 240 vehicles) depending on the station location. These trips have the potential to spillover into the neighborhoods surrounding each station and result in traffic effects to the local street system. The following sections discuss the traffic effects created by spillover parking demand for the four affected station areas. To determine cumulative effects, the analysis included traffic involving spillover parking as well as estimated kiss-and-ride and bus feeder trips at the stations.

West Loch Station

The West Loch Station was analyzed in *Section 5.6.3: Effects of Buses on Traffic near Stations* because of the substantial feeder buses activity planned. As shown previously in Table 5-41, this station is expected to attract approximately 115 to 117 spillover parking trips (cars seeking parking spaces) and approximately 120 kiss-and-ride trips during peak hours. The LOS results previously shown in Table 5-42 show that even with the additional transit service and spillover parking and kiss-and-ride activities expected at this West Loch location, no substantial traffic effects are expected with the Build Alternatives. The Salt Lake & Airport Build Alternative effects would be similar to the other Build Alternatives.

Pearlridge Station

The Pearlridge Station was analyzed in *Section 5.6.3: Effects of Buses on Traffic near Stations* because of the substantial feeder buses activity planned. As shown previously in Table 5-43, this station is expected to attract 46 to 57 spillover parking trips and 32 to 38 kiss-and-ride trips during the peak hours, respectively. The LOS results previously shown in Table 5-44 show that even with the additional transit service and spillover parking and kiss-and-ride activities expected at this location, no substantial traffic effects are expected with the Build Alternatives.

Iwilei Station

The Iwilei Station would be on Dillingham Boulevard near Ka‘aahi Street. This station is expected to attract substantial spillover parking patronage and kiss-and-ride trips, as shown in Table 5-55.

Table 5-55: Peak Hour Trip Generation—Iwilei

Type	Spillover Parking				Kiss-and-Ride				Bus Transit Vehicle Trips			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Salt Lake Alternative												
Iwilei Station	68	0	0	68	57	57	57	57	3	0	3	0
Airport Alternative												
Iwilei Station	73	0	0	73	57	57	57	57	3	0	3	0

Five intersections around this station are expected to experience a large increase in spillover parking and kiss-and-ride operations:

- Dillingham Boulevard and Ka‘aahi Street
- Dillingham Boulevard and King Street
- King Street and Beretania Street
- King Street and Iwilei Road
- Iwilei Road and Kūwili Street

Table 5-56 presents the intersection analysis results for the No Build Alternative and the Build Alternatives at the Iwilei Station. With the No Build Alternative, the following intersections are projected to operate at LOS E or F in either or both the a.m. and p.m. peak hours:

- Dillingham Boulevard and King Street
- King Street and Beretania Street

The intersection LOS results demonstrate that, even with the additional spillover parking demand and kiss-and-ride activity at this location, LOS would improve or mostly remain equivalent with the addition of the fixed guideway project. Therefore, the increase in vehicle activity would not substantially affect local traffic conditions surrounding the Iwilei Station.

Table 5-56: Iwilei Station Intersection Analysis

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Build Alternatives			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Dillingham Boulevard	&	Ka'aahi Street	S	A.M.	5	A	5	A	6	A	1	NO
				P.M.	4	A	5	A	5	A	0	NO
Dillingham Boulevard	&	King Street	S	A.M.	69	E	63	E	36	D	-27	NO
				P.M.	62	E	70	E	62	E	-8	NO
King Street	&	Beretania Street	S	A.M.	54	D	69	E	48	D	-21	NO
				P.M.	111	F	174	F	121	F	-53	NO
King Street	&	Iwilei Road	S	A.M.	11	B	11	B	12	B	1	NO
				P.M.	19	B	14	B	18	C	4	NO
Iwilei Road	&	Kūwili Street	OWSC [1]	A.M.	12	B	14	B	13	B	-1	NO
				P.M.	19	C	23	C	19	C	-4	NO
Airport Alternative												
Dillingham Boulevard	&	Ka'aahi Street	S	A.M.	5	A	5	A	6	A	1	NO
				P.M.	4	A	5	A	5	A	0	NO
Dillingham Boulevard	&	King Street	S	A.M.	69	E	63	E	38	D	-25	NO
				P.M.	62	E	70	E	61	E	-9	NO
King Street	&	Beretania Street	S	A.M.	54	D	69	E	42	D	-27	NO
				P.M.	111	F	174	F	140	F	-34	NO
King Street	&	Iwilei Road	S	A.M.	11	B	11	B	14	B	3	NO
				P.M.	19	B	14	B	13	B	-1	NO
Iwilei Road	&	Kūwili Street	OWSC [1]	A.M.	12	B	14	B	13	B	-1	NO
				P.M.	19	C	23	C	19	C	-4	NO

*S: Signal; OWSC: one-way stop control.

[1] This intersection has a stop sign for Kūwili Street. Analysis was done using HCM stop-controlled methodology, and the LOS and delay in seconds for the worst movement are reported.

Ala Moana Center Station

The Ala Moana Center Station was analyzed in *Section 5.6.3: Effects of Buses on Traffic near Stations* because of the substantial number of buses planned. As previously shown in Table 5-49, this station is expected to attract 143 to 148 spillover parking trips and up to 206 kiss-and-ride trips during peak hours. The LOS results in Table 5-50 show that combined effect of additional transit service and spillover parking and kiss-and-ride activities expected at this location would result in a substantial effect at the intersection of Kona Street and Ke‘eaumoku Street.

Effects Relating to Spillover Parking Demand

The spillover demand for parking was identified by the travel demand forecasting model for the year 2030; however the actual extent of spillover parking near stations would be influenced by a variety of factors, including:

- Lack of available parking. Some neighborhoods, such as near Ala Moana Center, do not have long-term parking available for commuters. As a result, the actual number of spillover parking would be less, as transit patrons would choose to park elsewhere (and use a different station), or use a feeder bus to access the fixed guideway station.
- Changing conditions between now and 2030. Additional parking could be provided in the future that is not there now, or feeder bus service could be used at a higher rate than anticipated.
- Future development around station areas. New land uses near stations could change both the demand for and supply of parking. These factors could influence how people choose to access the stations and where they would park.

Potential approaches to mitigation effects of spillover parking are addressed in Chapter 6: Mitigation of Long Term Transportation Effects.

5.9 Effects on Bike and Pedestrian Systems

Locations where potential effects to bike and pedestrian facilities could occur are shown in Table 5-57. Effects include either narrowing or widening sidewalks or bike lanes in some areas. Along Salt Lake Boulevard, striped bike lanes would be removed and replaced with a 14-foot wide shared travel lane.

Many bike lanes planned by the City and County of Honolulu would connect to transit stations (as shown in Figure 5-13). City proposed bike lanes along Farrington Highway would connect to stations at West Loch, the Waipahu Transit Center, Leeward Community College, and Pearl Highlands. City proposed bike lanes along Kamehameha Highway would link up with the Pearlridge and Aloha Stadium Stations. With the Salt Lake Alternative, several potential transit stations would link to the bike route along Salt Lake Boulevard.

Table 5-57: Summary of Potential Effects on Bicycle and Pedestrian Systems due to Fixed Guideway Column Placements.

Roadway Name	Cross-street From	Cross-street To	Column Placement	Summary of Potential Effects
Common to All Build Alternatives				
Farrington Highway	Kunia Road	Pupukahi Street	Median	Signed shared roadway would be narrowed from 16 to 14 feet inbound and from 14 to 13 feet outbound.
Farrington Highway	Pupukahi Street	Pupupuhi Street	Median	Existing 4-foot inbound bike lane would be replaced with a 14-foot signed shared roadway.
Farrington Highway	Pupupuhi Street	Awanui Street	Median	Shared roadway (outbound) would be reduced from 15 to 14 feet.
Dillingham Boulevard and Kamehameha Highway	Puʻuhale Road	Mokauea Street	Median	Makai sidewalk would be narrowed to 5 feet (currently 4 to 6.5 feet).
Dillingham Boulevard	Mokauea Street	Kalihi Street	Median	Makai sidewalk would be narrowed from 8 to 5 feet.
Dillingham Boulevard	McNeill Street	Waiakamilo Road	Median	Makai sidewalk would be narrowed to 5 feet (currently 4 to 6 feet).
Dillingham Boulevard	Kōkea Street	Alakawa Street	Side	Makai sidewalk would be narrowed to 5 feet (currently 4 to 7 feet).
Dillingham Boulevard	Kaʻaahi Street	King Street	Side	Makai sidewalk would be narrowed to 5 to 10 feet (currently 10 to 15 feet).
Halekauwila Street	Punchbowl Street	South Street	Side	Sidewalks would be narrowed to 7 feet.
Halekauwila Street	Keawe Street	Coral Street	Side	Makai sidewalk would be narrowed from 12 to 7 feet.
Salt Lake Alternative [1]				
Salt Lake Boulevard	Lawehana Street	Maluna Street	Median	Width of shared inbound lanes would be reduced.
Salt Lake Boulevard	Ala Lilikoʻi Street	Peltier Avenue	Median	Removal of the existing inbound bike lane is planned to be replaced with a 14-foot signed shared roadway.
Salt Lake Boulevard	Peltier Avenue	Puʻuloa Road	Median	Both bike lanes are planned to be replaced by a 14-foot signed shared roadway.
Pūkōloa Street	Puʻuloa Road	Ahua Street	Side	Columns may be placed on part of the sidewalk.

[1] Effects of the Airport & Salt Lake Alternative would be the same as for the Salt Lake Alternative.

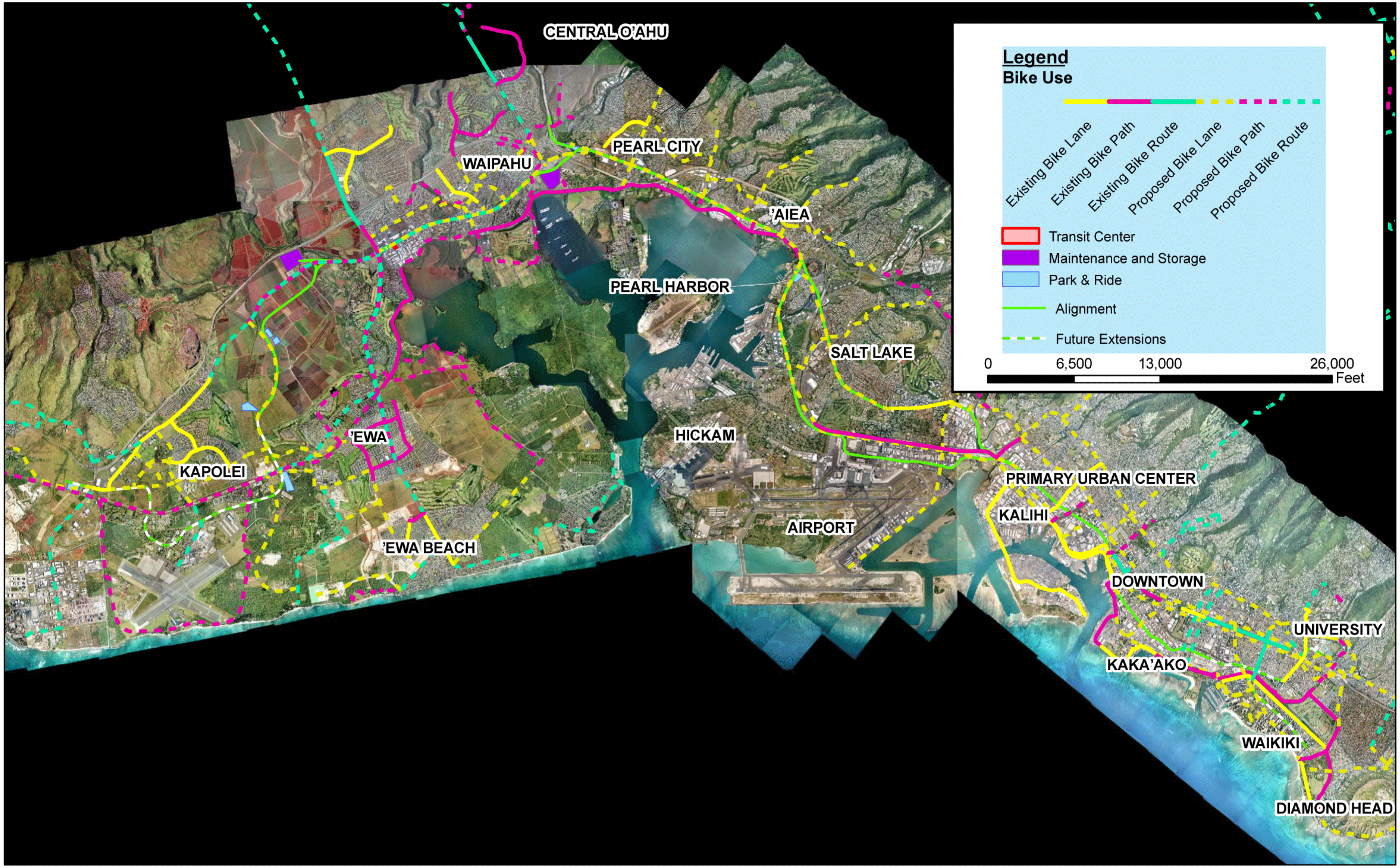


Figure 5-13: Existing and Planned Bicycle Facilities

Source: Hawai'i State Bicycle Master Plan; City of Honolulu Bicycle Master Plan

6 Mitigation of Long-Term Transportation Effects

This chapter summarizes the approach for mitigation of long-term effects relating to the Build Alternatives. The Build Alternatives would benefit the transportation system because they would help reduce transit travel times, VMT, VHT, and VHD. At locations where the Build Alternatives would affect roadways, the Project would include widening to maintain or improve traffic operating conditions. At other locations, mitigation measures would be evaluated to address estimated traffic and parking-related effects.

6.1 Mitigation of Traffic-Related Effects

As described in Chapter 5, potential traffic-related effects associated with the Build Alternatives were evaluated. The evaluation focused on potential traffic effects from the following:

- Guideway system construction
- Auto and bus access at the four guideway stations with park-and-ride facilities
- Bus and kiss-and-ride access at all stations
- Access at the maintenance and storage facility for guideway vehicles
- Access involving spillover parking demand at stations without park-and-ride facilities

Based on this evaluation it was determined that for the Pearl Highlands and Ala Moana Center Station areas, traffic conditions at four intersections would experience added delays and would require consideration of mitigation measures. Possible mitigation measures include the following:

- Widening existing roads
- Signalizing intersections that are currently controlled by stop signs
- Other treatments that would result in less delays during peak hours

6.2 Mitigation of Parking-Related Effects

As described in Chapter 5, potential parking-related effects would involve the following:

- Loss of parking resulting from construction of the guideway system
- Loss of parking resulting from spillover parking near guideway stations that would not have park-and-ride facilities.

The approaches to mitigating effects of spillover parking would be unique to each station area. Mitigation strategies would be determined in coordination with appropriate stakeholders. Parking surveys would be carried out to examine on-street unrestricted parking supply within proposed station areas. These surveys would occur approximately six months before implementation of the guideway service. Approximately six months after guideway service begins operating, surveys would be repeated for all locations. Results would be used to identify potential mitigation strategies.

To address estimated spillover parking-related effects at stations, several potential strategies could be considered, including the following:

- Establishing neighborhood parking programs that would provide residents with parking permits
- Identifying additional parking capacity through leasing arrangements with nearby property owners (e.g., churches that have capacity during weekdays)
- Constructing new parking facilities in affected areas
- Implementing off-street parking management programs developed with retail centers to minimize on-street spillover demand

7 Construction-Related Effects

This chapter identifies the short-term, construction-related effects on transportation from the Build Alternatives and discusses mitigation to address potential effects along the study corridor. These effects would be temporary and would occur between 2009 and 2018 at various times and locations in the study corridor. Mitigation is intended to address the temporary effects of Project construction.

The Project would be opened to the public as construction phases are completed, and there would be temporary effects on transportation in station areas in the interim between the opening of each phase and project completion. These short-term effects would be primarily transit-related as bus routes are changed to complement the fixed guideway service.

7.1 Construction Staging Plans

Prior to the start of construction, construction staging areas and plans would be identified and developed by the contractor and approved by the City. For each segment of the work, specific details would be developed and reviewed in consultation with relevant authorities, and needed approvals would be sought. These details would include, but are not limited to, specific permitted lane closures or road closures, hours of operation, penalties for extending beyond permitted hours, and holiday restrictions. The maintenance and storage facility, park-and-ride lots, and stations could be used for construction staging areas. These areas would be sufficient for the first construction phase. Additional construction and staging areas identified and requested by the contractor would be reviewed and approved by the City. Selected staging areas are not expected to cause a substantial effect. The average duration that a staging site would be used would depend on the construction sequencing and type of construction.

7.2 Construction-Related Effects on Transit Service

Local access to transit would be affected by lane closures within the construction corridor. TheBus routes affected by construction would generally be maintained by temporarily diverting or relocating routes within their current service areas to ensure reliable service. TheBus stops along diverted and relocated routes would be temporarily relocated, particularly if a stop’s current location is affected by temporary closure of a right lane during construction.

All existing bus routes within the study corridor were examined to determine the degree of effect during construction. Effects were classified as none, minor, and/or direct. Minor effects occur when a route intersects and crosses a street with construction activity, or when a route traverses a short section of a street within a construction zone. Direct effects occur where a transit route travels along a considerable length of the construction zone. Table 7-1 lists the bus routes that would be affected by construction. Since some bus routes pass through multiple parts of the study corridor, they may experience both minor and direct effects, depending on location.

Table 7-1: Bus Routes Affected by Construction

Minor Effects	Direct Effects
1, 2, 5, 7, 10, 11, 13, 17, 18, 31, 40, 40A, 44, 74, 83A, 86, 86A, 93A, 95, 201, 202, 413, 415, B, F11, F12 and F13	2, 3 4, 6, 8, 9, 11, 13, 19, 20, 22, 23, 31, 32, 40, 40A, 42, 43, 52, 53, 54, 55, 56, 57, 57A, 62, 65, 71, 73, 88, 88A, 98A, 201, 202, 203, 434 , A, B, C, E, F2, F3

In addition to TheBus routes operating near the fixed guideway alignment, the construction would affect TheHandi-Van operations. School bus routes may also be affected by temporary delays caused by construction activities. Delays in schedule may require alternative routes between stops.

A Transit Mitigation Program as further described in Section 7.7.2, would be developed to identify and implement those efforts considered necessary to address construction effects on transit service. Examples of mitigation efforts are identified in Section 7.7.2.

The Project would be constructed in phases and opened as sections are completed. As a result, there would be stations where fixed guideway service would temporarily end while the next section is under construction. This phased opening approach would require interim changes to bus transit service to complement the fixed guideway service. This could have a short-term effect at station areas as bus routes are temporarily moved to connect with fixed-guideway stations. This includes additional buses traveling near certain fixed-guideway stations and associated traffic and pedestrian effects from the bus service. A plan to accommodate the use of phased openings would be developed in advance.

7.3 Construction-Related Effects on Traffic

This section discusses potential construction-related traffic effects (e.g., lane closures) that may occur throughout the day, including peak travel periods. Additional lanes may be closed during off-peak travel periods. These additional lane closures would accommodate construction equipment. Construction activities would likely occur in a temporary construction corridor. Estimates of construction-related procedures that would affect road closures are as follows:

- Column Foundations (drilled shafts)—lane closures would be required throughout the column foundation installation process. The degree of traffic disruption around areas of drilled shaft work would vary depending on the roadway's width and the availability of alternate routes. The following scenarios are anticipated:
  - Off-peak closures—two lanes would be closed for each half-mile construction segment for foundation and column construction. If the alignment is along a roadway that is less than three lanes wide (e.g.,

Halekauwila Street), the road would be closed to all but local vehicular traffic during off-peak periods. If the street's median is more than 8 feet wide (e.g., Farrington Highway in parts of Waipahu), closure of only two lanes may be possible.

  - Peak closures—during peak times, closure may be restricted to one or two lanes, but the length of closure would remain the same. If a street is only two lanes wide, efforts would be made to open one lane during peak periods if necessary.
  - Cross-streets—if cross-streets are at least 150 feet apart to allow space for the required equipment, the only potential restrictions on cross-streets would be on turning movements onto the alignment road where lanes are closed. Access could be closed off-peak during erection of segments.

- Columns—lane closures would be required throughout the column construction process. Lane closures similar to those assumed for column foundations are assumed for aboveground column construction.
- Guideway Structure—during construction of the guideway structure between the columns, lane closures would be required. However, if the active work area spans an intersection, the cross-street would be open (with possible turning restrictions during peak hours) but closed during off-peak hours. Lane closure could also be needed in the off-peak direction during delivery and erection of segments.
- Stations—lane closures would be required at all locations where stations would be constructed over a roadway. Some operations would likely require completely closing all lanes for construction. These operations would be scheduled for permitted night work.
- Park-and-Ride and Other System Facilities—park-and-ride and other system facilities (e.g., traction power substations and the maintenance and storage facility) would primarily be built on parcels not located on public streets and highways. Substantial lane closures are not anticipated during construction of these facilities, but brief lane closures may be necessary during construction of entrances and exitways.

Table 7-2 shows the locations anticipated for temporary lane closures in the study corridor. In addition to travel lanes, a number of turning lanes would also be temporarily closed. Also, traffic signals adjacent to the proposed fixed guideway could also be temporarily replaced or re-timed. Delivery of construction materials would increase the numbers of trucks on local roadways.

Balanced cantilever construction likely would be used for the longer spans crossing the H-1 and H-2 Freeways and possibly Fort Weaver Road. Individual lanes would be closed to allow this work to be completed without full roadway closure. A detailed schedule showing which lanes would be affected would be prepared for the erection of segments. The actual means and methods for erecting these segments would be the contractor's decision. Construction with segmented precast sections would be brought in to avoid the need for substantial shoring or false work. Phased opening of the Project to the public would have only minor effects on traffic. This would be limited to the station areas where bus transit service has been temporarily altered to complement the interim configuration of the fixed-guideway service.

Table 7-2: Potential Peak Period Temporary Lane Closures during Construction[1]

Roadway Name	Cross Street From	Cross Street To	Number of Lanes	Number of Lanes to be Temporarily Closed [1]	
				Kapolei Bound	Koko Head Bound
Common to All Build Alternatives					
Farrington Highway	Paiwa Street	Kahualii Street	4	1 (a.m.) 0 (p.m.)	0 (a.m.) 1 (p.m.)
Kamehameha Highway	Acacia Road	Boathouse Entrance	6 [3]	0	1
Kamehameha Highway	Middle Street	Laumaka Street	5	1	1
Dillingham Boulevard. and Kamehameha Highway	Kohou Street	Alakawa Street (Costco Rear Parking)	4	1	1
Halekauwila Street	Punchbowl Street	South Street	2	1	0
Halekauwila Street	Keawe Street	Ward Avenue	2	0	1
Kona Street	Pensacola Street	Ke‘eaumoku Street	2	1	0
Salt Lake Alternative					
Salt Lake Boulevard	Luapele Drive	Maluna Street/ Namur Road	6	1	1
Salt Lake Boulevard	Wanaka Street	Kahikolu Place	2	0 [2]	0 [2]
Salt Lake Boulevard	Ala Liliko‘i Street	Ala Napunani Street	5	1	1
Salt Lake Boulevard	Ala Napunani Street	Pu‘uloa Road	5	0	1
Pūkōloa Street	Pu‘uloa Road	Ahua Street	5	0	1
Airport Alternative					
Kamehameha Highway	Salt Lake Boulevard	Center Drive	5 [3]	0	1
Airport & Salt Lake Alternative					
Salt Lake Boulevard	Luapele Drive	Maluna Street/ Namur Road	6	1	1
Salt Lake Boulevard	Wanaka Street	Kahikolu Place	2	0 [2]	0 [2]
Salt Lake Boulevard	Ala Liliko‘i Street	Ala Napunani Street	5	1	1
Salt Lake Boulevard	Ala Napunani Street	Pu‘uloa Road	5	0	1
Pūkōloa Street	Pu‘uloa Road	Ahua Street	5	0	1
Kamehameha Highway	Salt Lake Boulevard	Center Drive	5 [3]	0	1

[1] Additional closures would occur in short segments and/or during off-peak travel periods.
[2] An existing lane may be removed but would be supplemented with an additional lane at the time of construction
[3] The Kamehameha Highway narrows to four lanes around the Moanalua Freeway interchange

7.4 Construction-Related Effects on Parking

In general, on-street parking would be temporarily affected by construction. Table 7-3 identifies parking spots that would be temporarily unavailable at various points along the Project's alignment. All curb parking in areas adjacent to project construction would be temporarily unavailable to preserve vehicle travel lanes. Some parking lots adjacent to the study corridor would also be affected. Construction vehicle parking would occur in the designated staging areas.

Table 7-3: Construction-Related Parking Reductions

Roadway Name	Cross Street From	Cross Street To	On-Street Parking Temporarily Lost During Construction
Common to All Build Alternatives			
Moloalo Place	Waipahu Depot Street	Mokuola Street	5
Ka‘aahi Street	Dillingham Boulevard	Iwilei Road	17
Halekauwila Street	Punchbowl Street	South Street	21
Halekauwila Street	South Street	Keawe Street	15
Halekauwila Street	Keawe Street	Coral Street	38
Halekauwila Street	Coral Street	Cooke Street	10
Halekauwila Street	Cooke Street	Kamani Street	44
Halekauwila Street	Kamani Street	Ward Avenue	9
Queen Street	Ward Avenue	Kamake‘e Street	46
Queen Street Extension	Kamake‘e Street	Waimanu Street	21
Kona Street	Pensacola Street	Pi‘ikoi Street	92
Salt Lake Alternative and Airport & Salt Lake Alternative			
Salt Lake Boulevard	Lawehana Street	Maluna Street	17
Pūkōloa Street	Māpunapuna Street	Ahua Street	38

7.5 Construction-Related Effects on Bike and Pedestrian Facilities

Access to residences and businesses would be maintained during all construction phases. Warning and/or notification signs of modification to bicycle and pedestrian facilities during construction would be provided. Proposed pedestrian detours would be submitted to the City for review and approval to ensure they are reasonable for all pedestrians and meet ADA regulations. Proper deterrents, such as barriers or fencing, would be placed to prevent access (short-cuts) though the construction area.

Many crossings would be temporarily eliminated, and disruptions would occur along adjacent sidewalks and bike paths. In areas where additional right-of-way may be required (e.g., Dillingham Boulevard), sidewalks may be temporarily removed and pedestrians rerouted to safe locations. Information on the existing and proposed bikeway system within Honolulu was obtained from the *Bike Plan Hawai'i Master Plan* (HDOT 2003) and the *Honolulu Bicycle Master Plan* (DTS 1999).

7.6 Construction-Related Effects on Freight Movement

The fixed guideway would be built along several roadways that are heavily used freight routes. Construction effects on freight could occur during off-peak hours. If a roadway is less than three lanes wide, it would need to be closed. Freight movement may be delayed by the need to use an alternative route. Loading zones along the route would be temporarily eliminated.

7.7 Mitigation of Construction-Related Effects

The mitigation program is intended to address the temporary effects of project construction. Based on the transportation analysis conducted for the Project, long-term mitigation efforts for construction-related effects are not expected. Development of the Maintenance of Traffic (MOT) Plan and the Transit Mitigation Program (TMP) would identify the primary mitigation measures that would address temporary construction-related effects on transportation.

The MOT Plan would address effects on streets and highways, transit, businesses and residences, pedestrians and bicyclists, and parking. It would also identify additional bus service that may be necessary to mitigate effects. The construction methods identified by each contractor would be included in the MOT Plan. The TMP would identify and mitigate effects on transit services operating during project construction. These plans would be developed by the contractor for each construction phase and coordinated and/or approved by HDOT and the City prior to starting construction in an area. The MOT Plan and the TMP would include site-specific traffic control measures and would be developed in conjunction with the system's final design. The key objectives of these plans would be to limit effects on existing traffic and maintain access to businesses. These plans would be shared with the public.

7.7.1 Maintenance of Traffic Plan

The following sections discuss measures included in the MOT Plan that would help mitigate construction-related transportation effects. The contractor would be given parameters, such as the number of lanes that could be closed and the procedures for closures, and would develop the MOT plan accordingly with approval from the City or HDOT. The MOT plan would address roadway closures for streets identified in Table 7-2. The Plan would specifically account for the effect of drilled shaft installation, crane access and operations, and the delivery and operation of materials trucks. The MOT Plan would also address the delivery and unloading of pre-cast guideway sections, including crane positioning for unloading. The contractor would submit any proposed changes to the MOT Plan to the City for approval.

Streets and Highways

Construction would be phased so that the duration of drilled shaft work, which would have the largest effect on traffic, would be minimized. During final design, detailed Work Zone Traffic Control Plans, including detour plans, would be formulated in cooperation with all affected jurisdictions. Unless unforeseen circumstances occur, no designated major or secondary highway would be closed to vehicular or pedestrian traffic. In areas where a roadway is over three lanes wide, no roadway would be completely closed, so vehicular or pedestrian access to residences, businesses, or other establishments would still be provided.

Temporary lane closures would occur during non-peak hours, to minimize effects on heavy commuter traffic. It should be assumed that guideway segments would be delivered along arterial routes to the corridor. Delivery of other large equipment such as drilling equipment, cranes, launching gantry truss sections, etc., would also occur along arterial routes to the corridor. City and HDOT approvals would be sought for proposed haul routes and included in the contract packages.

An extensive public information program would be implemented to provide motorists with a thorough understanding of the location and duration of construction activities, as well as anticipated traffic conditions. The MOT Plan would also address traffic signal changes and the relocation of freight loading zones that would be temporarily eliminated.

Transit

The MOT Plan would determine when and where changes in bus service could be needed and would include Transportation Demand Management (TDM) elements. The Project would work with TheBus on potential changes to bus routes and service. Changes in bus service could include improving frequencies on existing routes or adding new routes that circumvent specific construction areas.

Businesses and Residences

During construction, access to businesses and residences near construction activities could be temporarily affected. In several locations left-turn lanes would be closed during construction, requiring drivers to change their approach and make a right-hand turn to the businesses. Such closures are expected on Farrington Highway in Waipahu, Kamehameha Highway in Pearl City, Salt Lake Boulevard, and Dillingham Boulevard. Segments of Halekauwila and Queen Streets may be made temporarily one-way or have parking eliminated during construction.

Mitigation to reduce disruptions in access to existing businesses may include the following:

- Maintaining auto access to residences and businesses during all phases of construction work

- Phasing and timing construction to maintain access to individual businesses for pedestrians, bicyclists, passenger vehicles, and trucks during business hours and important business seasons
- Taking existing freight movement into consideration when selecting detours; detours would ensure that roadways are capable of temporarily allowing for freight movement
- Providing access to emergency vehicles in areas where lane closures would affect the entire roadway; in areas where all lanes in one direction would be closed, a sufficient amount of space would be available for use by emergency vehicles

Pedestrians and Bikes

Pedestrian and bike access would be maintained during construction as much as possible, while emphasizing safety. Measures to maintain safe and efficient pedestrian and bike access would meet ADA regulations and could include the following:

- Maintaining pedestrian and bike access to residences and businesses during all construction phases
- Channelizing pedestrian flow in areas where sidewalks would be in close proximity to construction; channelized structures are generally steel-framed, three-sided plywood structures built above existing sidewalks
- Making extensive use of signage to direct pedestrians and bicyclists to the safest and most efficient routes through construction zones; signs would warn pedestrians and bicyclists well in advance of sidewalk and bike lane closures

Parking

The MOT Plan would consider potential measures to replace parking spaces temporarily lost during construction. These measures may include possible lease of off-street spaces. A temporary loading zone relocation plan would also be included.

Construction Phasing

The Build Alternatives would be constructed in phases. For example, the Airport & Salt Lake Alternative could be phased such that the guideway between East Kapolei and Ala Moana Center along Salt Lake Boulevard is built first, followed by a connection from Middle Street Transit Center to Honolulu International Airport. The connection from the Airport to Aloha Stadium could be completed as the final phase of the Project when additional funds become available.

The choice of phasing would affect construction methods and therefore the effects of construction on the transportation system. The MOT Plan and the TMP would be developed for the different construction phases to minimize effects to the traveling public.

7.7.2 Transit Mitigation Program

The Project's TMP would define adjustments that would mitigate the effects of construction on transit service. The TMP would minimize effects on existing bus service, and would be customized for each construction phase to properly serve projected rider demands. In some construction sections, parallel bus routes on roads not directly affected by construction may receive an increase in service to accommodate rider demand shifted from affected bus routes. Public information and outreach would be conducted to influence current and prospective transit rider behavior.

The TMP would consider the following factors in determining required bus route service adjustments:

- Minimizing the extent of changes for bus stops and rerouting (if necessary)
- The MOT Plan, as it relates to bus routes and pedestrian access to existing or relocated bus stops
- The severity and duration of construction along each corridor segment and within each construction phase
- Differences between scheduled bus route travel times currently operating and scheduled travel times expected during construction
- Differences between current travel times for existing traffic and traffic during construction, and whether transit can and should be given temporary traffic priority treatments during construction
- The types of temporary traffic priority treatments for transit that could be provided at a reasonable cost during construction

The TMP would generally maintain existing bus routes and stops. In areas where interruptions are expected, the following approaches may be adopted:

- Temporarily closing or relocating bus stops
- Rerouting existing service for short segments where no additional bus service is required
- Rerouting existing service for longer segments that require additional bus service
- Introducing new service to operate on different alignments not affected as heavily by construction
- Ceasing operation of routes (or portions of routes) on a temporary basis and redeploying the affected service hours to parallel routes
- Initiating a public information program to inform transit riders of service changes during construction
- Rerouting school bus routes that would be substantially delayed

7.8 Construction Traffic Effects

This section assesses potential transportation effects associated with the construction of the Project. It includes potential construction-related traffic effects, including temporary lane closures. The analysis is for individual segments of the proposed alignment. Construction-related traffic effects may be considered inconvenient, but are temporary in nature.

Detailed construction traffic management plans would be developed during the Project's preliminary engineering stage. These plans would attempt to ensure that traffic operations on affected roadways are maintained to the greatest extent possible during construction.

7.8.1 Kapolei to Waipahu—Including Future Planned Extension to West Kapolei

This part of the alignment would generally travel from the Kapolei terminus to Wākea Street (a future street), Saratoga Avenue (a future street), and North-South Road (a future street) to Farrington Highway, and ends at Fort Weaver Road. Eight stations are planned along this alignment (three as part of the Project, and five as part of the Future Planned Extension to West Kapolei).

Table 7-4 summarizes construction-related traffic effects for the rail alignment at key locations along this segment.

Table 7-4: Construction Related Effects on Kaploei Segment, Including West Kapolei Extension

Intersection/Roadway Segment	Column Placement	Summary of Effects
Kapolei Parkway from Kalaeloa Boulevard to Kamaaha Avenue	Median	Close left-turn lanes; close one through lane in each direction.
Wākea Street from Road "A" to Roosevelt Avenue	Median	Close left-turn lanes; close one through lane in each direction.
Saratoga Avenue from Wākea to North-South Road	Median	No effects expected. Work area expected to fit within wide median.
North-South Road from Saratoga Avenue to Kapolei Parkway	Median	Close left-turn lanes; close one through lane in each direction.
North-South Road from Kapolei Parkway to East-West Collector Road	Roadside	No effects expected. Work area expected to fit within wide median.
Ho'opili Community from North-South Road to Farrington Highway	Median	Left-turn lanes would be closed during construction of foundations and columns. Through lanes would remain open
Farrington Highway from Ho'opili Community to Kunia Road	Roadside	Existing one lane in each direction would remain open as construction be take place on road shoulder

Fixed guideway would be within new roadway right-of-way designated in the Kalaeloa Master Plan.

7.8.2 Waipahu to Aloha Stadium

This part of the alignment would travel from the Farrington Highway and Leokū Street Station to the vicinity of Aloha Stadium. Table 7-5 provides a summary of construction-related traffic effects for the Project's alignment at key locations along this segment.

7.8.3 Aloha Stadium to Middle Street (Salt Lake)

This part of the alignment would generally travel from Aloha Stadium along Salt Lake Boulevard to Pūkōloa Street, run adjacent to the Moanalua Stream and end at Middle Street. Five station locations are proposed along this alignment.

Table 7-6 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

7.8.4 Aloha Stadium to Middle Street (Airport)

This part of the alignment would generally travel from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continue along makai of the Airport Viaduct to Aolele Street through Ke‘ehi Lagoon Beach Park and continuing over Ke‘ehi Interchange to Kamehameha Highway at Middle Street. . Four station locations are proposed along this alignment.

Table 7-7 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

7.8.5 Middle Street to Iwilei

This part of the alignment would generally travel from the Ke‘ehi Interchange to Iwilei via Kamehameha Highway and Dillingham Boulevard. Three station locations are proposed along this alignment

Table 7-8 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

7.8.6 Iwilei to Ala Moana Center

This part of the alignment would generally travel from Downtown Honolulu to the Ala Moana Shopping Center via Nimitz Highway, Halekauwila Street, and Kona Street. Five station locations are proposed along this alignment.

Table 7-9 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

Table 7-5: Construction Related Traffic Effects on the Waipahu to Aloha Stadium Segment

Intersection/Roadway Segment	Column Placement	Effects
Farrington Highway and Leokū Street	Median	It is proposed that all left-turn lanes and the Koko Head-bound right-turn lane be closed during construction.
Farrington Highway and Leokane Street	Median	It is proposed that all left-turn lanes be closed during construction.
Farrington Highway and Pupukahi Street	Median	It is proposed that all left-turn lanes and the Koko Head-bound right-turn lane be closed during construction.
Farrington Highway and Aniani Place	Median	The road alignment would be shifted makai by 2 ft to eliminate "C" bents, reducing effect to through lanes during construction
Farrington Highway and Waipahu Depot Road	Median	"C" bent footings at 8 locations due to station and alignment shift.
Farrington Highway and Mokuola Street	Median	Left-turn lanes would be closed during construction of foundations and columns. Through lanes would remain open
Farrington Highway and Awamoku Street	Median	Left-turn lanes would be closed during construction of foundations and columns. Through lanes would remain open
Farrington Highway and Paiwa Street	Median	It is proposed that one through lane in each direction be maintained for installation for three "C" bent footings.
Farrington Highway and Kahualii Street	Median	It is proposed that one through lane in out-bound direction be closed during construction of foundations and columns
Farrington Highway and H-1/ H-2 Freeway Crossing	Median	One lane may need to be closed to provide working area for installation of columns
Kamehameha Highway (entire length)	Median	It is proposed that one through lane in the Koko Head direction be closed.
Kamehameha Highway and Acacia Road	Median	It is proposed that one left-turn lane in each direction be closed during construction.
Kamehameha Highway and Waimano Home Road/Lehua Avenue	Median	It is proposed that one Koko Head-bound left-turn lane be closed during construction.
Kamehameha Highway and Pu‘u Momi Street	Median	It is proposed that the Koko Head-bound left-turn lane be open during construction.
Kamehameha Highway unsignalized midblock left turns between Pu‘u Momi Street and Pu‘u Poni Street	Median	It is proposed that the median openings be closed during construction.
Kamehameha Highway and Pu‘u Poni Street	Median	It is proposed that the Koko Head-bound left-turn lane be open during construction.
Kamehameha Highway unsignalized midblock left turn between Pu‘u Poni Street and Kuleana Road	Median	It is proposed that the median opening be closed during construction.

