Executive Summary

The U.S. Department of Transportation Federal Transit Administration (FTA) and the City and County of Honolulu Department of Transportation Services (DTS) are undertaking a project that will provide high-capacity rail service on the Island of O‘ahu.

The study corridor for the Honolulu High-Capacity Transit Corridor Project (HHCTCP) extends from Kapolei in the west (the Wai‘anae or ‘Ewa direction) to the University of Hawai‘i at Mānoa (UH Mānoa) and Waikīkī in the east (the Koko Head direction). It is confined by the Wai‘anae and Ko‘olau Mountain Ranges in the mauka direction (toward the mountains, generally to the north within the study corridor) and the Pacific Ocean in the makai direction (toward the sea, generally to the south within the study corridor) (Figure S-1). This corridor includes the majority of residential and employment areas on O‘ahu. Its east-west length is approximately 23 miles, and between Pearl City and ‘Aiea, its width is less than 1 mile between Pearl Harbor and the base of the Ko‘olau Mountain Range.

The Project includes the construction and operation of a fixed guideway rail system. It is a portion of the Locally Preferred Alternative (LPA) that begins at the University of Hawai‘i-West O‘ahu (near the future Kroc Center), and proceeds via Farrington Highway and Kamehameha Highway (adjacent to Pearl Harbor), to Aolele Street serving the Airport, to Dillingham Boulevard, to Nimitz Highway, to Halekauwila Street, and ending at Ala Moana Center (Figures 2-8 to 2-11 in Chapter 2). The system will use steel-wheel-on-steel-rail technology. All parts of the guideway will be elevated except near Leeward Community College, where it will be at-grade in exclusive right-of-way.

Purpose of and Need for Transportation Improvements

The purpose of the Honolulu High-Capacity Transit Corridor Project is to provide high-capacity rapid transit in the highly congested east-west transportation corridor between Kapolei and UH Mānoa, as specified in the *O‘ahu Regional Transportation Plan 2030* (ORTP) (O‘ahuMPO 2007). The HHCTCP is intended to provide faster, more reliable public transportation service than

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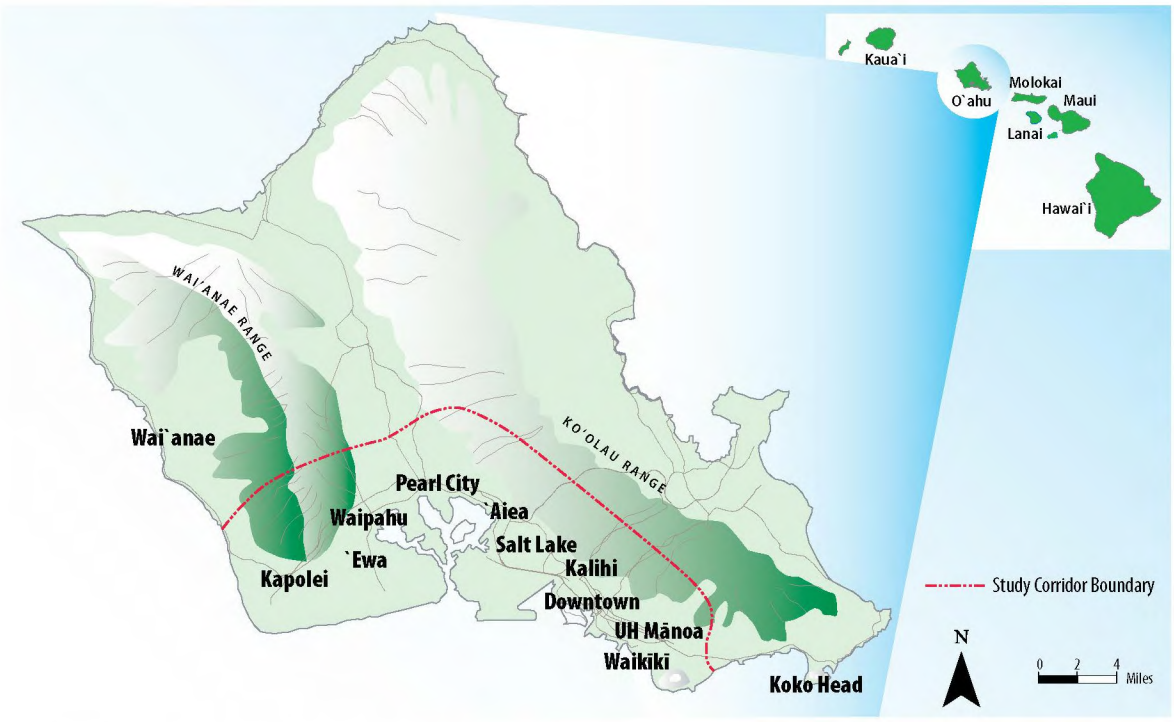

