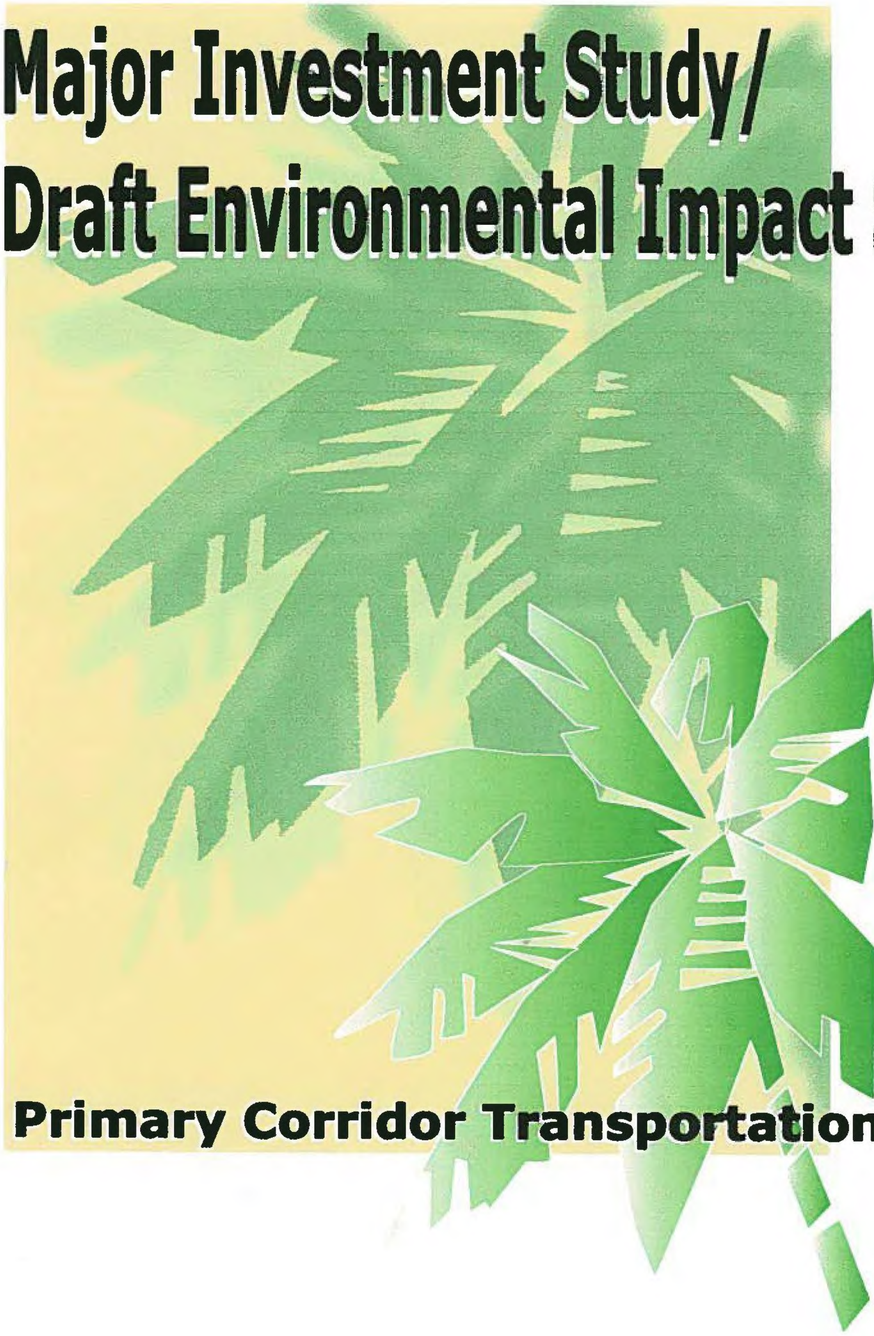
Major Investment Study/ Draft Environmental Impact Statement



Primary Corridor Transportation Project

US Department of Transportation
Federal Transit Administration

City and County of Honolulu
Department of Transportation Services

AUGUST 2000

Primary Corridor Transportation Project

MAJOR INVESTMENT STUDY / DRAFT ENVIRONMENTAL IMPACT STATEMENT

SUBMITTED PURSUANT TO:

National Environmental Policy Act of 1969, §102, 42 U.S.C. §4332; Federal Transit Laws, Title 49 U.S.C. Chapter 53, §5301(e), §5323(b) and §5324(b); Title 49 U.S.C. §303, formerly Department of Transportation Act of 1966, §4(f); National Historic Preservation Act of 1966, §106, 16 U.S.C. §470f; Executive Order 11990 (Protection of Wetlands); Executive Order 11988 (Floodplain Management); Executive Order 12898 (Environmental Justice); Chapter 343, Hawaii Revised Statutes; and Hawaii Administrative Rules Title 11, Chapter 200, Environmental Impact Statement Rules.

by the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

Cooperating Agencies

U.S.D.O.T. Federal Highway Administration
U.S. Army Corps of Engineers
State of Hawaii Department of Transportation

AUG 1 6 2000
Date of Approval

Leslie T. Rogers
Regional Administrator, Region IX
For Federal Transit Administration

August 16, 2000
Date of Approval

Director
Department of Transportation Services
For City and County of Honolulu

The following persons may be contacted for additional information concerning this document:

Ms. Donna Turchie
Senior Transportation Representative
Region IX
Federal Transit Administration
U.S. Department of Transportation
201 Mission Street, Suite 2210
San Francisco, California 94105-1839
(415) 744-3115

Ms. Cheryl Soon
Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813
(808) 523-4125

This document and all ancillary documents were prepared under my direction.

Director, Department of Transportation Services
For City and County of Honolulu

Abstract

Actions described in this Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS) are intended to address existing and future mobility constraints in Oahu's primary transportation corridor. The primary transportation corridor extends from Kapolei in the Ewa District to the University of Hawaii-Manoa and Waikiki in the Primary Urban Center (PUC). Three alternatives are explored in this document: (1) The No-Build Alternative includes those projects expected to be implemented in the next three years, and expansion of bus service in developing areas (e.g., Kapolei) to maintain existing service levels; (2) The Transportation System Management (TSM) Alternative which features the reconfiguration of the present bus route network to a hub-and-spoke system, and some highway elements; and (3) The Bus Rapid Transit (BRT) Alternative which builds on the hub-and-spoke bus system in the TSM Alternative, and adds Regional and In-Town BRT systems (the Regional BRT system includes a continuous H-1 BRT Corridor from Kapolei to Downtown with special ramps to transit centers; the In-Town BRT system is a high capacity transit spine from Middle Street to Downtown, a University Branch from Downtown to UH-Manoa, and a Kakaako/Waikiki Branch that extends from Downtown to Waikiki via Kakaako).

This document analyses these three alternatives in terms of transportation and environmental impacts, financial feasibility and sources of funding, and cost-effectiveness. Transportation analyses include effects on transit service and other surface transportation systems, and transit ridership. Environmental parameters examined include land use, displacements and relocations, neighborhood setting, natural resources, air quality, noise, parklands, historic sites, visual resources and impacts during construction.

Analyses are documented in this MIS/DEIS, and its appendices. Copies of these documents are available for review at the Department of Transportation Services, Office of Environmental Quality Control, Legislative Reference Bureau Library, Municipal Reference and Records Center, University of Hawaii Hamilton Library, and State Main and Regional Libraries on Oahu.

Comments

Comments on this document may be submitted in writing or may be made orally at a public hearing. Written comments should be submitted to Ms. Soon at the above address. Information on the public hearing can also be obtained from Ms. Soon.

Comments are due by November 6, 2000.

PREFACE

This Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS) is prepared in compliance with the National Environmental Policy Act (NEPA) and Chapter 343, Hawaii Revised Statutes (State EIS Law). The Federal Transit Administration (FTA) is the lead federal agency for this project, and the City and County of Honolulu's Department of Transportation Services (DTS) is the local lead agency. The Federal Highway Administration (FHWA), U.S. Army Corps of Engineers (ACOE), and Hawaii State Department of Transportation are cooperating agencies. This MIS/DEIS has been prepared in accordance with the National Environmental Policy Act of 1969, §102, 42 U.S.C. §4332; Federal Transit Laws, Title 49 U.S.C. Chapter 53, §5301(e), §5323(b) and §5324(b); Title 49 U.S.C. §303, formerly Department of Transportation Act of 1966, §4(f); National Historic Preservation Act of 1966, §106, 16 U.S.C. §470(f); Executive Order 11990 (Protection of Wetlands); Executive Order 11988 (Flood Plain Management); Executive Order 12898 (Environmental Justice); Chapter 343, Hawaii Revised Statutes; and Hawaii Administrative Rules Title 11, Chapter 200, Environmental Impact Statement Rules and FTA guidelines, Procedures and Technical Methods for Transit Project Planning; FTA/FHWA regulations, Environmental Impact and Related Procedures (August 1987); Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (July 1986).

Honolulu approached the MIS/DEIS process with a significantly enhanced early and proactive public involvement program. Public participation was the core of the alternatives development process and there exists a feeling of "ownership" by those who attended the meetings and actually worked with the agencies.

Since September 1998, DTS and the State Department of Transportation have sponsored transportation workshops, known as Oahu Trans 2K. In the four rounds of Oahu Trans 2K meetings that have been held throughout the island, the public worked to identify their needs, assisted the agencies in identifying transportation strategies and concurred with the final set of alternatives being evaluated in this MIS/DEIS.

Concurrently, the residents were invited to an islandwide community-based visioning process known as the 21st Century Vision for Oahu. The 21st Century Vision Program is being conducted by 19 geographically-based community vision teams. They are facilitated by Cabinet-level members and assisted by professional volunteers from the American Institute of Architects, American Planning Association, and American Society of Landscape Architects, who are skilled in design and presentation. Vision team membership is open to anyone and meetings occur at least monthly, usually more often.

The vision teams started by assessing their community assets and weaknesses. Next, they wrote a vision statement and goals and objectives. After that, the vision teams met to determine strategies for addressing their most important issues including economic development, public safety, recreation, resource protection and transportation.

The two citizen involvement efforts were closely monitored and coordinated by the City to assure integration. As a result, while the MIS/DEIS focuses on transportation, it views transportation within a framework that includes quality of life and the other benefits transportation can provide. A particular transportation investment is not seen as an end in itself. Rather, it is viewed as one component in a network of islandwide transportation improvements that will help improve mobility, shape the island's growth patterns, and stimulate livable communities. Mobility and transportation are now mixed with livability goals, land use and growth objectives.

The MIS/DEIS has made another important shift from previous efforts. Transportation investments that can occur at grade level, are of a neighborhood scale, and fit within existing transportation rights-of-way are being considered. Built at a more human scale, such transportation systems can preserve the City's neighborhoods and protect the environment while stimulating desirable growth. Through the public involvement program, people have said that the scale of road construction that would be required to address the mobility constraints within the corridor would cost too much, would have too severe impacts, and would not be a desirable solution given the density and space limitations in the primary transportation corridor. Transit, being more space-efficient, would be looked at as the preferred mode for in-town mobility.

ORGANIZATION OF THE MIS/DEIS

The MIS/DEIS consists of an Executive Summary, seven chapters and five appendices. The Executive Summary presents the major findings in summary form. The Executive Summary is intended to provide the reader with a basic understanding of the mobility constraints in the primary transportation corridor, the alternatives considered to address these mobility constraints, and the major impacts associated with the alternatives.

Chapter 1, Purpose and Need, provides a description of the mobility problems in the primary transportation corridor, leading to a statement of the goals and objectives that this investment in transportation improvements is meant to achieve.

Chapter 2, Alternatives Considered, provides an overview of the screening and selection process that was applied to alternative transportation investments. Three alternatives are described and subjected to detailed assessment. This chapter discusses the capital and the operating and maintenance costs of each alternative. Alternatives considered, but not ultimately included, are also discussed here.

Chapter 3, Affected Environment, describes the existing social and natural environmental conditions in the primary transportation corridor. This discussion provides an understanding of the environment in which the transportation investments would take place, identifies sensitive resources, and benchmarks the environmental conditions so that an assessment may be made of the impacts that alternative transportation investments could create.

Chapter 4, Transportation Impacts, describes impacts on the transportation system that would result from the alternative transportation investments. Conditions are assessed based on projections to year 2025. The chapter emphasizes the performance of the transit and roadway systems.

Chapter 5, Environmental Consequences, discusses potential impacts of the alternatives on the built and natural environment, both during project construction and upon completion. Mitigation measures to reduce the level of adverse impact are described where appropriate. Specific elements analyzed in the chapter include:

- Land Use and Economic Development
- Displacements and Relocations
- Neighborhoods
- Visual and Aesthetic Resources
- Air Quality
- Noise and Vibration
- Ecosystems
- Water
- Energy
- Historic and Archaeological Resources
- Parklands
- Construction
- Conformance with Sections 106 and 4(f)

Chapter 6, Financial Analysis, presents information on the financial feasibility and funding sources for each alternative.

Chapter 7, Comparison of Alternatives, evaluates how well each alternative satisfies the project purposes and needs, and compares the cost-effectiveness and equity of the alternatives.

Appendix A summarizes the public and agency coordination processes. Appendix B contains conceptual engineering drawings of the alternatives. Appendix C contains public and agency comments received in the project's Environmental Impact Statement Preparation Notice, and responses to those comments. Appendix D contains correspondence pertaining to various formal environmental coordination processes.

Primary Corridor Transportation Project

Executive Summary

S.0 EXECUTIVE SUMMARY

S.1 NEED FOR ACTION

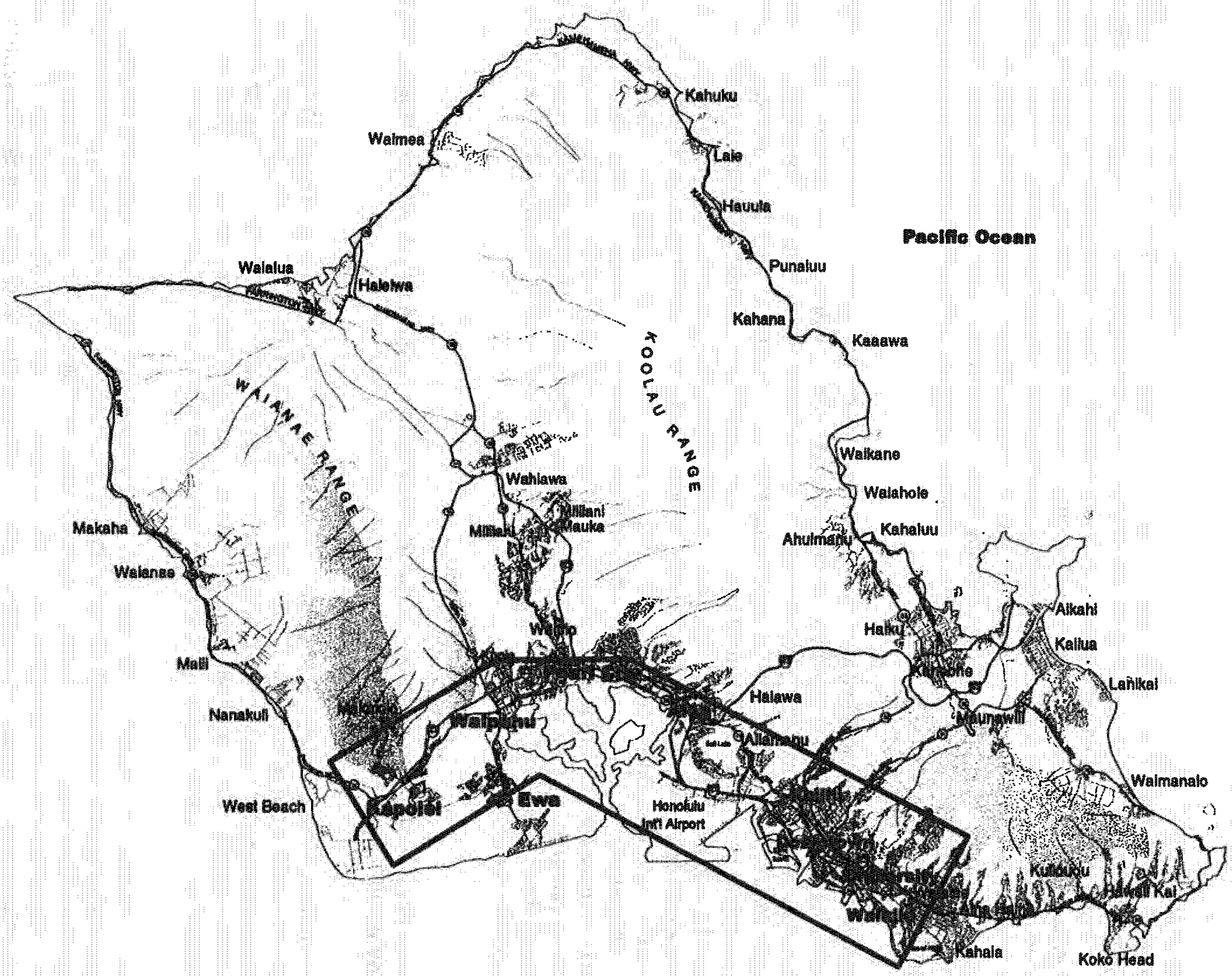
Oahu's primary transportation corridor, which stretches from Kapolei in the west to the University of Hawaii-Manoa (UH-Manoa) and Waikiki in the east (see Figure S.1-1), is the location of the vast share of the total travel occurring on the island. Existing transportation infrastructure in this corridor is overburdened handling current levels of travel demand. Further investment is required to improve the effectiveness of the corridor's transportation infrastructure. Transportation improvements in the corridor will enhance mobility, reduce travel time and improve the quality of life for Oahu's residents and visitors. The purpose of the Primary Corridor Transportation Project Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS) is to examine a range of alternative investments and identify the one that would most efficiently and effectively improve both the transportation system in the primary transportation corridor, and the connections between the corridor and the rest of the island.

For the past two years, the City and County of Honolulu (City) has conducted the 21st Century Oahu visioning process, including its transportation component, Oahu Trans 2K. Oahu Trans 2K has been the most extensive community-based transportation planning effort in the City's history, and it is the principal public outreach medium for the Primary Corridor Transportation Project. The Oahu Trans 2K workshops produced widespread agreement on certain fundamental issues. First, participants agreed that Oahu's traffic is a problem. Second, people felt strongly that proposed improvements must be reasonably affordable. Third, while there was agreement that road construction has an important role, building new highways in Honolulu's dense primary urban center cannot solve the traffic problem because there is inadequate space for new or wider streets. Additionally, any particular transportation investment is not seen as an end in itself but rather as one component in a network of islandwide transportation improvements that will help improve mobility, shape the island's growth patterns, and stimulate livable communities. Through continual public involvement and technical analysis, the following set of purposes and needs for a transportation investment in the primary transportation corridor was identified:

1. Increase the people-carrying capacity of the transportation system in the primary transportation corridor by providing attractive alternatives to the private automobile

With the sheer number of people living and working in Honolulu's urban core, a key strategy to mitigate traffic congestion is to get people out of their cars while they move around. This requires that alternative modes such as walking, bicycling and using public transit be given priority. Within the urban core, major destinations include Downtown, Waikiki, Kalihi, Kakaako and UH Manoa. Providing improved transit, bicycle, and pedestrian linkages to, from and between these major destinations is crucial to Honolulu's future.

If current levels of mobility and quality of life are to be maintained or improved, strategies are needed to increase people-carrying capacity instead of increasing vehicle capacity. Ever-increasing demands will be placed on the primary transportation corridor's roadways, which are already congested by existing levels of travel demand. Unless trends toward higher automobile usage can be altered, travel times and hours spent on congested highways will increase. Conversion of land from agriculture and open space into suburbs will require more and more local streets, and major roadway expansion. Caught in traffic, buses will operate more slowly and less efficiently than today, decreasing in reliability and attractiveness. This is the negative scenario to be avoided through enlightened investment.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N

Scale: 0 2 4 mi
Scale: 0 4 8 km

Primary Transportation Corridor Study Area

Figure S.1-1

Transportation capacity can be increased through multi-modal solutions planned in an integrated fashion. These include roadway, transit, bicycle, pedestrian and other elements. In order to increase the people-carrying capacity of the transportation system, the present automobile orientation must move to a more balanced mix of transportation modes.

Increased travel demand can be accommodated through roadway construction, and roadway improvements are often the most appropriate solution to a transportation problem. However, roadway widening or adding multiple roadway levels in the dense and geographically constrained Primary Urban Center (PUC) would be costly and disruptive, and would consume valuable land. Public input overwhelmingly indicates that for the PUC, roadway construction on the scale that would be required to satisfy projected travel demand is not a preferred alternative.

In the scenario preferred by the public during outreach meetings, public transit is used in higher proportion to move people in a more space-efficient manner. Improved transit offers the ability to expand people-carrying capacity sufficiently to meet rising levels of future travel demand. The transit system must be made convenient for the user, offering reasonable and dependable travel times. This will allow transit to be attractive and compete successfully with the automobile to slow the growth in demand for highway travel.