Table 7-5: Construction Related Traffic Effects on the Waipahu to Aloha Stadium Segment (continued)

Intersection/Roadway Segment	Column Placement	Effects
Kamehameha Highway and Kuleana Road	Median	It is proposed that both the ‘Ewa and Koko Head-bound left-turn lanes be open during construction.
Kamehameha Highway Koko Head of Pu‘u Poni Street	Median	It is proposed that the median opening be closed during construction.
Kamehameha Highway and Kaluamoi Drive	Median	It is proposed that the median opening be closed, restricting the ‘Ewa-bound left-turn lane during construction.
Kamehameha Highway and Ka‘ahumanu Street	Median	It is proposed that one left-turn lane in each direction be closed, restricting the ‘Ewa-bound left-turn lane during construction.
Kamehameha Highway and Hekaha Street	Median	It is proposed that one ‘Ewa-bound left-turn lane be closed during construction.
Kamehameha Highway and Kanuku Street	Median	It is proposed that one left-turn lane in each direction be closed during construction.
Kamehameha Highway and Kaonohi Street	Median	It is proposed that one Koko Head-bound left-turn lane be closed during construction.
Kamehameha Highway and Lipoa Place	Median	It is proposed that the median opening be closed, restricting the ‘Ewa-bound left-turn lane during construction.
Kamehameha Highway and Pali Momi Street (‘Ewa)	Median	It is proposed that one Koko Head-bound left-turn lane be closed during construction.
Kamehameha Highway and ‘Aiea Kai Place	Median	It is proposed that the median opening be closed, restricting the ‘Ewa-bound left-turn lane during construction.
Kamehameha Highway and McGrew Loop./Honomanu Street	Median	It is proposed that the Koko Head-bound left-turn lane be closed during construction.
Kamehameha Highway and Entrance to Boathouse	Median	It is proposed that the median opening be closed, restricting the ‘Ewa-bound left-turn lane during construction.

Table 7-6: Construction Related Effects on Aloha Stadium to Middle Street Segment (Salt Lake)

Intersection/Roadway Segment	Column Placement	Summary of Effects
Salt Lake Boulevard and Kalaloa Street	Roadside	It is proposed that one through lane in each direction be closed.
Salt Lake Boulevard and Kahuapa‘ani Street	Roadside	It is proposed that both left-turn lanes and one through lane in each direction be closed. The remaining through lane would be changed to a left-turn lane and right-turn lanes would be changed into through/ right-turn lanes.
Salt Lake Boulevard and Luapele Drive	Median	It is proposed that one through lane in each direction be closed.
Salt Lake Boulevard and Ala Oli Street	Median	It is proposed that one through lane in each direction be closed.
Salt Lake Boulevard and Bougainville Drive	Median	It is proposed that one through lane in each direction be closed. The west bound bike lane is replaced with a shared vehicle/bike lane.
Salt Lake Boulevard and Lawehana Street	Median	It is proposed that one through lane in each direction be closed. The west bound bike lane is replaced with a shared vehicle/bike lane.
Salt Lake Boulevard and Pakini Street-Marshall Road	Median	It is proposed that one through lane in each direction be closed. The west bound bike lane is replaced with a shared vehicle/ bike lane.
Salt Lake Boulevard and Maluna Street-Namur Road	Median	It is proposed that both left-turn lanes and one through lane in each direction be closed during construction. Change one through lane in each direction into a through/ left-turn lane.
Salt Lake Boulevard and Wanaka Street	Roadside	It is proposed that the Koko Head-bound through lane be closed and the left-turn lane be converted into a temporary through/left-turn lane.
Salt Lake Boulevard and Likini Place-Radford Drive	Roadside	It is proposed that the Koko Head-bound through lane be closed and the left-turn lane be converted into a temporary through/left-turn lane.
Salt Lake Boulevard and Kahikolu Place	Roadside	It is proposed that the Koko Head-bound through lane be closed and the left-turn lane be converted into a temporary through/ left-turn lane.
Salt Lake Boulevard and Ala Liliko‘i Street	Median	It is proposed that one through lane in each direction and the Koko Head-bound left-turn lane be closed. Change one Koko Head-bound through lane into a through/ left-turn lane.
Salt Lake Boulevard and Arizona Road	Median	It is proposed that one through lane in each direction be closed.
Salt Lake Boulevard and Peltier Avenue	Median	It is proposed that one through lane in each direction be closed.
Salt Lake Boulevard and Ala Napunani Street	Median	It is proposed that one through lane in each direction be closed.

Table 7-6: Construction Related Effects on Aloha Stadium to Middle Street Segment (Salt Lake) (continued)

Intersection/Roadway Segment	Column Placement	Summary of Effects
Salt Lake Boulevard-Pūkōloa Street and Pu‘uloa Road	Roadside	It is proposed that one through lane in each direction be closed.
Pūkōloa Street and Māpunapuna Street	Roadside	It is proposed that the Koko Head-bound through/ right-turn lane be closed. Change the through/ left-turn lane into a left/ through/ right-turn lane.
Pūkōloa Street and Hua Street	Roadside	It is proposed that the right-turn lane be closed during construction. Plan to convert left-turn lane into a left/ right-turn lane.

Table 7-7: Construction Related Effects on Aloha Stadium to Middle Street Segment (Airport)

Intersection/Roadway Segment	Column Placement	Effects
Kamehameha Highway and Salt Lake Boulevard	Roadside	This intersection would not be affected by construction.
Kamehameha Highway and Kalaloa Street	Median	It is proposed that the existing ‘Ewa-bound left-turn lane be closed during construction.
Kamehameha Highway and Hālawa Drive/Arizona Street	Median	Construction expected to fit within median.
Kamehameha Highway and Radford Drive/Makalapa Gate	Median	It is proposed that both left-turn lanes be closed during construction.
Kamehameha Highway and Center Drive	Roadside	This intersection would not be affected by construction.
Kamehameha Highway and Valkenburgh Street	Roadside	This intersection would not be affected by construction.
Kamehameha Highway and Main Street	Roadside	This intersection would not be affected by construction.
Kamehameha Highway and Elliott Street	Roadside	This intersection would not be affected by construction.
Aolele Street and Paiea Street	Roadside	This intersection would not be affected by construction.
Aolele Street and Lagoon Drive	Roadside	This intersection would not be affected by construction.

Table 7-8: Construction Related Effects on Middle Street to Iwilei Segment

Intersection/Roadway Segment	Column Placement	Effects
Kamehameha Highway and Middle Street	Roadside /Median	It is proposed that two ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed during construction of columns.
Kamehameha Highway and Gaspro	Median	It is proposed that two ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction.
Kamehameha Highway and Laumaka Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Pu‘uhale Road	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Mokauea Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Kalihi Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and McNeill Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Waiakamilo Road	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Kohou Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Kōkea Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Alakawa Street	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and Costco Rear Parking	Median	It is proposed that one ‘Ewa-bound, one Koko Head-bound, and left-turn lanes be closed for column construction. Keep one through lane in each direction.
Dillingham Boulevard and King Street	Roadside	It is proposed that the mauka bound right-turn lane be closed during construction. Plan to convert through/right-turn lane into a right-turn only lane.
Dillingham Boulevard and Kaahi Street	Roadside	It is proposed that the mauka bound curbside lane be closed during construction.

Table 7-9: Construction Related Effects on Iwilei to Ala Moana Center Segment

Intersection/Roadway Segment	Column Placement	Effects
Nimitz Highway and River Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction. During off-peak travel hours, additional lane closure may be necessary for delivery of materials.
Nimitz Highway and Kekaulike Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction.
Nimitz Highway and Maunakea Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction.
Nimitz Highway and Smith Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction. Close mauka bound left-turn lanes.
Nimitz Highway and Nu‘uanu Avenue	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction.
Nimitz Highway and Bethel Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction. Close one of two mauka bound left-turn lanes.
Nimitz Highway and Fort Street	Median	It is proposed that one travel lane and one bike lane in each direction be closed during construction.
Ala Moana Boulevard and Bishop Street	Median	It is proposed that one Koko Head-bound traffic lane be detoured makai onto Bishop Street then to Aloha Tower Drive.
Ala Moana Boulevard and Alakea Street	Median	It is proposed that one Koko Head-bound traffic lane be detoured makai onto Bishop Street then to Aloha Tower Drive. Close mauka bound left-turn lane.
Ala Moana Boulevard and Halekauwila Street	Median	It is proposed that one Koko Head-bound traffic lane be detoured makai onto Bishop Street then to Aloha Tower Drive. Close mauka bound left-turn lane.
Halekauwila Street and Punchbowl Street	Median	It is proposed that Koko Head bound traffic between Ala Moana Boulevard and Punchbowl Street be closed and that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and South Street	Median	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and Keawe Street	Median	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and Coral Street	Roadside	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and Cooke Street	Roadside	It is proposed that that Halekauwila Street between

Table 7-9: Construction Related Effects on Iwilei to Ala Moana Center Segment (continued)

Intersection/Roadway Segment	Column Placement	Effects
		Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and Kōʻula Street	Median	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and ʻĀhui Street	Median	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Halekauwila Street and Ward Avenue	Median	It is proposed that that Halekauwila Street between Punchbowl Street and Ward Avenue temporarily become a one-way street.
Queen Street and Kamakeʻe Street	Roadside/Median	It is proposed that parking be restricted and traffic be shifted to curbsides.
Queen Street and Waimanu Street	Roadside/Median	It is proposed that that parking be restricted and traffic be shifted to curbsides
Kona Street and Pensacola Street	Roadside	It is proposed that all ʻEwa bound travel lanes be closed.
Kona Street and Piʻikoi Street	Roadside/Median	It is proposed that all ʻEwa bound travel lanes be closed.
Kona Street and Kona Iki Street	Roadside/Median	It is proposed that all ʻEwa bound travel lanes be closed.

7.8.7 University Avenue—Future Planned Extension

This part of the alignment would generally travel from the intersection of Kalākaua Avenue and Kapiʻolani Boulevard to the UH Mānoa campus. The alignment would follow Kapiʻolani Boulevard to University Avenue, terminating on the UH Mānoa lower campus. Three station locations are proposed along this alignment.

Table 7-10 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

Table 7-10: Construction Related Effects on University Avenue Extension Segment

Intersection/Roadway Segment	Column Placement	Summary of Effects
Kona Street and Mahukona Street	Median	It is proposed that the intersection and roadway be closed during construction.
Kapiʻolani Boulevard from Atkinson Drive to Kalākaua Avenue	Roadside	It is proposed that one travel lane be closed during construction.
Kapiʻolani Boulevard from Kalākaua Avenue to Pumehana Street	Roadside	It is proposed that three through lanes and one left-turn lane be closed during construction.
Kapiʻolani Boulevard from Pumehana Street to McCully Street	Roadside	It is proposed that three through lanes and one left-turn lane be closed during construction.
Kapiʻolani Boulevard from McCully Street to Wiliwili Street	Median	It is proposed that two through lanes and one left-turn lane be closed during construction.
Kapiʻolani Boulevard from Wiliwili Street to University Avenue	Median	It is proposed that two through lanes and one left-turn lane be closed during construction.
University Avenue from Kapiʻolani Boulevard to Date Street	Median	It is proposed that the parking, bike lanes, and left-turn lanes be closed during construction.
University Avenue from Date Street to King Street	Median	It is proposed that the parking, bike lanes, and left-turn lanes be closed during construction.
University Avenue from King Street to Varsity Place	Median	It is proposed that the parking, bike lanes, left-turn lanes, and a right-turn lane be closed during construction.

7.8.8 Waikīkī—Future Planned Extension

This part of the alignment would travel from the intersection of Kalākaua Avenue and Kapiʻolani Boulevard to the Koko Head side of Waikīkī. The alignment would then follow Kalākaua Avenue to Kūhiō Avenue, ending at Kaʻiulani Avenue. Two station locations are proposed along this alignment.

Table 7-11 provides a summary of construction-related traffic effects for the rail alignment at key locations along this segment.

Table 7-11: Construction Related Effects on Waikīkī Extension Segment

Intersection/Roadway Segment	Column Placement	Effect Summary
Kalākaua Avenue from Kapiʻolani Boulevard to Ala Wai Boulevard	Roadside	It is proposed that one through lane be closed during construction.
Kalākaua Avenue from Ala Wai Boulevard to McCully Boulevard	Roadside	Construction is expected to fit within the ʻEwa-bound lane, which would be permanently closed.
Kalākaua Avenue from McCully Boulevard to Kuamoʻo Avenue	Roadside	Construction is expected to fit within the ʻEwa-bound bus-only lane, which would be permanently closed.
Kūhiō Avenue from Kuamoʻo Street to Namahana Street	Roadside	Construction is expected to fit within the right-turn only lane, which would be permanently closed.
Kūhiō Avenue from Namahana Street to ʻŌlohana Street	Roadside	Construction is expected to fit within the ʻEwa-bound lane, which would be permanently closed.
Kūhiō Avenue from ʻŌlohana Street to Kālaimoku Street	Roadside	It is proposed that one through lane be closed during construction in addition to the lane, which would be permanently closed.
Kūhiō Avenue from Kālaimoku Street to Kaiʻolu Street	Roadside	Construction is expected to fit within the ʻEwa-bound lane, which would be permanently closed.
Kūhiō Avenue from Kaiʻolu Street to Kealohilani Street	Roadside	It is proposed that one through lane and one left-turn lane be closed during construction. This closure is in addition to the lane that would be permanently closed.
Kūhiō Avenue from Kealohilani Street to Paoakalani Street	Roadside	It is proposed that one through lane be closed during construction in addition to the lane that would be permanently closed.

8 Future Build Alternatives Plus Planned Extensions Conditions and Performance

This chapter identifies the cumulative transportation system effects of the Build Alternatives plus planned extensions to West Kapolei, UH Mānoa, and Waikīkī.

8.1 Transit Ridership

Table 8-1 shows projected daily transit boardings for the No Build and Build Alternatives plus planned extensions. Ridership numbers are presented in terms of fixed guideway boardings and total transit boardings, which also include bus ridership.

Table 8-1: Daily Transit Boardings—2030 Build Alternatives Plus Planned Extensions

Alternative	Fixed Guideway Boardings	Total Transit Boardings
2030 No Build	N/A	314,000
Salt Lake Alternative	88,000	449,000
% Change from No Build		*47%*
Airport Alternative	95,000	450,000
% Change from No Build		*47%*
Airport & Salt Lake Alternative	93,000	446,000
% Change from No Build		*47%*
Salt Lake Alternative plus Planned Extensions	112,000	446,000
% Change from No Build		*46%*
Airport Alternative plus Planned Extensions	120,000	447,000
% Change from No Build		*46%*
Airport & Salt Lake Alternative plus Planned Extensions	118,000	445,000
% Change from No Build		*45%*

8.1.1 Station and Link Volumes—Daily Ridership

The three tables below show the number of daily fixed guideway boardings (passengers getting on), alightings (passengers getting off), and link volumes (passengers on guideway trains) at each station in each direction. Table 8-2 shows this information for the Salt Lake Alternative, including planned extensions.

Table 8-2: Total Daily Fixed Guideway Ridership—2030 Salt Lake Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to West Kapolei						
West Kapolei	4,210	N/A	4,210	N/A	4,210	N/A
Kapolei Transit Center	1,330	20	5,520	20	1,330	4,210
Kalaeloa	530	200	5,850	200	530	5,520
Fort Barrette Road	150	50	5,950	50	150	5,850
Kapolei Parkway	1,770	240	7,480	240	1,770	5,950
Airport Alternative						
East Kapolei	1,710	160	9,030	160	1,710	7,480
UH West O‘ahu	5,050	230	13,850	230	5,050	9,030
Ho‘opili	1,330	200	14,980	200	1,330	13,850
West Loch	4,190	690	18,480	690	4,190	14,980
Waipahu Transit Center	2,230	660	20,050	660	2,230	18,480
Leeward Community College	940	710	20,280	710	940	20,050
Pearl Highlands	7,120	2,010	25,390	2,010	7,120	20,280
Pearlridge	3,540	1,770	27,160	1,770	3,540	25,390
Aloha Stadium (Salt Lake)	1,930	860	28,230	860	1,930	27,160
Ala Liliko‘i	3,220	1,720	29,730	1,720	3,220	28,230
Middle Street	1,730	1,570	29,890	1,570	1,730	29,730
Kalihi	2,940	1,720	31,110	1,720	2,940	29,890
Kapālama	1,040	1,040	31,110	1,040	1,040	31,110
Iwilei	1,500	1,440	31,170	1,440	1,500	31,110
Chinatown	1,300	870	31,600	870	1,300	31,170
Downtown	3,040	5,780	28,860	5,780	3,040	31,600
Civic Center	1,170	2,470	27,560	2,470	1,170	28,860
Kaka‘ako	810	2,300	26,070	2,300	810	27,560
Ala Moana Center	2,110	5,900	22,280	5,900	2,110	26,070
East Kapolei	1,710	160	9,030	160	1,710	7,480
UH West O‘ahu	5,050	230	13,850	230	5,050	9,030
Planned Extension to UH Mānoa						
Convention Center	790	2,580	10,780	2,580	790	11,600
McCully	90	830	10,040	830	90	10,780
Date Street	60	1,660	8,440	1,660	60	10,040
Mō‘ili‘ili	20	3,520	4,940	3,520	20	8,450
UH Mānoa	N/A	4,940	N/A	4,940	N/A	4,940
Planned Extension to Waikīkī						
From Convention Center	–	–	9,710	–	–	10,680
Kālaimoku Street	30	4,540	5,200	4,540	30	9,710
Lili‘uokalani Avenue	N/A	5,200	N/A	5,200	N/A	5,200
Totals	*55,880*	*55,880*		*55,880*	*55,880*	

Table 8-3 shows the number of daily fixed guideway boardings, alightings, and link volumes at each station in each direction, for the Airport Alternative plus planned extensions.

Table 8-3: Total Daily Fixed Guideway Ridership—2030 Airport Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to West Kapolei						
West Kapolei	4,280	N/A	4,280	N/A	4,280	N/A
Kapolei Transit Center	1,340	10	5,610	10	1,340	4,280
Kalaeloa	530	190	5,950	190	530	5,610
Fort Barrette Road	150	60	6,040	60	150	5,950
Kapolei Parkway	1,770	240	7,570	240	1,770	6,040
Airport Alternative						
East Kapolei	1,730	170	9,130	170	1,730	7,570
UH West O‘ahu	5,100	240	13,990	240	5,100	9,130
Ho‘opili	1,320	200	15,110	200	1,320	13,990
West Loch	4,190	690	18,610	690	4,190	15,120
Waipahu Transit Center	2,260	640	20,230	640	2,260	18,610
Leeward Community College	930	710	20,450	710	930	20,230
Pearl Highlands	7,190	2,020	25,620	2,020	7,190	20,450
Pearlridge	3,740	1,600	27,760	1,600	3,740	25,620
Aloha Stadium (Kamehameha Highway)	2,180	750	29,190	750	2,180	27,760
Pearl Harbor Naval Base	2,860	1,830	30,220	1,830	2,860	29,190
Honolulu International Airport	1,860	1,620	30,460	1,620	1,860	30,220
Lagoon Drive	2,170	1,200	31,430	1,200	2,170	30,460
Middle Street	1,170	1,400	31,200	1,400	1,170	31,430
Kalihi	3,090	2,030	32,260	2,030	3,090	31,200
Kapālama	1,030	1,090	32,200	1,090	1,030	32,260
Iwilei	1,490	1,660	32,030	1,660	1,490	32,200
Chinatown	1,290	940	32,380	940	1,290	32,030
Downtown	3,050	5,920	29,510	5,920	3,050	32,380
Civic Center	1,170	2,480	28,200	2,480	1,170	29,510
Kaka‘ako	820	2,460	26,560	2,460	820	28,200
Ala Moana Center	2,100	5,970	22,690	5,970	2,100	26,560
Planned Extension to UH Mānoa						
Convention Center	780	2,640	10,800	2,640	780	11,680
McCully	100	850	10,050	850	100	10,800
Date Street	60	1,650	8,460	1,650	60	10,050
Mō‘ili‘ili	20	3,620	4,860	3,620	20	8,470
UH Mānoa	N/A	4,860	N/A	4,860	N/A	4,860
Planned Extension to Waikīkī						
From Convention Center	–	–	10,030	–	–	11,020
Kālaimoku Street	30	4,740	5,320	4,740	30	10,040
Lili‘uokalani Avenue	N/A	5,320	N/A	5,320	N/A	5,320
Totals	*59,800*	*59,800*		*59,800*	*59,800*	

Table 8-4 shows the number of daily fixed guideway boardings, alightings, and link volumes at each station in each direction, for the Airport & Salt Lake Alternative plus planned extensions. The data are listed for the individual Airport and Salt Lake alignments, as well as when they combine together as one alignment.

Table 8-4: Total Daily Fixed Guideway Ridership—2030 Airport & Salt Lake Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to West Kapolei						
West Kapolei	4,250	N/A	4,250	N/A	4,250	N/A
Kapolei Transit Center	1,330	10	5,570	10	1,330	4,250
Kalaeloa	520	190	5,900	190	520	5,570
Fort Barrette Road	150	50	6,000	50	150	5,900
Kapolei Parkway	1,750	240	7,510	240	1,750	6,000
Main Alignment						
East Kapolei	1,720	160	9,070	160	1,720	7,510
UH West O‘ahu	5,070	230	13,910	230	5,070	9,070
Ho‘opili	1,320	200	15,030	200	1,320	13,910
West Loch	4,140	690	18,480	690	4,140	15,030
Waipahu Transit Center	2,230	640	20,070	640	2,230	18,480
Leeward Community College	940	720	20,290	720	940	20,070
Pearl Highlands	7,150	2,040	25,400	2,040	7,150	20,290
Pearlridge	3,780	1,650		1,650	3,780	25,400
East Kapolei	1,720	160	9,070	160	1,720	7,510
Salt Lake Alignment						
From Pearlridge	–	–	20,290	–	–	–
Aloha Stadium (Salt Lake)	790	270	20,810	270	790	20,290
Ala Liliko‘i	1,640	740	21,710	740	1,640	20,810
From Middle Street	–	–	–	–	–	21,710
Airport Alignment						
From Pearlridge	–	–	7,230	–	–	–
Arizona Memorial	950	240	7,940	240	950	7,230
Pearl Harbor Naval Base	2,510	1,610	8,840	1,610	2,510	7,940
Honolulu International Airport	1,130	1,150	8,820	1,150	1,130	8,840
Lagoon Drive	860	830	8,850	830	860	8,820
From Middle Street	–	–	–	–	–	8,850
Main Alignment						
From Ala Liliko‘i & Lagoon Drive	–	–	30,560	–	–	–
Middle Street	1,780	1,500	30,840	1,500	1,780	30,560
Kalihi	3,010	1,940	31,910	1,940	3,010	30,840
Kapālama	1,030	1,060	31,880	1,060	1,030	31,910
Iwilei	1,500	1,580	31,800	1,580	1,500	31,880
Chinatown	1,300	930	32,170	930	1,300	31,800
Downtown	3,040	5,750	29,460	5,750	3,040	32,170
Civic Center	1,180	2,450	28,190	2,450	1,180	29,460
Kaka‘ako	810	2,460	26,540	2,460	810	28,190
Ala Moana Center	2,100	5,830	22,810	5,830	2,100	26,540
From Ala Liliko‘i & Lagoon Drive	–	–	30,560	–	–	–

Table 8-4: Total Daily Fixed Guideway Ridership—2030 Airport & Salt Lake Alternative Plus Planned Extensions (continued)

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to UH Mānoa						
Convention Center	1,060	2,680	10,930	2,680	1,060	22,810
McCully	100	910	10,120	910	100	10,930
Date Street	50	1,830	8,340	1,830	50	10,120
Mō‘ili‘ili	30	3,430	4,940	3,430	30	8,340
UH Mānoa	NA	4,940	NA	4,940	NA	4,940
Planned Extension to Waikīkī						
From Convention Center	–	–	10,270	–	–	–
Kālaimoku Street	30	4,800	5,500	4,800	30	10,270
Lili‘uokalani Avenue	N/A	5,500	N/A	5,500	N/A	5,500
Totals	*59,250*	*59,250*		*59,250*	*59,250*	

8.1.2 Station and Link Volumes—Peak-Period Ridership

Table 8-5 shows the projected number of a.m. two-hour peak-period fixed guideway boardings, alightings, and link volumes at each station in each direction for the Salt Lake Alternative plus planned extensions.

Table 8-6 shows the number of a.m. two-hour peak-period fixed guideway boardings, alightings, and link volumes at each station in each direction for the Airport Alternative plus planned extensions.

Table 8-7 shows the number of a.m. two-hour peak-period fixed guideway boardings, alightings, and link volumes at each station in each direction for the Airport & Salt Lake Alternative including planned extensions.

Table 8-5: A.M. Two-Hour Peak-Period Fixed Guideway Ridership—2030 Salt Lake Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to West Kapolei						
West Kapolei	880	0	880	0	410	0
Kapolei Transit Center	300	0	1,180	0	290	410
Kalaeloa	150	60	1,270	20	110	700
Fort Barrette Road	20	20	1,270	0	20	790
Kapolei Parkway	1,000	20	2,250	120	100	810
Airport Alternative						
East Kapolei	770	20	3,000	60	100	790
UH West O‘ahu	2,360	40	5,320	60	280	830
Ho‘opili	500	40	5,780	40	140	1,050
West Loch	1,590	160	7,210	140	350	1,150
Waipahu Transit Center	700	100	7,810	180	200	1,360
Leeward Community College	120	240	7,690	20	350	1,380
Pearl Highlands	3,970	260	11,400	760	190	1,710
Pearlridge	980	560	11,820	240	350	1,140
Aloha Stadium (Salt Lake)	370	320	11,870	100	190	1,250
Ala Liliko‘i	780	720	11,930	160	470	1,340
Middle Street	420	560	11,790	160	250	1,650
Kalihi	650	660	11,780	160	370	1,740
Kapālama	110	440	11,450	40	240	1,950
Iwilei	250	500	11,200	200	240	2,150
Chinatown	90	320	10,970	60	210	2,190
Downtown	430	2,580	8,820	340	730	2,340
Civic Center	140	1,000	7,960	180	280	2,730
Kaka‘ako	140	700	7,400	180	160	2,830
Ala Moana Center	120	1,800	5,720	420	410	2,810
East Kapolei	770	20	3,000	60	100	790
UH West O‘ahu	2,360	40	5,320	60	280	830
Planned Extension to UH Mānoa						
Convention Center	160	520	3,050	380	160	2,800
McCully	20	110	2,960	240	10	1,430
Date Street	10	470	2,500	330	10	1,200
Mō‘ili‘ili	0	640	1,860	730	0	880
UH Mānoa	N/A	1,860	N/A	150	N/A	150
Planned Extension to Waikīkī						
From Convention Center	–	–	2,310	–	–	–
Kālaimoku Street	0	1,260	1,050	480	10	1,150
Lili‘uokalani Avenue	N/A	1,050	N/A	680	N/A	680
Totals	*17,030*	*17,030*		*6,630*	*6,630*	

Table 8-6: A.M. Two-Hour Peak-Period Fixed Guideway Ridership—2030 Airport Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	**Alightings**	**Between Stations**	**Boardings**	**Alightings**	**Between Stations**
Planned Extension to West Kapolei						
West Kapolei	890	N/A	890	N/A	410	N/A
Kapolei Transit Center	300	0	1,190	0	290	410
Kalaeloa	150	50	1,290	20	100	700
Fort Barrette Road	20	20	1,290	0	20	780
Kapolei Parkway	1,000	20	2,270	120	120	800
Airport Alternative						
East Kapolei	770	20	3,020	60	100	800
UH West O‘ahu	2,400	40	5,380	60	270	840
Ho‘opili	510	40	5,850	40	140	1,050
West Loch	1,600	160	7,290	140	350	1,150
Waipahu Transit Center	700	100	7,890	190	200	1,360
Leeward Community College	120	240	7,770	20	350	1,370
Pearl Highlands	4,020	260	11,530	760	180	1,700
Pearlridge	1,060	540	12,050	220	400	1,120
Aloha Stadium (Kamehameha Highway)	640	200	12,490	180	180	1,300
Pearl Harbor Naval Base	420	760	12,150	120	540	1,300
Honolulu International Airport	290	600	11,840	100	360	1,720
Lagoon Drive	370	460	11,750	80	340	1,980
Middle Street	260	400	11,610	200	180	2,240
Kalihi	640	640	11,610	260	380	2,220
Kapālama	110	440	11,280	60	240	2,340
Iwilei	260	480	11,060	280	240	2,520
Chinatown	90	320	10,830	80	210	2,480
Downtown	440	2,580	8,690	400	730	2,610
Civic Center	140	990	7,840	200	280	2,940
Kaka‘ako	130	700	7,270	200	150	3,020
Ala Moana Center	120	1,800	5,590	460	410	2,970
Planned Extension to UH Mānoa						
Convention Center	160	500	2,970	400	160	2,920
McCully	20	100	2,890	240	10	1,480
Date Street	20	450	2,460	340	10	1,250
Mō‘ili‘ili	0	630	1,830	770	0	920
UH Mānoa	N/A	1,830	N/A	150	N/A	150
Planned Extension to Waikīkī						
From Convention Center	–	–	2,280	–	–	–
Kālaimoku Street	0	1,240	1,040	510	10	1,200
Lili‘uokalani Avenue	N/A	1,040	N/A	700	N/A	700
Totals	*17,650*	*17,650*		*7,360*	*7,360*	

Table 8-7: A.M. Two-Hour Peak-Period Fixed Guideway Ridership—Airport & Salt Lake Alternative Plus Planned Extensions

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to West Kapolei						
West Kapolei	880	N/A	880	N/A	410	N/A
Kapolei Transit Center	290	0	1,170	0	290	410
Kalaeloa	150	40	1,280	20	110	700
Fort Barrette Road	20	20	1,280	0	20	790
Kapolei Parkway	1,000	20	2,260	120	110	810
Main Alignment						
East Kapolei	760	20	3,000	60	100	800
UH West O‘ahu	2,370	40	5,330	60	270	840
Ho‘opili	500	60	5,770	40	140	1,050
West Loch	1,580	160	7,190	140	340	1,150
Waipahu Transit Center	700	100	7,790	200	200	1,350
Leeward Community College	120	240	7,670	40	350	1,350
Pearl Highlands	4,010	260	11,420	780	180	1,660
Pearlridge	1,070	560	11,930	220	360	1,060
East Kapolei	760	20	3,000	60	100	800
Salt Lake Alignment						
From Pearlridge	–	–	5,965	–	–	–
Aloha Stadium (Salt Lake)	220	110	6,075	40	70	920
Ala Liliko‘i	580	200	6,455	130	110	950
From Middle Street	–	–	–	–	–	930
Airport Alignment						
From Pearlridge	–	–	5,965	–	–	–
Arizona Memorial	150	40	6,075	50	100	280
Pearl Harbor Naval Base	320	670	5,725	70	480	330
Honolulu International Airport	90	430	5,385	60	280	740
Lagoon Drive	70	330	5,125	30	230	960
From Middle Street	–	–	–	–	–	1,160
Main Alignment						
From Ala Liliko‘i & Lagoon Drive	–	–	11,580	–	–	–
Middle Street	330	440	11,470	210	220	2,090
Kalihi	650	620	11,500	240	380	2,100
Kapālama	110	430	11,180	40	240	2,240
Iwilei	250	450	10,980	260	240	2,440
Chinatown	90	320	10,750	80	210	2,420
Downtown	430	2,500	8,680	390	730	2,550
Civic Center	150	970	7,860	200	290	2,890
Kaka‘ako	130	710	7,280	190	150	2,980
Ala Moana Center	130	1720	5,690	450	410	2,940
From Ala Liliko‘i & Lagoon Drive	–	–	11,580	–	–	–
Planned Extension to UH Mānoa						
Convention Center	160	480	3,070	500	260	2,900
McCully	20	140	2,950	260	10	1,450
Date Street	10	470	2,490	330	10	1,200
Mō‘ili‘ili	10	630	1,870	730	0	880
UH Mānoa	N/A	1,870	N/A	150	N/A	150

Table 8-7: A.M. Two-Hour Peak-Period Fixed Guideway Ridership—Airport & Salt Lake Alternative Plus Planned Extensions (continued)

Station Name	Koko Head Bound			‘Ewa Bound		
	Boardings	Alightings	Between Stations	Boardings	Alightings	Between Stations
Planned Extension to Waikīkī						
From Convention Center	–	–	2,300	–	–	–
Kālaimoku Street	0	1,270	1,030	500	10	1,210
Liliʻuokalani Avenue	N/A	1,030	N/A	720	N/A	720
Totals	*17,350*	*17,350*		*7,310*	*7,310*	

8.1.3 Changes in Transit and Automobile Demand

With the Build Alternatives plus planned extensions, transit person trips would grow compared with the Build Alternatives. At the same time, automobile person trips would decline while bike/walk person trips would remain the same. Table 8-8 shows daily person trips by mode for various alternatives.

Table 8-8: Total Daily Person Trips by Mode*

Alternative	Transit	Auto	Bike/Walk	Total
2007 Base Year	184,000	2,408,000	498,000	3,090,000
2030 No Build	226,000	2,975,000	596,000	3,797,000
Salt Lake Alternative	270,000	2,932,000	595,000	3,797,000
Airport Alternative	273,000	2,930,000	595,000	3,798,000
Airport & Salt Lake Alternative	272,000	2,931,000	595,000	3,798,000
Salt Lake Alternative plus planned extensions	279,000	2,926,000	595,000	3,800,000
Airport plus Alternative planned extensions	282,000	2,923,000	595,000	3,800,000
Airport & Salt Lake Alternative plus planned extensions	281,000	2,924,000	595,000	3,800,000

*Includes resident transit, visitor transit, resident vehicle, visitor automobile, and non-motorized trips

8.2 Effects on Transit Performance

As with the Build Alternatives, the Build Alternatives plus planned extensions would improve transit performance by reducing transit travel times and increasing reliability. In addition, total bus operating expenses would be less for the Build Alternatives plus planned extensions because fewer bus hours and miles would be needed. For the Build Alternatives without the planned extensions, additional bus service resources are required to provide access between the interim terminus stations at East Kapolei and Ala Moana Center and the planned extension stations. The fixed guideway would replace that bus service under the planned extensions.

8.2.1 Bus Access at Fixed Guideway Stations

This section discusses bus access at each extension station location.

West Kapolei Planned Extension

With the Build Alternatives plus planned extensions, transit services at West Kapolei, Kapolei Transit Center, Kalaeloa, Fort Barrette Road, and Kapolei Parkway would retain the underlying bus route system, which would work well with the fixed guideway operation.

Some Rapid Bus and Trunk routes would be replaced by the extension of the fixed guideway, as specified in the following descriptions. Table 8-9 provides an overview of the feeder bus services at each station as well as current service (effective December 2007).

Table 8-9: TheBus Routes Serving Kapolei Stations—Existing and Build Alternatives, including Planned Extensions

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
West Kapolei (Future Station)	No current routes.	N/S; 416	N/S; 416	C, 40/A, 416	C, 40/A, 416	C, 40/A, 416
Kapolei Transit Center (Future Station)	C, 40/A, 41, 93A, 411, 412, 413, 414, 415	N/S; C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	N/S; C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419
Kalaeloa (Future Station)	No current routes.	N/S; 418	N/S; 418	418	418	418
Fort Barrette Road (Future Station)	No current routes.	N/S; 418	N/S; 418	418	418	418
Kapolei Parkway (Future Station)	No current routes.	N/S; 41, 421, 422	N/S; 41, 421, 422	41, 421, 422	41, 421, 422	41, 421, 422
East Kapolei	No current routes.	C, 416, 417, 418, 419, 421, 422	C, 416, 417, 418, 419, 421, 422	C, 417, 421, 422	C, 417, 421, 422	C, 417, 421, 422
UH West Oʻahu	No current routes.	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421
Hoʻopili	No current routes.	421	421	421	421	421

N/S—No Station

Bus service would be provided at stations along the planned West Kapolei extension, as described below.

West Kapolei (Future Station)—this site is currently not served by local bus routes. The West Kapolei Station would become the anchor for a substantial amount of Wai‘anae Coast bus routes (and private vehicles) and served by the following:

- *CountryExpress!* C would connect Mākaha with the fixed guideway; the route would continue to the UH West O‘ahu Station where it would terminate.
- Route 40/A would provide local bus service to Wai‘anae communities and continue to town and Ala Moana Center.
- Route 416 would serve new West Kapolei development and Ko ‘Olina, and continue as Route 419 to the Makaiwa Hills development mauka of Farrington Highway with the 2030 Build Alternatives.