Figure S-1 Honolulu High-Capacity Transit Corridor Project Vicinity

can be achieved with buses operating in congested mixed traffic. It will provide reliable mobility in areas of the corridor where people of limited income and an aging population live and will serve rapidly developing areas of the study corridor. The HHCTCP will also provide additional transit capacity and an alternative to private automobile travel, as well as improve transit links within the study corridor. In conjunction with other improvements included in the ORTP, the HHCTCP will help moderate anticipated traffic congestion in the study corridor. It also supports the goals of the *City and County of Honolulu General Plan* (DPP 2002a) and the ORTP by serving areas designated for urban growth.

The project will improve mobility for travelers who face increasingly severe traffic congestion, improve transportation system reliability, provide accessibility to new development in the ʻEwa-Kapolei-Makakilo area in support of the City and County of Honolulu (City) policy to develop that area as a "second city," and improve transportation equity for all travelers.

Alternatives Considered

Prior to completing the Draft Environmental Impact Statement (EIS), alternatives were evaluated at three stages. First, a broad range of alternatives was considered and screened down to four alternatives that were evaluated as documented in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Report* (Alternatives Analysis) (DTS 2006b). Second, an alternatives analysis was conducted. The Alternatives Analysis Report recommended (and the City Council identified) the Fixed Guideway Alternative as the Locally Preferred Alternative. Third, scoping was

Scoping is an open process involving the public and other Federal, State, and Local agencies to identify the important issues for consideration in the EIS process.

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completed under the National Environmental Policy Act (NEPA) process. The scoping process concluded that no alternatives that had not been previously studied and eliminated for good cause would satisfy the Purpose and Need at less cost, with greater effectiveness, or with less environmental or community impact.

Prior to identifying an elevated fixed guideway system, the City and FTA evaluated a variety of high-capacity transit options. Options evaluated and rejected included an exclusively at-grade fixed guideway system using light rail or bus rapid transit (BRT) vehicles, as well as a mix of options consisting of both at-grade and grade-separated segments.

During the fall of 2005 and winter of 2006, the City conducted an alternatives screening. This is documented in the *Honolulu High-Capacity Transit Corridor Project Alternatives Screening Memorandum* (DTS 2006a).

The alternatives were screened through a series of steps, including gathering data, creating a comprehensive list of potential alternatives, developing screening criteria, and presenting viable alternatives to the public and interested public agencies and officials for comment. This process was completed in accordance with the Hawai'i Revised Statutes (HRS) Chapter 343 (the State of Hawai'i's environmental impact statement law) and the Alternatives Analysis scoping process. Input from the scoping process was analyzed and the alternatives were refined based on this input.

Once this evaluation was complete, the modal, technology, and alignment options were combined to create the following alternatives, which were evaluated and documented in the Alternatives Analysis Report (DTS 2006b), which is incorporated by reference:

- **No Build Alternative**
- **Transportation System Management Alternative**
- **Managed Lane Alternative**
  - Two-direction Option
  - Reversible Option
- **Fixed Guideway Alternative**
  - Kalaeloa-Salt Lake–North King–Hotel Option
  - Kamokila–Airport–Dillingham Option
  - Kalaeloa–Airport–Dillingham–Halekauwila Option

Chapter 2 of the Alternatives Analysis Report described these alternatives in detail, and Chapter 6 of that report compared them. After review of the Alternatives Analysis Report and consideration of public comments, the City Council identified a Locally Preferred Alternative that was signed into law by the Mayor, becoming Revised Ordinance of Honolulu (ROH) Section 07-001. This ordinance authorized the City to proceed with planning and engineering of a fixed guideway project from Kapolei to UH Mānoa with an extension to Waikīkī. The City Council also passed Resolution 07-039, which directed the first construction project to be fiscally constrained and to extend from East Kapolei to Ala Moana Center via Salt Lake Boulevard.