The transit system needs to operate as independently as possible from the congestion affecting general-purpose traffic. Then, transit can achieve the speeds and reliability required to attract ridership to transit, and to provide the additional people-carrying capacity needed to improve the overall level of transportation service within the primary transportation corridor. Freed from the congestion and delays of the roadway network, transit vehicles would be able to move quickly, reliably, and efficiently, and would be an attractive alternative to automobile travel.

2. Support desired development patterns

The City's land use policy for the primary transportation corridor requires that transportation and land use be planned and developed together to implement a comprehensive urban growth strategy. Integrated land use and transportation development will result in a pattern of land uses where many more trips than at present can be made by walking, bicycle, or neighborhood transit systems.

Transportation projects provide urban design opportunities to reinforce community livability. Transit-oriented planning targets a shift from auto-oriented, dispersed, single-use development to a land use pattern with a mix of activities that promotes walking and that focuses on a central transit facility. Transit-oriented, mixed-use developments can reduce vehicular travel and congestion by making it easier to make trips on foot or bicycle.

Transportation facilities and services are needed that can serve as the nucleus of new development in conformance with the land use visions articulated in the new Ewa and the draft Primary Urban Center (PUC) Development Plans (DPs). The PUC DP Draft states that an improved transit system can help re-focus growth in the desired development pattern. The PUC DP Draft calls for pedestrian-scale development, which has convenient walking access to transit. The PUC DP Draft uses phrases like "support unique and vibrant neighborhoods" and "focus density to create sustainable communities".

New transportation infrastructure must be built at a human scale, generally within the rights-of-way of existing streets. The goal is livable, mixed-use communities provided with improved mobility and with less need to use an automobile.

3. Improve the transportation linkage between Kapolei and Honolulu's Urban Core

Kapolei is intended by both the State and the City to be a center of growth and development as it becomes the "Secondary Urban Center" of Oahu. The emergence of Kapolei as a new city center will result in a fundamental shift in travel patterns. Now is the time to ensure this is done in a multi-modal manner.

Designation of Kapolei to be a fully developed city is in itself a traffic mitigation strategy, designed to reduce the dominant travel pattern in and out of Honolulu's urban core. Kapolei already contains vibrant and unique neighborhoods, high quality design, diversified employment, parks, open space and recreational resources, and further development is expected to continue these trends. The vision for Kapolei is a place where people live, work, shop, socialize, and recreate within the area and where alternative forms of transportation to the private automobile can access these facilities. Already the State has completed an office building for over 1,000 State employees relocated from other areas on Oahu. With a new civic center opening shortly, the City will also be relocating many employees to Kapolei. Other existing and future economic development activities include hotel and recreational facilities in Ko Olina, expansion of Kalaeloa-Barbers Point Harbor, redevelopment of Kalaeloa (the former Barbers Point Naval Air Station), world-class sports facilities, and a new University of Hawaii (UH) West Oahu campus. Jobs and other attractions in Kapolei will attract "reverse travel" to this part of Oahu from outside areas.

A transit-based travel option, with frequent express service to and from Downtown and connections to strategically located transit centers along the way, is a necessary transportation element to link Oahu's first and second cities, and will encourage their coordinated growth.

4. Improve the transportation linkages between communities in the PUC

Improving transportation linkages within the PUC is key to increasing the attractiveness of in-town living, thereby helping to focus growth in the PUC. Mobility within the PUC must be convenient and efficient in order to meet current and future travel demands.

The Draft PUC Development Plan update calls for the PUC to capture 36 to 43 percent of Oahu's population growth over the next 25 years. In addition, about 45 percent of the projected new job growth will be concentrated within the PUC. The PUC will remain the center for employment, cultural activities, educational opportunities, regional shopping, and recreation. It will continue to serve as a major hub for commuters, students and other individuals from all parts of the island.

A high level of transit service within the PUC would enhance in-town mobility and provide transit connections between the many travel markets that exist within the Urban Core. If focused on selected streets this concentration of transit service would support both existing activities and assist in creating new ones through redevelopment.

The usage of the terms mauka, makai, Ewa and Koko Head in this document is as follows:

- Mauka refers to the inland direction (which for the primary transportation corridor is to the north);
- Makai refers to the direction towards the shoreline (which for the primary transportation corridor is to the south);
- Ewa refers to the Ewa District of Oahu, or a westward direction; and
- Koko Head refers to an eastern direction.

S.2 ALTERNATIVES CONSIDERED

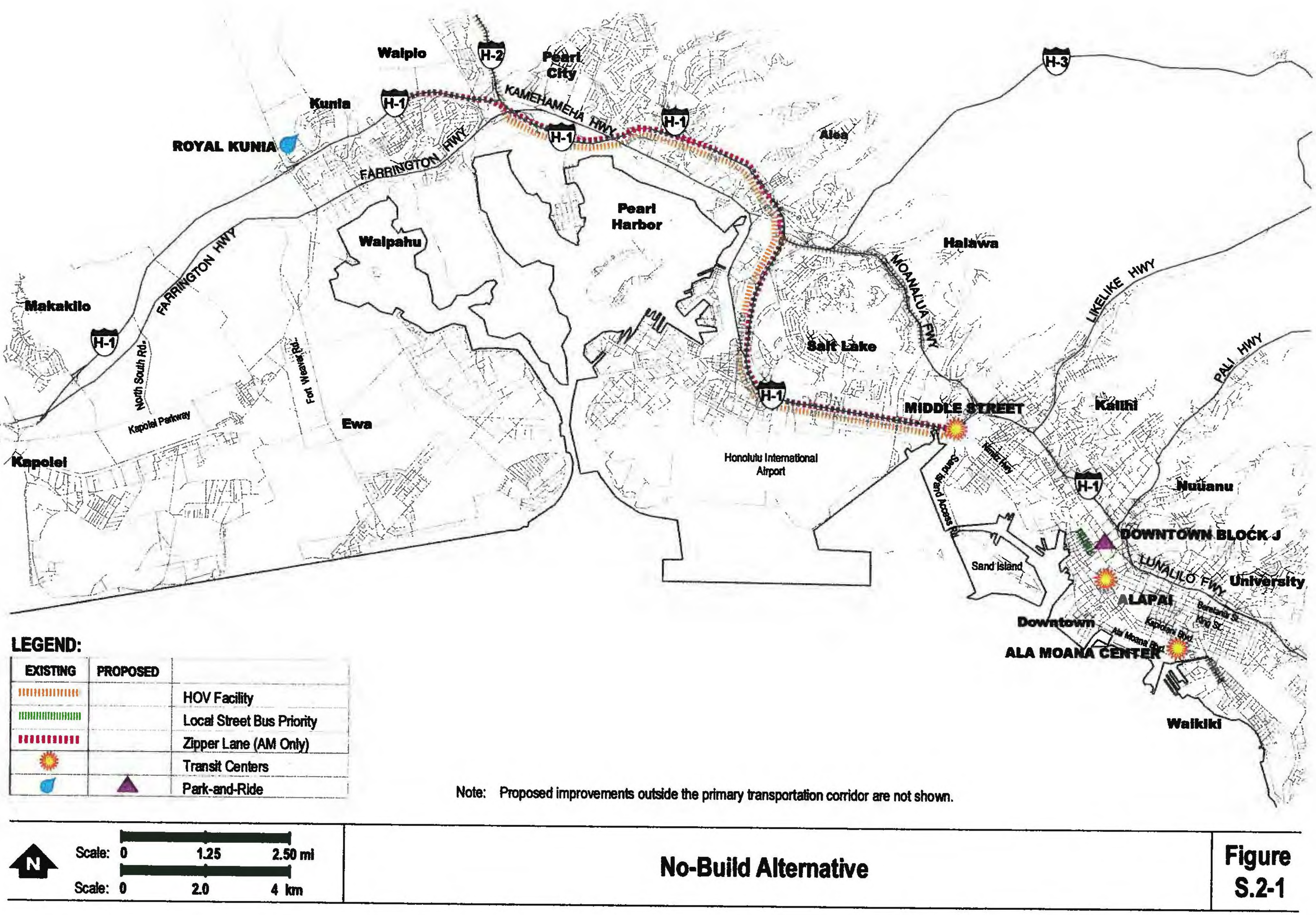
S.2.1 Summary of Alternatives

Three alternatives are analyzed in detail in this MIS/DEIS. Chapter 2 describes the other alternatives that were considered but rejected due to their failure to satisfy purpose and need and/or due to public opposition.

The three alternatives that are addressed in detail in this document are:

- The No-Build Alternative: The No-Build Alternative (see Figure S.2-1) consists of over eight roadway projects committed to implementation in the next three years, and expansion of bus service (additional vehicles and routes) in developing areas (e.g., Kapolei) to maintain existing service levels. Management of the Oahu component of the vanpool program by the City is included as part of the No-Build and the other alternatives.
- Transportation System Management (TSM) Alternative: The primary feature of this alternative (see Figure S.2-2) is the reconfiguration of the present bus route network to a hub-and-spoke network. The objectives of the hub-and-spoke bus network are to reduce overall travel times, improve schedule reliability, improve operational efficiency and improve off-peak service. Other benefits of a hub-and-spoke network are expansion of corridor capacity and improved transit network connectivity. Hub-and-spoke networks provide an integrated system of convenient and accessible circulator, local and express routes, organized around transit centers. The bus routes are the "spokes" of the hub-and-spoke system, and the transit centers are the "hubs" where people make intermodal and intramodal transfers. There would be a hierarchy of neighborhood, community, and regional transit centers, each drawing from an increasingly larger service area. Frequent express and limited-stop buses would run between the regional transit centers. Circulator routes would provide service between a transit center and a neighborhood or commercial district. The circulator buses would be smaller vehicles providing mobility within neighborhoods and delivering transit patrons to a transit center for connections to line-haul routes. Local routes would link multiple transit centers and provide service along major streets.
- Bus Rapid Transit (BRT) Alternative: This alternative (see Figure S.2-3) builds on the hub-and-spoke bus system in the TSM Alternative, and adds Regional and In-Town BRT elements. The Regional BRT element includes a continuous H-1 BRT Corridor from Kapolei to Downtown comprised of a new PM zipper lane and new express lanes to form an uninterrupted transitway. The H-1 BRT corridor would be used both by Regional BRT vehicles (buses) as well as private automobiles with three or more occupants, providing all vehicles with higher occupancies a congestion-free express trip between Kapolei and Downtown. Special ramps to facilitate movement between the H-1 Freeway BRT Corridor and selected transit centers would also be provided for BRT vehicles. Private automobiles would be prohibited on these special ramps. The In-Town BRT component would be a high capacity transit spine from Middle Street to Downtown, a University Branch from Downtown to UH-Manoa, and a Downtown to Kakaako/Waikiki Branch. Chapter 2 discusses the existing uses of the roadway elements that would be converted for use as Regional and In-Town BRT transitways. In general, the areas that would be converted to transitways are existing general purpose lanes, shoulders and medians. The BRT Alternative incorporates a very high level of transit service to draw people out of single-occupant automobiles.

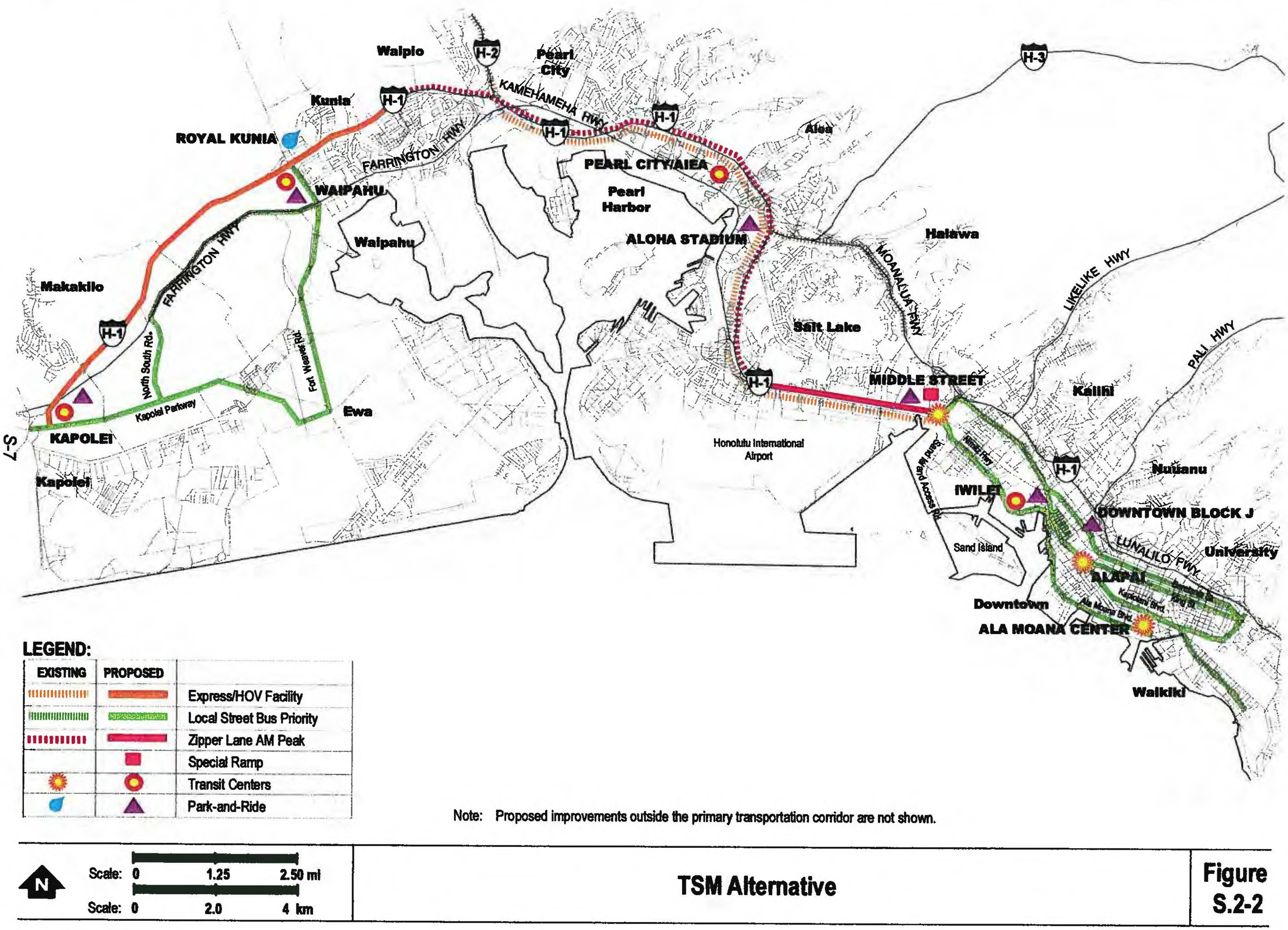
Two options for the technology of the In-Town BRT system are being studied. Both involve the use of low-floor, articulated electric buses. One is the "touchable embedded plate" technology, in which traction power would be provided to the BRT vehicles through a power strip embedded in the roadway. The other option is a hybrid diesel/electric technology. Neither would require overhead wires.



Note: Proposed improvements outside the primary transportation corridor are not shown.

No-Build Alternative

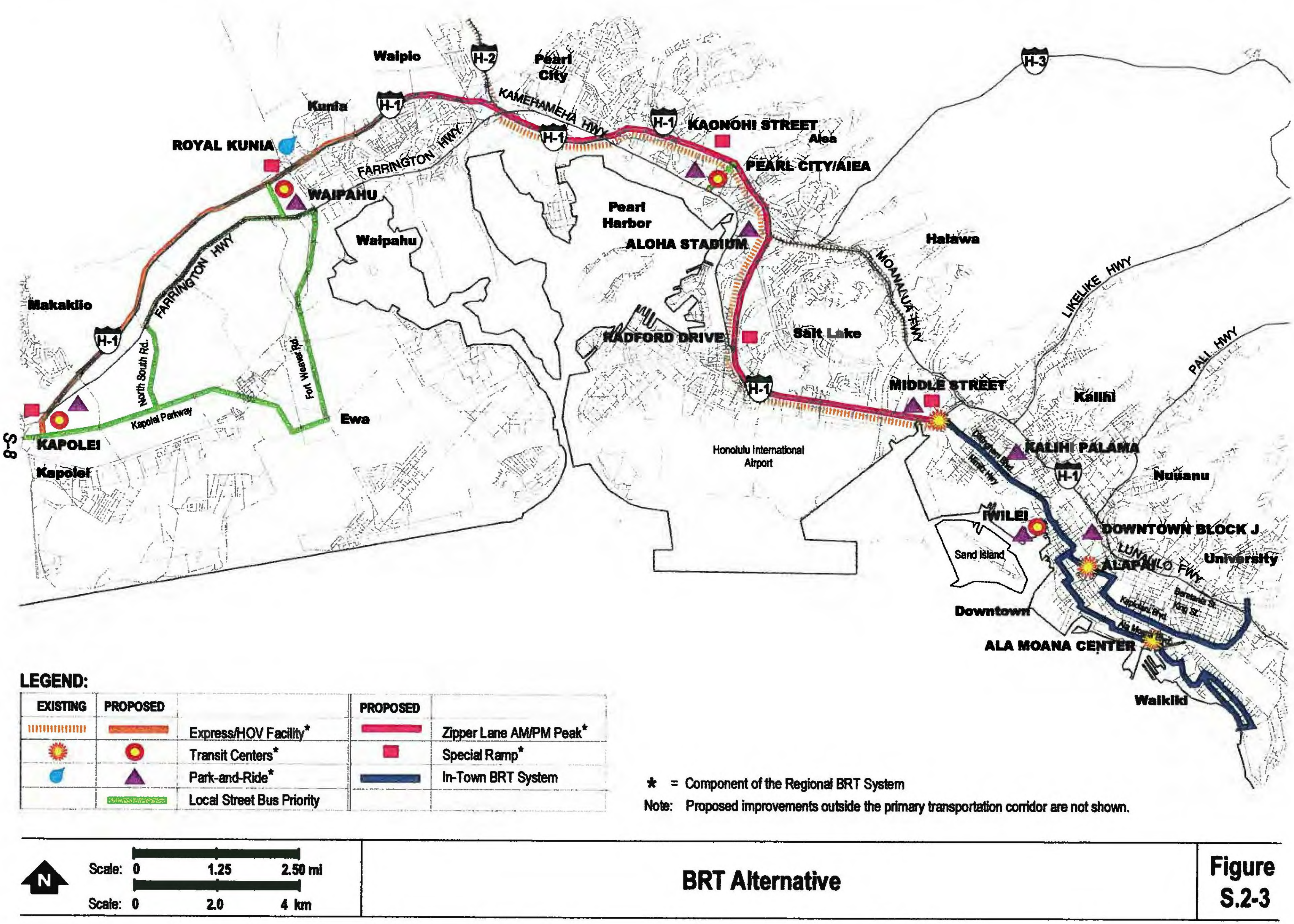
Figure S.2-1



Note: Proposed improvements outside the primary transportation corridor are not shown.

TSM Alternative

Figure S.2-2



* = Component of the Regional BRT System

Note: Proposed improvements outside the primary transportation corridor are not shown.

BRT Alternative

Figure S.2-3

S.2.2 Capital Costs

Table S.2-1 shows the capital cost estimates for the transit portion of the three alternatives, by project component. These cost estimates include the normal replacement of bus, TheHandi-Van, and BRT vehicles over the 25-year analysis period of the MIS/DEIS. Initial costs for the first 10 years (i.e. excluding long-term vehicle replacement) in 1998 dollars would be $135.5 million for the No-Build Alternative, $299.5 million for the TSM Alternative, and $767.7 million for the BRT Alternative. Total capital costs over a 25 year period span a range from about $317 million for the No-Build Alternative, to $1.06 billion for the BRT Alternative, in constant 1998 dollars.

TABLE S.2-1
CAPITAL COST SUMMARY (TOTAL COST OVER 25 YEARS)
(MILLIONS OF 1998 DOLLARS)

Project Component	No-Build	TSM	BRT
Bus & TheHandi-Van Acquisition	$316.9	$365.3	$421.8
Regional Bus Rapid Transit	$0.0	$153.4	$264.8
In-Town Bus Rapid Transit	$0.0	$0.0	$373.7
Total	**$316.9**	**$518.7**	**$1,060.3**

Source: Parsons Brinckerhoff, Inc.

S.2.3 Operating and Maintenance (O&M) Costs

Table S.2-2 presents estimates of annual operating and maintenance (O&M) costs for the three alternatives. The costs are for the forecast year 2025, assuming full development of each alternative, and are expressed in 1998 dollars.

O&M costs for the No-Build Alternative in 2025 would be about $125 million (in 1998 dollars). This compares to current operating costs for the existing bus system of about $102 million, not including TheHandi-Van operations. This increase is due to an increase in the constant dollar per unit cost of providing bus service. Comparing the TSM Alternative to the No-Build Alternative, operating and maintenance costs would increase to about $137 million due to the increase in the bus fleet. The O&M costs for the BRT Alternative include two components, the cost of systemwide bus service and the cost of the In-Town BRT.