Kapolei Transit Center (Future Station)—the Kapolei Transit Center would remain the dominant bus transit facility in West O‘ahu. This transit center already has extensive bus service. Routes currently serving the transit center (which would continue to operate) are C, 40/A, 41, 411, 412, 413, 414 and 415. New or redesigned services would include:

- Route 413, expanded to include mid-day service.
- Route 415, redesigned to connect the Kapolei, Kalaeloa, Ocean Pointe, and ‘Ewa communities with the West Loch Station in Waipahu.
- Route 416 serving West Kapolei development and Ko ‘Olina; continuing as Route 419 to the Makaiwa Hills development mauka of Farrington Highway in the 2030 Build Alternatives. The Kapolei West Development Concept Plan prepared by ‘Āina Nui Corporation in 2004 shows the extension of Kapolei Parkway connecting with Ali‘inui Drive in Ko ‘Olina. The Kapolei West project encompasses approximately 550 acres and would contain about 2,400 single and multi-family homes. Route 416 is designed to offer service to those new residential areas and some of the existing unserved residential areas, predominantly along the roadway extension using Kapolei Parkway to Ali‘inui Drive from the Kapolei Transit Center.
- Route 417 serving the new development on the Koko Head side of Makakilo and continuing to the North-South Road Development and UH West O‘ahu (connecting with Route 411 in Makakilo).
- Route 418 providing connections between the new development in Kalaeloa, the City of Kapolei, Villages of Kapolei, and the new Makana Ali‘i mall.
- Route 419 serving the Makaiwa Hills development (continuing to Ko ‘Olina as Route 416) in the 2030 Build Alternatives. Makaiwa Hills is an area of 1,300 acres that would be developed for a potential build-out of 2,000 residential units.

Kalaeloa (Future Station)—currently not served by local bus routes, the Kalaeloa Master Plan, dated February 17, 2006, was prepared by the State of Hawai‘i, Hawai‘i Community Development Authority. The plan is for a 3,700-acre site formally occupied by military-related functions. It would be redeveloped with 6,500 homes and employment, offering 7,000 jobs. Route 418 would provide local connections within the new development and Kapolei.

Fort Barrette Road (Future Station)—currently not served by local bus routes. Route 418 would provide connecting service to this station.

Kapolei Parkway (Future Station)—currently not served by local bus routes. Future connections would include:

- Route 41 connecting the City of Kapolei, UH West O‘ahu, and the Makana Ali‘i regional mall with ‘Ewa and ‘Ewa Beach neighborhoods. Makana Ali‘i regional mall is a planned 1.5 million-square-foot project planned on 67 acres located on Kapolei Parkway and North-South Road. Residential development is planned adjacent to the mall.
- Route 421 providing service between West Loch, Ho‘opili, UH West O‘ahu, Makana Ali‘i development, and ‘Ewa neighborhoods.
- Route 422 providing service between West Loch, Ho‘opili, and Makana Ali‘i through neighborhoods not served by Route 421.

West Loch to Pearlridge

Bus service in this segment would not be dramatically different between the Build Alternatives and the Build Alternatives with planned extensions. Bus feeder service would be provided at each station along the West Loch to Pearlridge segment of the proposed fixed guideway alignment, except for the Leeward Community College Station.

Table 8-10 provides an overview of proposed feeder bus services at each station as well as current service (effective December 2007).

Table 8-10: TheBus Routes serving West Loch to Pearlridge Station—Existing and Build Alternatives, including Planned Extensions

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
West Loch	A, E, 40/A, 42, 44, 201, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434
Waipahu Transit Center	A, E, 40/A, 42, 43, 201, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434
Leeward Community College	73 on limited schedule (7:36 AM to 2:35 PM)	No routes	No routes	No routes	No routes	No routes
Pearl Highlands	A, 40/A, 42, 62, 73	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441
Pearlridge	A, 11, 20, 32, 40/A, 42, 53, 54, 62, 71, 90	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548, 549	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548, 549	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548

Aloha Stadium to Middle Street

With the Build Alternatives plus planned extensions, the vast majority of current TheBus service along this section of the fixed guideway would be predominantly provided by through-routes. Table 8-11 provides an overview of proposed feeder bus services at each station as well as current service (effective December 2007).

Table 8-11: TheBus Routes serving Aloha Stadium to Ala Liliko'i Station—Existing and Build Alternatives, including Planned Extensions

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
Aloha Stadium (Salt Lake)	A, 11, 20, 32, 40, 40A, 42, 62, 74	40, 40A, 301, 312, 314, 541, 549	40, 40A, 301, 312, 314, 541	40, 40A, 301, 312, 314, 541, 549	40, 40A, 301, 312, 314, 541	40, 40A, 301, 312, 314, 541
Aloha Stadium (Kamehameha)	A, 20, 40, 40A, 42, 62	N/S; 40, 40A, 314, 549	40, 40A, 314	N/S; 40, 40A, 314, 549	40, 40A, 314	A/M 40, 40A, 314
Pearl Harbor Naval Base	9, 11, 20, 40, 40A, 42, 62, 86, 86A, 95	N/S; 40, 40A, 312, 313, 314, 549	40, 40A, 312, 313, 314	N/S; 40, 40A, 312, 313, 314, 549	40, 40A, 312, 313, 314	40, 40A, 312, 313, 314
Honolulu International Airport	19, 20, 31	N/S 19, 302, 311	19, 302, 311	N/S 19, 302, 311	19, 302, 311	19, 302, 311
Lagoon Drive	No current service, routes operate on Nimitz Highway	N/S; 306 (19 and 40A on Nimitz Highway)	31, 306 (19 and 40A on Nimitz Highway)	N/S; 306 (19 and 40A on Nimitz Highway)	31, 306 19 and 40A on Nimitz Highway)	306 (others on Nimitz Highway)
Ala Liliko'i	3 (one long block away) 32	301, 311, 313, 549 plus 31 one long block away	N/S; 301, 311 plus 31 one long block away	301, 311, 313, 549 plus 31 one long block away	N/S; 301, 311 plus 31 one long block away	301, 311 plus 31 one long block away

N/S—No Station; A/M—Under this alternative a station would be located at Arizona Memorial, instead of Aloha Stadium

Middle Street to Kapālama

With the Build Alternatives plus planned extensions, bus feeder services would be provided at each station this section of the alignment. Table 8-12 provides an overview of proposed bus feeder services at each station (effective December 2007).

Table 8-12: TheBus Routes serving Middle Street to Kapālama Station—Existing and Build Alternatives, including Planned Extensions

Station	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
Middle Street Transit Center	A, B, 1, 2, 16, 31, 32, 203 (plus C, 9, 40, 40A, 42, 52, 62 on Kamehameha)	A, 1, 2, 31, 40, 40A. 52, 301, 302, 303, 304, 305, 306	A, 1, 2, 31, 40, 40A. 52, 301, 302, 303, 304, 305, 306	1, 2, 31, 40, 40A. 52, 301, 302, 303, 304, 305, 306	1, 2, 31, 40, 40A. 52, 301, 302, 303, 304, 305, 306	1, 2, 31, 40, 40A. 52, 301, 302, 303, 304, 305, 306
Kalihi	C, 9, 10, 40, 40A, 42, 52, 62	40, 40A, 52, 62, 305	40, 40A, 52, 62, 305	40, 40A, 52, 62, 305	40, 40A, 52, 62, 305	40, 40A, 52, 62, 305
Kapālama	C, 9, 40, 40A, 42, 52, 62	40, 40A, 52	40, 40A, 52	40, 40A, 52	40, 40A, 52	40, 40A, 52

Iwilei to Ala Moana Center

Under the Build Alternatives plus planned extensions, bus feeder services would be provided at each station along the Iwilei to Ala Moana Center section of the Project. Table 8-13 provides an overview of proposed feeder services at each station as well as current service (effective December 2007).

Table 8-13: TheBus Routes and Bus Passenger Boardings—Iwilei to Ala Moana Shopping Center Station—Existing and Build Alternatives, including Planned Extensions

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
Iwilei	No routes directly serve this location. Routes on King & Iwilei	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)
Chinatown	Not directly served by transit due to proximity of Hotel and King Transit Streets					
Downtown	E, F2, F3, 88A, 19, 20, 55, 56, 57, 65	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A
Civic Center	6, 42, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89
Kaka‘ako	6	6	6	6	6	6
Ala Moana Center	C, 5, 6, 8, 17, 18, 19, 20, 23, 40, 40A, 43, 52, 53, 55, 56, 57, 57A, 62, 65, 88A (A, 3, 9 on Kapi‘olani; E, F3, 42, 98A on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40, 40A, 52, 88A (A, 3 on Kapi‘olani; F3 and 19 on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40, 40A, 52, 88A (A, 3 on Kapi‘olani; F3 and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40, 40A, 52, 88A (3 on Kapi‘olani; F3 and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40, 40A, 52, 88A (3 on Kapi‘olani; F3 and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40, 40A, 52, 88A (3 on Kapi‘olani; F3 and 19 on Ala Moana Blvd.)

University of Hawaiʻi at Mānoa Planned Extension

Bus feeder services would be provided at the McCully Street Station (for transfers to Waikīkī buses), and at the University and Date Street Stations (for transfers to/from buses serving east Honolulu). Table 8-14 summarizes current and future bus routes serving station locations in this section.

Table 8-14: TheBus Routes serving UH Mānoa Planned Extension Stations—Existing and Build Alternatives

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
Convention Center (Future Station)	A, B, 2, 3, 9, 13	A, 2, 3, 7, 9	A, 2, 3, 7, 9	2, 3	2, 3	2, 3
McCully (Future Station)	A, 3, 4, 9	A, 3, 7, 9, 18	A, 3, 7, 9, 18	3, 9, 18	3, 9, 18	3, 9, 18
Date Street (Future Station)	A, 4	A, 7, 18	A, 7, 18	9, 18	9, 18	9, 18
Mōʻiliʻili (Future Station)	A, F2, 1, 1L, 4, 6	A, F2, 1, 1L, 6, 7, 18	A, F2, 1, 1L, 6, 7, 18	F2, 1, 1L, 6, 18	F2, 1, 1L, 6, 18	F2, 1, 1L, 6, 18
UH Mānoa (Future Station)	No routes directly serve this station site; although routes do serve the University.					

For each station, the following bus routes would be provided:

Convention Center (Future Station)—the Convention Center site is currently served by Routes A, B, 2, 3, 9 and 13. The future Convention Center Station would be served by Routes 2 and 3 under the 2030 Build Alternatives with planned extensions.

McCully (Future Station)— the McCully Station site is currently served by Routes A, 3, 4 and 9. The station would be served by Routes 3, 9, and 18 under the 2030 Build Alternatives with planned extensions.

Date Street (Future Station)—this station site is currently served by Route A and 4. Routes 9 and 18 would serve the station under the 2030 Build Alternatives with planned extensions.

Mōʻiliʻili (Future Station)— the Mōʻiliʻili site on King Street is currently served by Routes A, F2, 1, 1L, 4 and 6. The station would be served by Routes F2, 1, 1L, 6 and 18 under the 2030 Build Alternatives.

UH Mānoa (Future Station)—this proposed station location is not directly served by the current or future bus system. It would likely be served by the University campus bus shuttle.

Waikīkī Planned Extension

Bus feeder services at stations would be provided at the Kālaimoku Street and Lili'uokalani Avenue Stations. Table 8-15 summarizes current and future bus routes serving station locations in this section.

Table 8-15: TheBus Routes serving Waikīkī Planned Extension Stations—Existing and Build Alternatives

Fixed Guideway Station Locations	2007 Existing Conditions	Salt Lake Alternative	Airport Alternative	Salt Lake Alternative plus Extensions	Airport Alternative plus Extensions	Airport & Salt Lake Alternative plus Extensions
Kālaimoku Street (Future Station)	B, E, F3, 2, 4, 8, 13, 19, 20, 22, 23, 42, 98A, 201, 202, 203	F3, 2, 4, 8, 18, 19, 22, 23	F3, 2, 4, 8, 18, 19, 22, 23	F3, 2, 4, 8, 18, 19, 22, 23	F3, 2, 4,8, 18, 19, 22, 23	F3, 2, 4,8, 18, 19, 22, 23
Lili'uokalani Avenue (Future Station)	B, E, F3, 2, 4, 8, 13, 19, 20, 22, 23, 42, 98A, 201, 202, 203	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23

For each station, the following bus routes would be provided:

Kālaimoku Street (Future Station)—this station location is currently served by Routes B, E, F3, 2, 4, 8, 13, 19, 20, 22, 23, 42, 98A, 201, 202 and 203. Future connections to the station would be provided by Routes F3, 2, 4, 8, 18, 19, 22 and 23.

Lili'uokalani Avenue (Future Station)—this proposed station location is currently served by Routes B, E, F3, 2, 4, 8, 13, 19, 20, 23, 42, 98A, 201, 202 and 203. Future connections to the station would be provided by Routes F3, 2, 4, 8, 19, 22 and 23.

8.3 Streets and Highways

The cumulative effects on streets and highways for the Build Alternatives plus planned extensions are similar to the Build Alternatives. There would be a reduction in traffic volumes at major screenlines compared to the No Build Alternative, and some small changes in traffic volumes near station areas. Effects are detailed below.

8.3.1 Daily Screenline Volumes

Daily Screenline Analysis

For the purposes of this analysis, the Airport & Salt Lake Alternative plus planned extensions was selected to represent the Build Alternatives plus planned extensions in the majority of the screenline tables. The other Build Alternatives plus planned extensions would have similar effects.

Table 8-16 presents the analysis of the daily traffic volumes for the Existing Conditions, 2030 No Build Alternative, and the Build Alternatives and planned extensions across eight screenlines described in the previous chapters. As shown in the table, the general trend in traffic patterns indicates a decrease in daily volumes across the screenlines in all of the Build Alternatives. The reduction in vehicle trips ranges from 1 percent at the Kapolei (Mauka bound) screenline and 2 percent at the Mānoa-Pālolo/Ala Wai Canal (both directions) screenlines, to 7 percent at the Salt Lake (Koko Head bound) screenline for the Airport & Salt Lake Alternative plus planned extensions. In absolute terms, the Kalauao screenline would decrease by approximately 23,420 daily vehicles and the Mānoa-Pālolo/Ala Wai Canal screenline would decrease by 7,870 daily vehicles. The Salt Lake screenline would exhibit a decrease of approximately 21,930 daily vehicles.

Screenline Traffic Effects

As shown in Table 8-17, the general traffic trend across all screenlines is a reduction in a.m. peak hour vehicular volumes with the Build Alternatives plus planned extensions. On the whole, traffic volumes are estimated to remain similar to No Build Alternative volumes. No project or cumulative effects were identified in the a.m. peak hours, but the following facilities were estimated to experience slight increases in vehicular volume:

- H-1 Freeway future HOV/‘Ewa Screenline (Wai‘anae-bound)—LOS C to D
- Kalākaua Avenue/Mānoa-Pālolo/Ala Wai Canal (‘Ewa-bound)—would stay at LOS D
- Kapi‘olani Boulevard/Mānoa-Pālolo/Ala Wai Canal (‘Ewa-bound)—would stay at LOS F
- Dole Street/Mānoa-Pālolo/Ala Wai Canal (‘Ewa-bound)—remain at LOS C

Similar to the a.m. peak hour, the p.m. peak hour (Table 8-18) showed a general trend of a reduction in vehicular travel volumes at all screenlines. No project or cumulative effects were identified in the p.m. peak hour, but the following facilities were estimated to experience slight increases in vehicular volume:

- Kalaeloa Boulevard/Kapolei Screenline (mauka-bound)—would stay at LOS D
- North South Road (future roadway)/Kapolei Screenline (mauka-bound)—would stay at LOS C
- Moanalua Freeway HOV/Salt Lake Screenline (Koko Head-bound)—would stay at LOS C
- H-1 Freeway + Shoulder Express/Salt Lake (Koko Head-bound)—would stay at LOS C
- Salt Lake Boulevard/Salt Lake Screenline (Koko Head-bound)—would stay at LOS C

Table 8-16: Comparison of Daily Screenline Volumes between Existing, 2030 No Build and Build Alternatives Plus Planned Extensions

ID[1]	Screenline and Direction	Existing Conditions (2035)	2030 No Build Conditions	Salt Lake Alternative		Airport Alternative		Airport & Salt Lake Alternative		Airport & Salt Lake Alternative with Extensions	
		Volume	Volume	Volume	% Change from No Build	Volume	% Change from No Build	Volume	% Change from No Build	Volume	% Change from No Build
A	Kapolei Mauka bound	23,750	44,920	N/A	N/A	N/A	N/A	N/A	N/A	44,340	-1%
	Kapolei Makai bound	29,380	48,340	N/A	N/A	N/A	N/A	N/A	N/A	46,560	-4%
	Total	*53,140*	*93,260*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*90,900*	*-3%*
B	‘Ewa Wai‘anae bound	83,400	116,250	111,470	-4%	111,690	-4%	108,860	-6%	110,550	-5%
	‘Ewa Koko Head bound	95,690	139,850	134,520	-4%	134,380	-4%	128,930	-8%	134,740	-4%
	Total	*179,080*	*256,100*	*245,990*	*-4%*	*246,070*	*-4%*	*237,790*	*-7%*	*245,290*	*-4%*
C	Waikele Stream ‘Ewa bound	110,650	148,440	142,210	-4%	142,040	-4%	139,280	-6%	141,310	-5%
	Waikele Stream Koko Head bound	93,590	125,080	119,360	-5%	119,230	-5%	113,590	-9%	118,840	-5%
	Total	*204,240*	*273,520*	*261,570*	*-4%*	*261,270*	*-4%*	*252,870*	*-8%*	*260,150*	*-5%*
D	Kalauao ‘Ewa bound	175,960	197,870	187,200	-5%	186,970	-6%	181,220	-8%	186,790	-6%
	Kalauao Koko Head bound	173,410	200,340	188,500	-6%	188,030	-6%	174,900	-13%	188,000	-6%
	Total	*349,370*	*398,210*	*375,700*	*-6%*	*375,000*	*-6%*	*356,120*	*-11%*	*374,790*	*-6%*
E	Salt Lake ‘Ewa bound	159,630	177,540	167,330	-6%	167,260	-6%	162,110	-9%	166,990	-6%
	Salt Lake Koko Head bound	150,740	170,610	159,840	-6%	159,330	-7%	151,620	-11%	159,230	-7%
	Total	*310,370*	*348,150*	*327,170*	*-6%*	*326,590*	*-6%*	*313,730*	*-10%*	*326,220*	*-6%*
F	Kapālama Canal ‘Ewa bound	204,460	223,790	215,500	-4%	215,120	-4%	211,600	-5%	215,000	-4%
	Kapālama Canal Koko Head bound	191,410	240,500	228,880	-5%	228,780	-5%	222,710	-7%	228,120	-5%
	Total	395,860	464,290	444,380	-4%	443,900	-4%	434,310	-6%	443,120	-5%
G	Ward Avenue ‘Ewa bound	160,210	175,480	170,610	-3%	170,140	-3%	168,960	-4%	169,570	-3%
	Ward Avenue Koko Head bound	103,550	223,690	217,480	-3%	217,430	-3%	215,390	-4%	216,540	-3%
	Total	263,760	399,170	388,090	-3%	387,570	-3%	384,350	-4%	386,110	-3%
H	Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound	191,720	206,420	N/A	N/A	N/A	N/A	N/A	N/A	202,690	-2%
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound	192,660	208,590	N/A	N/A	N/A	N/A	N/A	N/A	204,450	-2%
	Total	384,370	415,010	N/A	N/A	N/A	N/A	N/A	N/A	407,140	-2%

Existing peak hour and daily volumes were obtained from the Hawai‘i Department of Transportation (2005). Future 2030 forecast volumes are from the O‘ahuMPO Travel Demand Forecasting Model. Numbers are rounded to the nearest 10

Table 8-17: A.M. Peak Hour Screenline Volumes and Level of Service—2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
A	**Kapolei Mauka bound**					
	Kalaeloa Boulevard	2	790	C*	770	C*
	Fort Barrette Road	2	1,170	D	1,140	D
	North-South Road (future roadway)	3	2,300	E	2,100	D
	Total		*4,260*	*D*	*4,010*	*D*
	Kapolei Makai bound					
	Kalaeloa Boulevard	2	1,130	D	1,110	D
	Fort Barrette Road	2	1,580	F	1,510	E
	North-South Road (future roadway)	3	2,410	F	2,410	F
	Total		*5,120*	*F*	*5,030*	*E*
B	**‘Ewa Wai‘anae bound**					
	H-1 Freeway	3	4,290	D	4,090	D
	H-1 Freeway future HOV	1	1,180	C	1,230	D
	Farrington Highway	2	500	C	500	C
	Fort Weaver Road (SB)	2	2,040	F	1,980	F
	Total		*8,010*	*D*	*7,800*	*D*
	‘Ewa Koko Head bound					
	H-1 Freeway	3	5,080	E	4,510	D
	H-1 Freeway future HOV	1	1,530	D	1,520	D
	Farrington Highway	3	310	C	270	B*
	Fort Weaver Road (NB)	2	3,090	F	2,940	F
	Total		*10,010*	*E*	*9,240*	*E*
C	**Waikele Stream ‘Ewa bound**					
	H-1 Freeway	5	9,280	E	9,060	E
	Waipahu Street	1	330	C*	330	C*
	Farrington Highway	4	1,040	C	970	C
	Total		*10,650*	*E*	*10,360*	*E*
	Waikele Stream Koko Head bound					
	H-1 Freeway	4	7,800	F	7,230	E
	H-1 Freeway future HOV	1	1,670	E	1,510	D
	Waipahu Street	1	700	E	460	D
	Farrington Highway	3	1,900	C	1,660	C
	Total		*12,070*	*E*	*10,860*	*E*

Table 8-17: A.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
D	**Kalauao ‘Ewa bound**					
	H-1 Freeway	5	7,930	D	7,780	D
	Moanalua Road	2	1,240	D	1,120	D
	Kamehameha Highway	3	1,080	C	1,070	C
	Total		*10,250*	*D*	*9,970*	*D*
	Kalauao Koko Head bound					
	H-1 Freeway	5	13,160	F	12,340	F
	H-1 Freeway HOV	1	1,810	F	1,560	D
	H-1 Freeway Future Zipper Lane	1	1,500	D	1,450	D
	Moanalua Road	2	1,480	E	1,280	D
	Kamehameha Highway	3	2,850	F	2,200	D
	Total		*20,800*	*F*	*18,830*	*E*
E	**Salt Lake ‘Ewa bound**					
	Moanalua Freeway	4	4,260	C	4,130	C
	H-1 Freeway	4	2,830	B	2,740	B
	H-1 Freeway HOV	NA	NA	NA	NA	NA
	H-1 Freeway Future zipper lane	NA	NA	NA	NA	NA
	Nimitz Highway	3	1,190	C	1,140	C
	Salt Lake Boulevard	2	390	C*	350	C*
	Total		*8,670*	*C*	*8,360*	*C*
	Salt Lake Koko Head bound					
	Moanalua Freeway	2	3,690	F	3,350	E
	Moanalua Freeway HOV	1	1,750	E	1,620	E
	H-1 Freeway + Shoulder Express	5	8,270	D	7,790	D
	H-1 Freeway HOV	1	1,660	E	1,510	D
	H-1 Freeway zipper lane	1	1,520	D	1,480	D
	Nimitz Highway	5	1,770	C	1,340	C
	Salt Lake Boulevard	2	860	C*	700	C*
	Total		*19,520*	*D*	*17,790*	*D*

Table 8-17: A.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
F	**Kapālama Canal ʻEwa bound**					
	Nimitz Highway	3	1,570	C	1,550	C
	Dillingham Boulevard	2	560	C	550	C
	N King Street	2	790	C*	780	C*
	H-1 Freeway	4	8,150	F	8,060	F
	Hālona Street	2	1,180	C*	1,180	C*
	School Street	2	960	C*	930	C*
	Total		*13,210*	*E*	*13,030*	*E*
	Kapālama Canal Koko Head bound					
	Nimitz Highway	3	3,430	F	3,100	F
	Nimitz Flyover (Future Facility)	2	1,400	B	1,240	B
	Dillingham Boulevard	2	1,350	D	1,260	D
	N King Street	2	1,460	D	1,310	D
	Olomea Street	2	1,950	F	1,950	F
	H-1 Freeway	5	10,790	F	10,250	F
	School Street	2	1,760	F	1,570	F
	Total		*22,140*	*E*	*20,680*	*F*
G	**Ward Avenue ʻEwa bound**					
	H-1 Freeway	3	7,380	F	7,370	F
	Beretania Street	5	3,250	D	3,130	C*
	Kapiʻolani Boulevard	4	2,220	D	2,190	D
	Ala Moana Boulevard	3	2,150	D	2,100	D
	Total		*15,000*	*E*	*14,790*	*E*
	Ward Avenue Koko Head bound					
	H-1 Freeway	4	6,980	E	6,810	E
	Kīnaʻu Street	3	1,070	C*	1,040	C*
	S King Street	5	2,850	C*	2,220	C*
	Kapiʻolani Boulevard	2	820	C*	770	C*
	Ala Moana Boulevard	3	*1,740*	*C*	*1,520*	*C*
	Total		*13,460*	*D*	*12,360*	*D*

Table 8-17: A.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	**Forecast Volume (vph) [1]**	**LOS [2]**	**Forecast Volume (vph)**	**LOS [2]**
H	**Mānoa-Pālolo/Ala Wai Canal ‘Ewa bound**					
	Ala Moana Boulevard	3	1,580	C	1,520	C
	Kalākaua Avenue	2	1,260	D	1,280	D
	McCully Street (NB)	2	680	C*	650	C*
	Date Street	2	620	C*	600	C*
	Kapi‘olani Boulevard	3	3,340	F	3,360	F
	Old Wai‘alae Road	3	1,620	C*	1,600	C*
	Dole Street	2	950	C*	960	C*
	H-1 Freeway	3	*5,740*	*F*	*5,730*	*F*
	Total		*15,790*	*E*	*15,700*	*E*
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound					
	Ala Moana Boulevard	3	1,010	C	930	C
	Kalākaua Avenue	3	1,190	C*	1,140	C*
	McCully Street (SB)	2	1,010	C*	950	C*
	Date Street	1	460	D	420	C*
	Kapi‘olani Boulevard	2	600	C*	580	C*
	S King Street	2	1,770	D	1,680	D
	Dole Street	2	660	C*	660	C*
	H-1 Freeway	3	*6,020*	*F*	*6,000*	*F*
	Total		*12,720*	*E*	*12,360*	*E*

[1] Peak-hour traffic count data was obtained from the Hawai‘i Department of Transportation (2005).
[2] LOS thresholds were adapted from the Quality/Level of Service Handbook (Florida Department of Transportation, 2002). This handbook provides generalized peak-hour two-way volumes for Florida's urbanized areas. A directional split of 50% was applied to the two-way volumes to generate the peak-hour direction volume thresholds for the purpose of this analysis.
* The reported LOS "C*" means C or better and "B*" means B or better.
** LOS thresholds not reported due to type of facility.

Table 8-18: P.M. Peak Hour Screenline Volumes and Level of Service—2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
A	**Kapolei Mauka bound**					
	Kalaeloa Boulevard	2	1,260	D	1,280	D
	Fort Barrette Road	2	1,480	E	1,470	D
	North-South Road (future roadway)	3	1,420	C*	1,500	C*
	Total		*4,160*	*D*	*4,250*	*D*
	Kapolei Makai bound					
	Kalaeloa Boulevard	2	400	C*	400	C*
	Fort Barrette Road	2	1,200	D	1,080	D
	North-South Road (future roadway)	3	1,410	C*	1,350	C*
	Total		*3,010*	*C*	*2,830*	*C*
B	**‘Ewa Wai‘anae bound**					
	H-1 Freeway	3	4,680	D	4,170	D
	H-1 Freeway future HOV	1	1,100	C	1,100	C
	Farrington Highway	2	510	C	470	C
	Fort Weaver Road (SB)	2	2,410	F	2,290	F
	Total		*8,700*	*D*	*8,030*	*D*
	‘Ewa Koko Head bound					
	H-1 Freeway	3	6,120	F	5,980	F
	H-1 Freeway future HOV	1	990	C	980	C
	Farrington Highway	3	550	C	480	C
	Fort Weaver Road (NB)	2	2,620	F	2,580	F
	Total		*10,280*	*F*	*10,020*	*F*
C	**Waikele Stream ‘Ewa bound**					
	H-1 Freeway	4	9,010	F	8,440	F
	H-1 Freeway future HOV	1	490	A	430	A
	Waipahu Street	1	180	C*	150	C*
	Farrington Highway	4	1,450	C	1,300	C
	Total		*11,130*	*E*	*10,310*	*E*
	Waikele Stream Koko Head bound					
	H-1 Freeway	5	6,960	D	6,930	D
	Waipahu Street	1	410	C*	390	C*
	Farrington Highway	3	1,010	C	920	C
	Total		*8,380*	*D*	*8,240*	*D*

Table 8-18: P.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
D	**Kalauao ʻEwa bound**					
	H-1 Freeway	4	9,040	F	8,640	F
	H-1 Freeway HOV	1	1,720	E	1,430	D
	H-1 Freeway Future Zipper Lane	1	950	C	800	B
	Moanalua Road	2	2,250	F	1,880	F
	Kamehameha Highway	3	2,190	D	1,990	D
	Total		*16,150*	*E*	*14,740*	*E*
	Kalauao Koko Head bound					
	H-1 Freeway	5	8,060	D	7,850	D
	H-1 Freeway HOV	NA	NA	NA	NA	NA
	Moanalua Road	2	970	C*	940	C*
	Kamehameha Highway	3	1,780	C	1,700	C
	Total		*10,810*	*D*	*10,490*	*D*
E	**Salt Lake ʻEwa bound**					
	Moanalua Freeway	4	5,990	D	5,740	D
	H-1 Freeway	4	4,200	C	3,670	C
	H-1 Freeway HOV	1	1,210	C	1,070	C
	H-1 Freeway Future zipper lane	1	810	B	660	B
	Nimitz Highway	3	2,530	F	2,390	E
	Salt Lake Boulevard	2	870	C*	810	C*
	Total		*15,610*	*D*	*14,340*	*D*
	Salt Lake Koko Head bound					
	Moanalua Freeway	2	2,910	D	2,650	D
	Moanalua Freeway HOV	1	960	C	1,040	C
	H-1 Freeway + Shoulder Express	4	3,970	C	4,280	C
	H-1 Freeway HOV	1	1,070	C	1,030	C
	Nimitz Highway	5	1,600	C	1,560	C
	Salt Lake Boulevard	2	410	C*	420	C*
	Total		*10,920*	*C*	*10,980*	*C*

Table 8-18: P.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
F	**Kapālama Canal ‘Ewa bound**					
	Nimitz Highway	3	1,750	C	1,520	C
	Nimitz Flyover (Future Facility)	2	880	A	770	A
	Dillingham Boulevard	2	1,140	C	900	C
	N King Street	2	1,470	D	1,320	D
	H-1 Freeway	4	8,370	F	8,190	F
	Hālona Street	2	1,740	D	1,720	D
	School Street	2	1,370	D	1,260	D
	Total		*16,710*	*E*	*15,680*	*E*
	Kapālama Canal Koko Head bound					
	Nimitz Highway	3	3,520	F	3,280	F
	Dillingham Boulevard	2	1,020	C	1,000	C
	N King Street	2	1,470	D	1,430	D
	Olomea Street	2	1,670	D	1,670	D
	H-1 Freeway	5	8,050	D	7,970	D
	School Street	2	1,150	D	1,160	D
	Total		*16,880*	*D*	*16,510*	*D*
G	**Ward Avenue ‘Ewa bound**					
	H-1 Freeway	3	6,970	F	6,890	F
	Beretania Street	5	3,040	C*	2,810	C*
	Kapiʻolani Boulevard	2	1,570	F	1,420	D
	Ala Moana Boulevard	3	2,020	D	1,760	C
	Total		*13,600*	*E*	*12,880*	*E*
	Ward Avenue Koko Head bound					
	H-1 Freeway	4	7,370	E	7,320	E
	Kīnaʻu Street	4	1,810	C*	1,760	C*
	S King Street	6	3,450	C*	3,360	C*
	Kapiʻolani Boulevard	4	2,370	D	2,240	D
	Ala Moana Boulevard	*3*	*2,330*	*D*	*2,260*	*D*
	Total		*17,330*	*D*	*16,940*	*D*

Table 8-18: P.M. Peak Hour Screenline Volumes and Level of Service – 2030 No Build and Airport & Salt Lake Alternative Plus Planned Extensions (continued)

	Screenline/Facility	2030 No Build Conditions			Airport & Salt Lake	
		Facility Number of Lanes	Forecast Volume (vph) [1]	LOS [2]	Forecast Volume (vph)	LOS [2]
H	**Mānoa-Pālolo/Ala Wai Canal ʻEwa bound**					
	Ala Moana Boulevard	3	1,730	C	1,520	C
	Kalākaua Avenue	2	1,080	D	1,080	D
	McCully Street (NB)	2	1,160	D	1,090	D
	Date Street	1	710	E	700	E
	Kapiʻolani Boulevard	3	1,320	C*	1,320	C*
	Old Waiʻalae Road	3	1,230	C*	1,210	C*
	Dole Street	2	690	C*	690	C*
	H-1 Freeway	3	5,970	F	5,880	F
	Total		*13,890*	*E*	*13,490*	*E*
	Mānoa-Pālolo/Ala Wai Canal Koko Head bound					
	Ala Moana Boulevard	3	1,750	C	1,660	C
	Kalākaua Avenue	3	1,990	D	1,970	D
	McCully Street (SB)	2	920	C*	900	C*
	Date Street	2	750	C*	770	C*
	Kapiʻolani Boulevard	2	2,280	F	2,290	F
	S King Street	2	2,370	F	2,360	F
	Dole Street	2	1,000	C*	970	C*
	H-1 Freeway	3	*6,550*	*F*	*6,470*	*F*
	Total		*17,610*	*E*	*17,390*	*E*

[1] Peak-hour traffic count data was obtained from the Hawaiʻi Department of Transportation (2005).
[2] LOS thresholds were adapted from the Quality/Level of Service Handbook (Florida Department of Transportation, 2002). This handbook provides generalized peak-hour two-way volumes for Florida's urbanized areas. A directional split of 50% was applied to the two-way volumes to generate the peak-hour direction volume thresholds for the purpose of this analysis.
* The reported LOS "C*" means C or better and "B*" means B or better.
** LOS thresholds not reported due to type of facility.

- School Street/Kapālama Canal (Koko Head-bound)—would stay at LOS D
- Date Street/Mānoa-Pālolo/Ala Wai Canal (Koko Head-bound)—would stay at LOS C
- Kapiʻolani Boulevard/Mānoa-Pālolo/Ala Wai Canal (Koko Head-bound)—would stay at LOS F

The increase in trips was not substantial enough to result in either a project-based or cumulative traffic effect. LOS D is considered acceptable and thus does not constitute an effect as a result of the Project. Therefore, it can be concluded that the Build Alternatives plus planned extensions would not have a cumulative traffic effect in either of the peak travel hours.

8.3.2 Intersection Analysis

The model peak hour traffic volumes representing the Airport & Salt Lake Build Alternative plus planned extensions scenario were post-processed and analyzed to assess the projected LOS for four intersections in the Salt Lake area and nine intersections in the Waikīkī area. The results of the analysis, summarized in Table 8-19, indicates the projected LOS for these intersections for the Year 2007 conditions, the No Build Alternative, and for the Build Alternatives plus planned extensions.

The results of the analysis indicate that all but four of the intersections are projected to operate at LOS D or better, acceptable LOS for Oʻahu, under Year 2030 No Build traffic conditions, including three intersections in the Salt Lake area and one intersection in the Waikīkī area. The four intersections operating at unacceptable LOS (i.e., LOS E or F during one or both a.m. and p.m. peak hours) are as follows:

- Kamehameha Highway and Honomanu Street in the Salt Lake area
- Kamehameha Highway and Salt Lake Boulevard (mauka-bound) in the Salt Lake area
- Salt Lake Boulevard and Kahuapaʻani Street in the Salt Lake area
- Kalākaua Avenue and Ala Moana Boulevard/Pau Street (Waikīkī area) in the Waikīkī area

The Airport & Salt Lake Alternative plus planned extensions would not result in any of the intersections currently operating at LOS D to deteriorate to LOS E or F. Also, neither of the two intersections currently operating at LOS E or F would experience increases in delay or the total volume of vehicles. In most cases, delay to vehicles is estimated to decrease at the analyzed intersections listed in Table 8-19.

Therefore, the Build Alternative plus planned extensions would not have a substantial project or cumulative effect at any of the intersections analyzed in these affected corridors.