During the NEPA scoping process, several scoping comments were received requesting reconsideration of the Managed Lane Alternative. This alternative was considered and rejected during the Alternatives Analysis process. Because no new information was provided that would have substantially changed the findings of the Alternatives Analysis process regarding the Managed Lane Alternative, this alternative was not included in the Draft EIS.

In addition to suggestions to reconsider previously eliminated alternatives, three separate proposals were received and documented in the *Honolulu High-Capacity Transit Corridor Project National Environmental Policy Act Scoping Report* (DTS 2007). One proposal was to provide

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additional bus service with either school buses or private vehicles. The second was for a High-Speed Bus Alternative to include aspects of the Fixed Guideway Alternative and the Managed Lane Alternative. These proposals were similar to alternatives that had already been considered and eliminated during the Alternatives Analysis process. Therefore, they were not considered in the Draft EIS. The third proposal was for an additional fixed guideway alternative serving the Honolulu International Airport. This alternative was included in the Draft EIS.

During the scoping process, comments were requested on five transit technologies. The comments received did not substantially differentiate any of the following five considered technologies as being universally preferable to the other technologies:

- Light-rail transit
- Rapid-rail transit (steel wheel on steel rail)
- Rubber-tired guided vehicles
- Magnetic levitation system
- Monorail system

Subsequent to the scoping process, a technical review process that included opportunities for public comment was used to select a transit technology. Transit vehicle manufacturers submitted 12 responses detailing the features of these different vehicle technologies. The responses were reviewed in February 2008 by a technology panel that ranked the performance, cost, and reliability of the proposed technologies and accepted public comment on the technology selection. The independent five-member technology panel was composed of four transit experts and a transportation academic appointed by the City Council. The panel's report resulted in the City establishing steel wheel operating on steel rail as the technology for the Project and eliminated the other technologies from further consideration.

The alternatives that were evaluated in the Draft EIS resulted from this process of developing alternatives and reflect comments received during the scoping process. This information is summarized in the *Honolulu High-Capacity Transit Corridor Project National Environmental Policy Act Scoping Report* (DTS 2007).

The following four alternatives were evaluated in the Draft EIS. They were developed to comply with the Locally Preferred Alternative adopted by the City Council and to address the public and agency comments received during the comment period for the HRS Chapter 343 preparation notice for this Project and the NEPA scoping process:

- 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 and Salt Lake (Airport & Salt Lake Alternative)

As documented in the Draft EIS, adverse impacts to environmental resources would be slightly greater with the Salt Lake Alternative than with the Airport Alternative with respect to hazardous materials and noise. The guideway and stations would be dominant elements in views near the Project, while viewpoints farther away from either alternative would be less affected. Visual effects would be greater with the Salt Lake Alternative because it runs makai of several residential neighborhoods where many viewers would have an increased sensitivity to view changes and blocked views.

The Airport Alternative will carry the most passengers and provide the greatest transit-user benefits. The Airport Alternative also will result in the fewest vehicle miles traveled and vehicle hours of delay. It will provide access to employment centers at Pearl Harbor Naval Base and Honolulu

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International Airport and will have substantially greater ridership to those areas than the Salt Lake Alternative. It will serve the Salt Lake neighborhood with connecting bus service. The Airport Alternative will have slightly lower potential for encountering archaeological resources but will affect more historic resources than the Salt Lake Alternative. The Airport Alternative will result in the least overall harm to resources that are protected by Section 4(f) of the U.S. Department of Transportation Act and would encroach the least into waters of the U.S. during both construction and operation.