TABLE S.2-2
ANNUAL OPERATING AND MAINTENANCE COST SUMMARY IN 2025[1]
(MILLIONS OF 1998 DOLLARS)

Alternative	Bus O&M Cost	In Town BRT O&M Cost	Total Project O&M Cost
No-Build	$125.1		$125.1
TSM	$137.4		$137.4
BRT	$163.7	$12.3	$176.0

Source: Parsons Brinckerhoff, Inc.
Note: [1]Not including TheHandi-Van operations

S.3 IMPACTS AND MITIGATION

This section presents a summary of the significant transportation and environmental impacts associated with each of the alternatives.

S.3.1 Transportation Impacts

Conceptual engineering studies determined how the In-Town BRT transitway could be placed within existing streets through Honolulu. Further traffic analyses looked at how the transitway would affect traffic, on-street parking and loading zones. A computer model was used to see how regional traffic mobility and transit ridership would be affected under each alternative.

The transportation analyses indicated that major regional roadways would still have traffic bottlenecks in 2025 under any of the alternatives. However, the BRT Alternative would offer an alternative, fast, efficient travel mode through the congestion for those choosing to travel by transit, because transit vehicles would use the uncongested exclusive and semi-exclusive transitway lanes. Further, the TSM and BRT Alternatives would do the most to improve the capacity of the transportation system to carry people through Honolulu.

The No-Build Alternative would have the highest levels of delay for auto users.

Transit Supply

The No-Build Alternative includes about 10 percent more service than in 1997 to account for the slight increase in population through 2025. Transit operations under the BRT Alternative include 85,000 revenue bus miles (one bus moving one mile) each weekday. This would be about 56 percent more revenue miles of transit service than under the No-Build Alternative. The TSM Alternative would provide about 15 percent more service than the No-Build Alternative.

Transit Ridership

The BRT Alternative is forecast to garner the highest level of transit usage compared to the other alternatives. Throughout Oahu, about 333,000 trips per day would be made by transit in 2025 under the BRT Alternative. The BRT would attract about 46,000 additional trips by transit over the No-Build Alternative—an increase of over 16 percent.

The BRT Alternative would increase the mode share of transit more than the other alternatives by offering travel time savings for transit patrons, providing a reliable service that would be buffered from traffic delays, improving in-town mobility, and strengthening the connections throughout Oahu. As a result, transit would become a more competitive travel mode. Transit's share of work trips within the primary transportation corridor would be 22.6 percent with the BRT Alternative, versus 19.5 and 19.2 percent for the TSM and No-Build Alternatives, respectively.

The In-Town BRT system would have 72,000 boardings per day by 2025, accounting for about 17 percent of the total transit boardings throughout the island. The BRT Alternative would generate a 61 percent increase in transit boardings over 1991 levels (1991 was the last time comprehensive boarding counts were taken).

Transit Service Levels

Under the No-Build Alternative, the travel demand would on average exceed the available seats by about 30 percent. At peak times, passengers would either stand or be passed-up. Demand just about equals the supply in the TSM Alternative. With about 5 to 15 percent more seats than demand, passengers would be more likely to be seated under the BRT Alternative—even during peak periods. This alternative would also be better able to handle surges in ridership due to special events and sporting activities.

Transit Travel Times

The exclusive transit lanes for the In-Town BRT would provide significantly faster travel times by transit within Honolulu. Between Downtown Honolulu and UH-Manoa, the BRT Alternative would cut the travel time in half from 28 minutes under the No-Build Alternative, to 14 minutes. The In-Town BRT would also shave about 5 minutes, or 27 percent, off the travel time between Downtown and Waikiki. Between Downtown and Kalihi, the In-Town BRT would reduce travel times by 35 percent, or about 3 minutes. Travel time improvements under the TSM Alternative would range from 14 to 16 percent, or travel time savings of about 1 to 4 minutes.

Transit travel time between Downtown Honolulu and Kapolei during the afternoon peak period would be 37 minutes with the BRT Alternative versus 46 minutes and 54 minutes for the TSM and No-Build Alternatives, respectively.

Transfers

More transfers would be made under the BRT Alternative, primarily due to the proposed hub-and-spoke bus network. About 47 percent of all trips would require a transfer under the BRT Alternative. In contrast, about 27 percent of trips under the TSM Alternative would require a transfer. These transfers would be compensated by having timed transfers, more frequent service, and faster travel times.

Regional Mobility

The BRT Alternative would have the lowest number of vehicle miles traveled by autos of all the alternatives. This is consistent with its extensive focus on transit services. The BRT Alternative would also have fewer vehicle hours of delay for motorists than the No-Build.

The BRT Alternative could accommodate even further increases in travel demand beyond 2025 without major roadway reconstruction.

In-Town Roads

The traffic forecasts for 2025 show that most intersections within Downtown Honolulu and Waikiki would be operating at or near capacity, and would be subject to extreme congestion during peak periods. However, the exclusive BRT lanes would allow passengers on transit vehicles to avoid this congestion. This is one of its strongest benefits: providing faster transit services and improved schedule reliability. Semi-exclusive bus lanes under the TSM Alternative would provide some benefit to transit users, but substantially less than the BRT Alternative. The typical level of service on in-town roads for transit vehicles would be A or B under the BRT Alternative, and C or D with the TSM Alternative. Therefore, the BRT Alternative would be superior to the TSM and No-Build Alternatives in terms of enhancing mobility for transit patrons. Because of the congestion that would still occur in the general purpose lanes, travelers would have a strong incentive to modify their travel behavior and use transit.

The BRT Alternative would not necessarily improve automobile movements through congested intersections. However, it would dramatically increase the person-throughput capacity of streets within the urban core by an average of 10 percent (measured in terms of persons per hour). The In-Town BRT would therefore use the existing roadway lanes more efficiently to carry more people. To achieve an equivalent increase in person-carrying capacity through the construction of new general purpose lanes, it would be necessary to add two general purpose lanes in each direction, which is not feasible without substantial land use relocations or "double-decking" of existing roadways.

Parking

The BRT Alternative would provide 4,100 and the TSM Alternative 3,000 new parking spaces at transit centers and park-and-ride facilities throughout the island. These would intercept automobile drivers and provide convenient access to transit. The way to create bus priority lanes without taking travel lanes along major streets is to remove on-street parking spaces. About 300 unrestricted on-street parking spaces would be removed with the TSM Alternative. About 360 unrestricted on-street spaces would be removed along the 18.7 km (11.6 mile) long In-Town BRT route. About 590 restricted on-street spaces would also be affected. An efficient transit system should cause the demand for parking to decline within urban Honolulu. New neighborhood off-street parking facilities could be developed if community-based planning determined it was needed.

Loading Zones

The creation of transit lanes in each of the build alternatives would affect about 30 to 40 commercial and passenger loading zones along some major streets in Downtown Honolulu and Waikiki. Community-based planning efforts will take place during the next phase to develop specific solutions that address the ongoing needs of businesses and residents along the route.

Servicing needs would be met by consolidating or relocating some of these loading zones, and/or by sharing the use of the transit lanes during off-peak times.

Bicycle and Pedestrian Travel

The TSM Alternative's extensive network of bus priority treatments including semi-exclusive lanes in the downtown area could adversely affect bicycle travel. Where possible, existing bike lanes would be replaced by joint use bicycle/transit lanes.

The BRT Alternative has been planned to enhance bicycle travel, particularly in the PUC, by incorporating the following elements:

- Where the In-Town BRT system could affect lanes currently used by bicyclists, either a separate bike lane would be provided, or an alternate route has been identified. These are the preferred solutions to eliminate the conflict between transit vehicles and bicyclists.
- Where a bike lane cannot be accommodated, cyclists would be allowed to share the transitway where it is safe to do so. Many cities, including New York City, London, Toronto, Madison Wisconsin, Seattle and Portland Oregon, allow bicycles to use at least portions of their curb-running transitways.

S.3.2 Environmental Impacts

The environmental analyses that were conducted looked at parameters most pertinent for transportation projects, and those which would highlight the differences between the alternatives. The analyses addressed potential impacts on sensitive resources and issues identified during the scoping process. They also included other studies required by law.

Land Use

The transit components of the BRT Alternative are compatible with land use plans and policies at the City and State levels—including goals of focusing growth within the Primary Urban Center and Kapolei. The stations and transitway elements of the In-Town BRT would provide a sense of permanence and governmental commitment to the alignment, and therefore would encourage development along the alignment, particularly at transit centers and stops. Investments in fixed transit corridors have been shown to catalyze development in cities like Portland, San Diego and Denver.

The No-Build and TSM Alternatives are much less supportive of public policies that use transit improvements to link transportation and land use to yield sustainable land use development patterns.

Economic Impacts During Construction

Analyses were conducted of the effects of project construction on the local economy. Construction would be financed in part by new federal grants. Since the No-Build Alternative would not attract new federal grants, no new jobs would be created with construction of the No-Build Alternative. In contrast, 947 person-years of new jobs would be created by construction of the TSM Alternative, and 3,080 person-years of new jobs would be created by construction of the BRT Alternative.

Business Displacements

Depending on site selection, some business relocations could be necessary to develop new transit centers and an expanded maintenance facility under the TSM and BRT Alternatives. In all cases, however, sites exist where the transit centers and expanded maintenance facility could be located without any displacements.

Under worst case conditions, expansion of the existing Middle Street transit center could affect up to eight businesses. A transit center at the old OR&L site in Iwilei could displace four businesses. Development of the In-Town BRT alignment on Kapiolani Boulevard near the Hawaii Convention Center could affect one business. If displacements are required, landowners would be compensated and affected businesses would be provided with relocation assistance.

Visual And Aesthetic Resources

Development of In-Town BRT stops and transit centers would provide urban design opportunities to improve existing streetscapes with cohesively designed architectural elements, landscaping, street furniture, street trees and lighting. Transit stops in Iwilei, Chinatown, Capitol District, UH-Manoa and other special design districts would be designed to harmonize with their unique environments. Other project structures, such as sound barriers along H-1 Freeway, would be sensitively designed within the context of their surroundings.

Energy Consumption

Reduced auto usage under the BRT Alternative would save about 39,000 barrels of oil each year in comparison to the No-Build Alternative. The TSM Alternative would save about 8,600 barrels of oil per year compared to the No-Build.

Noise and Vibration

Future noise levels along the alignment of the In-Town BRT system would be lower than with the TSM and No-Build Alternatives because of the use of quiet, electric or hybrid diesel-electric vehicles. Because of the use of rubber-tired vehicles, no vibration impacts are expected.

Noise measurements along the H-1 Freeway in Waipahu indicate that future increases in peak-hour traffic in the TSM and BRT Alternatives would raise noise levels by one decibel, which is not perceptible by the human ear. Federal and State highway guidelines require that new noise barrier walls six to 20 feet high would be needed to reduce noise levels for approximately 150 homes.

Equity And Environmental Justice

Each alternative was reviewed in terms of its affect on surrounding neighborhoods and communities. The BRT Alternative would substantially improve the level of transit service to minority and low-income neighborhoods within Waipahu, Salt Lake and Kalihi. Adverse impacts would be minimal, and would not disproportionately affect minority and low-income areas with the build alternatives.

Parklands

The overflow parking lot at Aloha Stadium is considered a "park" for technical reasons relating to prior federal ownership of the land. Therefore, use of about half of this overflow lot for a park-and-ride lot under the TSM and BRT Alternatives is considered an impact to a park. However, because the park-and-ride lot would be jointly used by commuters and by stadium patrons park access could be enhanced. In addition, the overflow lot is used as a Commercial Vehicle Licensing Facility. Either the park-and-ride and the Commercial Vehicle Licensing Facility will coexist or be relocated. Discussions with Aloha Stadium are continuing. No other park areas would be affected other than increasing access to them through improved transit service with the build alternatives.

Air Quality

Vehicular emissions under each alternative were analyzed regionally and at specific locations. Regional emissions under the No-Build Alternative would increase by 15 to 30 percent by 2025 because of increased vehicular traffic. Localized air quality (worst-case 1-hour microscale concentrations) would deteriorate at 11 of 17 locations studied.

The TSM and BRT Alternatives would improve regional air quality by about 8 percent over the No-Build Alternative. Zero or low-emission transit vehicles would substantially reduce particulate emissions at street level locations along the In-Town route.

Historical Resources

The No-Build and TSM Alternatives would not have any impacts on historical or cultural resources. The design of transit stops at Iwilei, Chinatown, Iolani Palace and UH-Manoa would be sensitive to adjacent historic structures.

Ecosystems

No long-term adverse impacts to terrestrial or marine ecosystems are expected under any of the alternatives. "Exceptional Trees" would not be affected by the In-Town BRT transitway. However, there are nine locations along the In-Town BRT transitway where monkey pod, shower or palm trees may be trimmed, relocated or replaced. The design of the transitway and transit stops would be integrated with a tree preservation program involving coordination with interested parties.

Water

No major impacts on water resources are expected for any of the proposed alternatives. Increasing transit ridership through implementation of the BRT Alternative would reduce non-point source pollution generated by automobiles.

Construction Impacts

The construction-phase impacts of the BRT Alternative would be greater than those of the TSM Alternative because of the larger scale of construction. For example, a transitway would be constructed along the alignment of the In-Town BRT system, within existing streets. Construction impacts would be temporary and detailed mitigation plans would be developed, including a maintenance of traffic plan. An archaeological contingency procedure would be developed should unanticipated resources be encountered during construction.

Impacts to neighborhoods, ecosystems, and water resources would be similar to the No-Build and TSM Alternatives.

S.3.3 Mitigation Commitments

This section summarizes the mitigation measures being considered and the City's commitment to minimize any adverse impacts. For detailed discussions of environmental impacts and mitigation measures, the reader is referred to Chapter 5.0 of the MIS/DEIS.

1) Land Use and Development

A commitment has been made for coordination with various agencies and groups to continue throughout the design and implementation process to encourage appropriate transit-oriented land use and development. In addition, similar coordination would continue with specific developers, shopping centers, utility providers, and other interested entities to ensure project compatibility with plans.

2) Relocations

The No-Build Alternative would not entail any relocations.

The number of relocations associated with the TSM and BRT Alternatives depends on which sites are selected for the Iwilei and Middle Street transit centers. There are options being studied for each of these transit centers that would not entail any relocations. Should either the TSM or BRT Alternative be selected, supplemental environmental documentation would be prepared when the sites of these transit centers are selected.

Since federal funds would be used to assist project construction, the project would be subject to provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 CFR Part 24, 42 U.S.C. 4601, et seq.). State law on relocations is provided in Hawaii Revised Statutes (HRS) Chapter 111, Assistance to Displaced Persons.

Fair market compensation for land, buildings and uses would be provided to property owners directly affected by right-of-way requirements. For properties that would experience partial displacement but not relocation, mitigation would be provided at project cost, such as reconstruction of building façades. In addition, actual and reasonable moving expenses would be reimbursed. Affected businesses would be encouraged to plan moves in advance so that relocation would occur with minimal delays and inconvenience.

3) Safety and Security

Transit stops would be well lit to minimize areas of low visibility and discourage loitering. The transit system operations plan would include comprehensive security measures as needed to ensure the security of the transit patron. Transit stops in street medians would be designed to be safe for those waiting for In-Town BRT vehicles.

4) Visual and Aesthetic Resources

Architectural elements would harmonize the transit elements with the surrounding streetscape. Community input would be obtained in the development of architectural approaches and details.

5) Noise

Noise barrier walls would be provided along sections of H-1 Freeway in Waipahu in compliance with State and federal guidelines. However, these walls would be provided because existing noise levels are at or above federal guidelines. The additional noise impact of the Regional BRT system would be minimal.

6) Vegetation and Wildlife

Landscaping would harmonize transit elements with the streetscape. Interested City agencies, local groups, and the public would be encouraged to review the proposed landscaping plans and provide input. Tree trimming or removal plans would be coordinated with interested groups. When the preferred alternative is selected, site visits would be conducted to determine the actual amount of vegetation to be removed. Where feasible, trees would be preserved and utilized in project landscaping. A tree preservation program would be developed in conjunction with a certified arborist. Landscaping would be left in place and protected for as long as possible, and replaced as soon after construction as feasible.

7) Water Resources

Specific sediment and erosion control measures would be resolved during final design, and a best management practices plan would be developed to control roadway contaminants created by additional impervious surfaces.

8) Historic/Archaeological Resources

The design of In-Town BRT stops would be sensitive to nearby historic structures and the surrounding area, especially in Iwilei, Chinatown, Capitol District, UH-Manoa, and other special design districts. Should archeological resources be encountered during construction, work would stop immediately and the State Historic Preservation Officer would be contacted.

9) Parklands

Use of the overflow parking lot at Aloha Stadium would be coordinated with the Aloha Stadium Authority.

10) Parking and Loading Zones

Details of parking and loading zone mitigation would be coordinated at the neighborhood level during subsequent project planning.

11) Bicycle Facilities

In keeping with the purpose of enhancing bicycle travel to encourage a greater proportion of total travel by bicycle, the BRT Alternative has been developed to include additional bicycle facilities, enhancing bicycle travel in the PUC.

12) Construction

Coordination between project planners and the community would continue during the development and implementation of a Construction Management Plan and Mitigation Program that would address in detail the project's construction and construction impact mitigation.

A public information program would include education; the presence of representatives at public gatherings; promotional materials describing the construction process and its progress; dissemination of information on significant construction activities, detours, and recommended alternative routes; and information pertinent to methods of minimizing public inconvenience.

An overall project Maintenance of Traffic Plan would include measures to reduce the need for total street closures during construction, detailed traffic flow patterns and traffic detours, measures to minimize the impact of loss of parking during construction, and programs to increase transit ridership.

Detailed pedestrian flow patterns would be developed and alternative pedestrian routes would be provided around or through construction areas to provide access to all adjacent structures and affected facilities.

Access to docks, terminals and other water-related facilities would be maintained through close coordination with all public agencies having harbor-related responsibilities.

Abatement measures tailored to the source would be implemented for the control of fugitive dust, emissions, noise and vibration.

A number of plans would be developed during final design:

- Sediment and Erosion Control Plan incorporating Best Management Practices (BMPs) to control runoff;
- Spill Containment Control and Countermeasure Plan;
- Solid Waste Management Plan;
- Contaminant Management Plan detailing contaminant handling procedures and remedial response actions; and
- An Emergency Response Plan to establish procedures should contaminated materials be encountered.

An archaeological contingency procedure would be developed in the unlikely event that unanticipated resources are encountered during construction.

S.4 FINANCIAL ANALYSIS AND COST-EFFECTIVENESS ANALYSIS

A comprehensive financial analysis was conducted to identify the major differences in capital and operating costs among the alternatives. The analysis also identified the timing and level of financial commitments needed from federal, State and local sources, and assessed the City's ability to operate and maintain the transportation network. The financial plans were developed based on the assumptions that the full scope of each alternative must be completed without raising taxes, and that the City's high bond rating must not be affected.

Funding would be sought from multiple federal, State and local sources. Construction schedules would be phased according to the availability of funds. Therefore, the construction schedule would be flexible and could be adjusted according to fiscal and mobility considerations.

To determine the adequacy of sources of funds for the capital and operating requirements of the alternatives, major existing sources of revenues were examined. Costs were then compared to the revenues projected to be available from these sources over the 10-year period of Fiscal Year 2001 to Fiscal Year 2010 which is the period within which all of the capital improvements except vehicle replacements (and an additional bus maintenance facility in the TSM Alternative) would be implemented. Costs and revenues were also compared over the 25-year period of FY 2001 to FY 2025.

Tables S.4-1 and S.4-2 summarize the capital and operating and maintenance (O&M) funding required by source for the No-Build, TSM and BRT Alternatives in year of expenditure (YOE) dollars. Table S.4-1 compares the levels of capital funding required by source for each alternative over the ten-year implementation period of FY 2001-2010. Table S.4-2 contrasts the levels of O&M funding required, by source, for the representative years of FY 2005 and 2010.

The use of year-of-expenditure dollars (YOE $) provides a more accurate assessment of the actual funds needed and the relative impact of inflation.

TABLE S.4-1
FUNDING REQUIRED FOR CAPITAL, BY ALTERNATIVE AND BY SOURCE
TOTAL FOR FISCAL YEARS 2001- 2010 (YOE $, 000)

	NO-BUILD	TSM	BRT
CAPITAL SOURCES			
Federal Transit Administration			
Sec.5307 UZA Formula Grant	$113,662	$148,289	$203,836
Sec.5309 Fixed Guideway Modernization	$8,318	$8,318	$8,318
Sec.5309 New Starts		$43,636	$182,100
Federal & State Highway Funds			
FHWA		$27,353	$161,516
State Highway		$6,838	$40,379
Local Funds			
General Obligation (G.O.) Bonds	$3,000	$60,000	$238,885
City Highway Fund	$27,832	$36,679	$46,899
TOTAL CAPITAL FUNDS	**$152,812**	**$331,113**	**$881,933**

Source: Sharon Greene & Associates, Inc.