Table 8-19: Intersection Analysis—2030 Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control	Peak Hour	Year 2007		2030 No Build		Airport & Salt Lake Alternative Plus Planned Extensions (2030)			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Salt Lake Area												
Kamehameha Highway	&	Honomanu Street	S	A.M.	74	E	143	F	56	E	-87	NO
				P.M.	87	F	161	F	83	F	-78	NO
Moanalua Road	&	Kamehameha Highway Ramps	S	A.M.	20	C	18	B	22	C	4	NO
				P.M.	18	B	22	C	19	B	-3	NO
Kamehameha Highway	&	Salt Lake Boulevard (Makai Bound)	S	A.M.	10	A	15	B	9	A	-6	NO
				P.M.	14	B	47	D	18	B	-29	NO
Kamehameha Highway	&	Salt Lake Boulevard (Mauka Bound)	S	A.M.	28	C	145	F	107	F	-38	NO
				P.M.	18	B	24	C	19	C	-5	NO
Moanalua Road	&	Kaimakani Street	TWSC [1]	A.M.	10	B	27	D	16	C	-11	NO
				P.M.	24	C	20	C	15	C	-5	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	82	F	152	F	78	E	-74	NO
				P.M.	97	F	323	F	126	F	-197	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	10	A	9	A	9	A	0	NO
				P.M.	21	C	20	C	8	A	-12	NO
Salt Lake Boulevard	&	Ala Oli Street	S	A.M.	22	C	23	C	23	C	0	NO
				P.M.	13	B	14	B	16	B	2	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	31	C	29	C	25	C	-4	NO
				P.M.	41	D	41	D	34	C	-7	NO
Waikīkī Area												
Kalākaua Avenue	&	Ala Wai Boulevard	S	A.M.	41	D	46	D	25	C	-21	NO
				P.M.	18	B	19	B	18	B	-1	NO
McCully Street	&	Kalākaua Avenue	S	A.M.	13	B	13	D	13	B	0	NO
				P.M.	9	A	9	A	9	A	0	NO

Table 8-19: Intersection Analysis—2030 Airport & Salt Lake Alternative Plus Planned Extensions (continued)

Intersection			Control	Peak Hour	Year 2007		2030 No Build		Airport & Salt Lake Alternative Plus Planned Extensions (2030)			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Kalākaua Avenue	&	Ala Moana Boulevard/ Pau Street	S	A.M.	31	C	35	D	19	B	-16	NO
				P.M.	62	E	110	F	97	F	-13	NO
Kalākaua Avenue	&	Kuamoʻo Street/ Kūhiō Avenue	F/Y	A.M.	17	C	19	C	14	B [2]	-5	NO
				P.M.	16	C	18	C	16	C [2]	-2	NO
Kūhiō Avenue	&	ʻŌlohana Street	S	A.M.	27	C	17	B	12	B [3]	-5	NO
				P.M.	27	C	40	D	11	B [3]	-29	NO
Kūhiō Avenue	&	Kālaimoku Street	S	A.M.	13	B	16	B	17	B [4]	1	NO
				P.M.	25	C	24	C	22	C [4]	-2	NO
Kūhiō Avenue	&	Lewers Street	S	A.M.	12	B	13	B	12	B [5]	-1	NO
				P.M.	18	B	22	C	18	B [5]	-4	NO
Kūhiō Avenue	&	Kanekapolei Street	S	A.M.	18	B	41	D	41	D [5]	0	NO
				P.M.	16	B	19	B	17	B [5]	-2	NO
Kūhiō Avenue	&	Uluniu Avenue	S	A.M.	0.2	A	0.2	A	0	A [5]	0	NO
				P.M.	9	A	7	A	12	B [5]	5	NO
Kūhiō Avenue	&	Liliʻuokalani Avenue	S	A.M.	13	B	14	B	10	B [5]	-4	NO
				P.M.	20	B	23	C	22	C [5]	-1	NO
Kūhiō Avenue	&	ʻŌhua Avenue	S	A.M.	12	B	14	B	17	B [5]	3	NO
				P.M.	12	B	11	B	13	B [5]	2	NO
Kūhiō Avenue	&	Paokalani Avenue	S	A.M.	9	A	8	A	10	B [5]	2	NO
				P.M.	11	B	11	B	12	B [5]	1	NO

S = Signal. TWSC= Two-way-stop-control. F/Y=Free flow, only yield to pedestrians or transit buses in the contra flow lane on Kūhiō Avenue.

[1] Intersection is controlled by stop sign(s). Analysis was done using Highway Capacity Manual stop-controlled methodology. For this two-way controlled intersection, the level of service and delay in seconds for the worst movement are reported.

[2] Existing ʻEwa-bound bus lane would be removed under future with the build alternatives conditions.

[3] Existing two left turn lanes on Mauka side of roadway on Kūhiō Avenue would be removed under future with the build alternatives conditions.

[4] One right through lane and one right turn lane on Mauka side of Kūhiō Avenue would be removed under future with the build alternatives conditions.

[5] One ʻEwa-bound through lane on Kūhiō Avenue would be removed under future with the build alternatives conditions.

8.4 Traffic Effects at Park-and-Ride Stations

Park-and-ride lots can play a substantial role when assessing the Project's potential traffic effect. Two park-and-ride facilities are planned for the extension to West Kapolei. There are no park-and-ride facilities planned for the extensions to Waikīkī or UH Mānoa. Table 8-20 presents a summary of each park-and-ride location, the proposed number of parking spaces, and total number of feeder buses in the a.m. and p.m. peak hour.

Table 8-20: Park-and-Ride Stations in the West Kapolei Extension, Airport & Salt Lake Alternative Plus Planned Extensions

Park-and-Ride Station Location	Proposed Number of Parking Spaces	Total Number of Buses in A.M. Peak Hour	Total Number of Buses in P.M. Peak Hour
West Kapolei	1,200	26	26
Kapolei Parkway	1,700	24	24

8.4.1 West Kapolei Station

The West Kapolei Station would be the western terminus station for the West Kapolei extension. The station would be on Kapolei Parkway between Kalaeloa Boulevard and Hanua Street (a future four-lane state road), and vehicular access to the park-and-ride lot would be provided via Kapolei Parkway. Approximately 1,200 parking spaces are proposed. Table 8-21 provides the projected peak hour park-and-ride and kiss-and-ride vehicle trips for this station. The table also indicates that three bus feeder routes with approximately 26 transit vehicles are proposed to serve the station during the a.m. and p.m. peak hours as new service to the area.

Table 8-21: Peak Hour Trip Generation—West Kapolei Station—Airport & Salt Lake Alternative Plus Planned Extensions

Type	Park-and-Ride Trips				Kiss-and-Ride Trips				Transit Vehicle Trips (1 bus = 3 passenger-car-equivalent)			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Station	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
West Kapolei Station	62	0	0	62	27	27	27	27	13	13	13	13

Five intersections immediately adjacent to this station were analyzed with the expectation that they would most likely experience an effect because of traffic generated by park-and-ride lots:

- Kalaeloa Boulevard and Farrington Highway/H-1 Westbound On/Off-Ramps (existing intersection to be reconfigured in the future)

- Kalaeloa Boulevard and Kapolei Parkway (existing)
- Kalaeloa Boulevard and Saratoga Avenue (future intersection)
- Kapolei Parkway and Hanua Street (future intersection)
- Kapolei Parkway and Kamokila Boulevard (existing intersection under construction)

Table 8-22 presents the intersection analysis for the Airport & Salt Lake Alternative plus planned extensions. This Alternative would not result in a substantial project or cumulative effect at any of the analyzed intersections in the vicinity of the West Kapolei Station.

Table 8-22: West Kapolei Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control*	Peak Hour	Year 2007		No Build Alternative (2030)		Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay Change	Effect?
Farrington Highway/ H-1 WB On/Off Ramps	&	Kalaeloa Boulevard	TWSC	A.M.	31	D	122	F	105	F	-17	NO
				P.M.	>400	F	>400	F	27	D	<0	NO
Kalaeloa Boulevard	&	Kapolei Parkway [1]	S	A.M.	27	C	28	C	29	C	1	NO
				P.M.	52	D	58	F	55	D	-3	NO
Kalaeloa Boulevard	&	Saratoga Avenue	TWSC	A.M.	NA		193	F	159	F	-34	NO
				P.M.	NA		>400	F	253	F	<0	NO
Kapolei Parkway	&	Hanua Street [2]	S	A.M.	NA		35	D	34	C	-1	NO
				P.M.	NA		28	C	27	C	-1	NO
Kapolei Parkway	&	Kamokila Boulevard [3]	TWSC/S [4]	A.M.	NA		21	C	33	C	12	NO
				P.M.	NA		27	C	37	D	10	NO

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

[1] Future lane geometry assumed—northbound (NB): one left-turn lane, two through lanes, two right-turn lanes; southbound (SB): two left-turn lanes, two through lanes, two right-turn lanes; eastbound (EB): two left-turn lanes, three through lanes, two right-turn lanes; westbound (WB): two left-turn lanes, three through lanes, two right-turn lanes

[2] Lane geometry assumed—NB: one left-turn lane, two through lanes, one right-turn lane; SB: one left-turn lane, two through lanes, one right-turn lane; EB: two left-turn lanes, three through lanes, one right-turn lane; WB: one left-turn lane, three through lanes, one right-turn lane

[3] Lane geometry assumed—NB: one through/left-turn lane, one through/right-turn lane; SB: one through/left-turn lane, one through/right-turn lane; EB: one left-turn lane, two through lanes, one right-turn lane; WB: one left-turn lane, two through lanes, one right-turn lane.

[4] Currently stop-controlled, this intersection is signalized for the 2030 No Build and 2030 with Build Alternatives.

8.4.2 Kapolei Parkway Station

The Kapolei Parkway Station is proposed along the future North-South Road between Farrington Highway and Roosevelt Avenue. It would be located on North-South Road makai of Roosevelt Avenue. Approximately 1,700 parking spaces are proposed for this park-and-ride lot, with right-in/right-out access from Roosevelt Avenue and full access on a new East-West roadway immediately west of North-South Road. Four bus routes with approximately 24 feeder transit vehicles would serve this station during the a.m. and p.m. peak hours. Peak hour park-and-ride and kiss-and-ride vehicular trips are shown in Table 8-23.

Table 8-23: Peak Hour Trip Generation—Kapolei Parkway—Airport & Salt Lake Alternative Plus Planned Extensions

Type	Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips (1 bus = 3 passenger-car-equivalent)			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Station	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Kapolei Parkway Station	285	0	0	285	43	43	43	43	12	12	12	12

With the Build Alternatives plus planned extensions, no substantial traffic effects are projected for intersections in the vicinity of Kapolei Parkway station. The results of the intersection analysis indicate that this alternative has the potential to relieve or not substantially increase traffic congestion/delay in the area (Table 8-24).

Table 8-24: Kapolei Parkway Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control *	Peak Hour	No Build Alternative (2030)		Airport & Salt Lake Alternative plus Planned Extensions (2030)			
					Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Roosevelt Avenue	&	North-South Road [1]	S	A.M.	33	C	39	D	6	NO
				P.M.	19	B	30	C	11	NO
Kapolei Parkway	&	North-South Road [2]	S	A.M.	35	C	45	D	10	NO
				P.M.	33	C	35	C	2	NO
North-South Road	&	Road B [3]	S	A.M.	44	D	49	D	5	NO
				P.M.	37	D	25	C	-12	NO
North-South Road	&	East-West Connector Road [4]	S	A.M.	27	C	30	C	3	NO
				P.M.	33	C	24	C	-9	NO
Old Fort Weaver Road	&	Fort Weaver Road/'A'awa Drive	S	A.M.	114	F	91	F	-23	NO
				P.M.	68	E	46	D	-22	NO
Farrington Highway	&	New 'Ewa Road [5]	S	A.M.	49	D	42	D	-7	NO
				P.M.	44	D	45	D	-2	NO
Farrington Highway	&	North-South Road [4]	S	AM	105	F	30	C	-75	NO
				PM	39	D	42	D	3	NO
Farrington Highway	&	Old Fort Weaver Road	TWSC	A.M.	>400	F	>400	F	<0 [6]	NO
				P.M.	>400	F	>400	F	<0 [6]	NO
Farrington Highway	&	Kunia (Hwy 76) NB On-Ramp	S	AM	5	A	5	A	0	NO
				PM	2	A	2	A	0	NO
Fort Weaver Road	&	Laulaunui Street	S	AM	131	F	116	F	-15	NO
				PM	66	E	65	E	-1	NO

Note: All intersections are new or modified

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

[1] Lane geometry assumed—northbound (NB): one left-turn lane, one through lane, one right-turn lane; southbound (SB): one left-turn lane, one through lane, one right-turn lane; eastbound (EB): one left-turn lane, two through lanes, one right-turn lane; westbound (WB): one left-turn lane, two through lanes, one right-turn lane.

[2] Lane geometry assumed—NB: one left-turn lane, three through lanes, one right-turn lane; SB: one left-turn lane, three through lanes, one right-turn lane; EB: one left-turn lane, two through lanes, one right-turn lane; WB: one left-turn lane, two through lanes, two right-turn lanes.

[3] Future base lane configuration assumed for North-South Road at Road B: NB: single left-turn lane, three through lanes, single right turn lane; SB: dual left-turn lanes, three through lanes, single right-turn lane; WB: single left-turn lane, one through lane, dual right-turn lanes; EB: single left turn lane, one through lane, single right-turn lane.

[4] Future base lane configuration assumed for North-South Road at East-West Connector Road: NB: one left-turn lane, three through lanes, one right-turn lane; SB: one left-turn lane, three through lanes, one right-turn lane; EB: one left-turn lane, one through lane, one right-turn lane; WB: two left-turn lanes, one through lane, one right-turn lane.

[5] Future base lane configuration assumed for Farrington Highway at New 'Ewa Road: NB: single left-turn lane, one shared through/right-turn lane, single right-turn lane; SB: single left-turn lane, one through lane, single right-turn lane; WB: dual left-turn lanes, two through lanes, single right-turn lane; EB: single left-turn lane, two through lanes, single right-turn lane.

[6] Delay cannot be calculated. However, total volumes reduced with the Build Alternatives.

8.4.3 Pearl Highlands Station

Peak hour park-and-ride, kiss-and-ride and transit vehicular trips are shown in Table 8-25. This station was analyzed in Chapter 5 and it was determined that traffic generated by the presence of a park-and-ride facility and transit center in this location could have an effect on the performance of intersections in the area. In this section, intersections near the Pearl Highlands station were examined under the Build Alternative plus planned extensions for a determination of effect.

Based on the traffic analysis shown in Table 8-26, all intersections except Farrington Highway and Waiawa Road westbound currently operate at an unacceptable LOS during one or both peak hours. The traffic analysis conducted for the 2030 No Build Alternative shows that the LOS at all five study intersections is projected to deteriorate to LOS F during one or both peak hours.

Table 8-25: Peak Hour Trip Generation—Pearl Highlands Station—Airport & Salt Lake Alternative Plus Planned Extensions

Type	Formal Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips (1 bus = 3 passenger-car-equivalent)			
Peak Hour	**AM**		**PM**		**AM**		**PM**		**AM**		**PM**	
Stations/Alternatives	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Pearl Highlands Station	588	0	0	588	111	111	111	111	47	15	15	47

Under the Airport & Salt Lake Build Alternative plus planned extensions, the traffic analysis indicates that the addition of the Project, together with the projected park-and-ride, kiss-and-ride, and bus feeder services, would result in traffic increases that would result in a traffic effect at the intersections of Kamehameha Highway and Waihona Street/Pearl Highlands Station park-and-ride driveway, Kamehameha Highway and Kuala Street and Farrington Highway westbound and Waiawa Road/Pearl Highlands Station park-and-ride driveway. This effect is the same as under any of the Build Alternatives without extensions, and potential mitigation measures can be found in Chapter 6.

Table 8-26: Pearl Highlands Station Intersection Analysis— Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control *	Peak Hour	Year 2007		2030 No Build		2030 Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Farrington Highway	&	Waiawa Road (EB)	S	A.M.	78	E	149	F	45	D	-104	NO
				P.M.	13	B	162	F	105	F	-57	NO
Farrington Highway	&	Waiawa Road (WB)/ Park-and-Ride Driveway [1]	TWSC	A.M.	30	D	76	F	323	F	247	YES
				P.M.	29	D	30	D	134	F	104	YES
Kamehameha Highway	&	Waihona Street/Park-and-Ride Driveway [2]	TWSC/S[3]	A.M.	26	D	36	D	50	D	14	NO
				P.M.	>400	F	122	F	144	F	22	YES
Kamehameha Highway	&	Kuala Street	TWSC	A.M.	70	F	71	F	208	F	137	YES
				P.M.	>400	F	>400	F	>400	F	>0 [4]	YES
Ala Ike Street	&	Waiawa Road	TWSC	A.M.	45	E	376	F	297	F	-79	NO
				P.M.	19	C	27	D	14	B	-13	NO

* S = Signal-Controlled, TWSC = Two-Way Stop-Controlled

[1] With the Build Alternatives, this park-and-ride driveway would be limited to right-in and right-out access only.

[2] With the Build Alternatives, lane configuration assumed for park-and-ride driveway: dual left-turn lane, single through lane, single right-turn lane.

[3] Waihona Street currently provides a single left-turn lane and a right-turn lane and is controlled by stop signs. Traffic on Kamehameha Highway is currently uncontrolled. Under future 2030 No Build conditions and 2030 Build conditions, the T-intersection of Waihona Street and Kamehameha Highway is assumed to be signalized under 2030 No Build conditions and 2030 Build Alternatives. It is also assumed future planned Central Mauka Road would provide a direct connection to Kamehameha Highway eastbound through a grade-separation project rather than a direct connection to the intersection of Waihona Street and Kamehameha Highway.

[4] Delay cannot be calculated. However, total volumes are estimated to increase with the Build Alternatives.

8.4.4 Aloha Stadium Station

Intersections near Aloha Stadium were analyzed for effects under the Build Alternative plus planned extensions. Peak hour trip generation is shown in Table 8-27.

Table 8-27: Peak Hour Trip Generation—Aloha Stadium Station—Airport & Salt Lake Alternative Plus Planned Extensions

Type	Park-and-Ride				Kiss-and-Ride				Transit Vehicle Trips (1 bus = 3 passenger-car-equivalent)			
Peak Hour	**A.M.**		**P.M.**		**A.M.**		**P.M.**		**A.M.**		**P.M.**	
Stations	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Aloha Stadium Station (Salt Lake)	166	0	0	166	6	6	6	6	24	22	22	24
Aloha Stadium Station (Kamehameha Highway)	291	0	0	291	17	17	17	17	22	20	20	22
Aloha Stadium & Arizona Memorial Stations (Salt Lake & Airport Alternative)	157	0	0	157	2	2	2	2	22	20	20	22

The results of the analysis are shown in Table 8-28. Six of the nine intersections studied are projected to operate at LOS D or better under 2030 No Build conditions.

With the Build Alternatives plus planned extensions, none of the study intersections are projected to experience a substantial increase in vehicular delays. The three intersections projected to operate at LOS E or F under the No Build Alternative would continue to do so under all the Build Alternatives plus planned extensions.

Therefore, none of the Build Alternatives plus planned extensions would create a substantial project or cumulative effect at the analyzed intersections in the immediate vicinity of the Aloha Stadium Station.

Table 8-28: Aloha Stadium Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Salt Lake Alternative												
Kamehameha Highway	&	Honomanu Street	S	A.M.	74	E	143	F	53	E	-90	NO
				P.M.	87	F	161	F	88	F	-73	NO
Moanalua Road	&	Kamehameha Highway Ramps	S	A.M.	20	C	18	B	29	C	11	NO
				P.M.	18	B	22	C	21	B	-1	NO
Kamehameha Highway	&	Salt Lake Boulevard (makai-bound)	S	A.M.	10	A	15	B	10	B	-5	NO
				P.M.	14	B	47	D	22	B	-25	NO
Kamehameha Highway	&	Salt Lake Boulevard (mauka-bound)	S	A.M.	28	C	145	F	18	F	-127	NO
				P.M.	18	B	24	C	42	C	-18	NO
Moanalua Road	&	Kaimakani Street	TWSC	A.M.	10	B	27	D	21	C	-6	NO
				P.M.	24	C	20	C	13	C	-7	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	82	F	152	F	110	E	-72	NO
				P.M.	97	F	323	F	129	F	-194	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	10	A	9	A	7	A	-2	NO
				P.M.	21	C	20	C	8	D	-12	NO
Salt Lake Boulevard	&	Ala Oli Street	S	A.M.	22	C	23	C	22	C	-1	NO
				P.M.	13	B	14	B	13	B	-1	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	31	C	29	C	26	C	-3	NO
				P.M.	41	D	41	D	34	D	-7	NO

Table 8-28: Aloha Stadium Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions (continued)

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Airport Alternative												
Kamehameha Highway	&	Honomanu Street	S	A.M.	74	E	143	F	57	E	-86	NO
				P.M.	87	F	161	F	84	F	-77	NO
Moanalua Road	&	Kamehameha Hwy Ramps	S	A.M.	20	C	18	B	22	C	4	NO
				P.M.	18	B	22	C	19	B	-3	NO
Kamehameha Highway	&	Salt Lake Boulevard (makai-bound)	S	A.M.	10	A	15	B	10	A	-5	NO
				P.M.	14	B	47	D	18	B	-29	NO
Kamehameha Highway	&	Salt Lake Boulevard (mauka-bound)	S	A.M.	28	C	145	F	49	D	-96	NO
				P.M.	18	B	24	C	20	B	-4	NO
Moanalua Road	&	Kaimakani Street	TWSC	A.M.	10	B	27	D	18	C	-9	NO
				P.M.	24	C	20	C	13	B	-7	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	82	F	152	F	73	E	-79	NO
				P.M.	97	F	323	F	127	F	-196	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	10	A	9	A	6	A	-3	NO
				P.M.	21	C	20	C	5	A	15	NO
Salt Lake Boulevard	&	Ala Oli Street	S	A.M.	22	C	23	C	20	C	-3	NO
				P.M.	13	B	14	B	15	B	1	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	31	C	29	C	25	C	-4	NO
				P.M.	41	D	41	D	37	D	-4	NO

Table 8-28: Aloha Stadium Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions (continued)

Intersection			Control *	Peak Hour	Year 2007		No Build Alternative		Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
Airport & Salt Lake Alternative												
Kamehameha Highway	&	Honomanu Street	S	A.M.	74	E	143	F	56	E	-87	NO
				P.M.	87	F	161	F	83	F	-78	NO
Moanalua Road	&	Kamehameha Hwy Ramps	S	A.M.	20	C	18	B	22	C	4	NO
				P.M.	18	B	22	C	19	B	-3	NO
Kamehameha Highway	&	Salt Lake Boulevard (makai-bound)	S	A.M.	10	A	15	B	9	B	-6	NO
				P.M.	14	B	47	D	18	B	-29	NO
Kamehameha Highway	&	Salt Lake Boulevard (mauka-bound)	S	A.M.	28	C	145	F	107	F	-38	NO
				P.M.	18	B	24	C	19	C	-5	NO
Moanalua Road	&	Kaimakani Street	TWSC	A.M.	10	B	27	D	16	C	-11	NO
				P.M.	24	C	20	C	15	C	-5	NO
Salt Lake Boulevard	&	Kahuapa‘ani Street	S	A.M.	82	F	152	F	78	E	-74	NO
				P.M.	97	F	323	F	126	F	-197	NO
Salt Lake Boulevard	&	Luapele Drive	S	A.M.	10	A	9	A	9	A	0	NO
				P.M.	21	C	20	C	8	D	-12	NO
Salt Lake Boulevard	&	Ala Oli Street	S	A.M.	22	C	23	C	23	C	0	NO
				P.M.	13	B	14	B	16	B	2	NO
Salt Lake Boulevard	&	Bougainville Drive	S	A.M.	31	C	29	C	25	C	-4	NO
				P.M.	41	D	41	D	34	D	-7	NO

8.4.5 Fixed Guideway Column Placement Effects on Traffic—Build Alternatives Plus Planned Extensions

This section provides a summary of the effects on traffic of the fixed guideway support columns in the planned extensions. The Project alignment effects were discussed in Chapter 5.

West Kapolei Extension

This extension of the proposed alignment would generally travel from the West Kapolei terminus to Wākea Street (future street) to Saratoga Avenue (future street) to North-South Road (future street) where it would join the fixed guideway at the East Kapolei station. The following describes the potential effects from column placement on the roadways along this section:

- It is assumed that the guideway along the existing Kapolei Parkway and its planned extension would be placed along the makai side of the roadway. Acquisition of 21 feet of additional right-of-way for column placement would result in minimal effects. Through and right-turn travel lanes would be reduced to 11 feet and left-turn lanes would be reduced to 10 feet.
- Future streets Wākea Road and Saratoga Avenue are expected to have wide medians. There would be adequate space to accommodate columns in the median; no effects from column placement are anticipated.

Table 8-29 summarizes the column placement for the rail alignment at key locations along this segment. It describes each intersection and the column placement, and summarizes the facility's potential effect.

University of Hawai‘i at Mānoa Extension

This part of the alignment would generally travel from the intersection of Kalākaua Avenue and Kapi‘olani Boulevard to the UH Mānoa campus. The alignment would follow Kapi‘olani Boulevard to University Avenue, terminating at the UH Mānoa lower campus. Three station locations are proposed along this alignment. The potential effects are described below:

- Along Kapi‘olani Boulevard from Atkinson Drive to University Avenue, column placement would require construction of a new median or expansion of an existing median, depending on the intersection. All lanes and turning movements would be preserved by a combination of right-of-way acquisition and reducing lane widths from 11 to 10 feet.
- The section of University Avenue from Kapi‘olani Boulevard to King Street would have minimal effects because of acquisition of right-of-way. All lanes would be reduced from 11 to 10 feet. Bike lanes and parking would be preserved.

Table 8-29: Column Placement Effects—West Kapolei Extension

Street/Intersection ID	Column Placement	Impact Summary
Kapolei Parkway and Kalaeloa Boulevard	Roadside	Guideway columns would be placed on makai side of roadway through acquisition of 21-ft right-of-way.
Kapolei Parkway and Kamokila Boulevard	Roadside	Guideway columns would be placed on makai side of roadway through acquisition of 21-ft right-of-way.
Kapolei Parkway and Haumea Street	Roadside	Guideway columns would be placed on makai side of roadway. Impacts are anticipated to be minimal.
Kapolei Parkway and Wai Aniani Way	Roadside	Guideway columns would be placed on makai side of roadway. Impacts are anticipated to be minimal.
Kapolei Parkway and Kamaaha Avenue	Roadside	Guideway columns would be placed on makai side of roadway. Impacts are anticipated to be minimal.
Wākea Street and Road "A"	Median	Guideway columns are expected to fit within median as proposed in Kalaeloa Master Plan. No changes to roadway are anticipated.
Wākea Street and Road "B"	Median	Guideway columns are expected to fit within median as proposed in Kalaeloa Master Plan. No changes to roadway are anticipated.
Wākea Street and Roosevelt Avenue	Median	Guideway columns are expected to fit within median as proposed in Kalaeloa Master Plan. No changes to roadway are anticipated.
Saratoga Avenue in Kalaeloa	Median	Guideway columns are expected to fit within median as proposed in Kalaeloa Master Plan. No changes to roadway are anticipated.
North-South Road and Roosevelt Avenue	Roadside	Plans to place fixed guideway along Koko Head side of North-South Road. Do not anticipate changes in lane widths.
North-South Road and Kapolei Parkway	Roadside	Plans to place fixed guideway along Koko Head side of North-South Road. Do not anticipate changes in lane widths.

- On University Boulevard between King Street and Varsity Place, the mauka-bound right-turn lane would be removed. All other lanes would be reduced from 11 to 10 feet. Bike lanes and parking would be preserved.

Table 8-30 summarizes the column placement for the rail alignment at key locations along this segment. It describes each intersection and the column placement, and summarizes the facility's potential effect.

Table 8-30: Column Placement Effects—University of Hawai‘i at Mānoa Extension

Intersection(s)	Column Placement	Impact Summary
Kapi‘olani Boulevard from Atkinson Drive to Kalākaua Avenue	Roadside	All lanes (through and right turn lanes) would be preserved by acquisition of additional right-of-way. All lanes would be reduced from 11' to 10'.
Kapi‘olani Boulevard from Kalākaua Avenue to McCully Street	Median	All lanes (through and left-turn lanes) would be preserved through acquisition of additional right-of-way. All lanes would be reduced from 11' to 10'.
Kapi‘olani Boulevard from McCully Street to University Avenue	Median	All lanes would be preserved through acquisition of additional right-of-way. All lanes would be reduced from 11' to 10' in width.
University Avenue from Kapi‘olani Boulevard. to King Street	Median	All lanes would be preserved by acquisition of additional right-of-way. All lanes would be reduced from 11' to 10'. Bike lanes and parking would be preserved.
University Avenue from King Street to Varsity Place	Median	One right-turn lane would be removed. All lanes would be reduced from 11' to 10'. Bike lanes and parking would be preserved.

Waikīkī Extension

This section of the alignment would travel from the intersection of Kalākaua Avenue and Kapi‘olani Boulevard to the Koko Head side of Waikīkī. The alignment would then follow Kalākaua Avenue to Kūhiō Avenue, ending at Ka‘iulani Avenue. Two station locations are proposed along this alignment. The following describes potential effects along the alignment:

- The alignment would follow the Koko Head side of Kalākaua Avenue between Kapi‘olani Boulevard and Kūhiō Avenue. All travel lanes along this segment would be reduced from 11 to 10 feet. In addition, one through lane would be removed from the section between Ala Wai Boulevard and McCully Street, and the Koko Head-bound bus-only lane would be removed between McCully and Kuamo‘o Street.
- Along Kūhiō Avenue, from Kalākaua to Ka‘iulani Avenue, the alignment would follow the mauka side of the roadway. This would result in the loss of one ‘Ewa-bound lane. Additionally, all lane widths would be reduced to 10 feet. Parking and loading zones may be created in pockets between columns.

Table 8-31 summarizes the column placement for the rail alignment at key locations along this segment. It describes each intersection and the column placement, and summarizes the facility’s potential effect.

Table 8-31: Column Placement Effects—Waikīkī Planned Extension

Intersection(s)	Column Placement	Impact Summary
Kalākaua Avenue from Kapiʻolani Boulevard to Ala Wai Boulevard.	Koko head side of roadway	No lane removal, reduce lanes to 10'
Kalākaua Avenue from Ala Wai Boulevard to McCully Boulevard	Koko head side of roadway	Remove one through lane, reduce lanes to 10'
Kalākaua Avenue from McCully Boulevard to Kuamoʻo Avenue	Koko head side of roadway	Remove bus lane, reduce lane widths to 10'
Kūhiō Avenue from Kuamoʻo Street to Namahana Street (one block)	Mauka side of roadway	Remove existing right-turn lane, reduce lane widths to 10'
Kūhiō Avenue from Namahana Street to ʻŌlohana Street (one block)	Mauka side of roadway	Remove one through lane, reduce lane widths to 10'
Kūhiō Avenue from ʻŌlohana Street to Kālaimoku Street (one block)	Mauka side of roadway	Remove two left-turn lanes, reduce lane widths to 10'
Kūhiō Avenue from Kālaimoku Street to Kaiʻolu Street (two blocks)	Mauka side of roadway	Remove one through lane and one right-turn lane, reduce widths to 10'
Kūhiō Avenue from Kaiʻolu Street to Kealohilani Street	Mauka side of roadway	Remove one through lane, reduce widths to 10'
Kūhiō Avenue from Kealohilani Street to Paoakalani Street	Mauka side of roadway	Remove one through lane, reduce widths to 10'

8.5 Parking

The extensions could have an effect on parking in three ways:

- Construction of the guideway could result in the elimination of some existing on-street and off-street parking spaces;
- Spillover parking demand near stations could affect existing parking supply in neighborhoods; and
- Spillover parking demand near stations could affect traffic in the area.

Along the West Kapolei extension, space would be designed into the rights-of-way for streets that have yet to be built to accommodate the fixed guideway. No parking along the alignment would be eliminated. In addition, off-street park-and-ride capacity would be provided at the following stations:

- West Kapolei—1,200 spaces
- Kapolei Parkway—1,700 spaces

These two park-and-rides would accommodate projected future demand for parking in the area, reducing the incidence of spillover parking at other stations.

Along the Waikīkī extension, some parking could potentially be affected near the stations. In addition, there could be some spillover parking demand, although the current lack of parking in Waikīkī (and expense) makes spillover parking unlikely along this extension.

Along the extension serving UH at Mānoa, existing on-street and off-street parking along University Avenue could be affected by the placement of the fixed guideway structure and stations. In addition, spillover parking demand could affect existing parking near stations, as no park-and-ride facilities are planned for this extension. However, this extension should relieve pressure for spillover parking near Ala Moana Center Station, as demand for parking spreads out to other stations further out.

In the extension areas, the Mōʻiliʻili station is the most likely to be affected by spillover parking. This station is expected to attract spillover parking patronage and kiss-and-ride trips based on the patronage forecasts and frequent bus feeder services, as shown in Table 8-32.

Table 8-32: Peak Hour Trip Generation—Mōʻiliʻili Station—Airport & Salt Lake Alternative Plus Planned Extensions

Type	Spillover parking				Kiss-and-Ride				Transit Vehicle Trips (1 bus = 3 passenger-car-equivalent)			
Peak Hour	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
Stations/Alternatives	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Mōʻiliʻili Station	106	0	0	106	70	70	70	70	28	22	28	22

Nine intersections around this station could be affected:

- University Avenue and Dole Street
- University Avenue and Varsity Place
- University Avenue and King Street
- University Avenue and Kuʻilei Street
- University Avenue and Date Street
- University Avenue and Kapiʻolani Boulevard
- Kapiʻolani Boulevard and Date Street/Kamoku Street
- Beretania Street and Isenberg Street
- King Street and Isenberg Street

Table 8-33 presents the results for the 2030 No Build and Build Alternatives. With the 2030 No Build Alternative, all intersections except for University Avenue and Varsity Place are projected to operate at LOS E or F in either or both of the a.m. and p.m. peak hours. With the Build Alternatives plus planned extensions, the combined effect of spillover parking trips, kiss-and-ride trips, and bus activity would not affect traffic at this station.

Appropriate mitigation for the potential loss of parking and spillover demand along the extensions would be addressed prior to construction.

8.6 Bicycles and Pedestrians

8.6.1 Bicycle Facilities in the Future

Within the area of the West Kapolei extension, bicycle paths, bike routes and shared roadways are planned at various locations. Specifically, plans call for adding lanes near the City of Kapolei (along Fort Barrette Road and Manawai Street). There would be an opportunity for planned bicycle facilities to provide access to the fixed guideway stations proposed for this extension.

There is an existing bicycle route along University Avenue near UH Mānoa, which could be used to provide access to fixed guideway stations in this planned extension. There are no bicycle facilities existing or planned near the Waikīkī extension stations.

Table 8-33: Mōʻiliʻili Station Intersection Analysis—Airport & Salt Lake Alternative Plus Planned Extensions

Intersection			Control *	Peak Hour	Year 2007		2030 No Build		Airport & Salt Lake Alternative plus Planned Extensions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Project Delay	Effect?
University Avenue	&	Dole Street	S	A.M.	97	F	154	F	127	F	-27	NO
				P.M.	93	F	97	F	93	F	-4	NO
University Avenue	&	Varsity Place	S	A.M.	16	B	19	B	25	C [1]	6	NO
				P.M.	14	B	13	B	14	B [1]	1	NO
University Avenue	&	King Street	S	A.M.	96	F	133	F	116	F	-17	NO
				P.M.	95	F	110	F	94	F	-16	NO
University Avenue	&	Kuʻilei Street	TWSC	A.M.	44	E	101	F	94	F	-7	NO
				P.M.	84	F	>300	F	>400	F	>100	NO
University Avenue	&	Date Street	S	A.M.	71	E	200	F	127	F	-73	NO
				P.M.	101	F	111	F	110	F	-1	NO
University Avenue	&	Kapiʻolani Boulevard	S	A.M.	41	D	65	E	63	E	-2	NO
				P.M.	34	C	26	C	28	C	2	NO
Kapiʻolani Boulevard	&	Date Street/Kamoku Street	S [2]	A.M.	228	F	273	F	239	F	-34	NO
				P.M.	213	F	219	F	213	F	-6	NO
Beretania Street	&	Isenberg Street	S	A.M.	28	C	202	F	86	F	-116	NO
				P.M.	30	C	163	F	135	F	-28	NO
King Street	&	Isenberg Street	S	A.M.	16	B	74	E	50	D	-24	NO
				A.M.	97	F	154	F	127	F	-27	NO

[1] The northbound right-turn lane on University Avenue is proposed to be removed under future with Build Alternative conditions.

[2] This is a signalized intersection with six approaches, except that Kamoku Street southbound is controlled by a stop sign.

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Appendix A
LOS Thresholds

GENERALIZED **PEAK HOUR TWO-WAY** VOLUMES FOR FLORIDA'S **URBANIZED AREAS***

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	180	620	1,210	1,720	2,370
4	Divided	1,940	3,140	4,540	5,870	6,670
6	Divided	2,900	4,700	6,800	8,810	10,010

STATE TWO-WAY ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	400	1,310	1,560	1,610
4	Divided	460	2,780	3,300	3,390	***
6	Divided	700	4,240	4,950	5,080	***
8	Divided	890	5,510	6,280	6,440	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	180	1,070	1,460	1,550
4	Divided	**	390	2,470	3,110	3,270
6	Divided	**	620	3,830	4,680	4,920
8	Divided	**	800	5,060	6,060	6,360

Class III (more than 4.5 signalized intersections per mile and not within primary city central business district of an urbanized area over 750,000)

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	**	500	1,200	1,470
4	Divided	**	**	1,180	2,750	3,120
6	Divided	**	**	1,850	4,240	4,690
8	Divided	**	**	2,450	5,580	6,060

Class IV (more than 4.5 signalized intersections per mile and within primary city central business district of an urbanized area over 750,000)

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	**	490	1,310	1,420
4	Divided	**	**	1,170	2,880	3,010
6	Divided	**	**	1,810	4,350	4,520
8	Divided	**	**	2,460	5,690	5,910

NON-STATE ROADWAYS

Major City/County Roadways

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	**	870	1,390	1,480
4	Divided	**	**	2,030	2,950	3,120
6	Divided	**	**	3,170	4,450	4,690

Other Signalized Roadways
(signalized intersection analysis)

Lanes	Divided	A	B	C	D	E
		Level of Service				
2	Undivided	**	**	450	950	1,200
4	Divided	**	**	1,050	2,070	2,400

Source: Florida Department of Transportation 02/22/02
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450
http://www11.myflorida.com/planning/systems/sm/los/default.htm

FREEWAYS

Interchange spacing ≥ 2 mi. apart

Lanes	A	B	C	D	E
	Level of Service				
4	2,310	3,840	5,350	6,510	7,240
6	3,580	5,930	8,270	10,050	11,180
8	4,840	8,020	11,180	13,600	15,130
10	6,110	10,110	14,110	17,160	19,050
12	7,360	12,200	17,020	20,710	23,000

Interchange spacing < 2 mi. apart

Lanes	A	B	C	D	E
	Level of Service				
4	2,050	3,350	4,840	6,250	7,110
6	3,240	5,250	7,600	9,840	11,180
8	4,420	7,160	10,360	13,420	15,240
10	5,600	9,070	13,130	16,980	19,310
12	6,780	10,980	15,890	20,560	23,360

BICYCLE MODE

(**Note**: Level of service for the bicycle mode in this table is based on roadway geometrics at 40 mph posted speed and traffic conditions, not number of bicyclists using the facility.) (Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder Bicycle Lane Coverage	A	B	C	D	E
	Level of Service				
0-49%	**	**	310	1,310	>1,310
50-84%	**	240	390	>390	***
85-100%	300	680	>680	***	***

PEDESTRIAN MODE

(**Note:** Level of service for the pedestrian mode in this table is based on roadway geometrics at 40 mph posted speed and traffic conditions, not number of pedestrians using the facility.) (Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	A	B	C	D	E
	Level of Service				
0-49%	**	**	**	600	1,480
50-84%	**	**	**	940	1,800
85-100%	**	210	1,080	>1,080	***

BUS MODE (Scheduled Fixed Route)

(Buses per hour)

(**Note:** Buses per hour shown are only for the **peak hour** in the **single direction** of higher traffic flow.)