Because the Airport & Salt Lake Alternative includes elements of the individual Salt Lake and Airport Alternatives, the combined alternative would have the greatest impact of the three Build Alternatives.

Based on technical performance of the alternatives, public comment, and City Council Resolution 08-261, the Airport Alternative was identified as the Preferred Alternative, and it is described in this Final EIS as the "Project." The City identified the Preferred Alternative based on the evaluation of all reasonable alternatives presented in the Draft EIS and consideration of public comments [23CFR 771.125(a)(1)]. The Project includes the construction and operation of a fixed guideway rail system. It is a portion of the LPA that begins at the University of Hawai'i-West O'ahu (near the future Kroc Center), and proceeds via Farrington Highway and Kamehameha Highway (adjacent to Pearl Harbor), to Aolele Street serving the Airport, to Dillingham Boulevard, to Nimitz Highway, to Halekauwila Street, and ending at Ala Moana Center.

The No Build Alternative is included in this Final EIS to provide a comparison of what future conditions would be if the Project was not implemented. This alternative includes completion of the committed transportation projects identified in the O'ahu Metropolitan Planning Organization (O'ahuMPO) ORTP.

The Project will provide a fixed guideway transit system from East Kapolei to Ala Moana Center via the Airport. Plans of the Project are included in Appendix B, Preliminary Alignment Plans and Profiles. The system will use steel wheel on steel rail technology. The vehicles are designed for fully automated (driverless) operation, but may carry a driver and are capable of manual operation. All parts of the system will either be elevated or in exclusive right-of-way.

In addition to the guideway, the Project will require construction of transit stations and supporting facilities. Supporting facilities will include a vehicle maintenance and storage facility, transit centers, park-and-ride facilities with a total of approximately 4,100 spaces, an access ramp from Interstate Route H-2 (H-2 Freeway) to the Pearl Highlands Station, and traction power substations. The maintenance and storage facility will be located either in Ho'opili near Farrington Highway between North-South Road and Fort Weaver Road or near Leeward Community College, which is the preferred site option.

Some bus service will be reconfigured to bring riders on local buses to nearby fixed guideway transit stations. To support this system, the bus fleet will be increased. Analysis of the Project assumes completion of the committed transportation projects identified in the ORTP, including improvements to the H-1 Freeway and a Nimitz Viaduct.

Transportation

Existing and future (planning horizon year 2030) transportation system conditions, service characteristics, performance, and transportation effects for each of the alternatives (including the No Build Alternative) are evaluated in this Final EIS. The evaluation is organized into three sections:

- Existing (2007) conditions and performance

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- Future (2030) conditions and performance, with comparisons between the Project and 2030 No Build conditions
- Construction-related effects

The existing transportation network (streets, highways, parking, bicycle and pedestrian network, Honolulu International Airport, and public transportation) was evaluated. Current transit service in the corridor is heavily used, resulting in bus service productivity that is among the highest in the U.S. Congestion-related delays occur on roadways within the study corridor. This includes peak a.m. and p.m. congestion, especially in the peak direction (i.e., toward Downtown in the morning) and on existing high-occupancy vehicle (HOV) lanes.

These congestion-related delays increase travel times for the entire network; and increasing congestion and constrained operating conditions for public transit services have led to transportation conditions that are becoming less reliable. Although the bus system's productivity exceeds several systems that operate in larger metropolitan areas, gradually slower speeds, increased costs, and reduced service reliability have resulted from buses operating in mixed traffic. Even with the $3 billion in planned roadway improvements outlined in the ORTP, congestion will increase, making it more difficult for bus transit to effectively serve the population.

Under the No Build Alternative, transit service would experience somewhat slower operating speeds and reduced reliability through the 2030 horizon year.

With the Project, overall transit speeds will increase, which will reduce travel times and improve operating efficiency as a result of the fixed guideway system. The Project will reduce travel time to major activity centers, such as Downtown and Ala Moana Center. For example, transit travel times from Kapolei to Downtown Honolulu in the a.m. peak would be 90 minutes in 2030 with the No Build Alternative and 55 minutes with the Project. Trips to and from Central O'ahu and Waikīkī, while not directly served by the Project, also will benefit from reduced transit travel times. Total congestion will be reduced by 18 percent with the Project.