TABLE S.4-2
FUNDING REQUIRED FOR O&M, BY ALTERNATIVE AND BY SOURCE
FOR SELECTED YEARS: FY 2004-05 AND FY 2009-10 (YOE $, 000)

	NO-BUILD	TSM	BRT
FY 2004-05 OPERATING REVENUES			
Passenger Fares (Bus)	$35,529	$35,778	$33,078
TheHandi-Van Fares	$1,134	$1,134	$1,134
In-Town BRT Fares			$3,080
FTA Sec.5307 UZA Funds Preventive Mtnce)	$6,000	$6,000	$6,000
General Fund Revenues (for transit support)	$96,089	$98,230	$100,710
TOTAL O&M REVENUES	**$138,752**	**$141,142**	**$144,001**
FY 2009-10 OPERATING REVENUES			
Passenger Fares (Bus)	$42,156	$42,750	$39,423
TheHandi-Van Fares	$1,329	$1,329	$1,329
In-Town BRT Fares			$4,936
FTA Sec.5307 UZA Funds (Preventive Mtnce)	$0	$0	$0
General Fund Revenues (for transit support)	$120,125	$125,227	$135,988
TOTAL O&M REVENUES	**$163,610**	**$169,305**	**$181,676**

Source: Sharon Greene & Associates, Inc.

Capital Costs

Conceptual capital cost estimates were prepared as accurately as possible using historical data, local construction costs and other contingency factors. Capital cost estimates included the acquisition of transit vehicles as well as construction of fixed facilities.

The $152.8 million dollars in capital costs for the No-Build Alternative include the cost of replacement bus and paratransit vehicles through the year 2010. The TSM Alternative would cost $331.1 million through 2010 for regional transit improvements and new buses. This includes about $101.5 million dollars for transit centers, $18.7 million for on-street bus priority treatments and $34.8 million to extend the existing AM zipper lane to Middle Street. The balance of the capital costs are used to expand and replace outdated vehicles in the fleet.

The BRT Alternative would cost $881.9 million dollars over the course of the 10-year implementation period. Construction of new transit centers and park-and-rides would cost about $105.7 million dollars, while on-street bus priority treatments would cost $14.7 million dollars. Development of a Regional BRT system using a reversible zipper lane and new access ramps would cost $238.0 million dollars. Construction of the In-Town BRT transitway and acquisition of a fleet of high-capacity electric vehicles would cost $239.7 million dollars. The balance of the capital costs would be used to expand the existing maintenance facilities and increase the transit fleet to 730 buses.

No major capital projects would be deferred if either the TSM or BRT Alternatives were selected. As described in more detail in Chapter 6, it was a condition of the financial analysis that adequate capital improvement funds remain for other City priorities.

Operating And Maintenance Costs

Estimates of operating and maintenance costs were based on the proposed transit fleet and travel characteristics under each alternative. Using year of expenditure (YOE) dollars for comparison, the budget for bus and paratransit operations during FY 2001 is about $122.0 million dollars. Under the No-Build Alternative, $163.6 million dollars would need to be budged in 2010. The TSM Alternative would cost an estimated $169.3

million dollars in FY 2010 to operate. Under the BRT Alternative, the estimated operating cost would be $181.7 million dollars.

Table S.4-2 shows that the General Fund Revenues required on an annual basis for transit support would be lowest with the No-Build Alternative, and highest with the BRT Alternative.

The financial plan assumes that farebox revenues would cover 25 to 26 percent of the operating costs under all three alternatives, as they do presently.

Capital Cost Financing

The financial plan involves multiple federal, state and local funding sources. In accordance with City Council policy guidance, the financial plan was designed to accommodate as much federal funding as possible. City General Obligation (GO) bonds would be used to fund up to 35 percent of the cost of these alternatives. Additional GO bonds would be issued to fund early construction activities in anticipation of later federal or State reimbursement. The financing plan focuses on the initial capital implementation period (through the year 2010).

About 80 percent of the funding for the No-Build Alternative would come from FTA formula grants. About $27.8 million dollars from the City Highway fund would be used, and another $3 million dollars in GO bonds would be issued.

Financing for the TSM Alternative would require $60 million dollars in GO bonds and another $200.2 million dollars in FTA Formula and New Starts grants. About $34.2 million dollars would be needed from State and federal highway sources, while $36.7 million would be obtained from the City Highway fund.

The BRT Alternative would require $394.3 million in formula and special New Starts grants from the Federal Transit Administration. A total of $238.9 million dollars in GO bonds would be issued. Federal and State highway funds would provide another $201.9 million dollars, primarily for the Regional BRT and intermodal improvements. About $46.9 million dollars would be used from the City Highway fund.

Federal Highway Funding

The reversible zipper lane improvements, access ramps, transit centers and other components of the Regional BRT system in the BRT Alternative are eligible for federal and State highway funds. Less than 20 percent of the total annual funding from four eligible Federal Highway Administration funding categories would be used.

Overall Impact On City Budget

For FY 2001-2010 the average annual total City contribution from the General Fund and Highway Fund required for the capital (including debt service) and operating cost subsidy would be $59.5 million for the No-Build Alternative, $72.4 million for the TSM Alternative and $99.4 million for the BRT Alternative.

FTA Cost-Effectiveness

The Federal Transit Administration measures a project's cost-effectiveness by comparing the cost of a transit investment in relation to its ability to attract new riders to transit. This is only used to compare projects throughout the country, and is not an indicator of the costs and benefits.

When alternatives are compared in terms of the CEI parameter, the one with the lower cost per new rider represents the more cost-effective alternative. As shown in Tables S.4-3A and S.4-3B, the cost per new rider for the TSM Alternative is $9.74, which is more than the cost per new rider for the BRT Alternative of $7.67. Therefore, the BRT Alternative is more cost-effective than the TSM Alternative in terms of capturing new transit ridership over the level of the No-Build Alternative. In comparison to the level of transit ridership that would be achieved with the TSM Alternative, the CEI of further boosting transit ridership to the level forecast to occur with the BRT Alternative would be $7.11.

TABLE S.4-3A
FTA COST-EFFECTIVENESS FACTORS

	ALTERNATIVE		
Factor	**No-Build**	**TSM**	**BRT**
Annualized Capital Cost (1998 dollars)	$ 24,123,000	$ 41,167,000	$ 82,619,000
Total Systemwide Annual Operating and Maintenance Cost (1998 year dollars)	$ 125,068,000	$ 137,424,000	$ 175,954,000
Total Annualized Cost in Forecast Year (1998 year dollars)	$ 149,191,000	$ 178,591,000	$ 258,573,000
Total Annual Ridership (forecast year)	88,303,600	91,322,000	102,564,000

Source: Parsons Brinckerhoff, Inc.

TABLE S.4-3B
FTA COST-EFFECTIVENESS INDEX

	COMPARISON		
Factor	**TSM vs. No-Build**	**BRT vs. No-Build**	**BRT vs. TSM**
Incremental Annualized Cost	$ 29,400,000	$109,382,000	$ 79,982,000
Incremental Annual Ridership	3,018,400	14,260,400	11,242,000
Cost-Effectiveness Index (incremental cost per new rider)	$ 9.74	$ 7.67	$ 7.11

Source: Parsons Brinckerhoff, Inc.

S.5 EQUITY/ENVIRONMENTAL JUSTICE

Equity is defined as the fairness of the distribution of costs, benefits, and impacts across various population subgroups. Fairness is determined by the extent to which the costs and impacts are distributed in a way that is consistent with regional goals.

S.5.1 Impact on Low Income Areas

Waipahu, the residential area near Aloha Stadium, Chinatown, Kaheka, Lower McCully, and Kalihi-Palama contain concentrations of minority and low-income populations. Input from community residents and business owners serving the minority and low-income populations has been actively solicited throughout project planning through the community-based planning program (see Appendix A). None of the alternatives would cause a disproportionately high adverse health or environmental effect on any population group, including minority and low-income populations. Benefits to these groups would be substantial.

S.5.2 Environmental/Socioeconomic Equity and Benefit (Environmental Justice)

An analysis of equity and benefit from an environmental and socioeconomic perspective was developed based on the relative balance between environmental and/or socioeconomic impacts and change in transit accessibility. The BRT Alternative would result in improved transit accessibility relative to the No-Build and TSM Alternatives. The BRT Alternative would increase daily transit trips by 16.2 percent over the No-Build Alternative. The BRT Alternative is forecast to generate a 12.3 percent increase in daily transit trips over the TSM Alternative.

The TSM or BRT Alternatives would provide travel benefits to minority and low-income areas and would not cause disproportionately high and adverse health or environmental effects on these populations because:

- the populations would be located near elements of the proposed project, such as the alignment of the In-Town BRT, the project would benefit these populations by improving their transit service;
- the alignments were selected in a manner that would minimize adverse impact while maximizing travel benefits for minority and low-income residents;
- not all areas along the alignment are minority or low-income;
- minority and low-income areas are not being isolated by the project;
- the proposed project would not create health risks to the minority and low-income populations; and
- project-related impacts to the minority and low income populations would be avoided, minimized or mitigated whenever possible.

In summary, minority and low-income areas would not be disproportionately affected. Also, no geographic or socioeconomic group would pay a disproportionate share of the project's costs.

S.6 SIGNIFICANT TRADE-OFFS BETWEEN ALTERNATIVES

Table S.6-1 summarizes many of the factors that best distinguish the alternatives presented in this MIS/DEIS. What is particularly important is the relative trade-offs between the costs of the alternatives and the benefits received for those costs or investments.

S.6.1 No-Build Alternative

The level of environmental impact of the No-Build Alternative would be the least of all the alternatives studied, although air pollutant emissions would increase. It would also be the least expensive.

However, the No-Build Alternative would poorly support the purposes and needs of the project. It would not provide a transportation system that would effectively handle present or future levels of travel demand. It would not maintain even current levels of mobility. It would not develop attractive travel alternatives to the private automobile, encourage land use development in desired patterns, support implementation of an urban growth strategy that integrates land use and infrastructure planning, nor maintain the existing quality of life. It would only minimally increase the linkage between Kapolei and the Urban Core, and would not improve mobility within the Urban Core.

TABLE S.6-1
SUMMARY OF KEY EVALUATION MEASURES

Measures	No-Build	TSM	BRT
CAPITAL AND O&M COSTS			
Initial Capital Cost (first 10 years) (Millions of 1998 $)	$135.5	$299.5	$767.7
Total Capital Cost (over 25 years) (Millions of 1998 $)	$316.9	$518.7	$1,060.3
Annual Operating and Maintenance Cost at Full System Operation (Millions of 1998 $)	$125.1	$137.4	$176.0
Impact on City Budget (Average Annual Costs for Debt Service and O&M Net of Fare Revenue and Non-City Funding) FY 2001 - 2010	$59.5 million	$72.4 million	$99.4 million
MOBILITY			
Daily Transit Trips Within the Primary Transportation Corridor (2025) (Daily Linked Trips)	251,900	255,900	288,200
Increase in Transit Trips Over the No-Build Within the Primary Transportation Corridor (2025)	N.A.	4,000	36,300
Daily Transit Mode Share Within the Primary Transportation Corridor (2025) (Work Trips)	19.2%	19.5%	22.6%
Daily Revenue Bus Miles	54,500	62,800	84,800
Comfort Level (Passengers Per Transit Seat)(2025)	1.31	1.01	0.86
Daily Reduction in Vehicle Miles Traveled (Compared to No-Build)	N.A.	44,245	146,705
Daily Reduction in Vehicle Hours of Delay (2025) (Compared to No-Build)	N.A.	15,225	8,400
Projected Transit Travel Time Between Downtown and Kapolei (2025)	53.7 minutes	45.5 minutes	36.8 minutes
Projected Transit Travel Time between Downtown and Waikiki (2025)	18.7 minutes	15.8 minutes	13.7 minutes
Projected Transit Travel Time between Downtown and UH-Manoa (2025)	27.8 minutes	23.7 minutes	14.2 minutes
Projected Transit Travel Time between Downtown and Kalihi (2025)	7.9 minutes	6.8 minutes	5.1 minutes
Typical Levels of Service on In-Town Roads (Transit)	E/F	C/D	A/B
Typical Levels of Service on In-Town Roads (Autos)	E/F	E/F	E/F
New Parking Spaces Provided at Transit Centers/Park-and-Rides	0	3,000	4,150
On-Street Parking Spaces Removed (Unrestricted/Restricted) (U) or (R)	0	296 (U) / 0 (R)	386 (U) / 591 (R)
Number of Loading Zones to be Mitigated	0	43	30
GROWTH-SHAPING AND LAND USE			
Supports Growth-Shaping/Land Use Goals	Not Supportive	Somewhat Supportive	Most Supportive
ECONOMIC IMPACT			
Person-Years of Jobs From Construction Activities (Direct and Indirect)	0	947	3,080

TABLE S.6-1
SUMMARY OF KEY EVALUATION MEASURES

QUALITY OF LIFE AND LIVABILITY			
In-Town Transit Technology	Diesel Buses	Diesel Buses	Electric Buses for In-Town BRT
Visual Character	No Impacts	Positive Impacts Possible at Transit Centers	Positive Impacts Possible at Transit Centers and In-Town BRT stops
Noise/Vibration (In-Town)	Increased Noise	Increased Noise	Quieter Along BRT Route
Noise/Vibration (H-1 Freeway)	No Impact	Sound Walls in Waipahu	Sound Walls in Waipahu
ENVIRONMENTAL IMPACTS			
Number of Business Relocations	0	Depends on sites selected for transit centers (0-12)	Depends on sites selected for transit centers (0-12)
Street Trees	No Impact	No Impact	Some tree trimming or replacement at 9 locations (no exceptional trees affected)
Annual Energy Savings Compared to No-Build	N.A.	8,600 Barrels of oil	39,200 Barrels of oil
Historical Resources	No Impact	No Impact	In-Town BRT stops must be sensitive to historic structures, especially in Iwilei, Chinatown, Capitol District and UH-Manoa
Parkland Impacts	No Impact	Joint-use of Aloha Stadium Overflow Parking Lot	Joint-use of Aloha Stadium Overflow Parking Lot
COST-EFFECTIVENESS			
Incremental Cost Per New Rider (compared to No-Build Alternative)	N/A	$9.74	$7.67
EQUITY			
Impacts/benefits for minority or low-income populations	No adverse impacts/ No increased benefits	No adverse impacts/ Some improved transit service	No adverse impacts/ Increased transit service for minority and low income neighborhoods in Waipahu, Salt Lake and Kalihi

Source: Parsons Brinckerhoff, Inc.

The No-Build Alternative would cost $316.9 million in 1998 dollars which includes the replacement of buses over a 25-year period. Its initial capital cost over the first 10 years would be $135.5 million. Its annualized capital cost would be $24.1 million. Because the No-Build Alternative would not generate new federal funds, no additional employment would be created.

S.6.2 TSM Alternative

In comparison to the No-Build Alternative, the TSM Alternative, with its emphasis on enhancing and restructuring bus service, would provide some support to the project's purposes and needs in terms of enhancing people-carrying capacity within the corridor. However, this alternative would not go far in developing attractive alternatives to the private automobile, or in enhancing desired land use development patterns or the City's urban growth strategy that integrates land use and infrastructure planning. There would be some improvement in the linkage between Kapolei and the Urban Core. It would not significantly improve mobility within the Urban Core.

The level of environmental impact would be greater than under the No-Build Alternative to a degree that depends on the final selection of sites for the Middle Street and Iwilei Transit Centers. Depending on the sites selected, some businesses could be displaced. This alternative would limit the use of 326 parking spaces, mostly on King and Beretania Streets, and affect a substantial number of loading zones. Air pollutant and noise emissions would increase.

This Alternative would cost $518.7 million in 1998 dollars which includes the replacement of buses over a 25-year period. Its initial capital cost over the first 10 years would be $299.5 million. Its annualized capital cost would be $41.2 million. The additional federal funds that would be provided under this Alternative would create an estimated 947 person-years of employment during construction.

S.6.3 BRT Alternative

The BRT Alternative represents a major improvement over the TSM Alternative in terms of meeting the project purposes and needs. It would substantially increase people-carrying capacity within the corridor and help focus growth along the alignment of the In-Town BRT system. Higher density redevelopment in a transit-supportive manner, particularly at transit centers and transit stops, would be encouraged. This Alternative would be more effective than the TSM and No-Build Alternatives in supporting implementation of an urban growth strategy that integrates land use and infrastructure planning. It would help facilitate desired land use development patterns consistent with the vision for the island.

As part of the BRT Alternative, transit centers, transit stops, and other project elements would be designed to maintain or improve visual conditions through cohesively designed structures, street furniture, landscaping and lighting. The quality of urban living would increase.

This Alternative would establish transit as an attractive, viable alternative to the automobile. Transit patrons would reap travel time savings. The BRT Alternative would cause more motorist delay than the TSM Alternative, yet less than the No-Build Alternative. The delay to motorists is expected to accelerate a switch in travel behavior from automobiles to transit. It would establish an attractive, high capacity linkage between Kapolei and the Urban Core. It would improve mobility within the Urban Core by improving linkages between key destinations such as Downtown, Kakaako, Kalihi, UH-Manoa, and Waikiki, and decreasing transit travel times between these key destinations.

Potential displacement impacts of the BRT Alternative would be similar to the TSM Alternative, and associated with final site selection for certain transit centers. Parking provided at transit centers and park-and-ride lots would be greater than the TSM Alternative, as would the loss of on-street spaces. Interference with loading zones would be less than with the TSM Alternative. Regional air pollutant and noise emissions would decrease. Impacts on historic resources would be minor. Impacts during project construction would be greater than for the TSM Alternative because of the greater scope and duration of construction, particularly the building of the In-Town BRT system transitway on arterial streets.

The cost of this alternative would be $1,060.3 million in 1998 dollars which includes the replacement of buses and In-Town BRT vehicles over a 25-year period. Its initial capital cost over the first 10 years would be $767.7 million. Its annualized capital cost would be $82.1 million. The additional federal funds that would be provided under this Alternative would create an estimated 3,080 new jobs during construction. Using FTA criteria, the BRT Alternative would be more cost-effective in attracting new transit riders compared to the TSM Alternative.

S.7 ISSUES FOR FUTURE CONSIDERATION

Major issues for the decision makers and the public to consider include the following:

1. Selection of alternative (No-Build, TSM or BRT, or some other variation).
2. Transit center locations where not yet determined.
3. Selection of In-Town BRT technology if the BRT Alternative is chosen.
4. Source of funding for capital cost and operating and maintenance costs.
5. Environmental mitigation considerations, including mitigation for loss of on-street parking, replacement of loading zones, and coordination of details of the bicycle mitigation measures with cyclists.
6. Whether to transfer vanpool operations to the City.
7. Completion of the formal consultation process on historic resources with the State Historic Preservation Officer under Section 106 of the National Historic Preservation Act.
8. Continued coordination with Aloha Stadium Authority and National Park Service over the joint-use of the overflow parking lot at Aloha Stadium as a park-and-ride facility.

Subsequent steps will include selection of a preferred alternative by the City Council (the "Locally Preferred Alternative", or LPA), selection and implementation of a financing plan, and development of an implementation strategy. Also, project costs and impacts would be refined, a specific transit technology would be selected, and specific commitments to environmental mitigation would be made.

Should the TSM or BRT Alternative be selected, supplemental environmental documentation would be prepared for the transit centers once sites are selected.

S.8 REQUIRED PERMITS AND APPROVALS

Table S.8-1 lists the permits or approvals that may be required by each alternative.