Sidewalk Coverage	A	B	C	D	E
	Level of Service				
0-84%	**	>5	≥4	≥3	≥2
85-100%	>6	>4	≥3	≥2	≥1

ARTERIAL/NON-STATE ROADWAY ADJUSTMENTS

DIVIDED/UNDIVIDED
(alter corresponding volume by the indicated percent)

Lanes	Median	Left Turns Lanes	Adjustment Factors
2	Divided	Yes	+5%
2	Undivided	No	-20%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

ONE-WAY FACILITIES

Decrease corresponding two-directional volumes in this table by 40% to obtain the equivalent one directional volume for one-way facilities.

*This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Values shown are hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. Level of service letter grade thresholds are probably not comparable across modes and, therefore, cross modal comparisons should be made with caution. Furthermore, combining levels of service of different modes into one overall roadway level of service is not recommended. To convert to annual average daily traffic volumes, these volumes must be divided by an appropriate K factor. The table's input value defaults and level of service criteria appear on the following page. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.
**Cannot be achieved using table input value defaults.
***Not applicable for that level of service letter grade. For automobile/truck modes, volumes greater than level of service D become F because intersection capacities have been reached. For bicycle and pedestrian modes, the level of service letter grade (including F) is not achievable, because there is no maximum vehicle volume threshold using table input value defaults.

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GENERALIZED **PEAK HOUR TWO-WAY** VOLUMES FOR FLORIDA'S
Urbanized Areas
INPUT VALUE ASSUMPTIONS

	UNINTERRUPTED FLOW FACILITIES			
	Freeways		Highways	
ROADWAY CHARACATERISTICS				
Number of through lanes	4 - 12	4 - 12	2	4 - 6
Posted speed (mph)	65	55	50	50
Free flow speed (mph)	70	60	55	55
Basic segment length (mi)	1.5	0		
Interchange spacing per mile	2.5	1		
Median (n,y)			n	y
Left turn lanes (n,y)			y	y
Terrain (r,l)	l	l	l	l
% no passing zone			80	
Passing lanes (n,y)			n	
TRAFFIC CHARACTERISTICS				
Planning analysis hour factor (K)	0.097	0.093	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.95	0.95	0.925	0.925
Base capacity (pcphpl)			1700	2100
Heavy vehicle percent	6.0	4.0	2.0	2.0
Local adjustment factor	0.98	1.00	1.0	1.0

	INTERRUPTED FLOW FACILITIES																	
	State Arterials												Non-State Roadways			Bicycle	Pedestrian	Bus
ROADWAY CHARACTERISTICS	Class I			Class II			Class III			Class IV			Major City/County		Other Signalized	Class II	Class II	
Number of through lanes	2	4 - 6	8	2	4 – 6	8	2	4 - 6	8	2	4 – 6	8	2	4 - 6	2 - 4	4	4	
Posted speed (mph)	45	50	50	45	45	45	35	35	35	30	30	30	45	45		40	40	
Free flow speed (mph)	50	55	55	50	50	50	40	40	40	35	35	35	50	50		45	45	
Median type (n,nr,r)	n	r	r	n	r	r	n	r	r	n	r	r	n	r		r	r	
Left turn lanes (n,y)	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	
Paved shoulder/bicycle lane (n,y)																n,50%,y	n	
Outside lane width (n,t,w)																t	t	
Pavement condition (u,t,d)																t		
Sidewalk (n,y)																	n,50%,y	n,y
Sidewalk/roadway separation (a,t,w)																	t	
Sidewalk/roadway protective barrier (n,y)																	n	
Obstacle to bus stop (n,y)																		n
TRAFFIC CHARACTERISTICS																		
Planning analysis hour factor (K)	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Peak hour factor (PHF)	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	
Base saturation flow rate (pcphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Heavy vehicle percent	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.0	2.0	2.0	
Local adjustment factor	1.0	1.0	0.95	0.98	0.98	0.95	0.95	0.95	0.92	0.92	0.92	0.90	0.98	0.98	0.95	0.98	0.98	
% turns from exclusive turn lanes	12	12	12	12	12	12	12	12	12	12	12	12	14	14	16	12	12	
Bus span of service																		15
CONTROL CHARACTERISTICS																		
Signalized intersections per mile	1.5	1.0	1.0	3.0	3.0	3.0	5.0	5.0	5.0	8.0	8.0	8.0	3.0	3.0		3.0	3.0	
Arrival type (1-6)	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	
Signal type (a,s,f)	a	a	a	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
Cycle length (C)	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	
Effective green ratio (g/C)	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.41	0.41	0.31	0.44	0.44	

LEVEL OF SERVICE THRESHOLDS

	Freeways				Highways			State Two-Way Arterials				Non-State Roadways		Bicycle	Pedestrian	Bus
Level of	Class III		Class IV		Two-Lane	Multilane		Class I	Class II	Class III	Class IV	Major City/County	Other Signalized			
Service	v/c	Density	v/c	Density	% FFS	v/c	Density	ATS	ATS	ATS	ATS	ATS	Control Delay	Score	Score	Buses per hr.
A	≤ 0.32	≤ 11	≤ 0.29	≤ 11	> 0.917	≤ 0.29	≤ 11	> 42 mph	> 35 mph	> 30 mph	> 25 mph	> 35 mph	≤ 10 sec	≤ 1.5	≤ 1.5	> 6
B	≤ 0.53	≤ 18	≤ 0.47	≤ 18	> 0.833	≤ 0.47	≤ 18	> 34 mph	> 28 mph	> 24 mph	> 19 mph	> 28 mph	≤ 20 sec	≤ 2.5	≤ 2.5	> 4
C	≤ 0.74	≤ 26	≤ 0.68	≤ 26	> 0.750	≤ 0.68	≤ 26	> 21 mph	> 22 mph	> 18 mph	> 13 mph	> 22 mph	≤ 35 sec	≤ 3.5	≤ 3.5	≥ 3
D	≤ 0.90	≤ 35	≤ 0.88	≤ 35	> 0.667	≤ 0.88	≤ 35	> 21 mph	> 17 mph	> 14 mph	> 9 mph	> 17 mph	≤ 55 sec	≤ 4.5	≤ 4.5	≥ 2
E	≤ 1.00	≤ 45	≤ 1.00	≤ 45	> 0.583	≤ 1.00	≤ 41	> 16 mph	> 13 mph	> 10 mph	> 7 mph	> 13 mph	≤ 80 sec	≤ 5.5	≤ 5.5	≥ 1
F	> 1.00	> 45	> 1.00	> 45	≤ 0.583	> 1.00	> 41	≤ 16 mph	≤ 13 mph	≤ 10 mph	≤ 7 mph	≤ 13 mph	> 80 sec	> 5.5	> 5.5	< 1

v/c = Demand to Capacity Ratio % FFS = Percent Free Flow Speed ATS = Average Travel Speed 02/22/02

Appendix B
Feeder Bus Routes and Service Levels at Fixed Guideway Stations

Feeder Bus Routes and Service Levels at Fixed Guideway Stations

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
West Kapolei								
Routes	C, 40/A, 416	No Station	No Station	No Station	No Station	C, 40/A, 416	C, 40/A, 416	C, 40/A, 416
Number of Buses in Peak Hour	C—3 ea dir via H1 to Kalaeloa to Kapolei Pkwy 40/40A—3 ea dir via H1 to Kalaeloa to Kapolei Pkwy 416—2 ea dir via Ali'inui to Kapolei Pkwy					C—3 ea dir via H1 to Kalaeloa to Kapolei Pkwy 40/40A—4 ea dir via H1 to Kalaeloa to Kapolei Pkwy 416—6 ea dir via Ali'inui to Kapolei Pkwy	C—3 ea dir via H1 to Kalaeloa to Kapolei Pkwy 40/40A—4 ea dir via H1 to Kalaeloa to Kapolei Pkwy 416—6 ea dir via Ali'inui to Kapolei Pkwy	C—3 ea dir via H1 to Kalaeloa to Kapolei Pkwy 40/40A—4 ea dir via H1 to Kalaeloa to Kapolei Pkwy 416—6 ea dir via Ali'inui to Kapolei Pkwy
Kapolei Transit Center								
Routes	C, 40/A, 41, 93A, 411, 412, 413, 414, 415, 416, 417, 418, 419	No Station	No Station	No Station	No Station	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419	C, 40/A, 41, 411, 412, 413, 414, 415, 416, 417, 418, 419
Number of Buses in Peak Hour	C—3 ea dir via Kapolei Pkwy 40/40A—3 EB via Kamokila to Wākea to TC; 3 WB via Kapolei Pkwy to TC 41- 2 ea dir via Farrington to Kamokila to Wākea to TC 93A—1 trip EB 411-2 ea dir via Farrington to Kamokila to Wākea to TC 412-2 ea dir via Farrington to Kamokila to Wākea to TC 413-2 ea dir via Kalaeloa to Kapolei Pkwy to TC 414-1 ea dir via Farrington to Kamokila to Wākea to TC 415-2 NB via Wākea; 2 SB via Wākea 416-2 ea dir via Ali'inui to Kapolei Pkwy to Wākea 417-2 ea dir via N/S Rd to Kapolei Pkwy to TC					C—3 ea dir via Kapolei Pkwy 40/40A—4 EB via Kamokila to Wākea to TC; 4 WB via Kapolei Pkwy to TC 41- 4 ea dir via Farrington to Kamokila to Wākea to TC 411-6 ea dir via Farrington to Kamokila to Wākea to TC 412-2 ea dir via Farrington to Kamokila to Wākea to TC 413-2 ea dir via Kalaeloa to Kapolei Pkwy to TC 414-1 ea dir via Farrington to Kamokila to Wākea to TC 415-4 NB via Wākea; 4 SB via Wākea 416-6 ea dir via Ali'inui to Kapolei Pkwy to Wākea 417-6 ea dir via N/S Rd to Kapolei Pkwy to TC	C—3 ea dir via Kapolei Pkwy 40/40A—4 EB via Kamokila to Wākea to TC; 4 WB via Kapolei Pkwy to TC 41- 4 ea dir via Farrington to Kamokila to Wākea to TC 411-6 ea dir via Farrington to Kamokila to Wākea to TC 412-2 ea dir via Farrington to Kamokila to Wākea to TC 413-2 ea dir via Kalaeloa to Kapolei Pkwy to TC 414-1 ea dir via Farrington to Kamokila to Wākea to TC 415-4 NB via Wākea; 4 SB via Wākea 416-6 ea dir via Ali'inui to Kapolei Pkwy to Wākea 417-6 ea dir via N/S Rd to Kapolei Pkwy to TC	C—3 ea dir via Kapolei Pkwy 40/40A—4 EB via Kamokila to Wākea to TC; 4 WB via Kapolei Pkwy to TC 41- 4 ea dir via Farrington to Kamokila to Wākea to TC 411-6 ea dir via Farrington to Kamokila to Wākea to TC 412-2 ea dir via Farrington to Kamokila to Wākea to TC 413-2 ea dir via Kalaeloa to Kapolei Pkwy to TC 414-1 ea dir via Farrington to Kamokila to Wākea to TC 415-4 NB via Wākea; 4 SB via Wākea 416-6 ea dir via Ali'inui to Kapolei Pkwy to Wākea 417-6 ea dir via N/S Rd to Kapolei Pkwy to TC

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
	418-2 EB via Kalaeloa to Kapolei Pkwy to TC; 2 WB via Wākea to Kamokila to Farrington 419-2 ea dir via Farrington to Kamokila to Wākea					418-2 EB via Kalaeloa to Kapolei Pkwy to TC; 4 WB via Wākea to Kamokila to Farrington 419-6 ea dir via Farrington to Kamokila to Wākea	418-2 EB via Kalaeloa to Kapolei Pkwy to TC; 4 WB via Wākea to Kamokila to Farrington 419-6 ea dir via Farrington to Kamokila to Wākea	418-2 EB via Kalaeloa to Kapolei Pkwy to TC; 4 WB via Wākea to Kamokila to Farrington 419-6 ea dir via Farrington to Kamokila to Wākea
Kalaeloa								
Routes	418	No Station	No Station	No Station	No Station	418	418	418
Number of Buses in Peak Hour	418-2					418-4	418-4	418-4
Fort Barrette Road								
Routes	418	No Station	No Station	No Station	No Station	418	418	418
Number of Buses in Peak Hour	418-2					418-4	418-4	418-4
Kapolei Parkway								
Routes	41, 421, 422, 423	No Station	No Station	No Station	No Station	41, 421, 422	41, 421, 422	41, 421, 422
Number of Buses in Peak Hour	41-2 ea dir via Kapolei Pkwy/N/S Rd 421-2 ea dir via N/S Road 422-2 ea dir via N/S Road. 423-1 terminates at Mall via Kapolei Pkwy/N/S Road					41-4 ea dir via Kapolei Pkwy/N/S Rd 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	41-4 ea dir via Kapolei Pkwy/N/S Rd 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	41-4 ea dir via Kapolei Pkwy/N/S Rd 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.
East Kapolei								
Routes	C, 417, 421, 422	C, 416, 417, 418, 421, 422	C, 416, 417, 418, 421, 422	C, 416, 417, 418, 419, 421, 422	C, 416, 417, 418, 419, 421, 422	C, 417, 421, 422	C, 417, 421, 422	C, 417, 421, 422
Number of Buses in Peak Hour	C—3 ea dir via Kapolei Pkwy to N/S Road 417-2-SB via Makakilo to N/S Road; 2 NB via Kapolei pkwy to N/S Road. 421-2 ea dir via N/S Road 422-2 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 416-2-ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 418-4-ea dir via Kapolei Pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 416-2-ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 418-4-ea dir via Kapolei Pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 416-2-ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 418-4-ea dir via Kapolei Pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 416-2-ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 418-4-ea dir via Kapolei Pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.	C—3 ea dir via Kapolei Pkwy to N/S Road 417-4-SB via Makakilo to N/S Road; 4 NB via Kapolei pkwy to N/S Road. 421-4 ea dir via N/S Road 422-4 ea dir via N/S Road.

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
UH West O'ahu								
Routes	A, C, 41, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421	C, 41, 93, 417, 421
Number of Buses in Peak Hour	A-4 via Farrington WB to N/S Road, terminates at UH West O'ahu; 4 EB C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-2 ea dir via N/S Road. 417-2 ea dir via N/S Road 421-2 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road	C—3 NB via N/S Road; 3 SB via N/S Road to Kapolei Pkwy 41-4 ea dir via N/S Road. 93-6 ea dir via N/S Road to H-1 Interchange 417-4 ea dir via N/S Road 421-4 WB via Ho'opili Main; 4 EB via N/S Road
Ho'opili								
Routes	421	421	421	421	421	421	421	421
Number of Buses in Peak Hour	421-2 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE	421-4 ea dir via Ho'opili NE
West Loch								
Routes	A, E, 40/A, 42, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434	40/A, 42, 98A, 415, 421, 422, 432, 434
Number of Buses in Peak Hour	A-4 each dir on Farrington E-3 each dir on Farrington 40/A-3 ea dir via Farrington Hwy 42-3 EB via Fort Weaver Rd to Farrington; 3 WB via Farrington to Fort Weaver 415-2 WB via Farrington to Old Fort Weaver 421-2 WB via Farrington 422-2 WB via Farrington 432-2 NB via Kunia Access Road 434-2 WB via Kunia Road to Farrington; 2 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-4 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-2 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-4 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-2 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-4 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-4 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-4 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-4 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road	40/A-4 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 98A-4 EB via Kunia to Farrington. 415-4 WB via Farrington to Old Fort Weaver 421-4 WB via Farrington 422-4 WB via Farrington 432-2 NB via Kunia Access Road 434-4 WB via Kunia Road to Farrington; 4 WB via Farrington to Kunia Access Road

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Waipahu Transit Center								
Routes	A, E, 40/A, 42, 43, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434	40/A, 42, 50, 432, 433, 434
Number of Buses in Peak Hour	A-4-ea dir E- 3 ea dir 40/A-3 ea dir via Farrington Hwy 42/A-3 ea dir via Farrington Hwy 43-2 ea dir (AM) no PM 50-2 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-2 via Mokuola to Farrington Hwy 434-2 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-4 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-4 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC	40/A-3 ea dir via Farrington Hwy 42-6 EB via Fort Weaver Rd to Farrington; 4 WB via Farrington to Fort Weaver 50-4 SB via Managers Drive to WTC; 2 NB via TC to Managers Drive 432-2 EB via Waipahu Street to Waipahu Depot Road to TC; 2 via Mokuola to Waipahu Street 433-4 via Mokuola to Farrington Hwy 434-4 via Farrington to Waipahu Depot Road to TC
Leeward Community College								
Routes	73-2 terminate at LCC	No routes	No routes	No routes	No routes	No routes	No routes	No routes

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Pearl Highlands								
Routes	A, 40/A, 42, 51, 73, 441	D, 40/A, 51, 83/A, 84/A, 98, 441, 547	D, 40/A, 51, 83/A, 84/A, 98, 441, 547	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441	D, 40/A, 51, 83/A, 84/A, 98, 440, 441
Number of Buses in Peak Hour	A-4 each dir on Farrington 40/A-3 ea dir via Farrington Hwy 42-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 73-2 ea direction on Farrington to LCC 441-4 via Central Mauka Road then EB on Kamehameha, 4 via Waimano Home Road to Kamehameha	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station 547-4 WB via Kamehameha Hwy to Station.	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station 547-4 WB via Kamehameha Hwy to Station.	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 440-4 via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 440-4 via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 440-4 via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 440-4 via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station	D-4 SB via H2 to direct access lane; 4 NB to H-2 40/A-3 ea dir via Farrington Hwy 51-4 ea dir via Kamehameha Hwy 83/A-16 SB via H2 to direct access 84/A-8 SB via H2 to direct access 98-4 SB via H2 to direct access 440-4 via H2 to direct access 441-4 via Central Mauka Road to station; 4 via Waimano Home Road to Kamehameha to station

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Pearlridge								
Routes	A, 11, 20, 32, 40/A, 42, 51, 53, 54, 71, 90	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 548, 549	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 548	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548, 549	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548, 549	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548	40/A, 51, 54, 66, 541, 542, 543, 544, 545, 546, 547, 548
Number of Buses in Peak Hour	A-4 ea dir on Kamehameha 11-2 circle Pearlridge via Kamehameha WB to Kaonohe 20-3 circle Pearlridge via Kamehameha WB to Kaonohe 32-2 circle Pearlridge via Kamehameha WB to Kaonohe 40/A-3 ea dir via Kamehameha 42-3 ea dir via Kamehameha 51-4 ea dir via Kamehameha 53-3 ea dir via Kamehameha 54-2 ea dir on Moanalua 71-2 EB via Kamehameha to Kaonohi; 2 WB via Kaonohi to Kamehameha 90-2 EB on Moanalua	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 548-4 ea dir terminates at TC 549-2 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 548-4 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 547-4 ea dir terminates at TC 548-4 ea dir terminates at TC 549-2 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 547-4 ea dir terminates at TC 548-4 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 547-4 ea dir terminates at TC 548-4 ea dir terminates at TC 549-2 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 547-4 ea dir terminates at TC 548-4 ea dir terminates at TC	40/A-3 ea dir on Kamehameha 51-4 ea dir, terminates at TC 54-4 ea dir, terminates at TC 66-2 ea dir, terminates at TC 541-4 ea dir terminates at TC 542-2 ea dir terminates at TC 543-2 ea dir terminates at TC 544-2 ea dir terminates at TC 545-2 ea dir terminates at TC 546-2 ea dir terminates at TC 547-4 ea dir terminates at TC 548-4 ea dir terminates at TC

Fixed Guideway Station Locations	Alternative							
	2030 No Build	**2018 First Project (Via Salt Lake)**	**2018 First Project (Via Airport)**	**2030 First Project (Via Salt Lake)**	**2030 First Project (Via Airport)**	**2030 Full Project (Via Salt Lake)**	**2030 Full Project (Via Airport)**	**2030 Full Project (Via Airport & Salt Lake)**
Aloha Stadium								
Routes	A, 20, 32, 40/A, 42, 51, 74	40/A, 301, 312, 314, 541, 549	40/A, 301, 312, 314, 541	40/A, 301, 312, 314, 541, 549	40/A, 301, 312, 314, 541	40/A, 301, 312, 314, 541, 549	40/A, 301, 312, 314, 541	40/A, 301, 312, 314, 541
Number of Buses in Peak Hour	A-4 ea dir on Kamehameha 20-3 ea dir on Kamehameha 32-2 ea dir, Salt Lake to Kamehameha (to Pearlridge) 40/A-3 ea dir on Kamehameha 42-3 ea dir on Kamehameha 51-4 ea dir on Kamehameha 74-1 ea dir, Salt Lake to Kamehameha	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd. 549-2 ea dir on Kamehameha	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd.	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd. 549-2 ea dir on Kamehameha	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd.	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd. 549-2 ea dir on Kamehameha	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd.	40/A-3 ea dir on Kamehameha 301-4 terminates at Aloha Stadium via Salt Lake Blvd. 312-7 terminates at Aloha Stadium via Salt Lake Blvd. 314-4 EB on Salt Lake Blvd; 2 WB 541-4 terminates at Aloha Stadium via Salt Lake Blvd.
Kalaloa								
Routes	A, 20, 40/A, 42, 51	No Station	40/A, 314	No Station	40/A, 314	No Station	40/A, 314	40/A, 314
Number of Buses in Peak Hour	A-4 ea dir on Kamehameha 20-3 ea dir on Kamehameha 40/A-3 ea dir on Kamehameha 42-3 ea dir on Kamehameha 51-4 ea dir on Kamehameha		40/A-3 ea dir Kamehameha 314-4 terminates at Arizona Memorial via WB on Kamehameha		40/A-3 ea dir Kamehameha 314-4 terminates at Arizona Memorial via WB on Kamehameha		40/A-3 ea dir Kamehameha 314-4 terminates at Arizona Memorial via WB on Kamehameha	40/A-3 ea dir Kamehameha 314-4 terminates at Arizona Memorial via WB on Kamehameha

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Pearl Harbor Naval Base								
Routes	A, 9, 11, 20, 40/A, 42, 51, 86/A, 93A, 95	No Station	40/A, 312, 313, 314	No Station	40/A, 312, 313, 314	No Station	40/A, 312, 313, 314	40/A, 312, 313, 314
Number of Buses in Peak Hour	A-4 ea dir on Kamehameha 9-2 ea dir on Radford 11-2 EB Radford to H-1; 1 WB H-1 to Radford 20-3 ea dir on Kamehameha 40/A-3 ea dir on Kamehameha 42-3 ea dir on Kamehameha 51-4-ea dir on Kamehameha 86/A-2 trips WB H1 to Radford exit to PH 93A-1 trip EB H1 to Radford exit to PH 95-1 trip WB H1 to Radford exit to PH		40/A-3 ea dir Nimitz 312-7 SB Radford;4 NB Radford 313-4 ea dir Radford 314-4 SB Radford to WB Kamehameha		40/A-3 ea dir Nimitz 312-7 SB Radford;4 NB Radford 313-4 ea dir Radford 314-4 SB Radford to WB Kamehameha		40/A-3 ea dir Nimitz 312-7 SB Radford;4 NB Radford 313-4 ea dir Radford 314-4 SB Radford to WB Kamehameha	40/A-3 ea dir Nimitz 312-7 SB Radford;4 NB Radford 313-4 ea dir Radford 314-4 SB Radford to WB Kamehameha
Honolulu International Airport								
Routes	19, 20, 31	No Station	19, 302, 311	No Station	19, 302, 311	No Station	19, 302, 311	19, 302, 311
Number of Buses in Peak Hour	19-3 EB 20-3 EB 31-1 EB		19-3 EB 302-2 EB 311-6 EB		19-3 EB 302-2 EB 311-6 EB		19-3 EB 302-2 EB 311-6 EB	19-3 EB 302-2 EB 311-6 EB
Lagoon Drive								
Routes	None	No Station	31, 306 (others on Nimitz Highway)	No Station	31, 306 (others on Nimitz Highway)	No Station	31, 306 (others on Nimitz Highway)	306 (others on Nimitz Highway)
Number of Buses in Peak Hour			31-6 Pu‘uloa to terminate at Station 306-1 ea dir Lagoon Drive		31-6 Pu‘uloa to terminate at Station 306-1 ea dir Lagoon Drive		31-6 Pu‘uloa to terminate at Station 306-1 ea dir Lagoon Drive	31-6 Pu‘uloa to terminate at Station 306-1 ea dir Lagoon Drive

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Ala Liliko'i								
Routes	3, 32	301, 311, 313, 549 plus 31 one long block away	No Station	301, 311, 313, 549 plus 31 one long block away	No Station	301, 311, 313, 549 plus 31 one long block away	No Station	301, 311 plus 31 one long block away
Number of Buses in Peak Hour	3-6 ea dir Likini to Ala Liliko'i to Ala Ilima 32-2 ea dir Likini to Ala Liliko'i to Salt Lake (to/from Aloha Stadium)	31-6 ea dir Likini to Ala Liliko'i to Ala Ilima 301-4 EB Salt Lake Blvd to NB Ala Liliko'i; 4 SB Ala Liliko'i to WB Salt Lake Blvd 311-4 ea dir Ala Liliko'i to Arizona 313-4 SB Ala Liliko'i to WB Salt Lake Blvd. 549-2 SB Ala Liliko'i to EB on Salt Lake Blvd		31-6 ea dir Likini to Ala Liliko'i to Ala Ilima 301-4 EB Salt Lake Blvd to NB Ala Liliko'i; 4 SB Ala Liliko'i to WB Salt Lake Blvd 311-4 ea dir Ala Liliko'i to Arizona 313-4 SB Ala Liliko'i to WB Salt Lake Blvd. 549-2 SB Ala Liliko'i to EB on Salt Lake Blvd		31-6 ea dir Likini to Ala Liliko'i to Ala Ilima 301-4 EB Salt Lake Blvd to NB Ala Liliko'i; 4 SB Ala Liliko'i to WB Salt Lake Blvd 311-4 ea dir Ala Liliko'i to Arizona 313-4 SB Ala Liliko'i to WB Salt Lake Blvd. 549-2 SB Ala Liliko'i to EB on Salt Lake Blvd		31-6 ea dir Likini to Ala Liliko'i to Ala Ilima 301-4 EB Salt Lake Blvd to NB Ala Liliko'i; 4 SB Ala Liliko'i to WB Salt Lake Blvd 311-4 ea dir Ala Liliko'i to Arizona

Fixed Guideway Station Locations	Alternative							
	2030 No Build	**2018 First Project (Via Salt Lake)**	**2018 First Project (Via Airport)**	**2030 First Project (Via Salt Lake)**	**2030 First Project (Via Airport)**	**2030 Full Project (Via Salt Lake)**	**2030 Full Project (Via Airport)**	**2030 Full Project (Via Airport & Salt Lake)**
Middle Street Transit Center								
Routes	A, B, 1, 2, 16, 31, 32, 203; C, 9, 40/A, 42, 43, 51, 52	A, 1, 2, 31, 40/A. 52, 301, 302, 303, 304, 305, 306	A, 1, 2, 40/A. 52, 301, 302, 303, 304, 305, 306	A, 1, 2, 31, 40/A. 52, 301, 302, 303, 304, 305, 306	A, 1, 2, 40/A. 52, 301, 302, 303, 304, 305, 306	1, 2, 31, 40/A. 52, 301, 302, 303, 304, 305, 306	1, 2, 40/A. 52, 301, 302, 303, 304, 305, 306	1, 2, 31, 40/A. 52, 301, 302, 303, 304, 305, 306
Number of Buses in Peak Hour	A-4 ea dir TC to Middle Street to King	A-6 ea dir TC to Middle Street to King	A-6 ea dir TC to Middle Street to King	A-6 ea dir TC to Middle Street to King	A-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King
	B-4 ea dir TC to Middle Street to School	1-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King	1-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King
	1-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	2-6 ea dir TC to Middle Street to King	31-6 EB H1 to SB on Middle Street to TC	40/A-3 ea dir Dillingham	31-6 EB H1 to SB on Middle Street to TC
	2-6 ea dir TC to Middle Street to School	31-6 EB H1 to SB on Middle Street to TC	40/A-3 ea dir Dillingham	31-6 EB H1 to SB on Middle Street to TC	40/A-3 ea dir Dillingham	40/A-3 ea dir Dillingham	52-3 ea dir Dillingham	40/A-3 ea dir Dillingham
	16-2 ea dir TC to Middle Street to Moanalua	40/A-3 ea dir Dillingham	52-3 ea dir Dillingham	40/A-3 ea dir Dillingham	52-3 ea dir Dillingham	52-3 ea dir Dillingham	301-4 ea dir Middle Street to H-1access to TC	52-3 ea dir Dillingham
	31-2 TC to Middle Street to Moanalua; 2 TC to Middle Street to Nimitz	52-3 ea dir Dillingham	301-4 ea dir Middle Street to H-1access to TC	52-3 ea dir Dillingham	301-4 ea dir Middle Street to H-1access to TC	301-4 ea dir Middle Street to H-1access to TC	302-2 ea dir Middle Street to TC	301-4 ea dir Middle Street to H-1access to TC
	32-2 EB Middle Street to TC; 2 TC to Middle Street to Nimitz	301-4 ea dir Middle Street to H-1access to TC	302-2 ea dir Middle Street to TC	301-4 ea dir Middle Street to H-1access to TC	302-2 ea dir Middle Street to TC	302-2 ea dir Middle Street to TC	303-4 via SB Middle Street to TC	302-2 ea dir Middle Street to TC
	203-1 TC Middle Street to School	302-2 ea dir Middle Street to TC	303-4 via SB Middle Street to TC	302-2 ea dir Middle Street to TC	303-4 via SB Middle Street to TC	303-4 via SB Middle Street to TC	304-4 via SB Middle Street to TC	303-4 via SB Middle Street to TC
	C-3 ea dir Dillingham	303-4 via SB Middle Street to TC	304-4 via SB Middle Street to TC	303-4 via SB Middle Street to TC	304-4 via SB Middle Street to TC	304-4 via SB Middle Street to TC	305-4 WB Dillingham to Middle Street to TC	304-4 via SB Middle Street to TC
	9-2 ea dir Dillingham	304-4 via SB Middle Street to TC	305-4 WB Dillingham to Middle Street to TC	304-4 via SB Middle Street to TC	305-4 WB Dillingham to Middle Street to TC	305-4 WB Dillingham to Middle Street to TC	306-1 via H1 access to Middle Street to TC	305-4 WB Dillingham to Middle Street to TC
	40/A-3 ea dir Dillingham	305-4 WB Dillingham to Middle Street to TC	306-1 via H1 access to Middle Street to TC	305-4 WB Dillingham to Middle Street to TC	306-1 via H1 access to Middle Street to TC	306-1 via H1 access to Middle Street to TC		306-1 via H1 access to Middle Street to TC
	42-3 ea dir Dillingham							
	43-2 ea dir (AM) no PM on Dillingham							
	51-4 ea dir Dillingham							
	52-3 ea dir Dillingham	306-1 via H1 access to Middle Street to TC		306-1 via H1 access to Middle Street to TC				

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Kalihi								
Routes	C, 7, 9, 40/A, 42, 43, 51, 52	40/A, 52, 62, 305	40/A, 52, 62, 305	40/A, 52, 62, 305	40/A, 52, 62, 305	40/A, 52, 62, 305	40/A, 52, 62, 305	40/A, 52, 62, 305
Number of Buses in Peak Hour	C-3 ea dir Dillingham 7-4 ea dir Kalihi 9-2 ea dir Dillingham 40/A-3 ea dir Dillingham 42-3 ea dir Dillingham 43-2 ea dir (AM) no PM on Dillingham 51-4 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham 62-4 WB Dillingham; 3 EB Dillingham 305-3NB on Kalihi; 4 SB on Kalihi
Kapālama								
Routes	C, 9, 40/A, 42, 43, 51, 52	40/A, 52	40/A, 52	40/A, 52	40/A, 52	40/A, 52	40/A, 52	40/A, 52
Number of Buses in Peak Hour	C-3 ea dir Dillingham 9-2 ea dir Dillingham 40/A-3 ea dir Dillingham 42-3 ea dir Dillingham 43-2 ea dir (AM) no PM on Dillingham 51-4 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham	40/A-3 ea dir Dillingham 52-3 ea dir Dillingham
Iwilei								
Routes	None at site (routes are on Dillingham, King and Iwilei	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)	61 (plus others on King Street or Iwilei Road)
Number of Buses in Peak Hour		61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.	61-3 via Liliha to Dillingham to station.
Chinatown								
Routes	No routes	No routes	No routes	No routes	No routes	No routes	No routes	No routes

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Downtown								
Routes	E, F2, F3, 17, 19, 20, 55, 56, 57, 57A, 65, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A	F2, F3, 17, 19, 60, 63, 88A
Number of Buses in Peak Hour	E-3 Bishop to Ala Moana; 3 Ala Moana to Alakea F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB Ala Moana to Alakea 20-3 WB Ala Moana to Alakea 55-2 Bishop to Ala Moana; 2 Ala Moana to Alakea 56-3 Bishop to Ala Moana; 3 Ala Moana to Alakea 57-3 Bishop to Ala Moana; 3 Ala Moana to Alakea 57A-1 Bishop to Ala Moana;1 Ala Moana to Alakea 65-3 Bishop to Ala Moana; 3 Ala Moana to Alakea 88A-2 trips Bishop to Alakea in AM	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop	F2-4 Aloha Tower to EB on Ala Moana F3-4 Aloha Tower to EB on Ala Moana 17-6 ea dir Ala Moana 19-3 WB on Ala Moana to Alakea 60-4 terminate via SB Bishop, Aloha Tower, NB Alakea 63-4 terminate via SB Bishop, Aloha Tower, NB Alakea 88A-2 EB Ala Moana from Bishop
Civic Center								
Routes	6, 42, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89	6, 13, 85, 85A, 88, 89
Number of Buses in Peak Hour	6-3 ea dir on Queen 42-3 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South	6-4 ea dir on Queen 13-6 NB on South 85-3 trips NB on South 85A-3 trips NB on South 88-2 trips NB on South 89-2 trips NB on South

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Kaka'ako								
Routes	6	6	6	6	6	6	6	6
Number of Buses in Peak Hour	6-3 ea dir on Ward	6-4 ea dir Ward	6-4 ea dir Ward	6-4 ea dir Ward	6-4 ea dir Ward	6-4 ea dir Ward	6-4 ea dir Ward	6-4 ea dir Ward
Ala Moana Center								
Routes	C, 5, 6, 8, 17, 18, 19, 20, 23, 40/A, 43, 51, 52, 53, 55, 56, 57, 57A, 65, 88A (A, 3, 9 on Kapi'olani; E, F3, 42, 98A on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40/A, 52, 88A (A, 3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40/A, 52, 88A (A, 3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40/A, 52, 88A (A, 3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 7, 8, 9, 17, 18, 23, 40/A, 52, 88A (A, 3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40/A, 52, 88A (3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40/A, 52, 88A (3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)	5, 6, 8, 17, 18, 23, 40/A, 52, 88A (3 on Kapi'olani; F3, and 19 on Ala Moana Blvd.)
Number of Buses in Peak Hour	C-3 EB on Kona, C 5-3 EB on Kona; 3 WB on Kona 6-3 EB on Kona, C 8-4 EB on Kona in AM; 6 in PM, C 17-6 EB on Kona 18-2 EB on Kona, C 19-3 EB on Kona, C 20-3 EB on Kona, C 23-2 EB on Kona, C 40/A-3 EB Kona, C 43-2 EB on Kona, C 51-4 EB on Kona, C 52-3 EB on Kona, C 53-3 EB on Kona, C 55-2 EB on Kona, C 56-3 EB on Kona, C 57-3 EB on Kona, C 57A-1 EB Kona, C 65-3 EB on Kona, C 88A-2 trips EB Kona A-4 ea dir Kapi'olani 3-6 ea dir Kapi'olani 9-2 ea dir Kapi'olani E-3 ea dir Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 7-15 EB Kona 8-15 EB Kona, C 9-4 EB Kona 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C A-6 ea dir Kapi'olani 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 7-15 EB Kona 8-15 EB Kona, C 9-4 EB Kona 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C A-6 ea dir Kapi'olani 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 7-15 EB Kona 8-15 EB Kona, C 9-4 EB Kona 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C A-6 ea dir Kapi'olani 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 7-15 EB Kona 8-15 EB Kona, C 9-4 EB Kona 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C A-6 ea dir Kapi'olani 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 8-4 EB Kona, C 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana 19-4 ea dir Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 8-4 EB Kona, C 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana 19-4 ea dir Ala Moana	5-3 EB on Kona; 3 WB on Kona 6-8 EB on Kona, C 8-4 EB Kona, C 17-6 EB Kona 18-2 EB Kona, C 23-2 EB Kona, C 40/A-3 EB Kona, C 52-3 EB Kona, C 88A-2 EB Kona, C 3-5 ea dir Kapi'olani F3-4 WB Ala Moana; 2 EB Ala Moana 19-4 ea dir Ala Moana