Transit service will be improved through local bus routes and pedestrian and bicycle access to guideway stations, resulting in an increased transit share of total trips (particularly for work-related trips). A fixed guideway system will also improve transit equity by reducing travel times for transit-dependent populations to major employment areas.

With the Project, the fixed guideway will affect existing streets, parking capacity, and pedestrian and bicycle facilities. Effects of the Project will include reduced travel lane widths, parking, bicycle lanes, and sidewalks. Careful design and placement of guideway columns will minimize these potential effects. The Project will negatively affect traffic conditions at six intersections near the East Kapolei, UH West O'ahu, Pearl Highlands, and Ala Moana Center Stations. The Project will result in a loss of approximately 175 on-street and 690 off-street parking spaces. Traffic and parking effects will be mitigated. Construction of the Project will have temporary effects on the transportation system, and mitigation will include a Maintenance of Traffic Plan and Transit Mitigation Program.

Subsequent to the Draft EIS, additional coordination with FTA, the Federal Aviation Administration (FAA), and HDOT Airports Division revealed that the Aolele Street alignment required refinement to avoid impacting Honolulu Airport's runway protection zone. The refined project alignment is consistent with FAA's requirements for the approach surface, Runway Protection Zone, and runway safety areas, and will not result in long-term adverse effects on airport operations. There will be no significant adverse environmental

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effects from the refined design in the vicinity of the airport as documented in this Final EIS.

Environmental Analysis, Consequences, and Mitigation

The existing conditions, environmental effects of the No Build Alternative and the Project, and mitigation are documented in this Final EIS. All aspects of the natural and built environment were evaluated per NEPA and HRS Chapter 343 regulations. Efforts were made to avoid and minimize impacts to the natural and built environment. Following is a summary of those resources where an impact is anticipated and mitigation commitments have been made by the City (Appendix I, Mitigation and Commitments).

Displacements and Relocations

Property acquisition of 199 parcels will be required. The Project will require 40 full acquisitions. Partial acquisitions will include 159 parcels.

Acquisition of land used for residential and commercial purposes will result in displacements and relocations. Displaced residents will need to purchase or rent new dwellings. Displaced businesses will need to purchase or lease new commercial/industrial space, and the location where employees work will change.

Twenty residences, 1 church, and 66 businesses will be relocated by the Project. Acquisition of property for the Project will be conducted in accordance with Federal and State regulations. Where relocations will occur, affected property owners, businesses, or residents will receive compensation in compliance with all applicable Federal and State laws. Compensation will be in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (49 CFR 24).

Visual and Aesthetics

Visually sensitive resources in the study corridor include landmarks, significant views and vistas, historic and cultural sites, and Exceptional Trees. These resources are important because of their scenic quality, scale, and prominence within the visual environment.

Protected views and vistas, including mauka and makai views and views of prominent landmarks in the study corridor are identified in City development plans, including the ʻEwa Development Plan, the Central Oʻahu Sustainable Communities Plan, and the Primary Urban Center Development Plan. Protected views and vistas are view planes that the City has determined are important to protect because of their scenic quality, scale, and prominence within the visual environment. These views are generally protected through the City's urban design principles that relate to appropriate building heights, setbacks, and design and siting controls. The Project is supportive of the land use objectives included in these plans as summarized in Appendix J, which discusses the Project's relationship to State and City land use plans, polices, and controls for the study corridor. The summary includes the relevant provisions of policy documents related to visual and aesthetic conditions. The City's general urban design principles protect public views based on the type of view and are applicable to both public streets and public and private structures. Some protected views and vistas will change as a result of the Project, including public views along streets and highways, mauka-makai view corridors, panoramic and significant landmark views from public places, views of natural features, heritage resources and other landmarks, and view corridors between significant landmarks. The guideway and some stations will partially block mauka-makai public views from streets that intersect with the alignment.