TABLE S.8-1
PERMITS POTENTIALLY REQUIRED

PERMIT	ALTERNATIVE		
	NO-BUILD	TSM	BRT
Federal			
U.S. Coast Guard Bridge Advanced Approval			X
U.S. Environmental Protection Agency Section 1424(e) Approval (Sole Source Aquifer)	X	X	X
U.S. Department of Transportation Notice of Proposed Construction Near Airports			X
U.S. Department of Transportation FHWA Approval of Modifications Within Limits of Interstate Highways			X
U.S. Department of the Navy, Easements on Navy Base Property			X
State			
State Department of Land and Natural Resources Stream Channel Alteration Permit			X
State Department of Land and Natural Resources Historic Sites Review	X	X	X
State Department of Land and Natural Resources Conservation District Use Permit			
Hawaii Community Development Authority – Kakaako			X
State Department of Transportation Permit for Construction to Cross or Enter the State Energy Corridor			
State Department of Transportation Permit to Perform Work Upon a State Highway			X
Hawaii Coastal Zone Management Program – Federal Consistency	X	X	X
State Department of Health Noise Permit	X	X	X
National Pollutant Discharge Elimination System (NPDES) Permit	X	X	X
Development Plan Public Facilities Map Amendment		X	X
Special Design District Permit			X
Zoning Waivers for Public Uses, Public Utilities and Walls			X
Sewer Connection Permits	X	X	X
Water and Water System Requirements for Developments		X	X
Building Permit	X	X	X
Certificate of Occupancy		X	X
Combustible and Flammable Liquids Tank Installation		X	X
Liquefied Petroleum Gases Permit		X	X
Areawide Clearinghouse Review	X	X	X
Development Application in Flood Hazard Districts			X
Construction Dewatering Permit (Temporary)			X
Grubbing, Grading, Excavation, and Stockpiling Permit	X	X	X
Street Usage Permit	X	X	X
Stream Channel Alteration Permit			X
Discharge of Waters Permit	X	X	X

TABLE S.8-1
PERMITS POTENTIALLY REQUIRED (CONTINUED)

PERMIT	ALTERNATIVE		
	NO-BUILD	TSM	BRT
County			
Development Plan Public Facilities Map Amendment			X
Special Design District Permit			X
Zoning Waivers for Public Uses, Public Utilities and Walls			X
Sewer Connection Permits	X	X	X
Water and Water System Requirements for Developments		X	X
Building Permit		X	X
Certificate of Occupancy		X	X
Combustible and Flammable Liquids Tank Installation		X	X
Liquified Petroleum Gases Permit		X	X
Development Application in Flood Hazard Districts			X
Special Management Area Use Permit			X
Construction Dewatering Permit (Temporary)	X	X	X
Grubbing, Grading, Excavation, and Stockpiling Permit		X	X
Street Usage Permit	X	X	X
Discharge of Waters Permit		X	X

Source: Parsons Brinckerhoff, Inc.

PRIMARY CORRIDOR TRANSPORTATION PROJECT
MAJOR INVESTMENT STUDY/
DRAFT ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

CHAPTER 1

CHAPTER 2

CHAPTER 3

LIST OF FIGURES

CHAPTER 5

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

Table of Contents

Chapter 1.0
Purpose and Need

CHAPTER 1 PURPOSE AND NEED

1.0 CHAPTER OVERVIEW AND ORGANIZATION

Overview

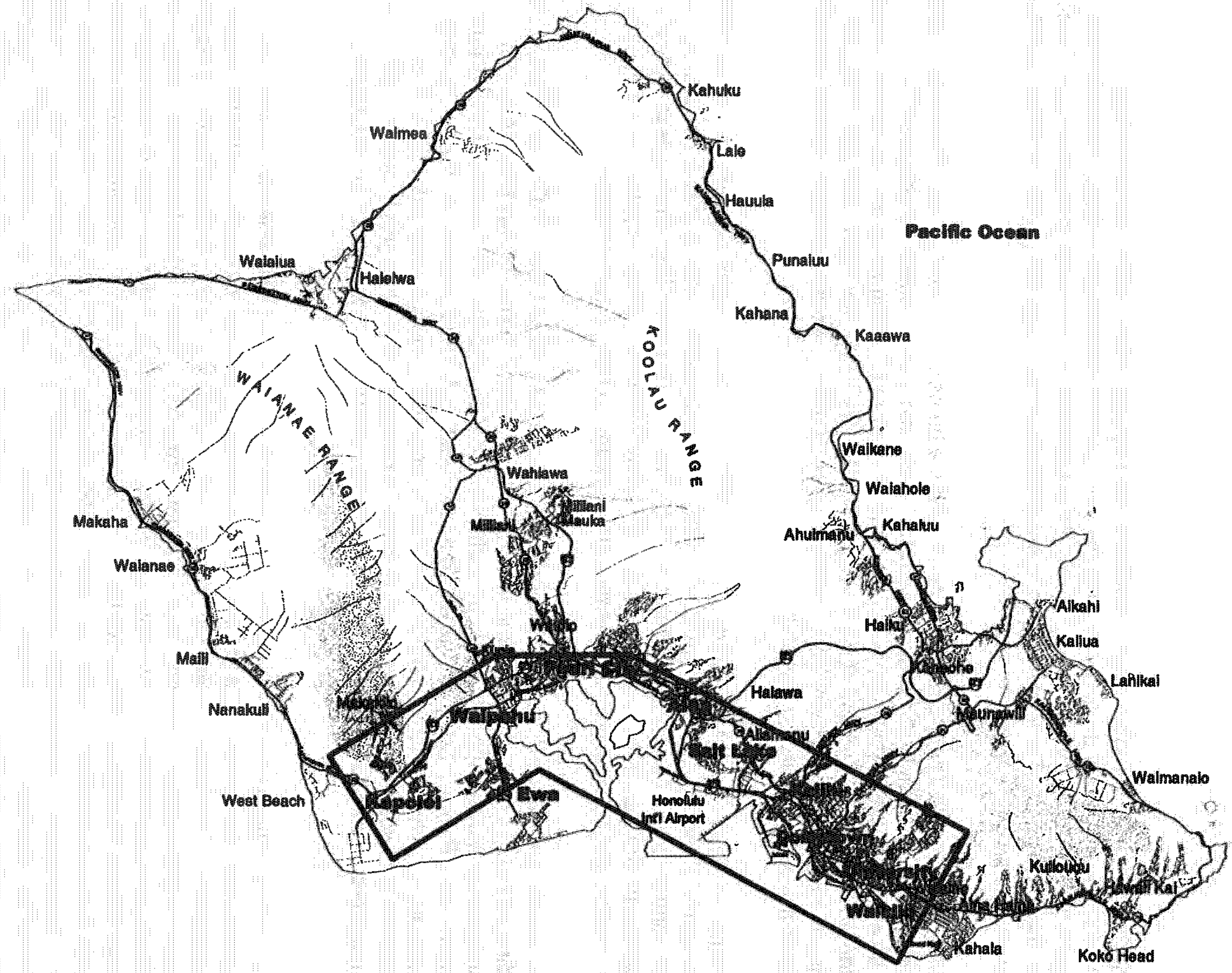
Oahu's primary transportation corridor, which stretches from Kapolei in the west to the University of Hawaii-Manoa (UH-Manoa) and Waikiki in the east (see Figure 1.0-1), is the location of the vast share of the total travel occurring on the island. Existing transportation infrastructure in this corridor is overburdened handling current levels of travel demand. Travelers experience substantial traffic congestion and delay at most times of the day, both on weekdays and weekends.

Congestion takes time away from other activities and creates a burden on the economy. Congestion wastes fuel, produces excess air pollutants, decreases roadway safety and causes stress. It reduces Oahu's attractiveness as a visitor destination and lowers residents' quality of life. Future growth will further increase traffic congestion and delay. The quality of life for Oahu's residents and visitors will continue to decrease unless the transportation system in the primary transportation corridor is modified to better accommodate existing and future travel necessary for daily life.

Investment is required to improve the efficiency of the corridor's transportation infrastructure. A more efficient transportation system in the corridor will enhance mobility, reduce travel time and improve the quality of life for Oahu's residents and visitors. The purpose of the Primary Corridor Transportation Project is to examine candidate investments that would improve the efficiency of both the transportation system in the primary transportation corridor, and the connections between the corridor and the rest of the island.

For the past two years, the City and County of Honolulu (City) has conducted the 21st Century Oahu visioning process, including its transportation component, Oahu Trans 2K. Oahu Trans 2K has been the most extensive community-based transportation planning effort in the City's history and it is the principal public outreach medium for the Primary Corridor Transportation Project. (More information on Oahu Trans 2K is provided in Appendix A). Thousands of people from every community on Oahu attended more than 44 Oahu Trans 2K workshops and worked to find solutions to mobility problems that have grown steadily worse over the past three decades. Participants studied maps, identified their unmet mobility needs and discussed ways to meet them.

The Oahu Trans 2K workshops produced widespread agreement on certain fundamental issues. First, participants agreed that Oahu's traffic is a problem. This perception was confirmed by the traffic analysis performed subsequently. There was agreement that something must be done to make it better. Second, people felt strongly that improvements must be reasonably affordable. Third, while there is an important role for roadways, there was agreement that building new or widening existing highways cannot solve the traffic problem because there is inadequate space for new or wider streets. Moreover, participants agreed that extensive double-decking of existing streets is unacceptable for aesthetic and environmental reasons. Fourth and finally, participants agreed that transportation must be viewed within a framework that includes quality of life and other benefits. Any particular transportation investment is not seen as an end in itself; it is viewed as one component in a network of islandwide transportation improvements that will help improve mobility, shape the island's growth patterns, and stimulate livable communities.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N	Scale: 0 2 4 mi Scale: 0 4 8 km	**Primary Transportation Corridor Study Area**	**Figure 1.0-1**

Mobility and transportation must be combined with livability goals. Oahu's citizens have supported a vision of the City's future that focuses on preserving the quality of life, protecting the health of the environment, and providing for growth necessary for prosperity. A network of transportation improvements is needed to address mobility and growth objectives of each of the island's communities.

Organization

This Chapter is organized to provide the reader with an understanding of the overall project purposes and the needs being addressed. Section 1.1 provides a Summary of the purposes that a transportation investment in Oahu's primary transportation corridor should satisfy. Section 1.2 establishes the basis for concluding that transportation improvements are needed. Section 1.2 begins by describing existing and future land use in the corridor. Land use is described because travel behavior and the demand for travel are derived from the spatial pattern of land uses. Section 1.2.2 describes the existing transportation infrastructure in the corridor because it is this infrastructure that must satisfy the travel demand created by the land use pattern. Section 1.2.3 then presents measures of transportation system performance used to assess how well the existing infrastructure handles travel demand, both now and in the future. Analyses are provided for both roadway infrastructure and the public transit system.

This Section concludes that an investment in transportation infrastructure must be made to handle both present and future levels of travel. Based, then, on the shortcomings of the existing transportation infrastructure, Section 1.2.4 elaborates on the requirements that an investment in transportation infrastructure should satisfy to remedy deficiencies. Section 1.3 discusses how an investment in transportation infrastructure in the primary transportation corridor is consistent with prior government plans and is derived from an extensive public outreach program. Section 1.4 closes the Chapter with a description of the formal process now underway to select the specific type of investment that is to be made.

1.1 PURPOSE

The early Oahu Trans 2K workshops established the broad points of agreement that a transportation investment is needed to achieve mobility, growth, and livability objectives. Working from these points of broad agreement, project planners have applied engineering, technology and operational approaches to develop a program that reflects the community consensus on transportation policy. The first product of this effort was the Islandwide Mobility Concept Plan (IMCP)(March 1999), which laid out a comprehensive framework for future transportation on Oahu. The IMCP identified three prime goals, and eight subgoals, for any transportation plan for Honolulu:

1. Improve In-Town Mobility
   - Subgoal A: Enhance urban roadways to embrace pedestrians, cyclists and transit users
   - Subgoal B: Develop high-capacity, frequent transit service through the urban core
2. Strengthen Islandwide Connections
   - Subgoal A: Maximize the efficiency of the public transportation system
   - Subgoal B: Manage existing roadway capacity
   - Subgoal C: Maintain and strengthen regional highway connections

- Subgoal D: Improve the linkage between city centers in the PUC and Kapolei

3. Foster Livable Communities

   - Subgoal A: Connect and reinforce local neighborhoods
   - Subgoal B: Improve accessibility for all
   - Subgoal C: Leverage transportation investments to promote economic development

Guided by the three goals in the IMCP, and through continued public involvement and technical analysis, the following set of purposes was identified for the Primary Corridor Transportation Project.

1. Increase the people-carrying capacity of the transportation system in the primary transportation corridor by providing attractive alternatives to the private automobile

With the sheer number of people living and working in Honolulu's urban core, a key strategy to mitigate traffic congestion is to get people out of their cars while they move around. This requires that alternative modes such as walking, bicycling and using public transit be given priority. Within the urban core, major destinations include Downtown, Waikiki, Kalihi, Kakaako and UH Manoa. Providing improved transit, bicycle, and pedestrian linkages to, from and between these major destinations is crucial to Honolulu's future.

If current levels of mobility and quality of life are to be maintained or improved, we need strategies to increase people-carrying capacity instead of increasing vehicle capacity. Ever-increasing demands will be placed on the primary transportation corridor's roadways, which are already congested by existing levels of transportation demand. Unless trends toward higher automobile usage can be altered, travel times and hours spent on congested highways will increase. Conversion of land from agriculture and open space into suburbs will require more and more local streets, and major roadway expansion. Caught in traffic, buses will operate more slowly and less efficiently than today, decreasing in reliability and attractiveness. This is the negative scenario to be avoided through enlightened investment.

Transportation capacity can be increased through multi-modal solutions planned in an integrated fashion. These include roadway, transit, bicycle, pedestrian and other elements. In order to increase the people-carrying capacity of the transportation system, the present automobile orientation must move to a more balanced mix of transportation modes.

Increased travel demand can be accommodated through roadway construction, and roadway improvements are often the most appropriate response to a transportation problem. However, roadway widening or adding multiple roadway levels in the dense and geographically constrained PUC would be costly and disruptive, and would consume valuable land. Public input overwhelmingly indicates that for the PUC, roadway construction on the scale that would be required to satisfy projected travel demand is not a preferred alternative.

In a preferred scenario, public transit is used in higher proportion to move people in a more space-efficient manner. Improved transit offers the ability to expand people-carrying capacity sufficiently to meet rising levels of future travel demand. The transit system must be made convenient for the user, offering reasonable and dependable travel times. This will allow transit to be attractive and compete successfully with the automobile to slow the growth in demand for highway travel.

The transit system needs to operate as independently as possible from the congestion affecting general-purpose traffic. Then, transit can achieve the speeds and reliability required to attract ridership to transit, and to provide the additional people-carrying capacity needed to improve the overall level of transportation service within the primary transportation corridor. Freed from the congestion and delays of the roadway network, transit vehicles would be able to move quickly, reliably, and efficiently, and would be an attractive alternative to automobile travel.

Increasing the people-carrying capacity of the transportation system in the primary transportation corridor by providing attractive alternatives to the private automobile would satisfy Goal 1 in the IMCP – Improve In-Town Mobility and subgoals A and B. It would also meet the IMCP's Goal 2 – Strengthen Islandwide Connections, subgoals A and B. It would also meet the IMCP's Goal 3 – Foster Livable Communities, subgoals A and B.

2. Support desired development patterns

The City's land use policy for the primary transportation corridor requires that transportation and land use be planned and developed together to implement a comprehensive urban growth strategy. Integrated land use and transportation development will result in a pattern of land uses where many more trips than at present could be made by walking, bicycle, or neighborhood transit systems.

Transportation projects provide urban design opportunities to reinforce community livability. Transit-oriented planning targets a shift from auto-oriented, dispersed, single-use development to a land use pattern with a mix of activities that promotes walking and that focuses on a central transit facility. Transit-oriented, mixed-use developments can reduce vehicular travel and congestion by making it easier to make trips on foot or bicycle.

Transportation facilities and services are needed that can serve as the nucleus of new development in conformance with the land use visions articulated in the new Ewa and the draft Primary Urban Center (PUC) Development Plans (DPs). The PUC DP Draft states that an improved transit system can help re-focus growth in the desired development pattern. The PUC DP Draft calls for pedestrian-scale development, which has convenient walking access to transit. The PUC DP Draft uses phrases like "support unique and vibrant neighborhoods" and "focus density to create sustainable communities".

New transportation infrastructure must be built at a human scale, generally within the existing streets. The goal is livable, mixed-use communities provided with improved mobility and with less need to use an automobile.

Supporting desired development patterns would satisfy Goal 1 in the IMCP – Improve In-Town Mobility and subgoals A and B. It would also meet the IMCP's Goal 2 – Strengthen Islandwide Connections, subgoals A, C and D. It would also meet the IMCP's Goal 3 – Foster Livable Communities, subgoals A and C.

3. Improve the transportation linkage between Kapolei and Honolulu's Urban Core

Kapolei is intended by both the State and the City to be a center of growth and development, as it becomes the "Secondary Urban Center" of Oahu. The emergence of Kapolei as a new city center represents a fundamental shift in travel patterns. Now is the time to ensure this is done in a multi-modal manner.

Designation of Kapolei to be a fully developed city is in itself a traffic mitigation strategy, designed to reduce the dominant travel pattern in and out of Honolulu. Kapolei already contains vibrant and unique neighborhoods, high quality design, diversified employment, parks, open space and recreational resources, and further development is expected to continue these trends. The vision for Kapolei is a place where people live, work, shop, socialize, and recreate within the area and where alternative forms of transportation to the private automobile can access these facilities. Already the State has completed an office building for over 1,000 State employees relocated from other areas on Oahu. With a new civic center opening shortly, the City will also be relocating many employees to Kapolei. Other existing and future economic development activities include hotel and recreational facilities in Ko Olina, expansion of Kalaeloa-Barbers Point Harbor, redevelopment of Kalaeloa (the former Barbers Point Naval Air Station), world-class sports facilities, and a new University of Hawaii (UH) West Oahu campus. Jobs and other attractions in Kapolei will attract "reverse travel" to this part of Oahu from outside areas.

A transit-based travel option, with frequent express service to and from Downtown and connections to strategically located transit centers, is a necessary transportation element to link Oahu's first and second cities, and will encourage their coordinated growth.

An improved transportation linkage between Kapolei and Honolulu's Urban Core would satisfy Goal 2 in the IMCP – Strengthen Islandwide Connections and each of its four subgoals. It would also meet the IMCP's Goal 3 – Foster Livable Communities, subgoals B and C.

4. Improve the transportation linkages between communities in the PUC

Improving transportation linkages within the PUC is key to increasing the attractiveness of in-town living, thereby helping to focus growth in the PUC. Mobility within the PUC must be convenient and efficient in order to meet current and future travel demands.

The PUC Development Plan update currently being prepared calls for the PUC to capture 36 to 43 percent of Oahu's population growth over the next 25 years. In addition, about 45% of the projected new job growth will be concentrated within the PUC. The PUC will remain the center for employment, cultural activities, educational opportunities, regional shopping, and recreation. It will continue to serve as a major hub for commuters, students and other individuals from all parts of the island.

A high capacity transit spine through the PUC would enhance in-town mobility and provide transit connections between the many travel markets that exist within the Urban Core. The transit spine would support existing activities and assist in creating new ones through redevelopment.

Improving the linkages between communities in the PUC satisfies Goal 1 of the IMCP – Improve In-Town Mobility and both of its subgoals. It will also addresses Goal 2 – Strengthen Islandwide Connections (subgoals A & B), and Goal 3 – Foster Livable Communities, including each of its three subgoals.

1.2 NEED FOR TRANSPORTATION IMPROVEMENTS

1.2.1 Description of the Study Corridor

The primary transportation corridor is a mix of existing residential and economic centers and areas designated by government plans to become residential and economic centers. The level of transportation service within the corridor, and between the corridor and other parts of Oahu, is vital to the economic well being of the island and the quality of life of Oahu's residents. With future growth being directed by government plans to occur in this corridor, the level of activity within the corridor, already substantial, is expected to increase.

The primary transportation corridor extends from Kapolei in the Ewa District of Oahu to the University of Hawaii at Manoa and Waikiki in the east. The east/west (Koko Head/Ewa) length of the corridor is approximately 42 kilometers (26 miles). The north/south (mauka/makai) width is a maximum of 6.4 kilometers (4.0 miles), bounded by the Koolau Mountain Range and the coastline. The corridor is by far the most urban region on Oahu and in the State, encompassing more than 60 percent of the island's population and more than 80 percent of its employment.

1) Existing Land Use

Oahu is divided into eight Development Plan Areas, or DP Areas. The primary transportation corridor includes portions of three DP Areas – the Primary Urban Center (PUC) DP Area, the Ewa DP Area, and the Central Oahu DP Area (see Figure 1.2-1). These DP Areas are either already substantial centers of population and employment (e.g., PUC DP Area), or are on their way to becoming urban centers in the future (e.g., Ewa DP Area).

Figure 1.2-2 shows the locations of the neighborhoods discussed in this Section.

Primary Urban Center (PUC) DP Area

The PUC extends from Waialae-Kahala to Pearl City and lies between the Koolau Mountain Range and the coastline. The PUC features the most diverse land uses on the island, including residential, military, industrial, commercial, and open space.

The PUC is by far the most populated DP Area with 432,000 people (52 percent of the island total) in 1990. The PUC is also the center of government, business, economic, and cultural activities in the State, including most of the major employment centers on the island, such as much of the Pearl Harbor Naval Station, Honolulu International Airport, Downtown Honolulu, Fort Shafter, Hickam Air Force Base, Ala Moana Center, and Waikiki. Economic activity is located primarily in the relatively narrow strip between Kalihi-Palama and Kaimuki, the urban core of Honolulu ("Urban Core", or "Heart of Honolulu"). In 1990, the PUC contained 398,164 jobs, or 87 percent of the total civilian employment on the island.