Fixed Guideway Station Locations	Alternative							
	2030 No Build	**2018 First Project (Via Salt Lake)**	**2018 First Project (Via Airport)**	**2030 First Project (Via Salt Lake)**	**2030 First Project (Via Airport)**	**2030 Full Project (Via Salt Lake)**	**2030 Full Project (Via Airport)**	**2030 Full Project (Via Airport & Salt Lake)**
	F3-4 WB Ala Moana; 2 EB Ala Moana 42-3 ea dir Ala Moana 98A-2 EB on Ala Moana	19-4 ea dir Ala Moana	19-4 ea dir Ala Moana	19-4 ea dir Ala Moana	19-4 ea dir Ala Moana			
Convention Center								
Routes	A, B, 2, 3, 9, 13	A, 2, 3, 7, 9	A, 2, 3, 7, 9	A, 2, 3, 7, 9	A, 2, 3, 7, 9	2, 3	2, 3	2, 3
Number of Buses in Peak Hour	A-4 ea dir Kapiʻolani B-4 ea dir Kalākaua 2-6 ea dir Kalākaua 3-6 ea dir Kapiʻolani 9-2 ea dir Kapiʻolani 13-6 ea dir Kalākaua in AM; 4 ea dir Kalākaua in PM	A-6 ea dir Kapiʻolani 2-5 ea dir Kalākaua 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani	A-6 ea dir Kapiʻolani 2-5 ea dir Kalākaua 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani	A-6 ea dir Kapiʻolani 2-5 ea dir Kalākaua 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani	A-6 ea dir Kapiʻolani 2-5 ea dir Kalākaua 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani	2-6 SB Kalākaua; 4 NB Kalākaua 3-5 ea dir Kapiʻolani	2-6 SB Kalākaua; 4 NB Kalākaua 3-5 ea dir Kapiʻolani	2-6 SB Kalākaua; 4 NB Kalākaua 3-5 ea dir Kapiʻolani
McCully								
Routes	A, 3, 9, 18	A, 3, 7, 9, 18	A, 3, 7, 9, 18	A, 3, 7, 9, 18	A, 3, 7, 9, 18	3, 9, 18	3, 9, 18	3, 9, 18
Number of Buses in Peak Hour	A-4 ea dir Kapiʻolani 3-6 ea dir Kapiʻolani 9-2 ea dir Kapiʻolani 18-2 ea dir McCully	A-6 ea dir Kapiʻolani 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani 18-2 ea dir McCully	A-6 ea dir Kapiʻolani 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani 18-2 ea dir McCully	A-6 ea dir Kapiʻolani 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani 18-2 ea dir McCully	A-6 ea dir Kapiʻolani 3-5 ea dir Kapiʻolani 7-15 EB Kapiʻolani;8 WB Kapiʻolani 9-4 ea dir Kapiʻolani 18-2 ea dir McCully	3-5 ea dir Kapiʻolani 9-4 EB McCully to Kapiʻolani 18-2 ea dir McCully	3-5 ea dir Kapiʻolani 9-4 EB McCully to Kapiʻolani 18-2 ea dir McCully	3-5 ea dir Kapiʻolani 9-4 EB McCully to Kapiʻolani 18-2 ea dir McCully
Date Street								
Routes	A, 18	A, 7, 18	A, 7, 18	A, 7, 18	A, 7, 18	9, 18	9, 18	9, 18
Number of Buses in Peak Hour	A-4 ea dir University 18-2 SB University to WB Date; 2 EB Date to NB University	A-6 ea dir University 7-15 NB University; 8 SB University 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	A-6 ea dir University 7-15 NB University; 8 SB University 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	A-6 ea dir University 7-15 NB University; 8 SB University 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	A-6 ea dir University 7-15 NB University; 8 SB University 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	9-4 WB via Date 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	9-4 WB via Date 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U	9-4 WB via Date 18-2 SB via University to Date to McCully; 2 NB via McCully to Date to U

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Mo'ili'ili								
Routes	A, F2, 1, 1L, 6, 18	A, F2, 1, 1L, 6, 7, 18	A, F2, 1, 1L, 6, 7, 18	A, F2, 1, 1L, 6, 7, 18	A, F2, 1, 1L, 6, 7, 18	F2, 1, 1L, 6, 18	F2, 1, 1L, 6, 18	F2, 1, 1L, 6, 18
Number of Buses in Peak Hour	A-4 ea dir University F2-4 EB King to NB University 1-6 ea dir King 1L-3 ea dir King 6-3 EB King to NB University; 3 SB University to WB King 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-4 WB King; 4 EB King 6-4 ea dir University 7-15 NB University; 8 SB University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-4 WB King; 4 EB King 6-4 ea dir University 7-15 NB University; 8 SB University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-6 WB King; 4 EB King 6-4 ea dir University 7-15 NB University; 8 SB University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-6 WB King; 4 EB King 6-4 ea dir University 7-15 NB University; 8 SB University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-6 WB King; 4 EB King 6-4 ea dir University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-6 WB King; 4 EB King 6-4 ea dir University 18-2 ea dir University	A-6 ea dir University F2-4 NB University 1-6 ea dir King 1L-6 WB King; 4 EB King 6-4 ea dir University 18-2 ea dir University
UH Mānoa								
Routes	No routes	No Station	No Station	No Station	No Station	No routes	No routes	No routes
Kālaimoku Street								
Routes	B, E, F3, 2, 4, 8, 13, 19, 20, 22, 23, 42, 98A, 203	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23
Number of Buses in Peak Hour	B-4 WB Kūhiō E-3 WB Kūhiō F3-4 EB Kūhiō 2-6 ea dir Kūhiō 4-4 ea dir Kūhiō 8-4-ea dir Kūhiō in AM; 6 in PM 13-6 ea dir Kūhiō in AM; 4 in PM 19-3 ea dir Kūhiō 20-3 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō 42-3 ea dir Kūhiō 98A-2 EB trips on Kūhiō; reverse in PM 203-2 EB trips on Kūhiō in AM; reverse in PM	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō

Fixed Guideway Station Locations	Alternative							
	2030 No Build	2018 First Project (Via Salt Lake)	2018 First Project (Via Airport)	2030 First Project (Via Salt Lake)	2030 First Project (Via Airport)	2030 Full Project (Via Salt Lake)	2030 Full Project (Via Airport)	2030 Full Project (Via Airport & Salt Lake)
Lili'uokalani Avenue								
Routes	B, E, F3, 2, 4, 8, 13, 19, 20, 22, 23, 42, 98A, 203	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23	F3, 2, 4, 8, 19, 22, 23
Number of Buses in Peak Hour	B-4 WB Kūhiō E-3 WB Kūhiō F3-4 EB Kūhiō 2-6 ea dir Kūhiō 4-4 ea dir Kūhiō 8-4-ea dir Kūhiō in AM; 6 in PM 13-6 ea dir Kūhiō in AM; 4 in PM 19-3 ea dir Kūhiō 20-3 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō 42-3 ea dir Kūhiō 98A-2 EB trips on Kūhiō; reverse in PM 203-2 EB trips on Kūhiō in AM; reverse in PM	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-15 EB Kūhiō; 8 WB 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō	F3-4 EB on Kūhiō; 2 WB 2-6 ea dir Kūhiō 4-3 ea dir Kūhiō 8-4 ea dir Kūhiō 19-4 ea dir Kūhiō 22-1 EB AM; PM 1 EB, 2WB Kūhiō 23-2 ea dir Kūhiō

Appendix C
Screenlines and LOS Worksheets

Table C-1: 2030 with Full Project + Future Extensions—A.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with Full Project Conditions							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume* (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Facility Number of Lanes	Forecast Volume (vph) [a]	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Forecast Volume (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
A. Kapolei Mauka bound																									
Kalaeloa Bl	2	500	**	**	1,020	1,480	1,560	C*	2	790	**	**	1,020	1,480	1,560	C*	770	**	**	1,020	1,480	1,560	C*		
Fort Barrette Rd	2	1,340	**	**	1,020	1,480	1,560	D	2	1,170	**	**	1,020	1,480	1,560	D	1,140	**	**	1,020	1,480	1,560	D		
North-South Rd (future roadway)	NA	NA	NA	NA	NA	NA	NA	NA	3	2,300	**	**	1,590	2,230	2,350	E	2,100	**	**	1,590	2,230	2,350	D		
Total		***1,840***						***D***		***4,260***						***D***	***4,010***						***D***	***NO***	***NO***
Kapolei Makai bound																									
Kalaeloa Bl	2	1,340	**	**	1,020	1,480	1,560	D	2	1,130	**	**	1,020	1,480	1,560	D	1,110	**	**	1,020	1,480	1,560	D		
Fort Barrette Rd	2	1,300	**	**	1,020	1,480	1,560	D	2	1,580	**	**	1,020	1,480	1,560	F	1,510	**	**	1,020	1,480	1,560	E		
North-South Rd (future roadway)	NA	NA	NA	NA	NA	NA	NA	NA	3	2,410	**	**	1,590	2,230	2,350	F	2,410	**	**	1,590	2,230	2,350	F		
Total		***2,640***						***D***		***5,120***						***F***	***5,030***						***E***	***NO***	***NO***
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	3	3,330	1,620	2,630	3,800	4,920	5,590	C	3	4,290	1,620	2,630	3,800	4,920	5,590	D	4,090	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,180	515	839	1,213	1,568	1,783	C	1,230	515	839	1,213	1,568	1,783	D		
Farrington Hwy	1	590	**	200	660	780	810	C	2	500	**	200	1,240	1,560	1,640	C	500	**	200	1,240	1,560	1,640	C		
Fort Weaver Rd (SB)	2	1,440	**	200	1,240	1,560	1,640	D	2	2,040	**	200	1,240	1,560	1,640	F	1,980	**	200	1,240	1,560	1,640	F		
Total		***5,360***						***C***		***8,010***						***D***	***7,800***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	3	4,130	1,620	2,630	3,800	4,920	5,590	D	3	5,080	1,620	2,630	3,800	4,920	5,590	E	4,510	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,530	515	839	1,213	1,568	1,783	D	1,520	515	839	1,213	1,568	1,783	D		
Farrington Hwy	2	210	230	1,390	1,650	1,700	**	A	3	310	**	310	1,920	2,340	2,460	C	270	**	310	1,920	2,340	2,460	B*		
Fort Weaver Rd (NB)	2	3,120	**	200	1,240	1,560	1,640	F	2	3,090	**	200	1,240	1,560	1,640	F	2,940	**	200	1,240	1,560	1,640	F		
Total		***7,460***						***E***		***10,010***						***E***	***9,240***						***E***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	4	6,110	2,210	3,580	5,180	6,710	7,620	D	5	9,280	2,800	4,540	6,570	8,490	9,660	E	9,060	2,800	4,540	6,570	8,490	9,660	E		
Waipahu St	1	360	**	**	440	700	740	C*	1	330	**	**	440	700	740	C*	330	**	**	440	700	740	C*		
Farrington Hwy	3	1,160	**	310	1,920	2,340	2,460	C	4	1,040	**	400	2,530	3,030	3,180	C	970	**	400	2,530	3,030	3,180	C		
Total		***7,630***						***D***		***10,650***						***E***	***10,360***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	4	7,380	2,210	3,580	5,180	6,710	7,620	E	4	7,800	2,210	3,580	5,180	6,710	7,620	F	7,230	2,210	3,580	5,180	6,710	7,620	E		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,670	515	839	1,213	1,568	1,783	E	1,510	515	839	1,213	1,568	1,783	D		
Waipahu St	1	580	**	**	440	700	740	D	1	700	**	**	440	700	740	E	460	**	**	440	700	740	D		
Farrington Hwy	2	1,210	**	200	1,240	1,560	1,640	C	3	1,900	**	310	1,920	2,340	2,460	C	1,660	**	310	1,920	2,340	2,460	C		
Total		***9,170***						***E***		***12,070***						***E***	***10,860***						***E***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	5	6,840	2,800	4,540	6,570	8,490	9,660	D	5	7,930	2,800	4,540	6,570	8,490	9,660	D	7,780	2,800	4,540	6,570	8,490	9,660	D		
Moanalua Rd	2	1,130	**	**	1,020	1,480	1,560	D	2	1,240	**	**	1,020	1,480	1,560	D	1,120	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	970	**	310	1,920	2,340	2,460	C	3	1,080	**	310	1,920	2,340	2,460	C	1,070	**	310	1,920	2,340	2,460	C		
Total		***8,940***						***D***		***10,250***						***D***	***9,970***						***D***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	5	10,140	2,800	4,540	6,570	8,490	9,660	F	5	13,160	2,800	4,540	6,570	8,490	9,660	F	12,340	5,600	9,080	13,140	16,980	19,320	F		
H-1 Fwy HOV	1	1,740	515	839	1,213	1,568	1,783	E	1	1,810	515	839	1,213	1,568	1,783	F	1,560	515	839	1,213	1,568	1,783	D		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,500	515	839	1,213	1,568	1,783	D	1,450	515	839	1,213	1,568	1,783	D		
Moanalua Rd	2	1,390	**	**	1,020	1,480	1,560	D	2	1,480	**	**	1,020	1,480	1,560	E	1,280	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	2,520	**	310	1,920	2,340	2,460	F	3	2,850	**	310	1,920	2,340	2,460	F	2,200	**	310	1,920	2,340	2,460	D		
Total		***17,300***						***F***		***20,800***						***F***	***18,830***						***E***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	4	3,700	2,210	3,580	5,180	6,710	7,620	C	4	4,260	2,210	3,580	5,180	6,710	7,620	C	4,130	2,210	3,580	5,180	6,710	7,620	C		
H-1 Fwy	3	2,460	1,620	2,630	3,800	4,920	5,590	B	4	2,830	2,210	3,580	5,180	6,710	7,620	B	2,740	2,210	3,580	5,180	6,710	7,620	B		
H-1 Fwy HOV	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
H-1 Fwy Future zipper lane	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
Nimitz Hwy	3	1,050	**	310	1,920	2,340	2,460	C	3	1,190	**	310	1,920	2,340	2,460	C	1,140	**	310	1,920	2,340	2,460	C		
Salt Lake Bl	1	330	**	**	440	700	740	C*	2	390	**	**	1,020	1,480	1,560	C*	350	**	**	1,020	1,480	1,560	C*		
Total		***7,540***						***C***		***8,670***						***C***	***8,360***						***C***	***NO***	***NO***
Salt Lake Koko Head bound																									
Moanalua Fwy	2	3,730	1,030	1,680	2,420	3,130	3,560	F	2	3,690	1,030	1,680	2,420	3,130	3,560	F	3,350	1,030	1,680	2,420	3,130	3,560	E		
Moanalua Fwy HOV	1	1,020	515	839	1,213	1,568	1,783	C	1	1,750	515	839	1,213	1,568	1,783	E	1,620	515	839	1,213	1,568	1,783	E		
H-1 Fwy + Shoulder Express	5	7,600	2,800	4,540	6,570	8,490	9,660	D	5	8,270	2,800	4,540	6,570	8,490	9,660	D	7,790	2,800	4,540	6,570	8,490	9,660	D		
H-1 Fwy HOV	1	1,620	515	839	1,213	1,568	1,783	E	1	1,660	515	839	1,213	1,568	1,783	E	1,510	515	839	1,213	1,568	1,783	D		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,520	515	839	1,213	1,568	1,783	D	1,480	515	839	1,213	1,568	1,783	D		
Nimitz Hwy	5	1,420	**	500	3,160	3,790	3,980	C	5	1,770	**	500	3,160	3,790	3,980	C	1,340	**	500	3,160	3,790	3,980	C		
Salt Lake Bl	1	520	**	**	440	700	740	D	2	860	**	**	1,020	1,480	1,560	C*	700	**	**	1,020	1,480	1,560	C*		
Total		***17,420***						***D***		***19,520***						***D***	***17,790***						***D***	***NO***	***NO***

Table C-1: 2030 with Full Project + Future Extensions—A.M. Peak Hour Screenline Impacts Analysis (continued)

F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	2	1,340	**	200	1,240	1,560	1,640	D	3	1,570	**	310	1,920	2,340	2,460	C	1,550	**	310	1,920	2,340	2,460	C		
Dillingham Blvd	2	690	**	200	1,240	1,560	1,640	C	2	560	**	200	1,240	1,560	1,640	C	550	**	200	1,240	1,560	1,640	C		
N King St	2	600	**	**	1,020	1,480	1,560	C*	2	790	**	**	1,020	1,480	1,560	C*	780	**	**	1,020	1,480	1,560	C*		
H-1 Fwy	4	7,300	2,210	3,580	5,180	6,710	7,620	E	4	8,150	2,210	3,580	5,180	6,710	7,620	F	8,060	2,210	3,580	5,180	6,710	7,620	F		
Halona Street	2	1,160	**	**	1,220	1,770	1,870	C*	2	1,180	**	**	1,220	1,770	1,870	C*	1,180	**	**	1,220	1,770	1,870	C*		
School St	2	780	**	**	1,020	1,480	1,560	C*	2	960	**	**	1,020	1,480	1,560	C*	930	**	**	1,020	1,480	1,560	C*		
Total		***11,870***						***D***		***13,210***						***E***	***13,030***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	4	3,210	**	400	2,530	3,030	3,180	F	3	3,430	**	310	1,920	2,340	2,460	F	3,100	**	310	1,920	2,340	2,460	F		
Nimitz Flyover (future facility)	NA	NA	NA	NA	NA	NA	NA	NA	2	1,400	1,030	1,680	2,420	3,130	3,560	B	1,240	1,030	1,680	2,420	3,130	3,560	B		
Dillingham Blvd	2	1,400	**	200	1,240	1,560	1,640	D	2	1,350	**	200	1,240	1,560	1,640	D	1,260	**	200	1,240	1,560	1,640	D		
N King St	2	1,340	**	**	1,020	1,480	1,560	D	2	1,460	**	**	1,020	1,480	1,560	D	1,310	**	**	1,020	1,480	1,560	D		
Olomea St	2	1,950	**	**	1,220	1,770	1,870	F	2	1,950	**	**	1,220	1,770	1,870	F	1,950	**	**	1,220	1,770	1,870	F		
H-1 Fwy	4	9,490	2,210	3,580	5,180	6,710	7,620	F	5	10,790	2,800	4,540	6,570	8,490	9,660	F	10,250	2,800	4,540	6,570	8,490	9,660	F		
School St	2	1,580	**	**	1,020	1,480	1,560	F	2	1,760	**	**	1,020	1,480	1,560	F	1,570	**	**	1,020	1,480	1,560	F		
Total		***18,970***						***F***		***22,140***						***E***	***20,680***						***F***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	3	7,290	1,620	2,630	3,800	4,920	5,590	F	3	7,380	1,620	2,630	3,800	4,920	5,590	F	7,370	1,620	2,630	3,800	4,920	5,590	F		
Beretania St	5	2,790	**	**	3,170	4,450	4,690	C*	5	3,250	**	**	3,170	4,450	4,690	D	3,130	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	4	1,920	**	**	2,110	2,970	3,130	C*	4	2,220	**	**	2,110	2,970	3,130	D	2,190	**	**	2,110	2,970	3,130	D		
Ala Moana Blvd	3	1,800	**	310	1,920	2,340	2,460	C	3	2,150	**	310	1,920	2,340	2,460	D	2,100	**	310	1,920	2,340	2,460	D		
Total		***13,800***						***E***		***15,000***						***E***	***14,790***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	3	5,740	1,620	2,630	3,800	4,920	5,590	F	4	6,980	2,210	3,580	5,180	6,710	7,620	E	6,810	2,210	3,580	5,180	6,710	7,620	E		
Kinau St	3	1,250	**	**	1,900	2,670	2,810	C*	3	1,070	**	**	1,900	2,670	2,810	C*	1,040	**	**	1,900	2,670	2,810	C*		
S King St	5	2,080	**	**	3,170	4,450	4,690	C*	5	2,850	**	**	3,170	4,450	4,690	C*	2,220	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	2	710	**	**	1,020	1,480	1,560	C*	2	820	**	**	1,020	1,480	1,560	C*	770	**	**	1,020	1,480	1,560	C*		
Ala Moana Blvd	3	1,610	**	310	1,920	2,340	2,460	C	3	1,740	**	310	1,920	2,340	2,460	C	1,520	**	310	1,920	2,340	2,460	C		
Total		***11,390***						***E***		***13,460***						***D***	***12,360***						***D***	***NO***	***NO***
H. Manoa-Palolo / Ala Wai Canal 'Ewa bound																									
Ala Moana Blvd	3	1,460	**	310	1,920	2,340	2,460	C	3	1,580	**	310	1,920	2,340	2,460	C	1,520	**	310	1,920	2,340	2,460	C		
Kalakaua Ave	2	1,220	**	**	1,020	1,480	1,560	D	2	1,260	**	**	1,020	1,480	1,560	D	1,280	**	**	1,020	1,480	1,560	D		
McCully St (NB)	2	680	**	**	1,020	1,480	1,560	C*	2	680	**	**	1,020	1,480	1,560	C*	650	**	**	1,020	1,480	1,560	C*		
Date St	2	560	**	**	1,020	1,480	1,560	C*	2	620	**	**	1,020	1,480	1,560	C*	600	**	**	1,020	1,480	1,560	C*		
Kapiolani Blvd	3	3,090	**	**	1,590	2,230	2,350	F	3	3,340	**	**	1,590	2,230	2,350	F	3,360	**	**	1,590	2,230	2,350	F		
Old Waialae Rd	3	1,540	**	**	1,900	2,670	2,810	C*	3	1,620	**	**	1,900	2,670	2,810	C*	1,600	**	**	1,900	2,670	2,810	C*		
Dole St	2	820	**	**	1,020	1,480	1,560	C*	2	950	**	**	1,020	1,480	1,560	C*	960	**	**	1,020	1,480	1,560	C*		
H-1	3	5,570	1,620	2,630	3,800	4,920	5,590	E	3	5,740	1,620	2,630	3,800	4,920	5,590	F	5,730	1,620	2,630	3,800	4,920	5,590	F		
Total		***14,940***						***D***		***15,790***						***E***	***15,700***						***E***	***NO***	***NO***
Manoa-Palolo / Ala Wai Canal Koko Head bound																									
Ala Moana Blvd	3	940	**	310	1,920	2,340	2,460	C	3	1,010	**	310	1,920	2,340	2,460	C	930	**	310	1,920	2,340	2,460	C		
Kalakaua Ave	3	1,110	**	**	1,590	2,230	2,350	C*	3	1,190	**	**	1,590	2,230	2,350	C*	1,140	**	**	1,590	2,230	2,350	C*		
McCully St (SB)	2	970	**	**	1,020	1,480	1,560	C*	2	1,010	**	**	1,020	1,480	1,560	C*	950	**	**	1,020	1,480	1,560	C*		
Date St	1	320	**	**	440	700	740	C*	1	460	**	**	440	700	740	D	420	**	**	440	700	740	C*		
Kapiolani Blvd	2	520	**	**	1,020	1,480	1,560	C*	2	600	**	**	1,020	1,480	1,560	C*	580	**	**	1,020	1,480	1,560	C*		
S King St	2	1,530	**	**	1,220	1,770	1,870	D	2	1,770	**	**	1,220	1,770	1,870	D	1,680	**	**	1,220	1,770	1,870	D		
Dole St	2	650	**	**	1,020	1,480	1,560	C*	2	660	**	**	1,020	1,480	1,560	C*	660	**	**	1,020	1,480	1,560	C*		
H-1	3	5,090	1,620	2,630	3,800	4,920	5,590	E	3	6,020	1,620	2,630	3,800	4,920	5,590	F	6,000	1,620	2,630	3,800	4,920	5,590	F		
Total		***11,130***						***D***		***12,720***						***E***	***12,360***						***E***	***NO***	***NO***

Notes:
[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005).
[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table C-2: 2030 with Full Project + Future Extensions—P.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with Full Project Conditions							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume (vph) [a]	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Facility Number of Lanes	Forecast Volume (vph)	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Forecast Volume (vph)	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
A. Kapolei Mauka bound																									
Kalaeloa Bl	**2**	1,360	**	**	1,020	1,480	1,560	D	2	1,260	**	**	1,020	1,480	1,560	D	1,280	**	**	1,020	1,480	1,560	D		
Fort Barrette Rd	**2**	1,190	**	**	1,020	1,480	1,560	D	2	1,480	**	**	1,020	1,480	1,560	E	1,470	**	**	1,020	1,480	1,560	D		
North-South Rd (future roadway)	**NA**	NA	NA	NA	NA	NA	NA	NA	3	1,420	**	**	1,590	2,230	2,350	C*	1,500	**	**	1,590	2,230	2,350	C*		
Total		***2,550***						***D***		***4,160***						***D***	***4,250***						***D***	***NO***	***NO***
Kapolei Makai bound																									
Kalaeloa Bl	**2**	400	**	**	1,020	1,480	1,560	C*	2	400	**	**	1,020	1,480	1,560	C*	400	**	**	1,020	1,480	1,560	C*		
Fort Barrette Rd	**2**	1,280	**	**	1,020	1,480	1,560	D	2	1,200	**	**	1,020	1,480	1,560	D	1,080	**	**	1,020	1,480	1,560	D		
North-South Rd (future roadway)	**NA**	NA	NA	NA	NA	NA	NA	NA	3	1,410	**	**	1,590	2,230	2,350	C*	1,350	**	**	1,590	2,230	2,350	C*		
Total		***1,680***						***D***		***3,010***						***C***	***2,830***						***C***	***NO***	***NO***
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	**3**	4,110	1,620	2,630	3,800	4,920	5,590	D	3	4,680	1,620	2,630	3,800	4,920	5,590	D	4,170	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	**NA**	NA	515	839	1,213	1,568	1,783	NA	1	1,100	515	839	1,213	1,568	1,783	C	1,100	515	839	1,213	1,568	1,783	C		
Farrington Hwy	**1**	310	**	200	660	780	810	C	2	510	**	200	1,240	1,560	1,640	C	470	**	200	1,240	1,560	1,640	C		
Fort Weaver Rd (SB)	**2**	2,400	**	200	1,240	1,560	1,640	F	2	2,410	**	200	1,240	1,560	1,640	F	2,290	**	200	1,240	1,560	1,640	F		
Total		***6,820***						***E***		***8,700***						***D***	***8,030***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	**3**	4,080	1,620	2,630	3,800	4,920	5,590	D	3	6,120	1,620	2,630	3,800	4,920	5,590	F	5,980	1,620	2,630	3,800	4,920	5,590	F		
H-1 Fwy future HOV	**NA**	NA	515	839	1,213	1,568	1,783	NA	1	990	515	839	1,213	1,568	1,783	C	980	515	839	1,213	1,568	1,783	C		
Farrington Hwy	**2**	620	230	1,390	1,650	1,700	**	B	3	550	**	310	1,920	2,340	2,460	C	480	**	310	1,920	2,340	2,460	C		
Fort Weaver Rd (NB)	**2**	2,060	**	200	1,240	1,560	1,640	F	2	2,620	**	200	1,240	1,560	1,640	F	2,580	**	200	1,240	1,560	1,640	F		
Total		***6,760***						***D***		***10,280***						***F***	***10,020***						***F***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	**4**	6,710	2,210	3,580	5,180	6,710	7,620	E	4	9,010	2,210	3,580	5,180	6,710	7,620	F	8,440	2,210	3,580	5,180	6,710	7,620	F		
H-1 Fwy future HOV	**NA**	NA	515	839	1,213	1,568	1,783	NA	1	490	515	839	1,213	1,568	1,783	A	430	515	839	1,213	1,568	1,783	A		
Waipahu St	**1**	530	**	**	440	700	740	D	1	180	**	**	440	700	740	C*	150	**	**	440	700	740	C*		
Farrington Hwy	**3**	1,280	**	310	1,920	2,340	2,460	C	4	1,450	**	400	2,530	3,030	3,180	C	1,300	**	400	2,530	3,030	3,180	C		
Total		***8,520***						***E***		***11,130***						***E***	***10,310***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	**4**	4,790	2,210	3,580	5,180	6,710	7,620	C	5	6,960	2,800	4,540	6,570	8,490	9,660	D	6,930	2,800	4,540	6,570	8,490	9,660	D		
Waipahu St	**1**	420	**	**	440	700	740	C*	1	410	**	**	440	700	740	C*	390	**	**	440	700	740	C*		
Farrington Hwy	**2**	790	**	200	1,240	1,560	1,640	C	3	1,010	**	310	1,920	2,340	2,460	C	920	**	310	1,920	2,340	2,460	C		
Total		***6,000***						***C***		***8,380***						***D***	***8,240***						***D***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	**5**	8,410	2,800	4,540	6,570	8,490	9,660	D	4	9,040	2,210	3,580	5,180	6,710	7,620	F	8,640	2,210	3,580	5,180	6,710	7,620	F		
H-1 Fwy HOV	**1**	1,530	515	839	1,213	1,568	1,783	D	1	1,720	515	839	1,213	1,568	1,783	E	1,430	515	839	1,213	1,568	1,783	D		
H-1 Fwy Future Zipper Lane	**NA**	NA	515	839	1,213	1,568	1,783	NA	1	950	515	839	1,213	1,568	1,783	C	800	515	839	1,213	1,568	1,783	B		
Moanalua Rd	**2**	2,020	**	**	1,020	1,480	1,560	F	2	2,250	**	**	1,020	1,480	1,560	F	1,880	**	**	1,020	1,480	1,560	F		
Kamehameha Hwy	**3**	2,110	**	310	1,920	2,340	2,460	D	3	2,190	**	310	1,920	2,340	2,460	D	1,990	**	310	1,920	2,340	2,460	D		
Total		***14,070***						***D***		***16,150***						***E***	***14,740***						***E***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	**4**	5,740	2,210	3,580	5,180	6,710	7,620	D	5	8,060	2,800	4,540	6,570	8,490	9,660	D	7,850	2,800	4,540	6,570	8,490	9,660	D		
H-1 Fwy HOV (Existing only)	**1**	1,360	515	839	1,213	1,568	1,783	D	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
Moanalua Rd	**2**	870	**	**	1,020	1,480	1,560	C*	2	970	**	**	1,020	1,480	1,560	C*	940	**	**	1,020	1,480	1,560	C*		
Kamehameha Hwy	**3**	1,500	**	310	1,920	2,340	2,460	C	3	1,780	**	310	1,920	2,340	2,460	C	1,700	**	310	1,920	2,340	2,460	C		
Total		***9,470***						***D***		***10,810***						***D***	***10,490***						***D***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	**4**	5,900	2,210	3,580	5,180	6,710	7,620	D	4	5,990	2,210	3,580	5,180	6,710	7,620	D	5,740	2,210	3,580	5,180	6,710	7,620	D		
H-1 Fwy	**4**	3,550	2,210	3,580	5,180	6,710	7,620	B	4	4,200	2,210	3,580	5,180	6,710	7,620	C	3,670	2,210	3,580	5,180	6,710	7,620	C		
H-1 Fwy HOV	**1**	1,410	515	839	1,213	1,568	1,783	D	1	1,210	515	839	1,213	1,568	1,783	C	1,070	515	839	1,213	1,568	1,783	C		
H-1 Fwy Future zipper lane	**NA**	NA	515	839	1,213	1,568	1,783	NA	1	810	515	839	1,213	1,568	1,783	B	660	515	839	1,213	1,568	1,783	B		
Nimitz Hwy	**3**	2,460	**	310	1,920	2,340	2,460	F	3	2,530	**	310	1,920	2,340	2,460	F	2,390	**	310	1,920	2,340	2,460	E		
Salt Lake Bl	**1**	730	**	**	440	700	740	E	2	870	**	**	1,020	1,480	1,560	C*	810	**	**	1,020	1,480	1,560	C*		
Total		***14,050***						***D***		***15,610***						***D***	***14,340***						***D***	***NO***	***NO***
Salt Lake Koko Head bound																									
Moanalua Fwy	**2**	3,330	1,030	1,680	2,420	3,130	3,560	E	2	2,910	1,030	1,680	2,420	3,130	3,560	D	2,650	1,030	1,680	2,420	3,130	3,560	D		
Moanalua Fwy HOV	**1**	240	515	839	1,213	1,568	1,783	A	1	960	515	839	1,213	1,568	1,783	C	1,040	515	839	1,213	1,568	1,783	C		
H-1 Fwy + Shoulder Express	**4**	4,500	2,210	3,580	5,180	6,710	7,620	C	4	3,970	2,210	3,580	5,180	6,710	7,620	C	4,280	2,210	3,580	5,180	6,710	7,620	C		
H-1 Fwy HOV	**1**	330	515	839	1,213	1,568	1,783	A	1	1,070	515	839	1,213	1,568	1,783	C	1,030	515	839	1,213	1,568	1,783	C		
Nimitz Hwy	**5**	1,500	**	500	3,160	3,790	3,980	C	5	1,600	**	500	3,160	3,790	3,980	C	1,560	**	500	3,160	3,790	3,980	C		
Salt Lake Bl	**1**	350	**	**	440	700	740	C*	2	410	**	**	1,020	1,480	1,560	C*	420	**	**	1,020	1,480	1,560	C*		
Total		***10,250***						***D***		***10,920***						***C***	***10,980***						***C***	***NO***	***NO***

Table C-2: 2030 with Full Project + Future Extensions—P.M. Peak Hour Screenline Impacts Analysis (continued)

F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	**3**	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,750	**	*310*	*1,920*	*2,340*	*2,460*	C	1,520	**	*310*	*1,920*	*2,340*	*2,460*	C		
Nimitz Flyover (Future Facility)	**NA**	NA	*NA*	*NA*	*NA*	*NA*	*NA*	NA	2	880	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A	770	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A		
Dillingham Blvd	**2**	1,460	**	*200*	*1,240*	*1,560*	*1,640*	D	2	1,140	**	*200*	*1,240*	*1,560*	*1,640*	C	900	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,340	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,320	**	**	*1,020*	*1,480*	*1,560*	D		
H-1 Fwy	**4**	7,570	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	4	8,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,190	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
Halona St	**2**	1,800	**	**	*1,220*	*1,770*	*1,870*	E	2	1,740	**	**	*1,220*	*1,770*	*1,870*	D	1,720	**	**	*1,220*	*1,770*	*1,870*	D		
School St	**2**	1,220	**	**	*1,020*	*1,480*	*1,560*	D	2	1,370	**	**	*1,020*	*1,480*	*1,560*	D	1,260	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***15,170***						***E***		***16,710***						***E***	***15,680***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	**3**	2,770	**	*310*	*1,920*	*2,340*	*2,460*	F	3	3,520	**	*310*	*1,920*	*2,340*	*2,460*	F	3,280	**	*310*	*1,920*	*2,340*	*2,460*	F		
Dillingham Blvd	**2**	1,080	**	*200*	*1,240*	*1,560*	*1,640*	C	2	1,020	**	*200*	*1,240*	*1,560*	*1,640*	C	1,000	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,110	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,430	**	**	*1,020*	*1,480*	*1,560*	D		
Olomea St	**2**	1,670	**	**	*1,220*	*1,770*	*1,870*	D	2	1,670	**	**	*1,220*	*1,770*	*1,870*	D	1,670	**	**	*1,220*	*1,770*	*1,870*	D		
H-1 Fwy	**4**	7,320	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	5	8,050	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,970	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
School St	**2**	990	**	**	*1,020*	*1,480*	*1,560*	C*	2	1,150	**	**	*1,020*	*1,480*	*1,560*	D	1,160	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***14,940***						***E***		***16,880***						***D***	***16,510***						***D***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	**3**	6,790	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	3	6,970	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	6,890	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F		
Beretania St	**5**	2,510	**	**	*3,170*	*4,450*	*4,690*	C*	5	3,040	**	**	*3,170*	*4,450*	*4,690*	C*	2,810	**	**	*3,170*	*4,450*	*4,690*	C*		
Kapiolani Blvd	**2**	1,420	**	**	*1,020*	*1,480*	*1,560*	D	2	1,570	**	**	*1,020*	*1,480*	*1,560*	F	1,420	**	**	*1,020*	*1,480*	*1,560*	D		
Ala Moana Blvd	**3**	1,650	**	*310*	*1,920*	*2,340*	*2,460*	C	3	2,020	**	*310*	*1,920*	*2,340*	*2,460*	D	1,760	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***12,370***						***E***		***13,600***						***E***	***12,880***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	**3**	6,150	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	4	7,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	7,320	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E		
Kinau St	**4**	1,870	**	**	*2,540*	*3,560*	*3,750*	C*	4	1,810	**	**	*2,540*	*3,560*	*3,750*	C*	1,760	**	**	*2,540*	*3,560*	*3,750*	C*		
S King St	**6**	3,370	**	**	*3,800*	*5,340*	*5,630*	C*	6	3,450	**	**	*3,800*	*5,340*	*5,630*	C*	3,360	**	**	*3,800*	*5,340*	*5,630*	C*		
Kapiolani Blvd	**4**	1,840	**	**	*2,110*	*2,970*	*3,130*	C*	4	2,370	**	**	*2,110*	*2,970*	*3,130*	D	2,240	**	**	*2,110*	*2,970*	*3,130*	D		
Ala Moana Blvd	**3**	*2,120*	**	*310*	*1,920*	*2,340*	*2,460*	*D*	*3*	*2,330*	**	*310*	*1,920*	*2,340*	*2,460*	*D*	*2,260*	**	*310*	*1,920*	*2,340*	*2,460*	*D*		
Total		***15,350***						***D***		***17,330***						***D***	***16,940***						***D***	***NO***	***NO***
H. Manoa-Palolo / Ala Wai Canal 'Ewa bound																									
Ala Moana Blvd	**3**	1,420	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,730	**	*310*	*1,920*	*2,340*	*2,460*	C	1,520	**	*310*	*1,920*	*2,340*	*2,460*	C		
Kalakaua Ave	**2**	1,050	**	**	*1,020*	*1,480*	*1,560*	D	2	1,080	**	**	*1,020*	*1,480*	*1,560*	D	1,080	**	**	*1,020*	*1,480*	*1,560*	D		
McCully St (NB)	**2**	1,140	**	**	*1,020*	*1,480*	*1,560*	D	2	1,160	**	**	*1,020*	*1,480*	*1,560*	D	1,090	**	**	*1,020*	*1,480*	*1,560*	D		
Date St	**1**	580	**	**	*440*	*700*	*740*	D	1	710	**	**	*440*	*700*	*740*	E	700	**	**	*440*	*700*	*740*	E		
Kapiolani Blvd	**3**	1,260	**	**	*1,590*	*2,230*	*2,350*	C*	3	1,320	**	**	*1,590*	*2,230*	*2,350*	C*	1,320	**	**	*1,590*	*2,230*	*2,350*	C*		
Old Waialae Rd	**3**	1,160	**	**	*1,900*	*2,670*	*2,810*	C*	3	1,230	**	**	*1,900*	*2,670*	*2,810*	C*	1,210	**	**	*1,900*	*2,670*	*2,810*	C*		
Dole St	**2**	670	**	**	*1,020*	*1,480*	*1,560*	C*	2	690	**	**	*1,020*	*1,480*	*1,560*	C*	690	**	**	*1,020*	*1,480*	*1,560*	C*		
H-1	3	5,500	1,620	2,630	3,800	4,920	5,590	E	3	5,970	1,620	2,630	3,800	4,920	5,590	F	5,880	1,620	2,630	3,800	4,920	5,590	F		
Total		***12,780***						***D***		***13,890***						***E***	***13,490***						***E***	***NO***	***NO***
Manoa-Palolo / Ala Wai Canal Koko Head bound																									
Ala Moana Blvd	**3**	1,570	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,750	**	*310*	*1,920*	*2,340*	*2,460*	C	1,660	**	*310*	*1,920*	*2,340*	*2,460*	C		
Kalakaua Ave	**3**	1,870	**	**	*1,590*	*2,230*	*2,350*	D	3	1,990	**	**	*1,590*	*2,230*	*2,350*	D	1,970	**	**	*1,590*	*2,230*	*2,350*	D		
McCully St (SB)	**2**	870	**	**	*1,020*	*1,480*	*1,560*	C*	2	920	**	**	*1,020*	*1,480*	*1,560*	C*	900	**	**	*1,020*	*1,480*	*1,560*	C*		
Date St	**2**	640	**	**	*1,020*	*1,480*	*1,560*	C*	2	750	**	**	*1,020*	*1,480*	*1,560*	C*	770	**	**	*1,020*	*1,480*	*1,560*	C*		
Kapiolani Blvd	**2**	2,140	**	**	*1,020*	*1,480*	*1,560*	F	2	2,280	**	**	*1,020*	*1,480*	*1,560*	F	2,290	**	**	*1,020*	*1,480*	*1,560*	F		
S King St	**2**	2,400	**	**	*1,220*	*1,770*	*1,870*	F	2	2,370	**	**	*1,020*	*1,480*	*1,560*	F	2,360	**	**	*1,020*	*1,480*	*1,560*	F		
Dole St	**2**	960	**	**	*1,020*	*1,480*	*1,560*	C*	2	1,000	**	**	*1,020*	*1,480*	*1,560*	C*	970	**	**	*1,020*	*1,480*	*1,560*	C*		
H-1	**3**	*5,890*	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	3	*6,550*	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	*F*	*6,470*	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	*F*		
Total		***16,340***						***E***		***17,610***						***E***	***17,390***						***E***	***NO***	***NO***

Notes:

[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005). Peak hour volumes for the HOV and zipper facilities on the H-1 Freeway were estimated based on Year 2005 Travel Demand Forecasting Model.