The Project will introduce a new linear visual element to the corridor and, as a result, changes to some views will be unavoidable. Depending on the degree of view obstruction or blockage, some changes in view will be significant. Viewers'

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responses to these changes will vary with their exposure and sensitivity and depend on the alignment orientation, guideway and station height, and height of surrounding trees and buildings. View changes will be less notable in wider vista or panoramic views where the project elements are smaller components of the larger landscape. Generally, the project elements will not be dominant features in these views.

Mitigation measures will focus on preserving visual resources, enhancing the Project with architectural and landscape design features—retaining existing trees where practical, providing new vegetation, shielding exterior lighting—and engaging the community in the design as appropriate.

Noise and Vibration

Noise impacts from the Project were evaluated using criteria established by the FTA, which are based on community reaction to environmental noise exposure (FTA 2006b).

Noise levels were measured at locations along the project alignment and near station locations to establish the most sensitive existing environment (i.e., existing baseline noise levels). Noise measurements were taken at ground-level and elevated noise-sensitive locations along the study corridor. Potential noise effects from transit park-and-ride lots and maintenance and storage facility operations were also evaluated.

A 3-foot parapet wall is included in the project design. As mitigation, wheel skirts have been added to the vehicle specifications to reduce noise generated from the Project by 3 dBA or more. Wheel skirts will reduce noise exposure levels below impact criteria at five of eight locations. Even with wheel skirts, three of these high-rise residential buildings will experience moderate noise impacts. The use of sound-absorptive materials under the tracks in these three areas will reduce the project noise exposure at upper floors to below the moderate noise impact threshold.

Traction power substations will be designed to meet the requirements of Hawai'i state law (HAR 11-46). Track lubrication will be provided at tight-radius curves within the maintenance and storage facility preferred site option near Leeward Community College to eliminate wheel squeal.

Once the Project is operating, noise measurements will be conducted at representative sites. Should the Project's noise exposure exceed the FTA noise impact criteria, further mitigation may be conducted on the receivers with the authorization of the property owners.

The Project will not create vibration effects, so no mitigation is proposed.

Hazardous Materials

A number of sites within the study corridor were identified as potential sites of concern for hazardous materials. In some locations, large or specialized hazardous waste or hazardous materials sites may be affected by right-of-way acquisition. These include underground and aboveground storage tanks (UST and AST), fuel islands, and engineered storage facilities. In a few cases, the Project may displace hazardous materials operations. This includes relocating gas station fuel islands and USTs and ASTs. Environmental site assessments will be conducted for potentially contaminated sites, and remediation will be completed where needed.

Water Resources

Twenty streams or conveyance channels are to be crossed by the guideway or other project structures. In 18 cases, where the Project crosses them, these stream channels have been modified within the study corridor. More importantly, the guideway traverses urban areas where streams have been realigned and otherwise modified for flood control purposes. The Project will, once

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constructed, permanently encroach upon 0.02 acre of waters of the U.S. These impacts are from placing piers in Waiawa Springs, Moanalua Stream, Kapālama Canal Stream, and Nu'uanu Stream and Waiawa Springs. Permanent mitigation features are proposed at Waiawa Stream, within the Pearl Highlands Station area.

The guideway will cross several floodplains in Waipahu and Pearl Highlands. However, the Project will not cause significant floodplain encroachment as defined by USDOT Order 5650.2. Any changes caused by the Project will be mitigated through design to comply with current flood zone regulations.

Where the guideway will cross floodplains, the columns supporting the guideway and stations will be designed to withstand flooding. Facilities in floodplains at ground level (e.g., stairs, elevators, and traction power substations) will be designed to function and remain safe during flooding. These features will comply with flood zone regulations. Hydraulic studies completed for specific locations where the Project will cross floodplains indicate that, with mitigation, the Project will not raise base flood elevations.

Pollution prevention best management practices (BMP), such as regular inspection and cleaning of the drainage system, will be a part of the stormwater management plan that will be developed during Final Design. Permanent BMPs will be installed at the maintenance and storage facility and the park-and-ride facilities. Permanent BMPs will also be installed for stormwater that drains from the guideway at all crossings of water bodies. Permanent BMPs will be installed as part of the Project to address stormwater quality before the water is discharged to streams or existing storm drain systems. The BMPs will promote a natural, low-maintenance, sustainable approach to managing and increasing stormwater quality. As part of the permitting process, project plans will be prepared that incorporate BMPs that will help prevent stormwater pollution.