Central Oahu DP Area

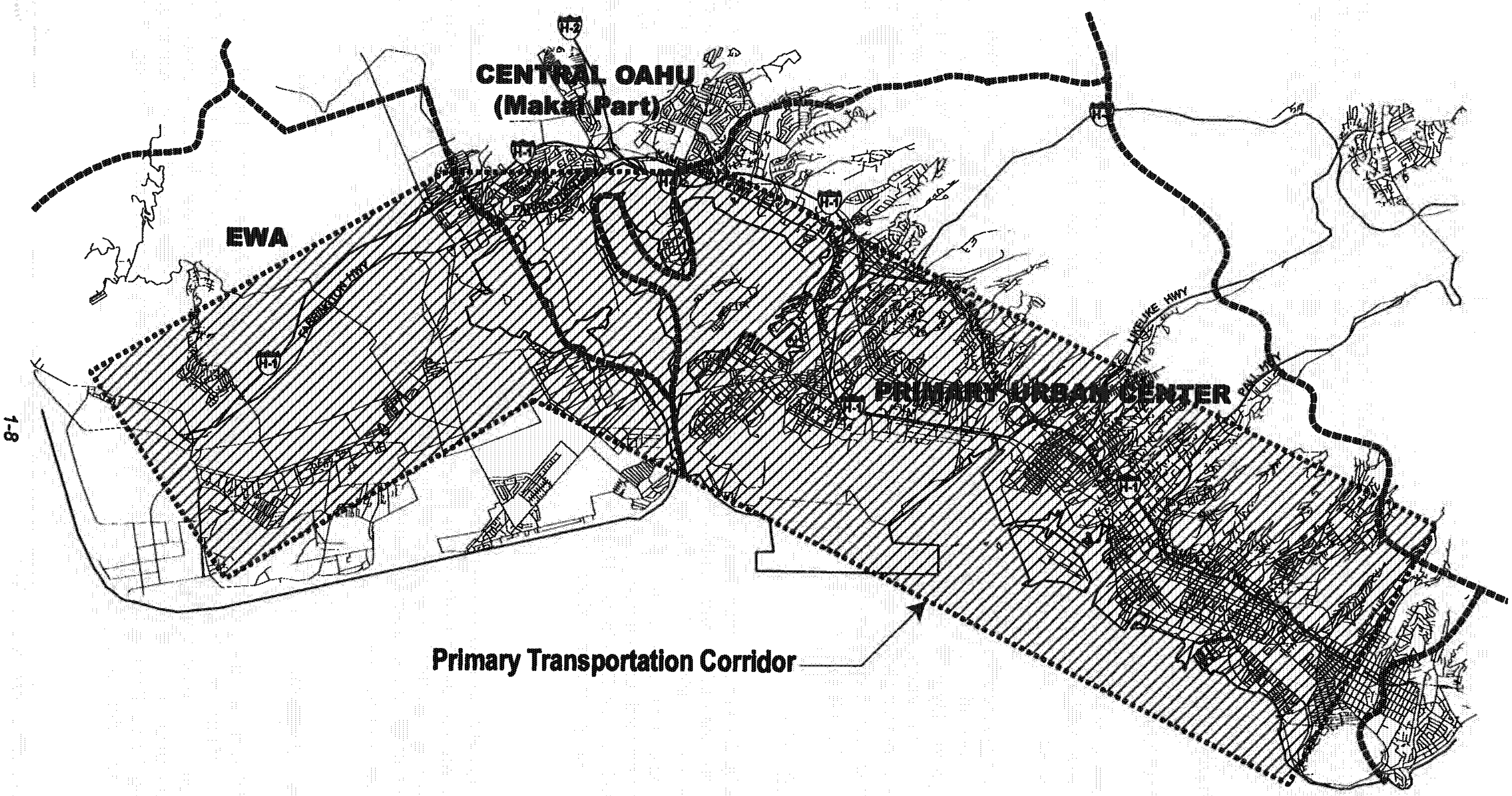
The Central Oahu DP Area contains the wide, fertile plateau between the Waianae and Koolau mountain ranges. While only the makai portion of the Central Oahu DP Area is within the primary transportation corridor, this portion includes Waipahu, Kunia, Waikele, and Waipio. These are some of the fastest growing parts of the Central Oahu DP Area where much new housing has been developed. In addition, Waipio, Waikele, and Kunia each contain a large commercial shopping center: Waipio Shopping Center, Waikele Center/Waikele Premium Outlets, and Royal Kunia Shopping Center. The latter two draw tourists and shoppers from other parts of the island.

Ewa DP Area

Much of the Ewa DP Area is within the primary transportation corridor, and is now experiencing urban growth. The State of Hawaii and the City are encouraging the development of this region as Oahu's "Secondary Urban Center", largely with new master-planned communities. Destinations include Barbers Point Harbor, Kalaeloa (the former Barbers Point Naval Air Station), a civic center with State and City offices, schools, the Ko Olina Resort, and a water theme park.

2) Future Development

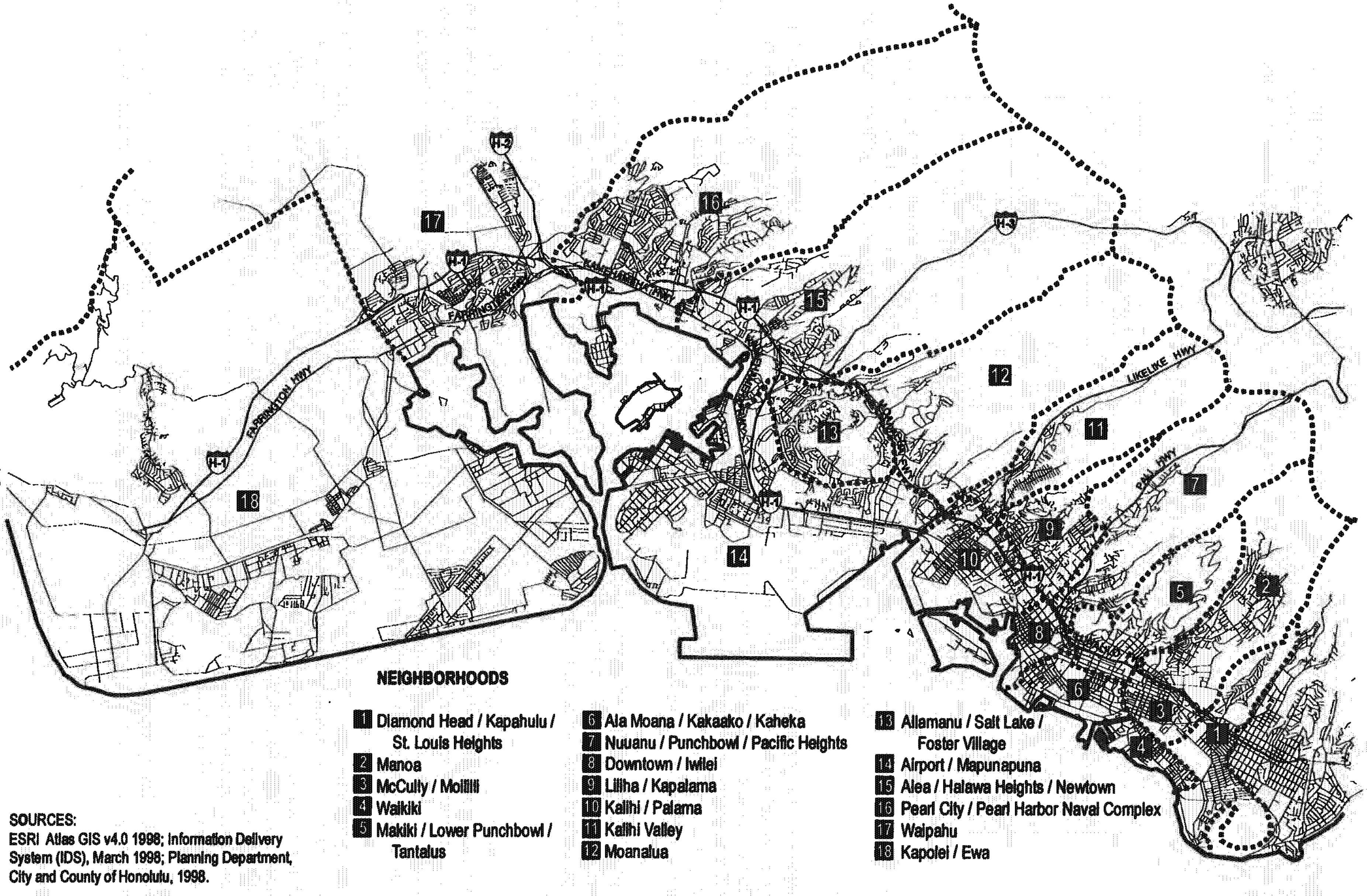
The State and City have a development policy encouraging growth in only two areas: the PUC and Ewa. One of the objectives of this policy is to minimize suburban sprawl and the associated costs of extending public infrastructure and services into presently undeveloped areas. The goal of preserving open space given the limited land area of Oahu, is not only a governmental policy, it is a widespread public sentiment frequently repeated during the public outreach activities that have been conducted during project planning. It is captured by the slogan "Keep the Country Country".



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Development Plan Areas In The Primary Transportation Corridor

Figure 1.2-1



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; Planning Department, City and County of Honolulu, 1998.

Neighborhoods

Figure 1.2-2

Oahu's population increased at an average annual rate of 1.63 percent during the twenty-year period from 1970 to 1990. Although this growth rate has slowed, according to the State Department of Business, Economic Development and Tourism (DBEDT), the population of Oahu is still expected to exceed one million people by 2025 (see Table 1.2-1).

TABLE 1.2-1
PROJECTED POPULATION SUMMARY

		Forecast	
	1997	**2025**	**Change From 1997**
PUC			
Waikiki	20,300	22,600	2,300
Other PUC	404,500	491,300	86,800
Ewa	67,700	127,500	59,800
Other	381,900	442,200	60,300
Total	**874,400**	**1,083,600[1]**	**209,200**

Source: Department of Planning and Permitting, City and County of Honolulu, January, 1999.
Note: [1]The forecast has recently been revised downward to 1,029,800 by DBEDT. Chapter 4 includes a sensitivity analysis which confirmed that this change is not significant enough to alter the analyses and conclusions in this document.

The majority of the population growth between now and 2025 is forecasted to occur at the two ends of the primary transportation corridor. As shown in Table 1.2-1, the fastest growing area will be Ewa. More than 127,000 people are expected to be living in the Ewa area in 2025, a growth of 88 percent in 28 years. The PUC will also experience significant growth, increasing by about 89,000 people. The Central Oahu population is projected to increase from 130,544 in 1997 to 164,935 in 2025, a gain of 26 percent (Department of Planning and Permitting, City and County of Honolulu, January 1999).

Accompanying the anticipated growth in population will be an increase in employment. Employment increased at an average annual rate of 4.13 percent from 1970 to 1990. The present employment projection is based on a 0.89 percent annual increase, resulting in forecasted job growth of almost 25 percent over the 1997 to 2025 period.

As shown in Table 1.2-2, the number of jobs on Oahu is projected to increase by approximately 117,000 between 1997 and 2025. About 44 percent of these new jobs will be located in the PUC. A high percentage of the employment growth islandwide is also expected to occur in Ewa/Kapolei (Department of Planning and Permitting, City and County of Honolulu, September 1999), consistent with government growth policies to concentrate development in the PUC and Kapolei.

The City is preparing a new Development Plan for the PUC (PUC DP) calling for the PUC to capture 36 to 43 percent of Oahu's population growth over the next 25 years (approximately 44,000 new households and 70,000 new residents). Directing residential growth to the PUC requires development of a high-quality, attractive urban lifestyle including opportunities for people to live, shop, work, and socialize all within a particular neighborhood or geographic area, without the need to travel long distances. A consequence of preserving open space in the country is that existing urban areas in the PUC must be redeveloped, and become attractive urban areas for both living and working.

To achieve this vision, improvements must be encouraged in older neighborhoods to attract new residents. The PUC DP introduces the concept of higher-density housing supported by extensive urban amenities.

TABLE 1.2-2
PROJECTED EMPLOYMENT SUMMARY[1]

		Forecast	
	1997	**2025**	**Change From 1997**
PUC			
Waikiki	38,000	40,100	2,100
Other PUC	326,400	375,600	49,200
Ewa	15,300	48,800	33,500
Other	89,600	121,600	32,000
Total	**469,300**	**586,100**[2]	**116,800**

Source: Department of Planning and Permitting, City and County of Honolulu, September, 1999.
Note: [1] Excludes construction employment, which totaled 24,800 in 1997 and is projected at 26,200 in 2025.
[2] This forecast has recently been revised upward to 608,200 by DBEDT. Chapter 4 includes a sensitivity analysis which confirmed that this change is not significant enough to alter the analyses and conclusions in this document.

Primary Urban Center DP Area

Elements of urban life that must be enhanced to attract new residents include quality housing; high-quality public spaces that are used as neighborhood focal points; livable neighborhoods where streets are used as public places; and enhanced transportation service, including pedestrian and bicycle facilities, so one does not have to use a car to have mobility and perform daily functions of work, shopping, education and recreation.

Redevelopment in the PUC is designated primarily for the area makai of the H-1 Freeway between Middle Street and Kapahulu Avenue. A secondary growth/redevelopment area is located between Aiea and Pearl City. These areas have the most favorable conditions for accommodating new housing, and 90 to 95 percent of the expected growth in population by 2025 is expected to occur within these redevelopment areas.

Central Oahu DP Area

A draft of the Central Oahu Development Plan (Central Oahu DP) was submitted to the Planning Commission in the fall of 1998. It has been revised and is undergoing further review by the Department of Planning and Permitting (DPP). The portion of the Central DP Area that is in the primary transportation corridor is slated for development.

Ewa DP Area

Kapolei is intended by both the State and the City to be a center of growth and development, as it becomes the "Secondary Urban Center" of Oahu. The vision for Kapolei is a place where people live, work, shop, socialize, and recreate within the area, without needing to travel long distances, and where alternative forms of transportation to the private automobile can access these facilities.

Designation of Kapolei to be a fully developed city is in itself a traffic mitigation measure, reducing the dominant flow to and from Honolulu.

The intent is that Kapolei's economic development will complement and support economic activity in the Urban Core, not compete with it. Therefore, the transportation linkage between Kapolei and the Urban Core, already important, will grow in importance.

1.2.2 Existing Transportation Facilities And Services In The Corridor

This Section discusses the existing infrastructure responsible for satisfying the travel demand in the corridor, and the next Section assesses how well this infrastructure is satisfying current travel demand. In brief, transportation service is provided by roadways, public bus service and special transportation facilities which encourage high occupancy vehicles. In addition, an intra-island ferry service is presently being demonstrated. Maps of the existing roadways, bus routes and other elements of the transportation system are provided in Chapter 3.

1) Roadway Network

The roadway network in the primary transportation corridor is concentrated in the area between the mountains and ocean, with the dominant highways generally paralleling the coastline. The principal Ewa/Koko Head roadway is the Interstate H-1 Freeway, which runs from Kapolei to Kahala. Moanalua Freeway, which runs from the Halawa Interchange to Kahauiki Interchange, also runs Ewa-Koko Head. The H-2 Freeway services traffic between Mililani/Wahiawa and Pearl City, and the H-3 Freeway is a trans-Koolau roadway between Windward Oahu and Halawa. In addition, there is an extensive network of arterial and local roadways.

2) Public Transit System

The City provides fixed-route public transit service on Oahu. TheBus, as this service is called, maintains a current fleet of 525 buses deployed on 80 routes extending to urban, suburban and rural areas throughout the island. The bus network includes five route types:

- Urban Trunk service is the direct bus service along the Ewa/Koko Head arterials of the central portion of the PUC, operating with a high level-of-service and connecting neighborhoods on both sides of Downtown. More than half of the system's daily boardings are on urban trunk routes. A special type of urban trunk service is the new Route A service (called "CityExpress!"), which provides limited stop service from Waipahu to UH-Manoa, and the "CountryExpress!" service that provides limited stop service along the Waianae coast.
- Urban Collector service provides access to the transit system from neighborhoods surrounding Downtown Honolulu that are not directly served by urban trunk routes.
- Suburban Trunk service provides a direct connection between suburban neighborhoods and Downtown Honolulu.
- Suburban Feeder service provides access to the transit system for neighborhoods outside the PUC not served by suburban trunk routes.
- Express routes provide direct, limited stop service between certain suburban neighborhoods and major activity centers within the PUC, generally limited to peak hours.

TheBus route network is based on a modified "radial" route pattern that focuses transit service to dominant employment and retail centers in the PUC, while providing service along major arterial streets enroute to these centers. Because of the locations of these centers, the area from Middle Street to Kahala has the most frequent bus coverage, with many of the bus lines coming together on a few parallel roadways.

Transit service to/from suburban areas is served by express bus service during the morning and afternoon peak periods, while these areas are served by regular route trunk lines during off-peak periods.

In addition, the City provides a comparable paratransit service, called TheHandi-Van, to complement the fixed route bus service. TheHandi-Van serves semi- and non-ambulatory disabled persons who cannot utilize TheBus.

TheBus vehicles are serviced at two maintenance facilities, one in Halawa Valley and the other in Kalihi-Palama. Because the Halawa facility will be converted to a base for other City vehicles, a new facility for TheBus is being constructed in Pearl City (the Manana facility).

3) Special Transportation Facilities

To facilitate bus service and improve the person-carrying capacity of major roadways, special lanes have been constructed for buses and other high-occupancy vehicles (HOVs). H-1 includes a Koko Head-bound contraflow lane (zipper lane) that operates during the a.m. peak period from Managers Drive to the Pearl Harbor Interchange, with a concurrent flow shoulder lane extension to Keehi Interchange. Several major arterial roadways are coned to create contraflow travel lanes during peak periods.

4) Bicycle Facilities

Bicycle facilities in the study area include a collection of routes, lanes, and paths. The longest, and one of the most heavily used, is the Pearl Harbor Bike Path. Other major bike facilities include a path on Bougainville Drive/Nimitz Highway from Radford Drive to Middle Street; lanes on Nimitz Highway from Waiakamilo Road to Bishop Street; a route on Young Street; lanes on University Avenue from Kapiolani Boulevard to Dole Street; paths along the Ala Wai Golf Course and Park; and paths along Kapiolani Park. Bike Plan Hawaii (April 1994), prepared by the State of Hawaii Department of Transportation (HDOT), and the Honolulu Bicycle Master Plan (April 1999), prepared by the City Department of Transportation Services (DTS), link existing and future bicycle facilities to create a network that can be used for both recreation and commuting.

Other bicycle facilities include bicycle parking in many areas in Downtown Honolulu. The City has placed bike racks on almost all of the City buses, with hookups to the bus bicycle racks now exceeding 27,000 per month.

1.2.3 Measures of Transportation System Performance

This Section describes the quality of current and future service provided by the roadway and transit components of the primary transportation corridor's system. The assessment of future performance assumes growth and development occur as predicted, and implementation of transportation improvements expected to occur in the next three years. Expected transportation improvements are based on the current State and City Capital Improvement Programs (CIPs), the current three-year Transportation Improvement Program (TIP), and other near-term projects. The assessment of future system performance assumes transit system coverage would be expanded to accommodate population growth.

1) Roadway Performance

Existing Roadway Performance

Travel demand within the primary transportation corridor currently overburdens the roadway system, particularly for the travel markets between suburban/Ewa/Kapolei areas and the Urban Core, and within the Urban Core. Symptoms of system inadequacy include congestion, delay, fuel waste, excess air pollutants and other detractions from the quality of life.

While resident households, port operations, airport activities, other commercial activities and visitors all generate travel on Oahu, travel by members of resident households represents over 90 percent of total traffic volume and transit ridership. In 1995, Oahu residents made more than 2.7 million trips on an average weekday. Of these, approximately 582,000 were work trips. Downtown Honolulu, by far the largest single employment concentration on Oahu, attracted 105,000 of the work trips (18 percent). Many work trips were also attracted to the Airport/Pearl Harbor area, Kakaako, and Waikiki. Many trips to work began in the residential areas of Aiea, Ewa, Kalihi, and Kaneohe. Over the next 25 years, these travel origin-destination combinations will continue to be important as the PUC grows and develops.

Historically, travel on Oahu has increased more rapidly than population. As shown in Table 1.2-3, while Oahu's population increased 14.2 percent from 1980 to 1995, daily vehicle miles traveled increased by more than 32.5 percent. This rapid increase in travel has caused roadway congestion, as demonstrated by the 103% growth in daily vehicle hours traveled during the same period.

TABLE 1.2-3
OAHU POPULATION AND DAILY TRAVEL CHARACTERISTICS

Year	Population	Vehicle Miles Traveled	Vehicle Hours Traveled
1960	500,409	4,301,370	N/A
1980	762,565	8,741,110	328,900
1995	870,761	11,585,364	669,731

Source: Oahu Metropolitan Planning Organization from US Census Data; Parsons Brinckerhoff, Inc., 1999.