[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.

* The reported level of service "C*" means C or better and "B*" means B or better.

** Level of Service thresholds not reported due to type of facility.

Table C-3: 2030 with Salt Lake Alternative—A.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with First Project Salt Lake Option							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume* (vph)	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Facility Number of Lanes	Forecast Volume (vph) [a]	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Forecast Volume (vph)	*Maximum Volume Threshold [b]* A	B	C	D	E	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	3	3,330	1,620	2,630	3,800	4,920	5,590	C	3	4,290	1,620	2,630	3,800	4,920	5,590	D	4,180	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,180	515	839	1,213	1,568	1,783	C	1,190	515	839	1,213	1,568	1,783	C		
Farrington Hwy	1	590	**	200	660	780	810	C	2	500	**	200	1,240	1,560	1,640	C	500	**	200	1,240	1,560	1,640	C		
Fort Weaver Rd (SB)	2	1,440	**	200	1,240	1,560	1,640	D	2	2,040	**	200	1,240	1,560	1,640	F	1,990	**	200	1,240	1,560	1,640	F		
Total		***5,360***						***C***		***8,010***						***D***	***7,860***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	3	4,130	1,620	2,630	3,800	4,920	5,590	D	3	5,080	1,620	2,630	3,800	4,920	5,590	E	4,590	1,620	2,630	3,800	4,920	5,590	E		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,530	515	839	1,213	1,568	1,783	D	1,490	515	839	1,213	1,568	1,783	D		
Farrington Hwy	2	210	230	1,390	1,650	1,700	**	A	3	310	**	310	1,920	2,340	2,460	C	280	**	310	1,920	2,340	2,460	B*		
Fort Weaver Rd (NB)	2	3,120	**	200	1,240	1,560	1,640	F	2	3,090	**	200	1,240	1,560	1,640	F	2,920	**	200	1,240	1,560	1,640	F		
Total		***7,460***						***E***		***10,010***						***E***	***9,280***						***E***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	4	6,110	2,210	3,580	5,180	6,710	7,620	D	5	9,280	2,800	4,540	6,570	8,490	9,660	E	9,160	2,800	4,540	6,570	8,490	9,660	E		
Waipahu St	1	360	**	**	440	700	740	C*	1	330	**	**	440	700	740	C*	330	**	**	440	700	740	C*		
Farrington Hwy	3	1,160	**	310	1,920	2,340	2,460	C	4	1,040	**	400	2,530	3,030	3,180	C	990	**	400	2,530	3,030	3,180	C		
Total		***7,630***						***D***		***10,650***						***E***	***10,480***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	4	7,380	2,210	3,580	5,180	6,710	7,620	E	4	7,800	2,210	3,580	5,180	6,710	7,620	F	7,360	2,210	3,580	5,180	6,710	7,620	E		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,670	515	839	1,213	1,568	1,783	E	1,520	515	839	1,213	1,568	1,783	D		
Waipahu St	1	580	**	**	440	700	740	D	1	700	**	**	440	700	740	E	460	**	**	440	700	740	D		
Farrington Hwy	2	1,210	**	200	1,240	1,560	1,640	C	3	1,900	**	310	1,920	2,340	2,460	C	1,700	**	310	1,920	2,340	2,460	C		
Total		***9,170***						***E***		***12,070***						***E***	***11,040***						***E***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	5	6,841	2,800	4,540	6,570	8,490	9,660	D	5	7,930	2,800	4,540	6,570	8,490	9,660	D	7,850	2,800	4,540	6,570	8,490	9,660	D		
Moanalua Rd	2	1,130	**	**	1,020	1,480	1,560	D	2	1,240	**	**	1,020	1,480	1,560	D	1,150	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	970	**	310	1,920	2,340	2,460	C	3	1,080	**	310	1,920	2,340	2,460	C	1,040	**	310	1,920	2,340	2,460	C		
Total		***8,950***						***D***		***10,250***						***D***	***10,030***						***D***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	5	10,140	2,800	4,540	6,570	8,490	9,660	F	5	13,160	2,800	4,540	6,570	8,490	9,660	F	12,170	515	839	1,213	1,568	1,783	F		
H-1 Fwy HOV	1	1,740	515	839	1,213	1,568	1,783	E	1	1,810	515	839	1,213	1,568	1,783	F	1,640	515	839	1,213	1,568	1,783	E		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,500	515	839	1,213	1,568	1,783	D	1,460	515	839	1,213	1,568	1,783	D		
Moanalua Rd	2	1,390	**	**	1,020	1,480	1,560	D	2	1,480	**	**	1,020	1,480	1,560	E	1,290	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	2,520	**	310	1,920	2,340	2,460	F	3	2,850	**	310	1,920	2,340	2,460	F	2,350	**	310	1,920	2,340	2,460	E		
Total		***17,300***						***F***		***20,800***						***F***	***18,910***						***F***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	4	3,700	2,210	3,580	5,180	6,710	7,620	C	4	4,260	2,210	3,580	5,180	6,710	7,620	C	4,140	2,210	3,580	5,180	6,710	7,620	C		
H-1 Fwy	3	2,460	1,620	2,630	3,800	4,920	5,590	B	4	2,830	2,210	3,580	5,180	6,710	7,620	B	2,730	2,210	3,580	5,180	6,710	7,620	B		
H-1 Fwy HOV	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
H-1 Fwy Future zipper lane	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
Nimitz Hwy	3	1,050	**	310	1,920	2,340	2,460	C	3	1,190	**	310	1,920	2,340	2,460	C	1,160	**	310	1,920	2,340	2,460	C		
Salt Lake Bl	1	330	**	**	440	700	740	C*	2	390	**	**	1,020	1,480	1,560	C*	360	**	**	1,020	1,480	1,560	C*		
Total		***7,550***						***C***		***8,670***						***C***	***8,390***						***C***	***NO***	***NO***
Salt Lake Koko Head bound																									
Moanalua Fwy	2	3,730	1,030	1,680	2,420	3,130	3,560	F	2	3,690	1,030	1,680	2,420	3,130	3,560	F	3,420	1,030	1,680	2,420	3,130	3,560	E		
Moanalua Fwy HOV	1	1,020	515	839	1,213	1,568	1,783	C	1	1,750	515	839	1,213	1,568	1,783	E	1,630	515	839	1,213	1,568	1,783	E		
H-1 Fwy + Shoulder Express (1 lane)	5	7,600	2,800	4,540	6,570	8,490	9,660	D	5	8,270	2,800	4,540	6,570	8,490	9,660	D	7,800	2,800	4,540	6,570	8,490	9,660	D		
H-1 Fwy HOV (1 lane)	1	1,620	515	839	1,213	1,568	1,783	E	1	1,660	515	839	1,213	1,568	1,783	E	1,550	515	839	1,213	1,568	1,783	D		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,520	515	839	1,213	1,568	1,783	D	1,430	515	839	1,213	1,568	1,783	D		
Nimitz Hwy	5	1,420	**	500	3,160	3,790	3,980	C	5	1,770	**	500	3,160	3,790	3,980	C	1,400	**	500	3,160	3,790	3,980	C		
Salt Lake Bl	1	520	**	**	440	700	740	D	2	860	**	**	1,020	1,480	1,560	C*	690	**	**	1,020	1,480	1,560	C*		
Total		***17,430***						***D***		***19,520***						***D***	***17,920***						***D***	***NO***	***NO***

Table C-3: 2030 with Salt Lake Alternative—A.M. Peak Hour Screenline Impacts Analysis (continued)

F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	2	1,340	**	200	1,240	1,560	1,640	D	3	1,570	**	310	1,920	2,340	2,460	C	1,580	**	310	1,920	2,340	2,460	C		
Dillingham Blvd	2	690	**	200	1,240	1,560	1,640	C	2	560	**	200	1,240	1,560	1,640	C	550	**	200	1,240	1,560	1,640	C		
N King St	2	600	**	**	1,020	1,480	1,560	C*	2	790	**	**	1,020	1,480	1,560	C*	770	**	**	1,020	1,480	1,560	C*		
H-1 Fwy	4	7,300	2,210	3,580	5,180	6,710	7,620	E	4	8,150	2,210	3,580	5,180	6,710	7,620	F	8,090	2,210	3,580	5,180	6,710	7,620	F		
Halona Street	2	1,160	**	**	1,220	1,770	1,870	C*	2	1,180	**	**	1,220	1,770	1,870	C*	1,180	**	**	1,220	1,770	1,870	C*		
School St	2	780	**	**	1,020	1,480	1,560	C*	2	960	**	**	1,020	1,480	1,560	C*	920	**	**	1,020	1,480	1,560	C*		
Total		***11,880***						***D***		***13,210***						***E***	***13,090***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	4	3,210	**	400	2,530	3,030	3,180	F	3	3,430	**	310	1,920	2,340	2,460	F	3,150	**	310	1,920	2,340	2,460	F		
Nimitz Flyover (future facility)	NA	NA	NA	NA	NA	NA	NA	NA	2	1,400	1,030	1,680	2,420	3,130	3,560	B	1,310	1,030	1,680	2,420	3,130	3,560	B		
Dillingham Blvd	2	1,400	**	200	1,240	1,560	1,640	D	2	1,350	**	200	1,240	1,560	1,640	D	1,220	**	200	1,240	1,560	1,640	C		
N King St	2	1,340	**	**	1,020	1,480	1,560	D	2	1,460	**	**	1,020	1,480	1,560	D	1,320	**	**	1,020	1,480	1,560	D		
Olomea St	2	1,950	**	**	1,220	1,770	1,870	F	2	1,950	**	**	1,220	1,770	1,870	F	1,950	**	**	1,220	1,770	1,870	F		
H-1 Fwy	4	9,490	2,210	3,580	5,180	6,710	7,620	F	5	10,790	2,800	4,540	6,570	8,490	9,660	F	10,260	2,800	4,540	6,570	8,490	9,660	F		
School St	2	1,580	**	**	1,020	1,480	1,560	F	2	1,760	**	**	1,020	1,480	1,560	F	1,550	**	**	1,020	1,480	1,560	E		
Total		***18,970***						***F***		***22,140***						***E***	***20,760***						***E***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	3	7,290	1,620	2,630	3,800	4,920	5,590	F	3	7,380	1,620	2,630	3,800	4,920	5,590	F	7,380	1,620	2,630	3,800	4,920	5,590	F		
Beretania St	5	2,790	**	**	3,170	4,450	4,690	C*	5	3,250	**	**	3,170	4,450	4,690	D	3,160	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	4	1,920	**	**	2,110	2,970	3,130	C*	4	2,220	**	**	2,110	2,970	3,130	D	2,200	**	**	2,110	2,970	3,130	D		
Ala Moana Blvd	3	1,800	**	310	1,920	2,340	2,460	C	3	2,150	**	310	1,920	2,340	2,460	D	2,150	**	310	1,920	2,340	2,460	D		
Total		***13,800***						***E***		***15,000***						***E***	***14,890***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	3	5,740	1,620	2,630	3,800	4,920	5,590	F	4	6,980	2,210	3,580	5,180	6,710	7,620	E	6,800	2,210	3,580	5,180	6,710	7,620	E		
Kinau St	3	1,250	**	**	1,900	2,670	2,810	C*	3	1,070	**	**	1,900	2,670	2,810	C*	1,080	**	**	1,900	2,670	2,810	C*		
S King St	5	2,080	**	**	3,170	4,450	4,690	C*	5	2,850	**	**	3,170	4,450	4,690	C*	2,340	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	2	710	**	**	1,020	1,480	1,560	C*	2	820	**	**	1,020	1,480	1,560	C*	780	**	**	1,020	1,480	1,560	C*		
Ala Moana Blvd	3	1,610	**	310	1,920	2,340	2,460	C	3	1,740	**	310	1,920	2,340	2,460	C	1,560	**	310	1,920	2,340	2,460	C		
Total		***11,390***						***E***		***13,460***						***D***	***12,560***						***D***	***NO***	***NO***

Notes:

[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005).

[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.

* The reported level of service "C*" means C or better and "B*" means B or better.

** Level of Service thresholds not reported due to type of facility.

Table C-4: 2030 with Salt Lake Alternative—P.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with First Project Salt Lake Option)							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume (vph) [a]	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Facility Number of Lanes	Forecast Volume (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Forecast Volume (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	**3**	4,110	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	3	4,680	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	4,270	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	1,100	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,110	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Farrington Hwy	**1**	310	**	*200*	*660*	*780*	*810*	C	2	510	**	*200*	*1,240*	*1,560*	*1,640*	C	450	**	*200*	*1,240*	*1,560*	*1,640*	C		
Fort Weaver Rd (SB)	**2**	2,400	**	*200*	*1,240*	*1,560*	*1,640*	F	2	2,410	**	*200*	*1,240*	*1,560*	*1,640*	F	2,310	**	*200*	*1,240*	*1,560*	*1,640*	F		
Total		***6,820***						***E***		***8,700***						***D***	***8,140***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	**3**	4,080	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	3	6,120	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	6,060	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	990	*515*	*839*	*1,213*	*1,568*	*1,783*	C	930	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Farrington Hwy	**2**	620	*230*	*1,390*	*1,650*	*1,700*	**	B	3	550	**	*310*	*1,920*	*2,340*	*2,460*	C	510	**	*310*	*1,920*	*2,340*	*2,460*	C		
Fort Weaver Rd (NB)	**2**	2,060	**	*200*	*1,240*	*1,560*	*1,640*	F	2	2,620	**	*200*	*1,240*	*1,560*	*1,640*	F	2,540	**	*200*	*1,240*	*1,560*	*1,640*	F		
Total		***6,760***						***D***		***10,280***						***F***	***10,040***						***F***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	**4**	6,710	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	4	9,010	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,550	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	490	*515*	*839*	*1,213*	*1,568*	*1,783*	A	440	*515*	*839*	*1,213*	*1,568*	*1,783*	A		
Waipahu St	**1**	530	**	**	*440*	*700*	*740*	D	1	180	**	**	*440*	*700*	*740*	C*	150	**	**	*440*	*700*	*740*	C*		
Farrington Hwy	**3**	1,280	**	*310*	*1,920*	*2,340*	*2,460*	C	4	1,450	**	*400*	*2,530*	*3,030*	*3,180*	C	1,250	**	*400*	*2,530*	*3,030*	*3,180*	C		
Total		***8,520***						***E***		***11,130***						***E***	***10,390***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	**4**	4,790	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	5	6,960	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,030	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
Waipahu St	**1**	420	**	**	*440*	*700*	*740*	C*	1	410	**	**	*440*	*700*	*740*	C*	390	**	**	*440*	*700*	*740*	C*		
Farrington Hwy	**2**	790	**	*200*	*1,240*	*1,560*	*1,640*	C	3	1,010	**	*310*	*1,920*	*2,340*	*2,460*	C	860	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***6,000***						***C***		***8,380***						***D***	***8,280***						***D***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	**5**	8,410	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	4	9,040	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,610	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
H-1 Fwy HOV	**1**	1,530	*515*	*839*	*1,213*	*1,568*	*1,783*	D	1	1,720	*515*	*839*	*1,213*	*1,568*	*1,783*	E	1,490	*515*	*839*	*1,213*	*1,568*	*1,783*	D		
H-1 Fwy Future Zipper Lane	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	950	*515*	*839*	*1,213*	*1,568*	*1,783*	C	810	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Moanalua Rd	**2**	2,020	**	**	*1,020*	*1,480*	*1,560*	F	2	2,250	**	**	*1,020*	*1,480*	*1,560*	F	1,860	**	**	*1,020*	*1,480*	*1,560*	F		
Kamehameha Hwy	**3**	2,110	**	*310*	*1,920*	*2,340*	*2,460*	D	3	2,190	**	*310*	*1,920*	*2,340*	*2,460*	D	2,000	**	*310*	*1,920*	*2,340*	*2,460*	D		
Total		***14,070***						***D***		***16,150***						***E***	***14,770***						***E***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	**4**	5,740	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	5	8,060	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,870	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
H-1 Fwy HOV (Existing only)	**1**	1,360	*515*	*839*	*1,213*	*1,568*	*1,783*	D	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA		
Moanalua Rd	**2**	870	**	**	*1,020*	*1,480*	*1,560*	C*	2	970	**	**	*1,020*	*1,480*	*1,560*	C*	900	**	**	*1,020*	*1,480*	*1,560*	C*		
Kamehameha Hwy	**3**	1,500	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C	1,720	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***9,470***						***D***		***10,810***						***D***	***10,490***						***D***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	**4**	5,900	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	4	5,990	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	5,790	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D		
H-1 Fwy	**4**	3,550	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	B	4	4,200	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	3,660	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C		
H-1 Fwy HOV	**1**	1,410	*515*	*839*	*1,213*	*1,568*	*1,783*	D	1	1,210	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,040	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
H-1 Fwy Future zipper lane	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	810	*515*	*839*	*1,213*	*1,568*	*1,783*	B	660	*515*	*839*	*1,213*	*1,568*	*1,783*	B		
Nimitz Hwy	**3**	2,460	**	*310*	*1,920*	*2,340*	*2,460*	F	3	2,530	**	*310*	*1,920*	*2,340*	*2,460*	F	2,430	**	*310*	*1,920*	*2,340*	*2,460*	E		
Salt Lake Bl	**1**	730	**	**	*440*	*700*	*740*	E	2	870	**	**	*1,020*	*1,480*	*1,560*	C*	800	**	**	*1,020*	*1,480*	*1,560*	C*		
Total		***14,050***						***D***		***15,610***						***D***	***14,380***						***D***	***NO***	***NO***

Table C-4: 2030 with Salt Lake Alternative—P.M. Peak Hour Screenline Impacts Analysis (continued)

Salt Lake Koko Head bound																									
Moanalua Fwy	**2**	3,330	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	E	2	2,910	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D	2,670	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D		
Moanalua Fwy HOV	**1**	240	*515*	*839*	*1,213*	*1,568*	*1,783*	A	1	960	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,000	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
H-1 Fwy + Shoulder Express (1 lane)	**4**	4,500	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	4	3,970	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	4,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C		
H-1 Fwy HOV (1 lane)	**1**	330	*515*	*839*	*1,213*	*1,568*	*1,783*	A	1	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,020	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Nimitz Hwy	**5**	1,500	**	*500*	*3,160*	*3,790*	*3,980*	C	5	1,600	**	*500*	*3,160*	*3,790*	*3,980*	C	1,560	**	*500*	*3,160*	*3,790*	*3,980*	C		
Salt Lake Bl	**1**	350	**	**	*440*	*700*	*740*	C*	2	410	**	**	*1,020*	*1,480*	*1,560*	C*	410	**	**	*1,020*	*1,480*	*1,560*	C*		
Total		***10,250***						***D***		***10,920***						***C***	***10,990***						***C***	***NO***	***NO***
F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	**3**	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,750	**	*310*	*1,920*	*2,340*	*2,460*	C	1,520	**	*310*	*1,920*	*2,340*	*2,460*	C		
Nimitz Flyover (Future Facility)	**NA**	NA	*NA*	*NA*	*NA*	*NA*	*NA*	NA	2	880	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A	810	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A		
Dillingham Blvd	**2**	1,460	**	*200*	*1,240*	*1,560*	*1,640*	D	2	1,140	**	*200*	*1,240*	*1,560*	*1,640*	C	900	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,340	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,310	**	**	*1,020*	*1,480*	*1,560*	D		
H-1 Fwy	**4**	7,570	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	4	8,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,180	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
Halona St	**2**	1,800	**	**	*1,220*	*1,770*	*1,870*	E	2	1,740	**	**	*1,220*	*1,770*	*1,870*	D	1,730	**	**	*1,220*	*1,770*	*1,870*	D		
School St	**2**	1,220	**	**	*1,020*	*1,480*	*1,560*	D	2	1,370	**	**	*1,020*	*1,480*	*1,560*	D	1,240	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***15,170***						***E***		***16,710***						***E***	***15,690***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	**3**	2,770	**	*310*	*1,920*	*2,340*	*2,460*	F	3	3,520	**	*310*	*1,920*	*2,340*	*2,460*	F	3,280	**	*310*	*1,920*	*2,340*	*2,460*	F		
Dillingham Blvd	**2**	1,080	**	*200*	*1,240*	*1,560*	*1,640*	C	2	1,020	**	*200*	*1,240*	*1,560*	*1,640*	C	1,020	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,110	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,420	**	**	*1,020*	*1,480*	*1,560*	D		
Olomea St	**2**	1,670	**	**	*1,220*	*1,770*	*1,870*	D	2	1,670	**	**	*1,220*	*1,770*	*1,870*	D	1,670	**	**	*1,220*	*1,770*	*1,870*	D		
H-1 Fwy	**4**	7,320	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	5	8,050	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,980	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
School St	**2**	990	**	**	*1,020*	*1,480*	*1,560*	C*	2	1,150	**	**	*1,020*	*1,480*	*1,560*	D	1,160	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***14,940***						***E***		***16,880***						***D***	***16,530***						***D***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	**3**	6,790	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	3	6,970	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	6,920	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F		
Beretania St	**5**	2,510	**	**	*3,170*	*4,450*	*4,690*	C*	5	3,040	**	**	*3,170*	*4,450*	*4,690*	C*	2,800	**	**	*3,170*	*4,450*	*4,690*	C*		
Kapiolani Blvd	**2**	1,420	**	**	*1,020*	*1,480*	*1,560*	D	2	1,570	**	**	*1,020*	*1,480*	*1,560*	F	1,460	**	**	*1,020*	*1,480*	*1,560*	D		
Ala Moana Blvd	**3**	1,650	**	*310*	*1,920*	*2,340*	*2,460*	C	3	2,020	**	*310*	*1,920*	*2,340*	*2,460*	D	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***12,370***						***E***		***13,600***						***E***	***12,960***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	**3**	6,150	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	4	7,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	7,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E		
Kinau St	**4**	1,870	**	**	*2,540*	*3,560*	*3,750*	C*	4	1,810	**	**	*2,540*	*3,560*	*3,750*	C*	1,770	**	**	*2,540*	*3,560*	*3,750*	C*		
S King St	**6**	3,370	**	**	*3,800*	*5,340*	*5,630*	C*	6	3,450	**	**	*3,800*	*5,340*	*5,630*	C*	3,370	**	**	*3,800*	*5,340*	*5,630*	C*		
Kapiolani Blvd	**4**	1,840	**	**	*2,110*	*2,970*	*3,130*	C*	4	2,370	**	**	*2,110*	*2,970*	*3,130*	D	2,280	**	**	*2,110*	*2,970*	*3,130*	D		
Ala Moana Blvd	*3*	*2,120*	**	*310*	*1,920*	*2,340*	*2,460*	*D*	3	2,330	**	*310*	*1,920*	*2,340*	*2,460*	*D*	2,270	**	*310*	*1,920*	*2,340*	*2,460*	D		
Total		***15,350***						***D***		***17,330***						***D***	***17,020***						***D***	***NO***	***NO***

Notes:
[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005).
[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002). A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.
* The reported level of service "C*" means C or better and "B*" means B or better.
** Level of Service thresholds not reported due to type of facility.

Table C-5: 2030 with Airport Alternative—A.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with First Project Airport Option							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume* (vph)	*Maximum Volume Threshold [b]* *A*	*B*	*C*	*D*	*E*	LOS [b]	Facility Number of Lanes	Forecast Volume (vph) [a]	*Maximum Volume Threshold [b]* *A*	*B*	*C*	*D*	*E*	LOS [b]	Forecast Volume (vph)	*Maximum Volume Threshold [b]* *A*	*B*	*C*	*D*	*E*	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	3	3,330	1,620	2,630	3,800	4,920	5,590	C	3	4,290	1,620	2,630	3,800	4,920	5,590	D	4,180	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,180	515	839	1,213	1,568	1,783	C	1,180	515	839	1,213	1,568	1,783	C		
Farrington Hwy	1	590	**	200	660	780	810	C	2	500	**	200	1,240	1,560	1,640	C	500	**	200	1,240	1,560	1,640	C		
Fort Weaver Rd (SB)	2	1,440	**	200	1,240	1,560	1,640	D	2	2,040	**	200	1,240	1,560	1,640	F	2,010	**	200	1,240	1,560	1,640	F		
Total		***5,360***						***C***		***8,010***						***D***	***7,880***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	3	4,130	1,620	2,630	3,800	4,920	5,590	D	3	5,080	1,620	2,630	3,800	4,920	5,590	E	4,400	1,620	2,630	3,800	4,920	5,590	D		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,530	515	839	1,213	1,568	1,783	D	1,440	515	839	1,213	1,568	1,783	D		
Farrington Hwy	2	210	230	1,390	1,650	1,700	**	A	3	310	**	310	1,920	2,340	2,460	C	290	**	310	1,920	2,340	2,460	B*		
Fort Weaver Rd (NB)	2	3,120	**	200	1,240	1,560	1,640	F	2	3,090	**	200	1,240	1,560	1,640	F	2,860	**	200	1,240	1,560	1,640	F		
Total		***7,460***						***E***		***10,010***						***E***	***8,990***						***E***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	4	6,110	2,210	3,580	5,180	6,710	7,620	D	5	9,280	2,800	4,540	6,570	8,490	9,660	E	9,130	2,800	4,540	6,570	8,490	9,660	E		
Waipahu St	1	360	**	**	440	700	740	C*	1	330	**	**	440	700	740	C*	320	**	**	440	700	740	C*		
Farrington Hwy	3	1,160	**	310	1,920	2,340	2,460	C	4	1,040	**	400	2,530	3,030	3,180	C	1,000	**	400	2,530	3,030	3,180	C		
Total		***7,630***						***D***		***10,650***						***E***	***10,450***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	4	7,380	2,210	3,580	5,180	6,710	7,620	E	4	7,800	2,210	3,580	5,180	6,710	7,620	F	7,230	2,210	3,580	5,180	6,710	7,620	E		
H-1 Fwy future HOV	NA	NA	515	839	1,213	1,568	1,783	NA	1	1,670	515	839	1,213	1,568	1,783	E	1,570	515	839	1,213	1,568	1,783	E		
Waipahu St	1	580	**	**	440	700	740	D	1	700	**	**	440	700	740	E	460	**	**	440	700	740	D		
Farrington Hwy	2	1,210	**	200	1,240	1,560	1,640	C	3	1,900	**	310	1,920	2,340	2,460	C	1,710	**	310	1,920	2,340	2,460	C		
Total		***9,170***						***E***		***12,070***						***E***	***10,970***						***E***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	5	6,841	2,800	4,540	6,570	8,490	9,660	D	5	7,930	2,800	4,540	6,570	8,490	9,660	D	7,800	2,800	4,540	6,570	8,490	9,660	D		
Moanalua Rd	2	1,130	**	**	1,020	1,480	1,560	D	2	1,240	**	**	1,020	1,480	1,560	D	1,130	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	970	**	310	1,920	2,340	2,460	C	3	1,080	**	310	1,920	2,340	2,460	C	1,080	**	310	1,920	2,340	2,460	C		
Total		***8,950***						***D***		***10,250***						***D***	***10,010***						***D***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	5	10,140	2,800	4,540	6,570	8,490	9,660	F	5	13,160	2,800	4,540	6,570	8,490	9,660	F	12,190	5,600	9,080	13,140	16,980	19,320	F		
H-1 Fwy HOV	1	1,740	515	839	1,213	1,568	1,783	E	1	1,810	515	839	1,213	1,568	1,783	F	1,690	515	839	1,213	1,568	1,783	E		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,500	515	839	1,213	1,568	1,783	D	1,450	515	839	1,213	1,568	1,783	D		
Moanalua Rd	2	1,390	**	**	1,020	1,480	1,560	D	2	1,480	**	**	1,020	1,480	1,560	E	1,270	**	**	1,020	1,480	1,560	D		
Kamehameha Hwy	3	2,520	**	310	1,920	2,340	2,460	F	3	2,850	**	310	1,920	2,340	2,460	F	2,230	**	310	1,920	2,340	2,460	D		
Total		***17,300***						***F***		***20,800***						***F***	***18,830***						***E***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	4	3,700	2,210	3,580	5,180	6,710	7,620	C	4	4,260	2,210	3,580	5,180	6,710	7,620	C	4,160	2,210	3,580	5,180	6,710	7,620	C		
H-1 Fwy	3	2,460	1,620	2,630	3,800	4,920	5,590	B	4	2,830	2,210	3,580	5,180	6,710	7,620	B	2,740	2,210	3,580	5,180	6,710	7,620	B		
H-1 Fwy HOV	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
H-1 Fwy Future zipper lane	NA	NA	515	839	1,213	1,568	1,783	NA	NA	NA	515	839	1,213	1,568	1,783	NA	NA	515	839	1,213	1,568	1,783	NA		
Nimitz Hwy	3	1,050	**	310	1,920	2,340	2,460	C	3	1,190	**	310	1,920	2,340	2,460	C	1,160	**	310	1,920	2,340	2,460	C		
Salt Lake Bl	1	330	**	**	440	700	740	C*	2	390	**	**	1,020	1,480	1,560	C*	360	**	**	1,020	1,480	1,560	C*		
Total		***7,550***						***C***		***8,670***						***C***	***8,420***						***C***	***NO***	***NO***

Table C-5: 2030 with Airport Alternative—A.M. Peak Hour Screenline Impacts Analysis (continued)

Salt Lake Koko Head bound																									
Moanalua Fwy	2	3,730	1,030	1,680	2,420	3,130	3,560	F	2	3,690	1,030	1,680	2,420	3,130	3,560	F	3,430	1,030	1,680	2,420	3,130	3,560	E		
Moanalua Fwy HOV	1	1,020	515	839	1,213	1,568	1,783	C	1	1,750	515	839	1,213	1,568	1,783	E	1,590	515	839	1,213	1,568	1,783	E		
H-1 Fwy + Shoulder Express (1 lane)	5	7,600	2,800	4,540	6,570	8,490	9,660	D	5	8,270	2,800	4,540	6,570	8,490	9,660	D	7,740	2,800	4,540	6,570	8,490	9,660	D		
H-1 Fwy HOV (1 lane)	1	1,620	515	839	1,213	1,568	1,783	E	1	1,660	515	839	1,213	1,568	1,783	E	1,520	515	839	1,213	1,568	1,783	D		
H-1 Fwy Zipper	1	1,510	515	839	1,213	1,568	1,783	D	1	1,520	515	839	1,213	1,568	1,783	D	1,460	515	839	1,213	1,568	1,783	D		
Nimitz Hwy	5	1,420	**	500	3,160	3,790	3,980	C	5	1,770	**	500	3,160	3,790	3,980	C	1,380	**	500	3,160	3,790	3,980	C		
Salt Lake Bl	1	520	**	**	440	700	740	D	2	860	**	**	1,020	1,480	1,560	C*	700	**	**	1,020	1,480	1,560	C*		
Total		***17,430***						***D***		***19,520***						***D***	***17,820***						***D***	***NO***	***NO***
F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	2	1,340	**	200	1,240	1,560	1,640	D	3	1,570	**	310	1,920	2,340	2,460	C	1,550	**	310	1,920	2,340	2,460	C		
Dillingham Blvd	2	690	**	200	1,240	1,560	1,640	C	2	560	**	200	1,240	1,560	1,640	C	560	**	200	1,240	1,560	1,640	C		
N King St	2	600	**	**	1,020	1,480	1,560	C*	2	790	**	**	1,020	1,480	1,560	C*	770	**	**	1,020	1,480	1,560	C*		
H-1 Fwy	4	7,300	2,210	3,580	5,180	6,710	7,620	E	4	8,150	2,210	3,580	5,180	6,710	7,620	F	8,080	2,210	3,580	5,180	6,710	7,620	F		
Halona Street	2	1,160	**	**	1,220	1,770	1,870	C*	2	1,180	**	**	1,220	1,770	1,870	C*	1,170	**	**	1,220	1,770	1,870	C*		
School St	2	780	**	**	1,020	1,480	1,560	C*	2	960	**	**	1,020	1,480	1,560	C*	920	**	**	1,020	1,480	1,560	C*		
Total		***11,880***						***D***		***13,210***						***E***	***13,050***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	4	3,210	**	400	2,530	3,030	3,180	F	3	3,430	**	310	1,920	2,340	2,460	F	3,120	**	310	1,920	2,340	2,460	F		
Nimitz Flyover (future facility)	NA	NA	NA	NA	NA	NA	NA	NA	2	1,400	1,030	1,680	2,420	3,130	3,560	B	1,280	1,030	1,680	2,420	3,130	3,560	B		
Dillingham Blvd	2	1,400	**	200	1,240	1,560	1,640	D	2	1,350	**	200	1,240	1,560	1,640	D	1,220	**	200	1,240	1,560	1,640	C		
N King St	2	1,340	**	**	1,020	1,480	1,560	D	2	1,460	**	**	1,020	1,480	1,560	D	1,320	**	**	1,020	1,480	1,560	D		
Olomea St	2	1,950	**	**	1,220	1,770	1,870	F	2	1,950	**	**	1,220	1,770	1,870	F	1,950	**	**	1,220	1,770	1,870	F		
H-1 Fwy	4	9,490	2,210	3,580	5,180	6,710	7,620	F	5	10,790	2,800	4,540	6,570	8,490	9,660	F	10,310	2,800	4,540	6,570	8,490	9,660	F		
School St	2	1,580	**	**	1,020	1,480	1,560	F	2	1,760	**	**	1,020	1,480	1,560	F	1,570	**	**	1,020	1,480	1,560	F		
Total		***18,970***						***F***		***22,140***						***E***	***20,770***						***E***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	3	7,290	1,620	2,630	3,800	4,920	5,590	F	3	7,380	1,620	2,630	3,800	4,920	5,590	F	7,380	1,620	2,630	3,800	4,920	5,590	F		
Beretania St	5	2,790	**	**	3,170	4,450	4,690	C*	5	3,250	**	**	3,170	4,450	4,690	D	3,100	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	4	1,920	**	**	2,110	2,970	3,130	C*	4	2,220	**	**	2,110	2,970	3,130	D	2,200	**	**	2,110	2,970	3,130	D		
Ala Moana Blvd	3	1,800	**	310	1,920	2,340	2,460	C	3	2,150	**	310	1,920	2,340	2,460	D	2,140	**	310	1,920	2,340	2,460	D		
Total		***13,800***						***E***		***15,000***						***E***	***14,820***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	3	5,740	1,620	2,630	3,800	4,920	5,590	F	4	6,980	2,210	3,580	5,180	6,710	7,620	E	6,840	2,210	3,580	5,180	6,710	7,620	E		
Kinau St	3	1,250	**	**	1,900	2,670	2,810	C*	3	1,070	**	**	1,900	2,670	2,810	C*	1,080	**	**	1,900	2,670	2,810	C*		
S King St	5	2,080	**	**	3,170	4,450	4,690	C*	5	2,850	**	**	3,170	4,450	4,690	C*	2,300	**	**	3,170	4,450	4,690	C*		
Kapiolani Blvd	2	710	**	**	1,020	1,480	1,560	C*	2	820	**	**	1,020	1,480	1,560	C*	770	**	**	1,020	1,480	1,560	C*		
Ala Moana Blvd	3	1,610	**	310	1,920	2,340	2,460	C	3	1,740	**	310	1,920	2,340	2,460	C	1,510	**	310	1,920	2,340	2,460	C		
Total		***11,390***						***E***		***13,460***						***D***	***12,500***						***D***	***NO***	***NO***

[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005).

[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002).
A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.

* The reported level of service "C*" means C or better and "B*" means B or better.