Street Trees

Coordination regarding street trees was initiated with the City Department of Parks and Recreation Division of Urban Forestry and community groups, such as the Outdoor Circle and Sierra Club. This has resulted in identifying Exceptional Trees along the project alignment. The City will coordinate as the Project progresses.

The Project will require tree pruning and removal. Tree removal will be minimized to the greatest extent possible, but if a street tree is close to the guideway, it will likely require periodic pruning if it is not removed.

Effects on street trees will be mitigated by transplanting existing trees or planting new ones.

Pruning will be in compliance with City and County ordinances and require supervision by a certified arborist. The City will coordinate with the State of Hawai`i Department of Transportation landscape architect and other agencies.

Archaeological, Cultural, and Historic Resources

Under the *National Historic Preservation Act* (NHPA) (USC 1966a), Section 106 requires Federal agencies to consider the effects of their actions on historic properties. This includes archaeological and traditional cultural properties, which are the beliefs, customs, and practices of a living community of people that have been passed down through the generations. Hawai'i's historic preservation review legislation (HAR 2002) includes similar requirements.

Archaeological resources already documented within the APE include remnants of fishponds, cultivation terraces, irrigation systems, habitated sites, and subsurface cultural layers related to Native Hawaiians that may include religious or

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cultural artifacts and resources, including iwi kupuna or Hawaiian burials. These effects will occur during construction. After completion of construction, no additional project-related effects on archaeological resources are expected.

Prior to Final Design of each construction phase, an archaeological inventory study will be completed to investigate the potential for sub-surface deposits. The Programmatic Agreement outlines the process for developing an archaeological inventory survey, treatment of burials discovered during preliminary archaeological work, prior to Final Design, as well as burials found during project construction.

The analysis of cultural resources was based on compliance requirements specified in NEPA, NHPA Section 106, and Act 50 (HHB 2000), as it amends the State of Hawai'i EIS law (HRS Chapter 343) to include "effects on the cultural practices of the community and State."

Act 50 Findings: Based on personal consultations and examination of historic documents and existing archaeological information, the cultural impact assessment concluded that most of the traditional cultural practices associated with cultural resources, such as the gathering of plant and marine resources for subsistence activities within the study corridor, have been heavily damaged or destroyed through previous development. No ongoing practices related to traditional gathering were identified during the assessment.

Historic resources were identified and evaluated, and the Project's effects on them were determined. Properties within the Area of Potential Effects (APE) were identified as those with construction dates before 1969. The APE contains 81 historic resources (individual or districts). Through consultation, the Project was determined to have an adverse effect on 33 resources. Of the 81 historic resources, FTA has determined that the Project will have adverse effects to 33 historic resources. While the Project was designed to avoid and minimize effects to historic properties, this was not always possible in meeting the Project's Purpose and Need. A draft Programmatic Agreement (PA) was developed in consultation among the consulting parties. The draft PA records the terms and conditions agreed upon to resolve potential adverse effects and is attached to this Final EIS in Appendix H. The Section 106 signatories (FTA, SHPO, and ACHP) clarified the language in the draft PA, and in May 2010 FTA distributed the draft PA to the Section 106 consulting parties for informational purposes. FTA, SHPO, and ACHP will finalize this draft PA prior to the ROD (see Appendix H, Section 106 of the National Historic Preservation Act Programmatic Agreement).

Construction Effects

Construction is planned to begin in 2010 and be completed by 2019. Construction effects will be temporary and limited in areas as construction proceeds along the project alignment. These effects will vary depending on the land use in each sub-area. Construction-related effects will primarily result during construction of the main structural components: the foundations and columns, superstructure (the elevated guideway structure), and stations. Construction of other system components, such as traction power substations, will also have associated effects, but to a lesser degree. Construction activities at the maintenance and storage facility, park-and-ride lots, transit centers, and staging and support facilities will result in effects that are localized to the vicinity of those facilities.