Table 1.2-4 shows Honolulu compared to similar sized urban areas. The travel rate index (TRI) measures how much longer a trip takes on a congested facility compared to the travel time when the road is not congested. For at least the 15 years between 1982 and 1997, Honolulu travelers experienced more roadway congestion than similar-sized cities across the U.S. Congestion has gotten progressively worse in Honolulu, increasing from 12 percent in 1982 to 22 percent in 1997.

TABLE 1.2-4
TRAVEL RATE INDEX[1]

	1982	1986	1990	1996	1997
Honolulu	1.12	1.16	1.21	1.21	1.22
Average Medium-Sized Urban Area[2]	1.05	1.07	1.11	1.16	1.17

Source: Texas Transportation Institute, Urban Roadway Congestion-Annual Report, 1998, Texas A&M University, 1999.

Notes: [1] TRI is a measure of how much longer a trip takes during congested conditions compared to the same trip during uncongested conditions. A TRI of 1.2 means the trip during a congested period takes 20 percent longer than during an uncongested time.
[2] Population between 500,000 and 1,000,000.

Honolulu's arterial street system reflects the same high levels of congestion when measured in person-miles (one person traveling one mile on a roadway). In 1990, 70 percent of person-miles traveled on arterial streets were on congested roadways, but by 1996 the percentage had increased to 80 percent.

Delays due to roadway congestion are equivalent to the loss of three working days for every Oahu resident each year, or roughly four working days for every driver in Honolulu in the past few years. The annual delay per driver for Honolulu is shown in Table 1.2-5.

Further, vehicles idling on congested roadways waste fuel, costing money and contributing to air pollution and global warming. In 1997, over 25 million gallons of fuel were wasted by cars stuck in traffic in Honolulu, amounting to over 45 gallons of fuel wasted for every eligible driver on Oahu (see Table 1.2-6). This fuel waste is up from 22 gallons per eligible driver in 1982.

TABLE 1.2-5
ANNUAL DELAY PER DRIVER (HOURS)

	1982	1986	1990	1995	1997
Honolulu	14	20	25	30	29

Source: Texas Transportation Institute, Urban Roadway Congestion-Annual Report, 1998, Texas A&M University, 1999. P.55.

TABLE 1.2-6
ANNUAL WASTED FUEL (MILLIONS OF GALLONS)

	1982	1986	1990	1995	1997
Honolulu	11	16	18	24	25

Source: Texas Transportation Institute, Urban Roadway Congestion-Annual Report, 1998, Texas A&M University, 1999. P.85.

Combining these various measures of transportation system performance produces a "cost of congestion." The annual "cost of congestion" in 1997 for Honolulu was $280 million (The 1999 Annual Mobility Report, Texas Transportation Institute). With an annual average cost of congestion for similarly sized cities of $274 million, Honolulu exceeds the average cost of congestion among its peer group of cities.

Stepping this cost down to a per capita basis, the annual cost of congestion was $510 in 1997 per eligible driver in Honolulu. This cost represents a substantial drag on the local economy. The annual cost of congestion was only $150 per eligible driver in 1982.

Reliance on the automobile has also resulted in the demand to convert land for parking. Based on an average of 2.17 automobiles per household, 350,000 private automobiles are estimated to be based in the PUC. On average, every vehicle requires 350 square feet for parking, totaling 2,800 acres of land in residential areas for parking, some of which could otherwise be used for parks and affordable housing, or other purposes. This 2,800 acres figure does not include parking lots at employment sites, retail outlets, or recreation venues.

In sum, the existing transportation system struggles to serve the present level of travel demand in the primary transportation corridor, subjecting travelers to substantial congestion, delay and waste of fuel. Existing shortcomings will become more pronounced with growth.

Future Highway Performance

Travel demand between suburban/Ewa/Kapolei areas and the Urban Core, and within the Urban Core, will continue to tax the highway system, even with the roadway improvements presently programmed. Growth in resident travel relates to growth in population and employment. Table 1.2-7 summarizes the projected growth in resident vehicular travel demand between 1995 and 2025. (In accordance with FTA guidelines, the planning horizon for a possible transit investment is 25 years from the present.) Travel demands in the a.m. and p.m. peak periods (which vary by roadway segment) are projected to grow by 33 percent.

Table 1.2-8 shows the projected growth in travel by Oahu residents between 1995 and 2025 categorized by key travel markets.

TABLE 1.2-7
TOTAL RESIDENT VEHICLE TRIP TRAVEL DEMAND

	A.M. Peak Period	P.M. Peak Period
1995	368,769	461,135
2025	489,312	612,757
Growth	120,543	151,622
Percent Growth	33%	33%

Source: Parsons Brinckerhoff, Inc.

TABLE 1.2-8
RESIDENT PERSON TRIP TRAVEL DEMAND WITHIN SELECTED TRAVEL MARKETS

Travel Market	Daily Person Trips			
	1995	2025	Difference	Percent Change
Within Urban Core	1,100,901	1,410,500	309,599	28%
Suburban to Urban Core	498,685	563,542	64,857	13%
Ewa/Kapolei to Urban Core	28,622	48,609	19,987	70%
Suburban to Ewa/Kapolei	71,776	179,983	108,207	151%

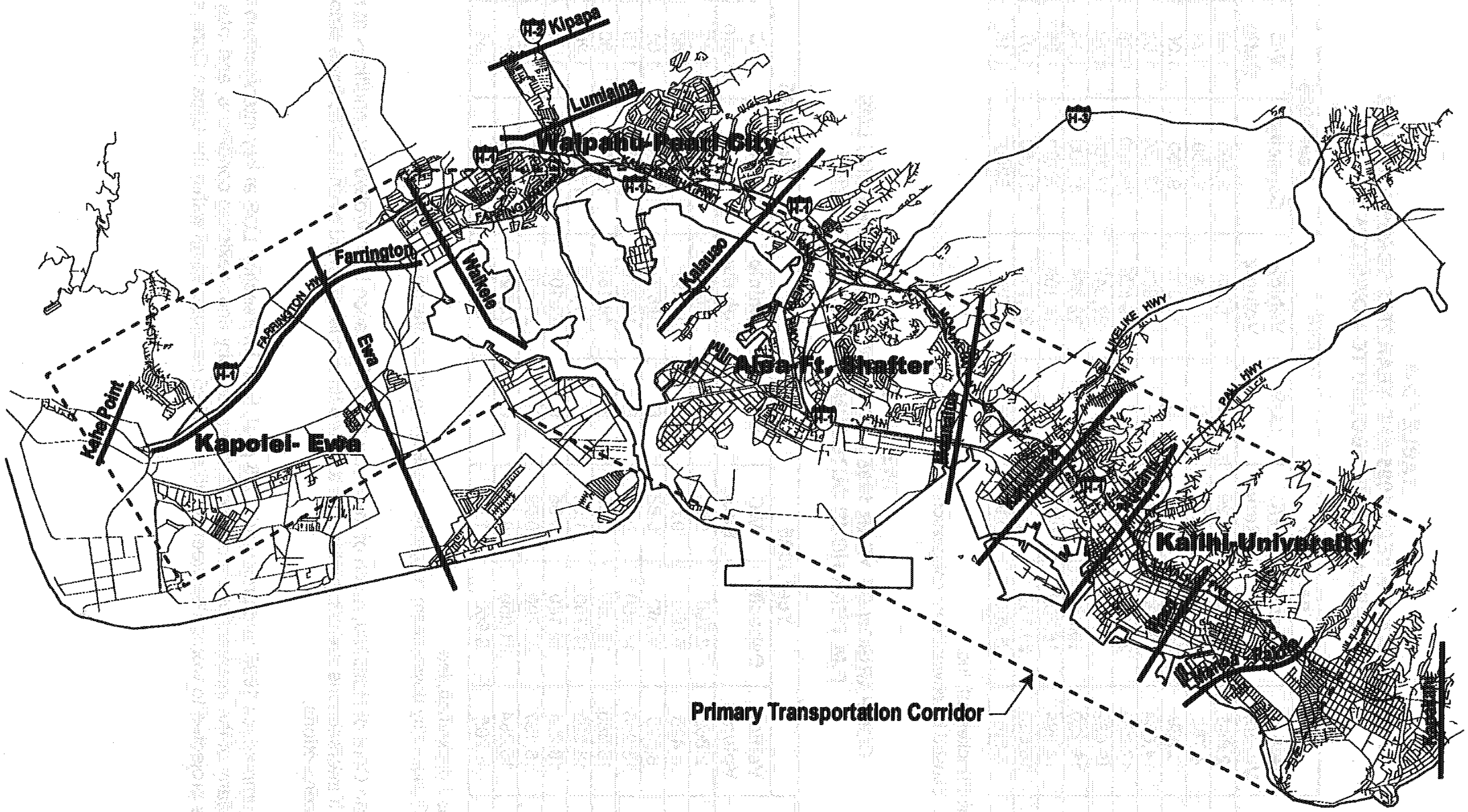
Source: Parsons Brinckerhoff, Inc.

The travel market between suburban areas and Ewa/Kapolei will be the most rapidly growing on a percentage basis. However, over one-half of the island's travel will continue to occur wholly within the PUC, heavily concentrated in an Ewa-Koko Head direction, with intra-PUC travel expected to increase by over 300,000 trips per day. Even with the significant reorientation of travel patterns to and from the Ewa/Kapolei area, there is substantial projected growth in travel between the PUC and Kapolei, and within the PUC. This large increase in travel within the PUC is a major reason why the capacity to handle in-town mobility must substantially increase through the improvement of transit service.

The relationship between travel demand and roadway capacity may be illustrated through the analysis of screenlines, imaginary lines drawn at strategic locations. Traffic volumes on roadways crossing the defined screenlines are summed to produce a total travel demand across a screenline. This screenline travel demand is compared to the total roadway capacity across the screenline, derived by summing the capacities of the key roadways as they cross the screenlines. Ratios of travel demand to roadway capacity (volume/capacity ratios) are then calculated to assess highway performance at the screenlines. A volume/capacity ratio of 1.00 indicates that the roadway capacity of the screenline is completely utilized, while a volume/capacity ratio greater than 1.00 indicates that significant vehicular delay would occur because of roadway congestion. These volume/capacity ratios are frequently related to an index called level-of-service (LOS), which ranges from A (free-flow) to F (congested flow).

Tables 1.2-9 and 1.2-10 summarize 1995 and 2025 peak period data at selected screenlines, focusing on traffic flowing in the Ewa-Koko Head direction. Figure 1.2-3 illustrates the location of these screenlines.

At key screenlines between the Waiawa Interchange (H-1/H-2 junction), through the Urban Core and into East Honolulu, the LOS analysis indicates that many roadways are significantly over capacity under existing conditions. This finding on the current level of transportation service supports the analysis reported in the previous section, that the existing transportation infrastructure is severely taxed even under current levels of travel demand. Further, even including the near-term improvements to the transportation system presently programmed, volume/capacity ratios are projected to worsen between 1995 and 2025.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N	Scale: 0 1.25 2.50 mi Scale: 0 2.0 4 km	Screenlines At Or Near The Primary Transportation Corridor	Figure 1.2-3

TABLE 1.2-9
COMPARISON OF YEAR 1995 AND YEAR 2025 SCREENLINE LOS
A.M. PEAK HOUR INBOUND TO DOWNTOWN

Screenline	Year 1995				Year 2025			
	Vehicle Volume	Capacity	V/C Ratio	LOS	Vehicle Volume	Capacity	V/C Ratio	LOS
Kahe Pt.	2,846	3,200	0.89	D	4,783	3,200	1.49	F
Ewa	4,783	6,800	0.70	C	7,309	9,950	0.74	C
Waikele	6,939	9,750	0.71	C	10,307	9,750	1.06	F
Kalauao	14,654	15,900	0.92	E	18,061	17,650	1.02	F
Moanalua	17,829	20,400	0.87	F[1]	19,580	22,100	0.89	F[1]
Kapalama	19,082	17,700	1.08	F	22,347	17,700	1.26	F
Nuuanu	18,320	19,600	0.94	F[1]	22,394	19600	1.14	F
Ward	14,594	18,200	0.80	F[1]	19,109	18200	1.05	F
Manoa-Palolo	16,929	21,150	0.80	F[1]	22,714	21150	1.07	F
Kapakahi	4,895	5,200	0.94	E	5,957	5200	1.15	F

Source: Parsons Brinckerhoff, Inc.
Note: [1] LOS F caused by downstream congestion backing up across the screenline.

TABLE 1.2-10
COMPARISON OF YEAR 1995 AND YEAR 2025 SCREENLINE LOS
P.M. PEAK HOUR OUTBOUND FROM DOWNTOWN

Screenline	Year 1995				Year 2025			
	Vehicle Volume	Capacity	V/C Ratio	LOS	Vehicle Volume	Capacity	V/C Ratio	LOS
Kahe Pt.	2,662	3,200	0.83	D	4,583	3,200	1.43	F
Ewa	4,435	6,800	0.65	B	6,756	9,950	0.68	B
Waikele	6,670	9,750	0.68	B	9,890	9,750	1.01	F
Kalauao	13,268	14,150	0.94	E	16,276	14,150	1.15	F
Moanalua	16,680	18,200	0.92	E	18,181	18,200	1.00	F
Kapalama	18,393	17,700	1.04	F	21,319	17,700	1.20	F
Nuuanu	18,221	19,100	0.95	E	22,104	19,100	1.16	F
Ward	16,137	20,700	0.78	F[1]	21,590	20,700	1.04	F
Manoa-Palolo	16,284	21,050	0.77	C	23,325	21,050	1.11	F
Kapakahi	4,205	3,900	1.08	F	5,217	3,900	1.34	F

Source: Parsons Brinckerhoff, Inc.
Note: [1] LOS F caused by downstream congestion backing up across the screenline.

Within the Urban Core of Honolulu, much of the roadway performance is controlled by conditions at key intersections. If intersections are congested, the total trip time is lengthened even if traffic flows smoothly between the intersections.

Table 1.2-11 summarizes 1995 and projected 2025 peak hour intersection LOS at key intersections within the Urban Core. Many of the intersections are approaching capacity under existing conditions, and intersection performance is projected to worsen between 1995 and 2025 because travel within the Urban Core is projected to grow.

TABLE 1.2-11
COMPARISON OF EXISTING AND FUTURE INTERSECTION LOS

Intersection	Peak Time Period	1995	2025
Kalihi Street & Dillingham Boulevard	A.M.	C	F
	P.M.	E	F
Kalihi Street & N. King Street	A.M.	D	F
	P.M.	D	F
Bishop Street & S. King Street	A.M.	D	F
	P.M.	D	F
Punchbowl Street & S. King Street	A.M.	D	F
	P.M.	C	F
Punchbowl Street & Ala Moana Boulevard	A.M.	B	C
	P.M.	D	F
Kalakaua Avenue & Kapiolani Boulevard	A.M.	C	F
	P.M.	E	F
Nimitz Highway & Sand Island Access Road	A.M.	E	F
	P.M.	F	F

Source: Parsons Brinckerhoff, Inc.

In summary, both the highway screenline and the Urban Core intersection analyses indicate that highway users currently experience substantial traffic congestion. Even with the assumed improvements to the transportation system (these assumed improvements are contained in the No-Build Altemative as discussed further in Chapter 2), peak hour conditions for 2025 vehicular traffic would be even worse than 1995 conditions because of growth in travel demand. Thus, an approach of increasing person-capacity is needed.

2) Public Transit Performance

TheBus carried approximately 235,000 boardings per day in 1999. Measured in passengers per revenue-mile and operating expenses per passenger, TheBus is one of the most productive and efficient bus systems in the U.S. In 1994 and again in 2000 the City bus system received a "Best Transit System in America Award" from the American Public Transit Association.

TheBus has excellent service coverage and there is significant passenger demand. Many express and trunk routes experience substantial overcrowding. On an average day across the system, there are 35 instances of waiting passengers being passed up because buses are full. Bunching of buses caught in traffic congestion causes schedules to be unreliable. Because buses must compete for roadway space with other vehicles, increasing capacity on bus routes is difficult. With the high level of traffic congestion on today's highway system, and increased traffic congestion forecasted for the future, the ability of the bus system to continue providing the service it does today is limited. The ability of the system to improve the level of service to reduce current overloads and meet future travel demand would be even more limited.

In summary, unless significant changes are made to the transit system, increasing congestion on the roadway system will constrain the ability of TheBus to provide convenient and reliable mobility options for those who can choose between transit and driving. With roadway congestion continuing to worsen, average bus speeds and on time performance will be poor as long as buses operate in mixed traffic. Ridership growth will be more difficult to achieve under such circumstances. The ability of TheBus to absorb future travel demand, much less improve the current level of service for transit patrons, is limited if the system continues to be operated in congested traffic.

1.2.4 Zonal Requirements for Travel Within the Corridor

Not only must the network increase its capacity to move people, but the types of transportation service to be provided must be reflective of the unique transportation needs that exist on a subarea basis.

Figure 1.2-4 displays three distinct travel zones or market areas within the primary transportation corridor. Zone I extends from Kapolei to Middle Street, and contains three subzones: Kapolei/Ewa, Waipahu/Waikele/Pearl City, and Salt Lake/Airport. Zone II encompasses Downtown Honolulu, extending from Middle Street to the University of Hawaii. Zone III covers Waikiki as well as overlapping with parts of the Urban Core. A fourth zone includes the rest of the island outside of the primary transportation corridor. In developing transportation alternatives to address future demand, the travel patterns and unique needs of the individual zones and subzones must be understood so the alternatives that address the mobility issues of the corridor also match localized needs for transportation service.

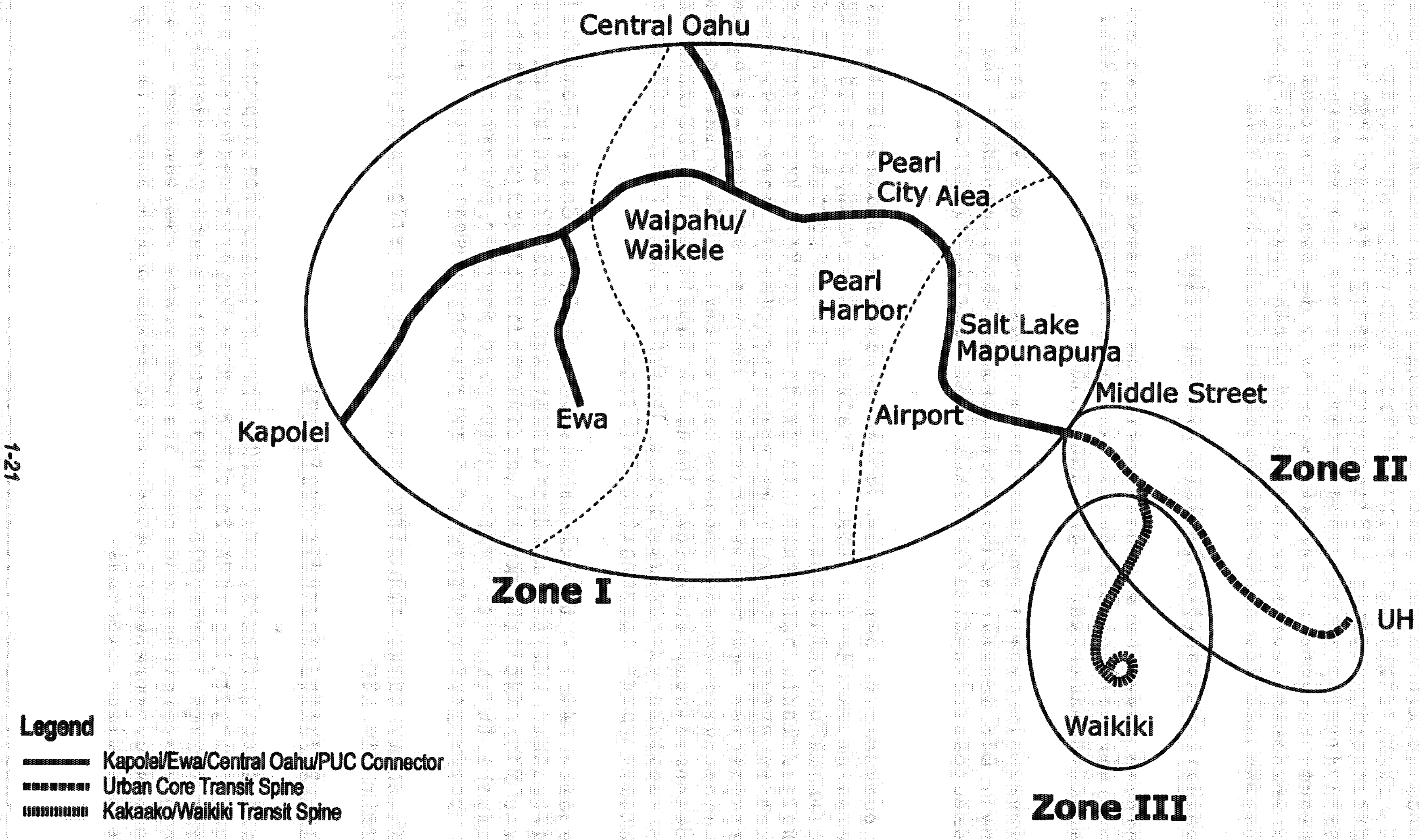
Zone I, the region of the Secondary Urban Center, has the principal travel requirements of more frequent express service from Kapolei to Downtown Honolulu, intrazonal circulation, and connections to the rest of Oahu. Since Kapolei will support jobs and a range of cultural, educational, and other activities, residents need to be able to meet many of their needs by traveling wholly within the City of Kapolei. In addition, jobs and other attractions in Kapolei will attract "reverse travel" to this part of Oahu from outside areas.