** Level of Service thresholds not reported due to type of facility.

Table C-6: 2030 with Airport Alternative—P.M. Peak Hour Screenline Impacts Analysis

Screenline / Facility	Year 2007 Conditions								2030 No Build Conditions								2030 with First Project Airport Option							Screenline Impact Analysis	
	Facility Number of Lanes	Observed Volume (vph) [a]	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Facility Number of Lanes	Forecast Volume (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Forecast Volume (vph)	Maximum Volume Threshold [b] A	B	C	D	E	LOS [b]	Project Impact? (Yes or No)	Cumulative Impact? (Yes or No)
B. 'Ewa 'Wai'anae bound																									
H-1 Fwy	**3**	4,110	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	3	4,680	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	4,220	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	1,100	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,130	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Farrington Hwy	**1**	310	**	*200*	*660*	*780*	*810*	C	2	510	**	*200*	*1,240*	*1,560*	*1,640*	C	450	**	*200*	*1,240*	*1,560*	*1,640*	C		
Fort Weaver Rd (SB)	**2**	2,400	**	*200*	*1,240*	*1,560*	*1,640*	F	2	2,410	**	*200*	*1,240*	*1,560*	*1,640*	F	2,350	**	*200*	*1,240*	*1,560*	*1,640*	F		
Total		***6,820***						***E***		***8,700***						***D***	***8,150***						***D***	***NO***	***NO***
'Ewa Koko Head bound																									
H-1 Fwy	**3**	4,080	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	D	3	6,120	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	6,040	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	990	*515*	*839*	*1,213*	*1,568*	*1,783*	C	940	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Farrington Hwy	**2**	620	*230*	*1,390*	*1,650*	*1,700*	**	B	3	550	**	*310*	*1,920*	*2,340*	*2,460*	C	510	**	*310*	*1,920*	*2,340*	*2,460*	C		
Fort Weaver Rd (NB)	**2**	2,060	**	*200*	*1,240*	*1,560*	*1,640*	F	2	2,620	**	*200*	*1,240*	*1,560*	*1,640*	F	2,550	**	*200*	*1,240*	*1,560*	*1,640*	F		
Total		***6,760***						***D***		***10,280***						***F***	***10,040***						***F***	***NO***	***NO***
C. Waikele Stream 'Ewa bound																									
H-1 Fwy	**4**	6,710	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	4	9,010	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,490	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
H-1 Fwy future HOV	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	490	*515*	*839*	*1,213*	*1,568*	*1,783*	A	440	*515*	*839*	*1,213*	*1,568*	*1,783*	A		
Waipahu St	**1**	530	**	**	*440*	*700*	*740*	D	1	180	**	**	*440*	*700*	*740*	C*	140	**	**	*440*	*700*	*740*	C*		
Farrington Hwy	**3**	1,280	**	*310*	*1,920*	*2,340*	*2,460*	C	4	1,450	**	*400*	*2,530*	*3,030*	*3,180*	C	1,290	**	*400*	*2,530*	*3,030*	*3,180*	C		
Total		***8,520***						***E***		***11,130***						***E***	***10,360***						***E***	***NO***	***NO***
Waikele Stream Koko Head bound																									
H-1 Fwy	**4**	4,790	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	5	6,960	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,080	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
Waipahu St	**1**	420	**	**	*440*	*700*	*740*	C*	1	410	**	**	*440*	*700*	*740*	C*	380	**	**	*440*	*700*	*740*	C*		
Farrington Hwy	**2**	790	**	*200*	*1,240*	*1,560*	*1,640*	C	3	1,010	**	*310*	*1,920*	*2,340*	*2,460*	C	810	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***6,000***						***C***		***8,380***						***D***	***8,270***						***D***	***NO***	***NO***
D. Kalauao 'Ewa bound																									
H-1 Fwy	**5**	8,410	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	4	9,040	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,560	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
H-1 Fwy HOV	**1**	1,530	*515*	*839*	*1,213*	*1,568*	*1,783*	D	1	1,720	*515*	*839*	*1,213*	*1,568*	*1,783*	E	1,520	*515*	*839*	*1,213*	*1,568*	*1,783*	D		
H-1 Fwy Future Zipper Lane	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	950	*515*	*839*	*1,213*	*1,568*	*1,783*	C	800	*515*	*839*	*1,213*	*1,568*	*1,783*	B		
Moanalua Rd	**2**	2,020	**	**	*1,020*	*1,480*	*1,560*	F	2	2,250	**	**	*1,020*	*1,480*	*1,560*	F	1,860	**	**	*1,020*	*1,480*	*1,560*	F		
Kamehameha Hwy	**3**	2,110	**	*310*	*1,920*	*2,340*	*2,460*	D	3	2,190	**	*310*	*1,920*	*2,340*	*2,460*	D	2,000	**	*310*	*1,920*	*2,340*	*2,460*	D		
Total		***14,070***						***D***		***16,150***						***E***	***14,740***						***E***	***NO***	***NO***
Kalauao Koko Head bound																									
H-1 Fwy	**5**	5,740	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	5	8,060	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,860	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
H-1 Fwy HOV (Existing only)	**1**	1,360	*515*	*839*	*1,213*	*1,568*	*1,783*	D	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA		
Moanalua Rd	**2**	870	**	**	*1,020*	*1,480*	*1,560*	C*	2	970	**	**	*1,020*	*1,480*	*1,560*	C*	920	**	**	*1,020*	*1,480*	*1,560*	C*		
Kamehameha Hwy	**3**	1,500	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C	1,710	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***9,470***						***D***		***10,810***						***D***	***10,490***						***D***	***NO***	***NO***
E. Salt Lake 'Ewa bound																									
Moanalua Fwy	**4**	5,900	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	4	5,990	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D	5,780	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	D		
H-1 Fwy	**4**	3,550	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	B	4	4,200	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	3,640	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C		
H-1 Fwy HOV	**1**	1,410	*515*	*839*	*1,213*	*1,568*	*1,783*	D	1	1,210	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
H-1 Fwy Future zipper lane	**NA**	NA	*515*	*839*	*1,213*	*1,568*	*1,783*	NA	1	810	*515*	*839*	*1,213*	*1,568*	*1,783*	B	660	*515*	*839*	*1,213*	*1,568*	*1,783*	B		
Nimitz Hwy	**3**	2,460	**	*310*	*1,920*	*2,340*	*2,460*	F	3	2,530	**	*310*	*1,920*	*2,340*	*2,460*	F	2,380	**	*310*	*1,920*	*2,340*	*2,460*	E		
Salt Lake Bl	**1**	730	**	**	*440*	*700*	*740*	E	2	870	**	**	*1,020*	*1,480*	*1,560*	C*	830	**	**	*1,020*	*1,480*	*1,560*	C*		
Total		***14,050***						***D***		***15,610***						***D***	***14,360***						***D***	***NO***	***NO***

Table C-6: 2030 with Airport Alternative—P.M. Peak Hour Screenline Impacts Analysis (continued)

Salt Lake Koko Head bound																									
Moanalua Fwy	**2**	3,330	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	E	2	2,910	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D	2,700	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	D		
Moanalua Fwy HOV	**1**	240	*515*	*839*	*1,213*	*1,568*	*1,783*	A	1	960	*515*	*839*	*1,213*	*1,568*	*1,783*	C	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
H-1 Fwy + Shoulder Express (1 lane)	**4**	4,500	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	4	3,970	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C	4,200	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	C		
H-1 Fwy HOV (1 lane)	**1**	330	*515*	*839*	*1,213*	*1,568*	*1,783*	A	1	1,070	*515*	*839*	*1,213*	*1,568*	*1,783*	C	990	*515*	*839*	*1,213*	*1,568*	*1,783*	C		
Nimitz Hwy	**5**	1,500	**	*500*	*3,160*	*3,790*	*3,980*	C	5	1,600	**	*500*	*3,160*	*3,790*	*3,980*	C	1,590	**	*500*	*3,160*	*3,790*	*3,980*	C		
Salt Lake Bl	**1**	350	**	**	*440*	*700*	*740*	C*	2	410	**	**	*1,020*	*1,480*	*1,560*	C*	400	**	**	*1,020*	*1,480*	*1,560*	C*		
Total		***10,250***						***D***		***10,920***						***C***	***10,950***						***C***	***NO***	***NO***
F. Kapalama Canal 'Ewa bound																									
Nimitz Hwy	**3**	1,780	**	*310*	*1,920*	*2,340*	*2,460*	C	3	1,750	**	*310*	*1,920*	*2,340*	*2,460*	C	1,510	**	*310*	*1,920*	*2,340*	*2,460*	C		
Nimitz Flyover (Future Facility)	**NA**	NA	*NA*	*NA*	*NA*	*NA*	*NA*	NA	2	880	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A	810	*1,030*	*1,680*	*2,420*	*3,130*	*3,560*	A		
Dillingham Blvd	**2**	1,460	**	*200*	*1,240*	*1,560*	*1,640*	D	2	1,140	**	*200*	*1,240*	*1,560*	*1,640*	C	900	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,340	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,310	**	**	*1,020*	*1,480*	*1,560*	D		
H-1 Fwy	**4**	7,570	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	4	8,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F	8,170	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	F		
Halona St	**2**	1,800	**	**	*1,220*	*1,770*	*1,870*	E	2	1,740	**	**	*1,220*	*1,770*	*1,870*	D	1,730	**	**	*1,220*	*1,770*	*1,870*	D		
School St	**2**	1,220	**	**	*1,020*	*1,480*	*1,560*	D	2	1,370	**	**	*1,020*	*1,480*	*1,560*	D	1,250	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***15,170***						***E***		***16,710***						***E***	***15,680***						***E***	***NO***	***NO***
Kapalama Canal Koko Head bound																									
Nimitz Hwy	**3**	2,770	**	*310*	*1,920*	*2,340*	*2,460*	F	3	3,520	**	*310*	*1,920*	*2,340*	*2,460*	F	3,270	**	*310*	*1,920*	*2,340*	*2,460*	F		
Dillingham Blvd	**2**	1,080	**	*200*	*1,240*	*1,560*	*1,640*	C	2	1,020	**	*200*	*1,240*	*1,560*	*1,640*	C	1,010	**	*200*	*1,240*	*1,560*	*1,640*	C		
N King St	**2**	1,110	**	**	*1,020*	*1,480*	*1,560*	D	2	1,470	**	**	*1,020*	*1,480*	*1,560*	D	1,430	**	**	*1,020*	*1,480*	*1,560*	D		
Olomea St	**2**	1,670	**	**	*1,220*	*1,770*	*1,870*	D	2	1,670	**	**	*1,220*	*1,770*	*1,870*	D	1,670	**	**	*1,220*	*1,770*	*1,870*	D		
H-1 Fwy	**4**	7,320	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	5	8,050	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D	7,990	*2,800*	*4,540*	*6,570*	*8,490*	*9,660*	D		
School St	**2**	990	**	**	*1,020*	*1,480*	*1,560*	C*	2	1,150	**	**	*1,020*	*1,480*	*1,560*	D	1,150	**	**	*1,020*	*1,480*	*1,560*	D		
Total		***14,940***						***E***		***16,880***						***D***	***16,520***						***D***	***NO***	***NO***
G. Ward Avenue 'Ewa bound																									
H-1 Fwy	**3**	6,790	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	3	6,970	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	6,930	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F		
Beretania St	**5**	2,510	**	**	*3,170*	*4,450*	*4,690*	C*	5	3,040	**	**	*3,170*	*4,450*	*4,690*	C*	2,760	**	**	*3,170*	*4,450*	*4,690*	C*		
Kapiolani Blvd	**2**	1,420	**	**	*1,020*	*1,480*	*1,560*	D	2	1,570	**	**	*1,020*	*1,480*	*1,560*	F	1,440	**	**	*1,020*	*1,480*	*1,560*	D		
Ala Moana Blvd	**3**	1,650	**	*310*	*1,920*	*2,340*	*2,460*	C	3	2,020	**	*310*	*1,920*	*2,340*	*2,460*	D	1,810	**	*310*	*1,920*	*2,340*	*2,460*	C		
Total		***12,370***						***E***		***13,600***						***E***	***12,940***						***E***	***NO***	***NO***
Ward Avenue Koko Head bound																									
H-1 Fwy	**3**	6,150	*1,620*	*2,630*	*3,800*	*4,920*	*5,590*	F	4	7,370	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E	7,330	*2,210*	*3,580*	*5,180*	*6,710*	*7,620*	E		
Kinau St	**4**	1,870	**	**	*2,540*	*3,560*	*3,750*	C*	4	1,810	**	**	*2,540*	*3,560*	*3,750*	C*	1,780	**	**	*2,540*	*3,560*	*3,750*	C*		
S King St	**6**	3,370	**	**	*3,800*	*5,340*	*5,630*	C*	6	3,450	**	**	*3,800*	*5,340*	*5,630*	C*	3,370	**	**	*3,800*	*5,340*	*5,630*	C*		
Kapiolani Blvd	**4**	1,840	**	**	*2,110*	*2,970*	*3,130*	C*	4	2,370	**	**	*2,110*	*2,970*	*3,130*	D	2,280	**	**	*2,110*	*2,970*	*3,130*	D		
Ala Moana Blvd	***3***	*2,120*	**	*310*	*1,920*	*2,340*	*2,460*	*D*	*3*	*2,330*	**	*310*	*1,920*	*2,340*	*2,460*	*D*	*2,270*	**	*310*	*1,920*	*2,340*	*2,460*	*D*		
Total		***15,350***						***D***		***17,330***						***D***	***17,030***						***D***	***NO***	***NO***

Notes:

[a] Peak hour traffic count data was obained from the State of Hawaii Department of Transporation (2005).

[b] LOS threadsholds were adapted from *Quality Level of Service Handbook (2002)* by the State of Florida's Department of Transportation (FDOT). The Handbook provides the Generanlized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2002).
A directoinal split of 50% was applied to the two-way volumes to generate the peak hour direction volume threasholds for the purpose of this analysis.

* The reported level of service "C*" means C or better and "B*" means B or better.

** Level of Service thresholds not reported due to type of facility.

Appendix D
A.M. Two-Hour Peak Period Transit Trips, Origin-Destination Format

Table D-1: 2007 A.M. Two-Hour Peak Period Transit Trips Origin-Destination Format

	Origin	Destination																									
		Downtown	Kakaʻako	Mōʻiliʻili	Waikīkī	Kaimukī-Waiʻalae	Palama-Liliha	Kalihi-Iwilei	Airport-Pearl Harbor	Salt Lake-Āliamanu	Pearl City-ʻAiea	ʻEwa	Kapolei	Makakilo	Waipahu-Waikele	Waiawa	Mililani	Wahiawa	East Honolulu	Kāneʻohe	Kailua	Koʻolau Loa	North Shore	Waiʻanae	Makiki-Mānoa	UH Mānoa	Ala Moana	Total
1	Downtown	138	85	135	119	85	102	131	70	72	28	7	4	1	12	3	9	7	18	26	37	2	3	6	44	33	72	1,249
2	Kakaʻako	153	35	72	96	65	51	81	29	21	12	2	1	0	3	0	5	5	9	9	4	1	1	4	30	27	38	754
3	Mōʻiliʻili	698	199	163	224	292	118	201	69	66	30	3	5	2	7	1	5	4	42	11	17	2	2	2	89	96	103	2,451
4	Waikīkī	581	188	222	196	272	79	139	114	38	38	6	1	3	44	0	5	7	79	8	32	10	17	7	88	86	427	2,687
5	Kaimukī-Waiʻalae	529	154	306	310	292	68	111	36	33	15	3	1	1	7	1	1	0	81	9	12	2	0	4	97	103	108	2,284
6	Palama-Liliha	679	151	126	97	63	249	365	141	129	53	1	7	0	17	0	4	4	8	23	20	4	1	0	38	76	59	2,315
7	Kalihi-Iwilei	270	92	80	60	38	132	117	122	92	51	3	4	1	8	2	6	3	8	16	8	2	3	4	24	36	44	1,226
8	Airport-Pearl Harbor	80	17	15	18	20	33	72	106	77	42	3	1	1	21	2	6	3	1	4	4	4	0	6	2	12	13	563
9	Salt Lake-Āliamanu	324	108	59	42	33	83	187	246	326	156	6	3	2	34	3	8	6	5	14	13	1	2	4	15	64	27	1,771
10	Pearl City-ʻAiea	268	52	47	42	30	48	156	258	218	497	19	32	4	184	28	46	29	3	13	13	4	0	7	12	86	18	2,114
11	ʻEwa	134	32	39	89	30	28	40	44	27	59	249	113	8	75	4	12	5	4	2	5	5	1	19	18	87	13	1,142
12	Kapolei	48	14	16	37	9	14	22	15	14	24	43	132	27	30	1	5	3	4	4	2	3	0	57	11	38	10	583
13	Makakilo	60	17	18	41	16	21	19	16	15	18	7	56	7	11	1	1	2	3	3	3	4	1	13	12	39	6	410
14	Waipahu-Waikele	134	28	45	128	19	28	52	52	40	138	70	80	9	282	48	79	38	6	1	9	9	1	28	11	81	20	1,436
15	Waiawa	27	3	12	22	3	7	9	12	11	36	4	7	1	65	7	51	22	1	0	1	0	1	3	2	14	2	323
16	Mililani	166	30	41	33	26	24	55	58	32	68	6	19	1	84	30	332	225	6	6	3	19	16	3	23	85	10	1,401
17	Wahiawa	76	19	19	23	18	15	27	35	21	41	4	12	0	46	12	206	203	4	1	2	7	23	3	10	43	7	877
18	East Honolulu	314	61	147	152	255	38	67	25	25	6	2	1	1	6	0	1	1	241	7	28	4	0	1	46	113	52	1,594
19	Kāneʻohe	362	76	66	53	36	101	118	65	54	27	0	4	0	8	0	1	1	6	336	126	30	2	5	14	64	22	1,577
20	Kailua	446	85	56	63	47	87	94	58	44	25	1	7	0	13	0	3	1	14	107	385	7	1	1	14	83	33	1,675
21	Koʻolau Loa	43	12	11	14	6	5	12	9	5	3	0	2	0	2	0	2	1	2	14	4	186	8	0	3	14	5	363
22	North Shore	50	15	16	18	10	11	21	16	10	8	1	1	1	12	2	29	41	2	2	2	47	118	1	5	31	9	479
23	Waiʻanae	175	45	47	59	35	21	60	60	31	23	6	75	6	21	1	8	5	4	8	8	3	1	423	16	80	22	1,243
24	Makiki-Mānoa	508	130	172	174	138	95	144	45	48	16	0	3	1	11	1	3	0	20	6	8	2	2	3	78	86	79	1,773
25	UH Mānoa	59	15	28	27	25	9	12	6	5	4	2	1	1	4	0	2	1	6	1	2	2	0	2	13	3	10	240
26	Ala Moana Center	33	18	24	42	16	8	11	4	4	3	1	0	1	2	0	1	1	5	3	2	0	1	2	11	4	0	197
	Total	6,355	1,681	1,982	2,179	1,879	1,475	2,323	1,711	1,458	1,421	449	572	79	1,009	147	831	618	582	634	750	360	205	608	726	1,484	1,209	32,727

Table D-2: 2030 No Build A.M. Two-Hour Peak Period Transit Trips Origin-Destination Format

	Origin	Destination																										
		Downtown	Kaka‘ako	Mō‘ili‘ili	Waikīkī	Kaimukī-Wai‘alae	Palama-Liliha	Kalihi-Iwilei	Airport-Pearl Harbor	Salt Lake-Āliamanu	Pearl City-‘Aiea	‘Ewa	Kapolei	Makakilo	Waipahu-Waikele	Waiawa	Mililani	Wahiawa	East Honolulu	Kāne‘ohe	Kailua	Ko‘olau Loa	North Shore	Wai‘anae	Makiki-Mānoa	UH Mānoa	Ala Moana	Total
1	Downtown	152	149	202	152	109	150	186	99	95	50	14	13	3	16	7	14	3	24	29	34	3	6	6	60	66	73	1,715
2	Kaka‘ako	359	90	168	201	148	121	222	77	58	27	4	9	1	7	4	8	2	17	17	16	1	1	3	73	81	58	1,773
3	Mō‘ili‘ili	789	273	195	245	323	122	248	81	70	26	3	10	1	13	8	4	5	48	13	16	7	1	2	97	123	108	2,831
4	Waikīkī	595	233	242	197	313	76	152	121	30	35	5	8	1	64	6	4	10	76	9	42	14	12	4	98	104	409	2,860
5	Kaimukī-Wai‘alae	494	185	323	303	317	68	108	41	34	18	6	3	0	3	1	0	1	84	3	12	4	2	4	101	136	93	2,344
6	Palama-Liliha	655	186	131	87	63	273	396	146	124	63	2	11	0	20	5	5	2	11	26	23	6	0	4	38	51	48	2,376
7	Kalihi-Iwilei	285	133	93	69	47	161	150	133	118	62	5	10	1	13	4	6	6	7	15	9	2	1	2	29	30	44	1,435
8	Airport-Pearl Harbor	76	20	16	19	26	32	73	118	71	62	3	5	0	20	10	6	4	1	7	5	1	1	4	5	14	8	607
9	Salt Lake-Āliamanu	287	124	54	35	29	87	175	229	314	175	6	14	1	31	17	12	2	8	12	11	5	4	1	12	74	20	1,739
10	Pearl City-‘Aiea	218	51	41	34	32	40	141	246	188	563	26	74	2	210	99	51	25	4	13	14	4	6	8	17	95	18	2,220
11	‘Ewa	211	66	59	165	41	44	62	55	34	83	502	608	46	151	16	19	14	10	10	8	6	1	31	17	72	20	2,351
12	Kapolei	113	31	39	82	20	26	36	32	26	61	190	788	99	89	16	13	9	9	2	5	7	2	102	11	39	26	1,873
13	Makakilo	62	18	21	42	12	12	24	21	9	28	48	295	46	28	6	5	5	2	1	3	4	0	28	7	27	6	760
14	Waipahu-Waikele	164	39	65	177	23	31	46	54	36	147	206	190	17	317	103	78	41	8	3	9	9	5	10	16	70	17	1,881
15	Waiawa	116	24	45	96	23	16	40	50	29	143	39	88	5	179	151	145	80	1	6	5	5	7	8	9	53	17	1,380
16	Mililani	152	32	38	38	24	24	54	48	29	89	23	52	5	100	119	361	232	5	4	4	14	15	5	13	65	12	1,557
17	Wahiawa	77	23	25	21	16	14	25	31	16	40	7	28	5	43	42	177	220	2	3	2	8	19	6	8	40	5	903
18	East Honolulu	322	91	155	149	265	40	75	25	31	11	4	3	1	5	2	1	2	275	8	37	3	1	4	53	115	43	1,721
19	Kāne‘ohe	351	75	50	51	35	94	114	57	53	26	3	7	0	14	2	4	3	3	364	134	29	3	2	11	75	24	1,584
20	Kailua	448	99	64	60	41	86	105	61	41	29	4	10	1	10	6	2	4	17	107	409	11	0	1	19	76	27	1,738
21	Ko‘olau Loa	44	17	10	17	8	8	12	11	7	3	1	3	0	1	1	2	3	2	12	5	224	8	1	4	12	7	423
22	North Shore	59	22	14	18	12	16	22	13	16	12	2	7	1	13	10	29	50	6	4	1	58	139	2	9	29	11	575
23	Wai‘anae	150	44	50	54	29	27	50	56	31	27	23	262	16	40	11	12	8	5	7	9	2	1	456	11	42	15	1,438
24	Makiki-Mānoa	497	162	182	156	152	88	150	54	47	18	0	3	1	14	2	5	3	23	8	7	4	1	1	87	194	73	1,932
25	UH Mānoa	56	20	30	23	31	8	16	5	6	3	3	1	1	6	1	1	2	5	3	2	0	1	1	14	2	11	252
26	Ala Moana Center	32	21	25	39	14	10	11	4	2	2	0	1	1	2	1	1	0	4	2	2	1	0	1	9	5	0	190
	Total	6,764	2,228	2,337	2,530	2,153	1,674	2,693	1,868	1,515	1,803	1,129	2,503	255	1,409	650	965	736	657	688	824	432	237	697	828	1,690	1,193	40,458

Table D-3: 2030 Salt Lake Alternative A.M. Two-Hour Peak Period Transit Trips Origin-Destination Format

		Destination																									
	Origin	Downtown	Kaka‘ako	Mō‘ili‘ili	Waikīkī	Kaimukī-Wai‘alae	Palama-Liliha	Kalihi-Iwilei	Airport-Pearl Harbor	Salt Lake-Āliamanu	Pearl City-‘Aiea	‘Ewa	Kapolei	Makakilo	Waipahu-Waikele	Waiawa	Mililani	Wahiawa	East Honolulu	Kāne‘ohe	Kailua	Ko‘olau Loa	North Shore	Wai‘anae	Makiki-Mānoa	UH Mānoa	Ala Moana	Total
1	Downtown	144	136	195	149	106	154	194	84	99	61	24	16	6	21	12	20	7	32	25	52	3	5	10	55	86	87	1,783
2	Kaka‘ako	340	84	176	202	151	120	242	66	66	33	11	12	2	18	8	7	1	18	15	25	2	4	4	73	92	51	1,823
3	Mō‘ili‘ili	777	266	206	239	330	117	245	77	66	48	10	9	3	20	10	4	3	47	19	22	3	3	6	104	133	113	2,880
4	Waikīkī	553	216	227	192	367	77	167	143	37	74	25	12	2	68	21	5	9	77	14	36	14	26	7	76	119	398	2,962
5	Kaimukī-Wai‘alae	484	174	343	322	345	62	111	41	26	22	4	3	3	8	3	2	4	85	7	19	2	2	4	104	136	100	2,416
6	Palama-Liliha	648	186	138	96	56	308	406	128	145	78	6	10	1	30	8	4	5	7	36	42	4	3	4	39	69	61	2,518
7	Kalihi-Iwilei	305	152	108	69	49	161	139	132	119	70	10	10	1	16	13	5	7	9	26	16	2	3	9	27	41	51	1,550
8	Airport-Pearl Harbor	95	20	18	23	24	36	70	112	93	58	5	9	5	31	14	5	4	1	6	7	0	2	6	3	23	15	685
9	Salt Lake-Āliamanu	354	150	73	55	40	101	234	336	371	213	8	28	1	55	20	12	8	5	23	21	6	2	3	16	108	28	2,271
10	Pearl City-‘Aiea	399	116	73	81	57	74	231	292	253	672	31	112	6	276	107	58	29	7	31	30	10	6	9	16	212	42	3,230
11	‘Ewa	463	168	151	465	91	74	187	128	94	151	602	768	54	212	26	31	24	17	21	35	19	4	41	44	219	46	4,135
12	Kapolei	246	89	80	274	52	40	95	82	55	105	238	917	117	131	21	32	20	13	11	21	12	4	112	21	122	69	2,979
13	Makakilo	141	58	48	148	32	29	60	44	34	49	65	343	51	63	6	12	6	5	7	12	13	0	36	18	77	17	1,374
14	Waipahu-Waikele	315	82	154	467	66	50	111	96	63	204	222	218	22	386	120	96	43	9	18	21	17	1	19	28	175	58	3,061
15	Waiawa	240	58	110	327	36	29	82	77	50	175	49	126	8	258	156	162	83	10	7	15	16	9	6	16	105	40	2,250
16	Mililani	291	91	78	100	50	39	108	90	65	129	34	100	6	165	130	401	254	6	18	20	11	23	6	20	157	24	2,416
17	Wahiawa	149	57	50	56	34	21	66	56	34	55	11	60	4	69	44	209	254	4	10	8	11	29	4	14	96	14	1,419
18	East Honolulu	329	90	168	151	279	46	77	30	23	14	4	14	0	8	3	2	1	296	10	40	1	0	2	52	154	48	1,842
19	Kāne‘ohe	263	63	52	45	24	94	134	70	53	45	2	16	2	22	7	4	2	2	376	191	33	2	2	12	82	16	1,614
20	Kailua	487	93	73	64	42	98	110	53	46	34	3	15	2	20	3	9	3	20	123	622	15	3	2	20	99	27	2,086
21	Ko‘olau Loa	46	15	12	22	8	5	19	9	14	6	3	4	1	4	1	3	2	0	13	7	243	13	1	3	23	9	486
22	North Shore	104	43	38	51	21	22	42	22	26	24	4	19	2	28	13	35	61	5	4	10	78	164	0	11	69	13	909
23	Wai‘anae	240	96	81	109	54	41	88	107	59	50	34	292	16	70	12	20	14	10	11	19	8	0	527	18	120	29	2,125
24	Makiki-Mānoa	468	165	200	170	153	80	158	59	29	23	4	4	1	21	0	2	2	18	9	16	3	3	3	94	201	78	1,964
25	UH Mānoa	58	18	33	25	30	7	18	4	5	5	7	4	2	8	2	5	2	5	4	4	1	2	3	17	1	10	280
26	Ala Moana Center	37	23	25	37	16	10	13	1	6	3	2	2	1	2	3	1	1	4	1	2	1	1	1	10	6	0	209
	Total	7,976	2,709	2,910	3,939	2,513	1,895	3,407	2,339	1,931	2,401	1,418	3,123	319	2,010	763	1,146	849	712	845	1,313	528	314	827	911	2,725	1,444	51,267

Table D-4: 2030 Airport Alternative A.M. Two-Hour Peak Period Transit Trips Origin-Destination Format

	Origin	Destination																										
		Downtown	Kaka'ako	Mō'ili'ili	Waikīkī	Kaimukī-Wai'alae	Palama-Liliha	Kalihi-Iwilei	Airport-Pearl Harbor	Salt Lake-Āliamanu	Pearl City-'Aiea	'Ewa	Kapolei	Makakilo	Waipahu-Waikele	Waiawa	Mililani	Wahiawa	East Honolulu	Kāne'ohe	Kailua	Ko'olau Loa	North Shore	Wai'anae	Makiki-Mānoa	UH Mānoa	Ala Moana	Total
1	Downtown	143	142	191	149	109	149	190	102	102	63	23	18	6	24	14	18	6	24	20	52	4	4	13	56	77	97	1,796
2	Kaka'ako	342	94	169	210	139	120	239	82	64	34	10	10	3	17	8	5	3	19	14	22	3	5	5	72	93	53	1,835
3	Mō'ili'ili	779	268	202	241	322	113	242	100	72	43	9	13	4	22	8	3	2	47	12	22	3	4	6	106	140	112	2,895
4	Waikīkī	555	212	233	185	377	77	169	188	32	73	20	11	6	70	18	4	11	80	5	41	16	24	8	81	110	396	3,002
5	Kaimukī-Wai'alae	484	174	337	321	332	65	110	44	34	24	5	9	1	10	2	2	2	88	4	23	2	1	2	108	145	98	2,427
6	Palama-Liliha	652	194	125	88	64	306	407	181	143	68	6	11	1	32	9	8	3	10	34	41	4	1	4	36	69	67	2,564
7	Kalihi-Iwilei	307	150	107	75	52	158	144	155	120	71	6	12	2	19	11	8	5	11	28	18	1	3	7	28	41	50	1,589
8	Airport-Pearl Harbor	105	23	29	31	29	42	82	132	96	76	11	10	4	40	15	7	5	3	8	7	4	3	5	6	21	24	818
9	Salt Lake-Āliamanu	351	146	67	58	34	86	222	387	362	204	9	26	1	57	20	12	7	4	25	17	4	2	8	20	104	30	2,263
10	Pearl City-'Aiea	416	108	79	83	44	75	233	396	252	672	33	109	5	288	107	63	24	13	32	33	14	2	9	19	204	47	3,360
11	'Ewa	455	168	148	446	100	69	173	182	99	151	608	769	53	213	28	31	24	12	21	38	19	2	40	40	206	45	4,140
12	Kapolei	242	83	80	258	60	41	91	111	58	105	236	918	111	133	22	26	24	12	13	20	12	3	111	23	119	68	2,980
13	Makakilo	140	54	49	144	35	28	56	60	38	47	65	347	50	61	9	11	7	2	7	12	12	0	36	16	72	17	1,375
14	Waipahu-Waikele	307	82	150	453	63	52	96	138	75	205	214	217	24	392	119	98	39	7	14	19	19	6	16	30	175	54	3,064
15	Waiawa	230	66	98	316	41	30	83	110	56	173	49	125	12	259	155	161	82	7	8	15	14	9	6	14	103	40	2,262
16	Mililani	279	89	78	91	54	36	108	131	60	134	38	97	8	163	127	399	257	8	16	19	12	23	5	19	154	23	2,428
17	Wahiawa	151	51	45	55	30	18	61	70	40	62	10	58	4	66	46	210	247	7	9	8	12	28	5	15	99	18	1,425
18	East Honolulu	330	91	170	152	275	40	77	40	22	14	4	8	0	9	2	3	0	299	11	41	4	3	2	59	152	46	1,854
19	Kāne'ohe	272	61	50	46	28	88	135	84	63	38	4	12	0	22	6	4	1	5	378	191	34	2	3	8	86	19	1,640
20	Kailua	480	90	76	65	37	91	118	70	46	32	5	9	2	25	5	6	2	17	126	623	15	4	0	24	106	28	2,102
21	Ko'olau Loa	45	13	14	23	4	7	17	17	9	8	0	5	1	3	2	3	4	2	13	7	244	12	0	5	22	10	490
22	North Shore	108	37	39	49	20	18	42	34	26	24	6	23	1	24	15	32	62	3	4	10	78	160	2	11	68	14	910
23	Wai'anae	237	89	82	107	56	37	93	145	62	49	31	292	24	73	18	14	13	7	10	20	8	0	525	16	114	26	2,148
24	Makiki-Mānoa	468	167	193	162	162	80	162	67	36	27	1	6	1	13	6	4	1	17	8	19	2	2	3	94	201	77	1,979
25	UH Mānoa	52	21	30	25	29	10	17	8	3	6	7	4	2	7	3	3	2	9	1	5	1	1	4	13	2	16	281
26	Ala Moana Center	37	23	26	38	17	10	15	3	4	5	1	2	1	3	2	2	0	4	2	2	0	1	1	10	4	0	213
	Total	7,967	2,696	2,867	3,871	2,513	1,846	3,382	3,037	1,974	2,408	1,411	3,121	327	2,045	777	1,137	833	717	823	1,325	541	305	826	929	2,687	1,475	51,840

Table D-5: 2030 Airport & Salt Lake Alternative A.M. Two-Hour Peak Period Transit Trips Origin-Destination Format

		Destination																									
	Origin	Downtown	Kaka'ako	Mō'ili'ili	Waikīkī	Kaimukī-Wai'alae	Palama-Liliha	Kalihi-Iwilei	Airport-Pearl Harbor	Salt Lake-Āliamanu	Pearl City-'Aiea	'Ewa	Kapolei	Makakilo	Waipahu-Waikele	Waiawa	Mililani	Wahiawa	East Honolulu	Kāne'ohe	Kailua	Ko'olau Loa	North Shore	Wai'anae	Makiki-Mānoa	UH Mānoa	Ala Moana	Total
1	Downtown	138	145	196	148	108	148	190	104	103	55	18	18	6	26	13	15	10	31	20	49	6	6	8	60	82	85	1,788
2	Kaka'ako	340	87	175	202	148	118	237	82	68	30	6	13	2	16	9	6	4	17	15	24	3	1	6	75	95	56	1,835
3	Mō'ili'ili	779	268	195	251	319	113	243	102	69	41	8	6	6	20	12	4	2	45	14	24	6	5	3	111	134	116	2,896
4	Waikīkī	552	211	238	195	370	77	166	198	30	67	19	10	3	76	17	7	6	79	9	43	13	26	8	76	124	390	3,010
5	Kaimukī-Wai'alae	481	168	344	325	337	66	114	49	32	14	8	5	0	9	3	4	4	93	7	15	1	2	1	109	142	95	2,428
6	Palama-Liliha	646	192	129	90	71	313	406	167	137	79	7	15	1	28	9	5	3	12	37	37	3	0	5	31	67	58	2,548
7	Kalihi-Iwilei	302	151	107	70	51	166	145	155	119	65	12	14	1	21	6	4	8	7	25	20	2	1	2	26	39	47	1,566
8	Airport-Pearl Harbor	94	27	22	28	27	39	80	126	96	64	10	7	1	34	15	8	4	4	9	6	3	3	7	6	20	22	762
9	Salt Lake-Āliamanu	346	143	68	58	33	97	228	369	351	206	10	25	3	60	22	9	8	5	23	19	4	3	2	15	109	32	2,248
10	Pearl City-'Aiea	389	107	78	79	41	72	222	347	252	671	33	114	9	278	109	57	32	7	32	33	11	6	6	15	204	38	3,242
11	'Ewa	445	165	142	440	96	76	172	170	101	160	602	763	53	212	26	34	22	10	23	32	19	3	40	37	215	46	4,104
12	Kapolei	240	82	70	256	54	39	88	114	55	105	240	901	116	136	22	23	20	12	13	19	10	4	112	24	115	72	2,942
13	Makakilo	144	51	49	139	32	25	59	60	30	52	68	342	51	61	11	7	6	6	7	12	12	0	36	18	72	18	1,368
14	Waipahu-Waikele	313	76	154	450	53	51	98	133	69	207	227	213	26	386	118	97	42	8	18	20	16	5	16	24	170	50	3,040
15	Waiawa	231	58	101	312	37	32	75	103	57	179	53	125	14	254	159	161	85	8	9	16	13	9	7	15	99	42	2,254
16	Mililani	279	87	74	96	46	34	104	118	66	132	32	104	7	169	126	400	255	8	13	19	13	23	5	21	156	25	2,412
17	Wahiawa	148	52	48	54	28	20	57	77	35	60	12	59	3	69	39	215	247	5	8	8	10	30	5	20	94	15	1,418
18	East Honolulu	328	92	173	151	278	44	77	43	19	18	3	8	0	7	2	3	3	294	7	44	3	2	2	53	153	46	1,853
19	Kāne'ohe	265	62	52	46	23	86	136	82	60	47	2	11	1	20	4	5	4	4	381	192	36	1	3	13	84	18	1,638
20	Kailua	481	94	65	63	41	100	116	72	45	35	2	13	3	13	8	3	6	18	123	625	14	2	3	18	105	32	2,100
21	Ko'olau Loa	44	14	14	23	6	8	16	16	8	9	3	3	0	4	1	1	4	1	13	7	244	13	1	6	21	10	490
22	North Shore	102	40	38	47	21	21	44	37	23	22	5	18	0	25	11	38	60	4	4	10	77	163	3	11	67	12	903
23	Wai'anae	234	85	75	111	44	40	89	140	67	47	31	290	23	74	11	19	12	11	11	20	7	0	525	15	119	30	2,130
24	Makiki-Mānoa	460	167	197	167	159	93	155	56	47	24	1	9	0	13	3	3	5	18	7	19	4	1	2	92	202	76	1,980
25	UH Mānoa	58	20	26	29	28	8	15	5	6	5	6	4	2	8	2	4	3	7	2	4	0	3	5	15	1	19	285
26	Ala Moana Center	36	23	28	37	15	9	15	4	3	4	2	1	1	3	2	1	1	5	1	3	1	0	2	11	3	0	211
	Total	7,875	2,667	2,858	3,867	2,466	1,895	3,347	2,929	1,948	2,398	1,420	3,091	332	2,022	760	1,133	856	719	831	1,320	531	312	815	917	2,692	1,450	51,451