During construction, access to businesses near construction activities will be maintained.

DTS has prepared a Safety and Security Management Plan Manual that requires contractors to adhere to safe practices. This plan will protect the

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general public, private property, and workers from construction risks.

During construction, visual quality may be altered for all viewer groups. Construction-related signage and heavy equipment will be visible at and near construction sites. Mature vegetation, including trees, may be removed from some areas or pruned to accommodate construction of the guideway, stations, and park-and-ride lots. This will degrade or partially obstruct views or vistas.

Noise during construction could be bothersome and annoying to nearby residents, visitors, and businesses. The Project will generate noise that will occur intermittently in different locations throughout the nine-year construction period.

Common sources of vibration during construction activities include jackhammers, pavement breakers, hoe rams, bulldozers, and backhoes. Pavement breaking and soil compaction will likely produce the highest levels of vibration. Depending on soil conditions in a given sub-area, activities such as pile driving can generate enough vibration to result in substantial short-term noise impacts. Various mitigation methods will be used to minimize noise and vibration impacts during construction.

Archaeological resources or native Hawaiian burials could be encountered during construction. The potential to encounter these resources will be reduced through pre-construction site investigations completed in coordination with the State Historic Preservation Division (SHPD) and the O'ahu Island Burial Council. Any resources encountered during construction will be treated as outlined in the Section 106 Programmatic Agreement.

Section 4(f)

Section 4(f) of the *U.S. Department of Transportation Act of 1966* (49 USC 303) protects public parklands, recreational lands, wildlife refuges, and historic sites of National, State, or Local significance from acquisition and conversion to transportation use. Because avoiding Section 4(f) properties was an important consideration, most public parks, recreational properties, and historic properties identified within the study corridor were avoided in designing the Project. However, the Project will result in the use of 11 Section 4(f) historic properties, de minimis use of two historic properties; de minimis use of three park and recreational properties; and temporary occupancy of 2 recreational properties. FTA and the City considered all possible planning to minimize harm to these Section 4(f) properties.

Cost and Financial Analysis

The capital cost of the Project, in year-of-expenditure dollars, will be $5.1 billion, excluding finance charges.

The local funding source for the Project is a dedicated 0.5-percent surcharge on the State of Hawai'i's General Excise and Use Tax (GET). This GET surcharge revenue is to be used exclusively for the Project's capital and/or operating expenditures and is expected to generate $3.5 billion (year-of-expenditure dollars) through 2022. The FTA has agreed to consider $1.55 billion (year-of-expenditure dollars) for the Federal contribution to the Project from its New Starts program.

The City receives Federal assistance through various funding programs from the FTA for ongoing capital investments to maintain and overhaul its transportation system. The financial analysis performed assumes the City will continue to receive these funds, some of which will increase noticeably after implementation of the Project.

Comments and Coordination

Agencies, non-governmental groups, and the public have been engaged throughout the project planning process, as required by Federal and State law. Public involvement efforts, including agency coordination and consultation, have been continuous throughout the Project, beginning with

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the Alternatives Analysis phase in December 2005 through the public comment period on the Draft EIS and during preparation of this Final EIS. In accordance with Executive Order 12898, particular attention has been paid to reaching low-income and minority populations, which are traditionally underserved and underrepresented in the public involvement process.

As part of the NEPA and HRS Chapter 343 process, the Draft EIS was circulated for a 75-day review and comment period starting in November 2008. Formal public hearings were held during this period. Attendance at the hearings was not required to submit comments.

In total, 586 comment submissions were received. The majority of the comments received were related to the following topics: alternatives considered, planned extensions, ridership and travel forecasting, parking, traffic analysis, visual, noise, cost and financing, construction phasing, construction effects, and acquisition and relocation.

Public involvement activities and program will continue throughout the construction period. This program will continue to involve the community while advancing project activities, education, and construction assistance. Project staff will work with businesses and residents prior to and during construction to provide information and address concerns about the construction process. The Project will also continue use of the Speakers Bureau, the project website (www.honolulutransit.org), and the hotline.

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