The Waipahu/Waikele/Pearl City subzone of Zone I is a suburban area, including the regional shopping hubs of Waikele Center/Waikele Premium Outlets and Pearlridge Center. Therefore, the Waipahu/Waikele/Pearl City subzone's primary travel needs are connections to the Urban Core for residents who work in town, a connection to Kapolei, and connections into this subzone to access the shopping centers.

The Salt Lake/Airport subzone of Zone I contains the largest housing areas for military families, and employment centers such as the Honolulu International Airport and the Mapunapuna industrial area. Pearl Harbor is a major employer and visitor attraction. Connections to this subzone from all parts of the island will continue to be critical for commuters and airport users, and connections from all over Oahu to Pearl Harbor will be important.

Zone II is Honolulu's Urban Core, where the travel needs relate to convenient and efficient in-town mobility associated with "in-town" living. Many trips could be made by walking, bicycling or public transportation. Since Zone II will remain the primary center for employment, cultural activities, educational opportunities, regional shopping, and recreation, it will continue to serve as a major hub for commuters, students, and other individuals from all parts of the island. With major redevelopment planned for Kakaako, an opportunity exists to coordinate transit plans with Kakaako development plans so that mobility and livability objectives are fully realized.

Zone III comprises Waikiki and its 20,300 residents, 31,300 hotel rooms, 38,000 employees, plus numerous retail, entertainment, and recreational attractions. Waikiki has the highest concentration of trip making per square mile of any area on the island, with population and employment projected to increase further by 2025. While many trips stay within Waikiki and are made by walking or transit, most Waikiki residents work, go to school or have health care and other needs outside of Waikiki. They therefore require good connections to Downtown and other parts of the PUC. Also, most of the employees who work in Waikiki live elsewhere, and need good transportation access to places of employment. Waikiki's concentration of recreational activities, restaurants, nightlife, parks and beaches attract residents from around the island.



Travel Zones Within The Primary Transportation Corridor

Figure 1.2-4

1.3 PLANNING CONTEXT

This Section discusses the context within which planning for transportation improvements in the primary transportation corridor has been occurring. Section 1.3.1 discusses how an investment in transportation infrastructure in the primary transportation corridor would be consistent with government plans. Section 1.3.2 discusses the public outreach activities that DTS has conducted, starting in the Fall of 1998. Input from the Oahu Trans 2K series of meetings has been critical in establishing consensus on key issues and in developing and evaluating alternative transportation solutions for the corridor, as described in more detail in Chapter 2. Section 1.3.2 also describes the development of the Islandwide Mobility Concept Plan (IMCP), an important document that integrated public input into transportation goals and objectives for the island.

1.3.1 Transportation Improvements in Relation to Government Plans

The purposes and needs presented so far in this Chapter have been discussed for many years, and government planning has long recognized them in transportation goals and objectives for the island, although not necessarily stated in the current terminology of sustainability.

Transportation planning in the primary transportation corridor involves several local, State, and federal agencies, primarily the DTS, the HDOT, and the Oahu Metropolitan Planning Organization. The transportation-related goals and objectives developed by transportation planning agencies are summarized in Table 1.3-1.

Since the 1960s, public transit has been acknowledged as a key component of local and State plans to meet transportation demands in urban Honolulu. Therefore, in addition to the previously presented quantitative analysis showing the need for transit to address the inadequacy of the existing roadway system to satisfy existing and future travel demand, improvements in the transit system conform to long-standing government policies. Specifically, the 2020 Oahu Regional Transportation Plan (ORTP)(November, 1995) includes in its transit element a project called "rapid transit in PUC corridor". This project is described as a "high-capacity rapid transit system operating on exclusive right-of-way from Pearl City to UH Manoa (technology and alignment to be determined through future study)." The need for "rapid transit in the PUC corridor" therefore emerged from a transportation system planning process. The Primary Corridor Transportation Project represents the subsequent phase of planning of this ORTP project.

In addition to the goals in Table 1.3-1, the goals and objectives in the City and County of Honolulu's Islandwide Mobility Concept Plan (March 1999) present a vision for integrating transportation and land use planning. This plan, which grew out of the public involvement activities conducted for this project (described further in Appendix A), emphasizes the role of transportation in helping build, strengthen, and connect communities throughout Oahu; focusing growth in designated areas; and enhancing the island's overall quality of life.

The evaluation of alternative transportation solutions must address the range of government goals and objectives reflected in Table 1.3-1.

1.3.2 Oahu Trans 2K Public Outreach Planning Process

The Oahu Trans 2K series of participatory workshops (the islandwide transportation component of the 21st Century Oahu visioning program) began in the Fall of 1998, and has thus far included four rounds of community outreach meetings. Together, DTS and HDOT went out to the public to provide background information on mobility issues and listen to the public. The meetings were widely advertised and well attended. These meetings represented a continuation and acceleration of public outreach meetings that had begun on a more informal basis a year earlier.

TABLE 1.3-1
LOCAL AND STATE TRANSPORTATION GOALS AND OBJECTIVES FROM ADOPTED PLANS

City and County of Honolulu, General Plan for the City and County of Honolulu (updated 1991)
• To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel. • To maintain transportation and utility systems that will help Oahu continue to be a desirable place to live and visit.
City and County of Honolulu, Primary Urban Center Development Plan (Public Review Draft, June 1999)
• Recognize the important connection between land use and transportation and develop a long-range land use plan that supports a balanced transportation system. • Develop an urban transportation system that is responsive to existing development, as well as projected growth in housing and employment. It shall sustain and enhance the quality of life of PUC residents, employees and visitors. • Implement Transportation Demand Management (TDM) strategies to achieve and manage the desired land use pattern, shifting the focus from increasing roadway capacity to optimizing the present transportation infrastructure. • Integrate land use and transportation planning within the Urban Core to ensure the viability of transit-oriented development.
City and County of Honolulu, Ewa Development Plan (Public Review Draft, June 1999)
• Certification of adequate access and transportation service before approval of new residential and commercial development. • Provision of adequate and improved access, and adequate transportation capacity. • Improved linkages within the region, including to and across the former Barbers Point Naval Air Station • Reduce reliance on automobile use.
State of Hawaii, Hawaii State Plan (January 30, 1989)
• An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods. • A statewide transportation system consistent with planned growth objectives throughout the State. • Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in Chapter 226, HRS. • Coordinate State, County, Federal, and private transportation activities and programs toward the achievement of statewide objectives. • Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties. • Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs. • Encourage transportation systems that serve to accommodate present and future development needs of communities. • Promote programs to reduce dependence on the use of automobiles. • Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment. • Encourage safe and convenient uses of low-cost, energy-efficient, non-polluting means of transportation.

TABLE 1.3-1 (CONTINUED)
LOCAL AND STATE TRANSPORTATION GOALS AND OBJECTIVES FROM ADOPTED PLANS

Oahu Metropolitan Planning Organization, Oahu Regional Transportation Plan (2020) (November 1995)
• Develop and maintain Oahu's islandwide transportation system to ensure safe, convenient, and economical movement of people and goods. • Develop and maintain Oahu's transportation system in a manner which maintains environmental quality and community cohesiveness. • Develop and maintain Oahu's transportation system in a manner that is sensitive to community needs and desires. • Develop a travel demand management system for Oahu which optimizes use of existing transportation resources.

During Round 1 of the meetings (September/October 1998), participants viewed an introductory video and presentation boards showing possible solutions to transportation problems. Participants were then encouraged to brainstorm about neighborhood and islandwide transportation issues and possible solutions. They made comments directly onto large area maps. The results of this round of meetings were compiled into a database of 2,400 specific ideas, and were used to develop a draft islandwide mobility concept.

In Round 2 of the meetings (November/December 1998), participants viewed a video summarizing the Round 1 process and a short presentation that outlined the draft islandwide mobility concept, which was developed from the Round 1 input. With the assistance of trained facilitators, participants gathered in groups organized by neighborhood to review workbooks tailored to each transportation planning zone.

After two rounds of community-based meetings, the input obtained was incorporated into the Islandwide Mobility Concept Plan, which was prepared and issued in March 1999. This plan articulated three central goals:

- Improve in-town mobility;
- Strengthen islandwide connections; and
- Foster livable communities.

The Round 3 meetings were held during March/April 1999 and were held in combination with the meetings of 19 vision teams across the island. Information presented included the Islandwide Mobility Concept Plan and transit alternatives for a high-capacity transit spine in the primary transportation corridor. The Round 3 meetings also announced the upcoming formal scoping for the Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS), which occurred in May 1999.

In Round 4 of the meetings (October 1999), the plans for public transit, as discussed in the first three rounds of meetings, were presented for questions and discussion. Discussion included the operation of the passenger loading platforms in the middle of the street, center-running transit operations in comparison to curbside-running, the use of "high-tech" approaches to provide schedule and waiting time information to transit users, possible features of transit vehicles, and route alignment details.

The four rounds of community-based meetings showed that there is a strong interest in transit technology, how a new transit technology would integrate into the community and with the existing bus system, and the funding aspect of the project.

1.4 ROLE OF THE MIS/DEIS IN PROJECT DEVELOPMENT

This Section provides an overview of the formal transportation project development process, focusing on statutory requirements of the National Environmental Policy Act (NEPA) and the Hawaii Environmental Impact Statement (EIS) Law.

The City Council approved local funds for the MIS/DEIS in the 1999 and 2000 City Capital Improvement Program budgets. Federal funds were programmed in the 1999 OMPO Overall Work Program and TIP, and FTA has approved grants for the work.

An MIS is a prescribed federal planning study that is conducted when a need for a major metropolitan transportation investment is identified and federal funding is potentially involved. The planning horizon is typically 25 years into the future. Honolulu has enough population to qualify as a metropolitan area, and so preparation of an MIS is appropriate to maintain project eligibility for federal funding.

The purpose of an MIS is to initiate formal study of the many ways to address mobility problems within the primary transportation corridor. The purpose of this MIS is to identify, analyze and evaluate the most promising alternatives so that the City Council and OMPO may make an informed decision. The MIS is a planning study that leads to planning decisions (mode, general location, capacity, access control, etc.). More detailed design options are evaluated in subsequent phases. Therefore, the MIS is also prepared to serve local decision-making needs.

A transportation solution can consist of roadway, transit, pedestrian, and other elements singly or in combination. The MIS evaluates alternative transportation solutions to the mobility problems of the corridor. One alternative is selected as the "Locally Preferred Alternative" (LPA) and the reasons for its selection described in a final document.

A DEIS addresses the potential environmental impact of a project, and meets the environmental review requirements of the NEPA and the Hawaii EIS Law (Chapter 343, Hawaii Revised Statutes). The NEPA established national environmental policies and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals by federal agencies. It requires that an EIS be prepared for all proposed federal actions that could significantly affect environmental quality. Under NEPA, the term "environment" encompasses the natural and physical environment (air, water, geography, and geology) as well as the relationship of people to that environment (health and safety, jobs, housing, schools, transportation, cultural resources, noise, and aesthetics).

Combining the MIS with the DEIS allows for a more comprehensive analysis of possible environmental impacts and alternatives, and facilitates project delivery. No program decisions can be finalized until these processes are completed.

Major steps in preparing an EIS (and this MIS/DEIS) are listed below:

- Notice of Intent (NOI)/EIS Preparation Notice
- Public Scoping
- Preparation of the DEIS
- Public Comment Period
- Identification of the "Locally Preferred Alternative" (LPA)
- Response to Comments and Final EIS
- Acceptance of Final EIS/Record of Decision (ROD)

The purpose of the NEPA process is to ensure that accurate environmental studies are performed, that they are done with public involvement, and that public officials make decisions based on an understanding of environmental consequences. Decisions are not made in an EIS; rather, an EIS is one tool decision-makers must consider when deciding among various alternatives. The particulars of these steps in relation to this project are now discussed.

1) Notice of Intent (NOI)/EIS Preparation Notice

The environmental review process allows for three courses of action depending on a project's anticipated level of impact. The first course would be "exemption" from environmental review per the Hawaii Administrative Rules (HAR) Chapter 200 (Environmental Impact Statement Rules), and qualification as a "categorical exclusion" per 23 Code of Federal Regulations (CFR) 771 and 40 CFR 1508. These "exemption" and "exclusion" procedures are applicable to projects with minimal environmental impact. However, the level of impact anticipated for this project exceeds minimal levels, so this avenue is not appropriate.

The second route applies to projects whose impacts, while not minimal, are less than "significant". The term "significant" has a technical definition under both State and federal law. For such projects, an "Environmental Assessment" (EA) is prepared.

The third route applies to projects expected to have a "significant" impact on the environment. For such projects, an EIS is prepared. Since the impacts of this project are expected to be "significant", an EIS is the appropriate form of environmental document.

The NOI for the DEIS was published in the April 27, 1999 Federal Register. The NOI informed the public and agencies that an EIS would be prepared, and formally announced the beginning of the scoping process. The NOI described the proposed action and alternatives as they were understood at that time, provided information on issues and potential impacts; and invited comments, questions, and suggestions (both written and oral) on the scope of the EIS.

The Chapter 343, HRS, EIS Preparation Notice was published in the April 23, 1999 The Environmental Notice.

2) Public Scoping

NEPA regulations direct federal agencies preparing an EIS to engage in a public scoping process. The purpose of this process is to establish the scope of the EIS so that the document is responsive to public and agency concerns. Scoping is intended to identify potential issues early and ensure they are properly studied; avoid excessive attention to issues of little significance; produce a DEIS that is thorough and balanced; and avoid delays occasioned by an inadequate DEIS. The material to be covered in scoping was discussed in the Round 3 Oahu Trans 2K meetings.

The formal scoping meeting for this DEIS was held on May 11, 1999. Comments received are summarized in Appendix A, and were used in the development and evaluation of alternatives.

3) Preparation of the DEIS

This DEIS is the next step in the NEPA process. It compares the potential environmental impacts of the alternatives developed to satisfy the purposes and needs described in this chapter. Chapter 2 discusses candidate transportation solutions, and evaluates them so a manageable number are addressed in detail in the balance of the document. This DEIS describes the affected environment (existing conditions) in Chapter 3, and the environmental consequences (impacts) of the alternatives that advance from Chapter 2 in Chapters 4 and 5. Chapters 4 and 5 also discuss measures to minimize or avoid adverse impacts. In a

Federal Transit Administration (FTA) DEIS, it is also customary to discuss the project financial plan, and this is provided in Chapter 6. Chapter 7 is a summary of evaluation findings. Appendix A summarizes public and agency coordination activities that have occurred to date. Appendix B contains conceptual design drawings of the BRT Alternative. Appendix C includes the comments received in response to the EIS Preparation Notice and the response to those comments. Appendix D contains detailed cash flow tables.

In December 1999, the City Council passed a resolution confirming the alternatives to be studied, the areas of analysis, and the financial tools to be included.

4) Public Comment on the DEIS

Once the DEIS is issued, there is a public comment period (minimum of 45 days) during which agencies and the public may comment on the DEIS. The comment period begins with publication of a Notice of Availability (NOA) of the DEIS in the Federal Register, and a similar notice in The Environmental Notice. Federal and State regulations require at least one public hearing to solicit public input on the DEIS. All comments received during the public review period are recorded and must be addressed in the Final EIS.

5) Identification of the "Locally Preferred Alternative" (LPA)

After the DEIS is issued and public and agency comments have been considered, the local project sponsor (in this case the City) identifies the "locally preferred alternative" (LPA).

The LPA may be one of the alternatives addressed in the DEIS, a modification of one of those alternatives, or a hybrid combining the best features of several. The City Council will be asked to identify the LPA through a resolution. Following this City Council action, an "LPA Report" will be prepared for submission to the FTA.

The identification of the LPA is a signal to the FTA that sufficient local consensus exists on a particular project alternative to proceed to FEIS and beyond the environmental review process. The step after the environmental review process is to enter a national competition against other cities in the country that are seeking grants from FTA to start transit systems.

The desired end result is efficient transportation and more livable communities throughout the island. A bottom-up process is being used to define and select the "best fit" transportation solution. Residents in each of the island's communities have repeatedly been and will continue to be solicited for input. So far, this input has resulted in the range of investment alternatives addressed in this MIS/DEIS. The chosen solution will address Oahu's growing congestion problem in an affordable manner.

6) Response to Comments and the Final EIS

Following the public comment period, the Final EIS is prepared. The Final EIS responds to all comments received on the DEIS and identifies the LPA. The release of the Final EIS is announced by publishing an NOA in the Federal Register and The Environmental Notice.

7) Acceptance of Final EIS/Record of Decision (ROD)

Once the Final EIS is published, a 30-day minimum waiting period is required by NEPA before the ROD can be published in the Federal Register. The ROD notifies the public of the decision made on the proposed action and the reasons for that decision.

Pursuant to Chapter 343 Hawaii Revised Statutes, the Governor of the State of Hawaii must accept the Final EIS, completing the environmental review process under the State EIS Law. Acceptance of the Final EIS by the Governor is followed by a 30-day legal challenge period.

Chapter 2.0
Alternatives Considered

CHAPTER 2 ALTERNATIVES CONSIDERED

2.0 CHAPTER OVERVIEW AND ORGANIZATION

Overview

This Chapter defines the three alternatives analyzed in this MIS/DEIS. It also describes other alternatives that were considered but eliminated due to failure to satisfy purpose and need requirements and/or due to other concerns such as public opposition, significant environmental impacts and financial feasibility.

The three alternatives that meet the four purpose and need requirements stated in Chapter 1, although to varying degrees, are:

- The No-Build Alternative: The No-Build Alternative consists of more than eight roadway projects expected to be implemented in the next three years, and expansion of bus service in developing areas (e.g., Kapolei) to maintain existing service levels by adding 16 buses and developing new routes.
- Transportation System Management (TSM) Alternative: This is a required alternative in the Federal Transit Administration (FTA) process. The primary feature of this alternative is the reconfiguration of the present bus route network to a hub-and-spoke network.
- Bus Rapid Transit (BRT) Alternative: This alternative builds on the hub-and-spoke bus system in the TSM Alternative, and adds Regional and In-Town BRT routes. The Regional BRT element includes a continuous H-1 BRT Corridor from Kapolei to Downtown using a reversible zipper lane and new express lanes. The In-Town BRT component is a high capacity transit spine from Middle Street to Downtown, a University Branch from Downtown to UH-Manoa, and a Downtown to Kakaako/Waikiki Branch.

Organization

Section 2.1 summarizes the development and evaluation of candidate alternatives that were considered to meet the purpose and need requirements. It describes the development of the three alternatives carried forward for detailed assessment. Section 2.2 provides a physical description of the three alternatives. Sections 2.3 and 2.4 present capital and operating cost information on each alternative. Section 2.5 presents the proposed implementation schedule for each alternative. Section 2.6 describes the alternatives that were analyzed and eliminated.

2.1 EVOLUTION OF THE ALTERNATIVES CARRIED FORWARD

The alternatives described in this Chapter evolved over the course of developing the MIS/DEIS through an iterative process wherein a wide-range of options was progressively analyzed in increasing detail until it was winnowed down to the "best fit" alternatives.

The first step in the evolution of the alternatives involved combining information gathered from public and agency outreach with the results of prior studies to identify a broad range of alternatives for consideration in addressing the project purposes and needs. Public input was obtained primarily through the 21st Century Oahu Visioning Process and its transportation component, Oahu Trans 2K. The 21st Century Oahu Visioning process began in September 1998, and consisted of a series of neighborhood-based community meetings designed to enhance public input in planning the vision for Oahu communities.

To date, the Oahu Trans 2K process has involved a series of four meetings in each of 19 districts throughout the island. The first two rounds of meetings resulted in the Islandwide Mobility Concept Plan (1999). This

Plan, described in Chapter 1, crystallized transportation goals and objectives for the island, and outlined transportation alternatives for the primary transportation corridor.

In addition to public and agency input, alternatives were developed based on site visits, review of City and State plans, existing and projected land use and travel demand patterns, and other research. Transportation alternatives were configured to support land uses that would boost transit ridership and sustain livable communities. This will maximize the efficiency and effectiveness of the transportation system, and create a mutually supportive transportation system and land use development pattern.

After Rounds 1 and 2 of the Oahu Trans 2K meetings, public and agency input was combined with technical analysis to define an initial set of alternatives: No-Build, Enhanced Bus/Transportation System Management (TSM), Bus Rapid Transit (BRT), and Light Rail Transit (LRT) (see Figure 2.1-1). These alternatives were defined as follows:

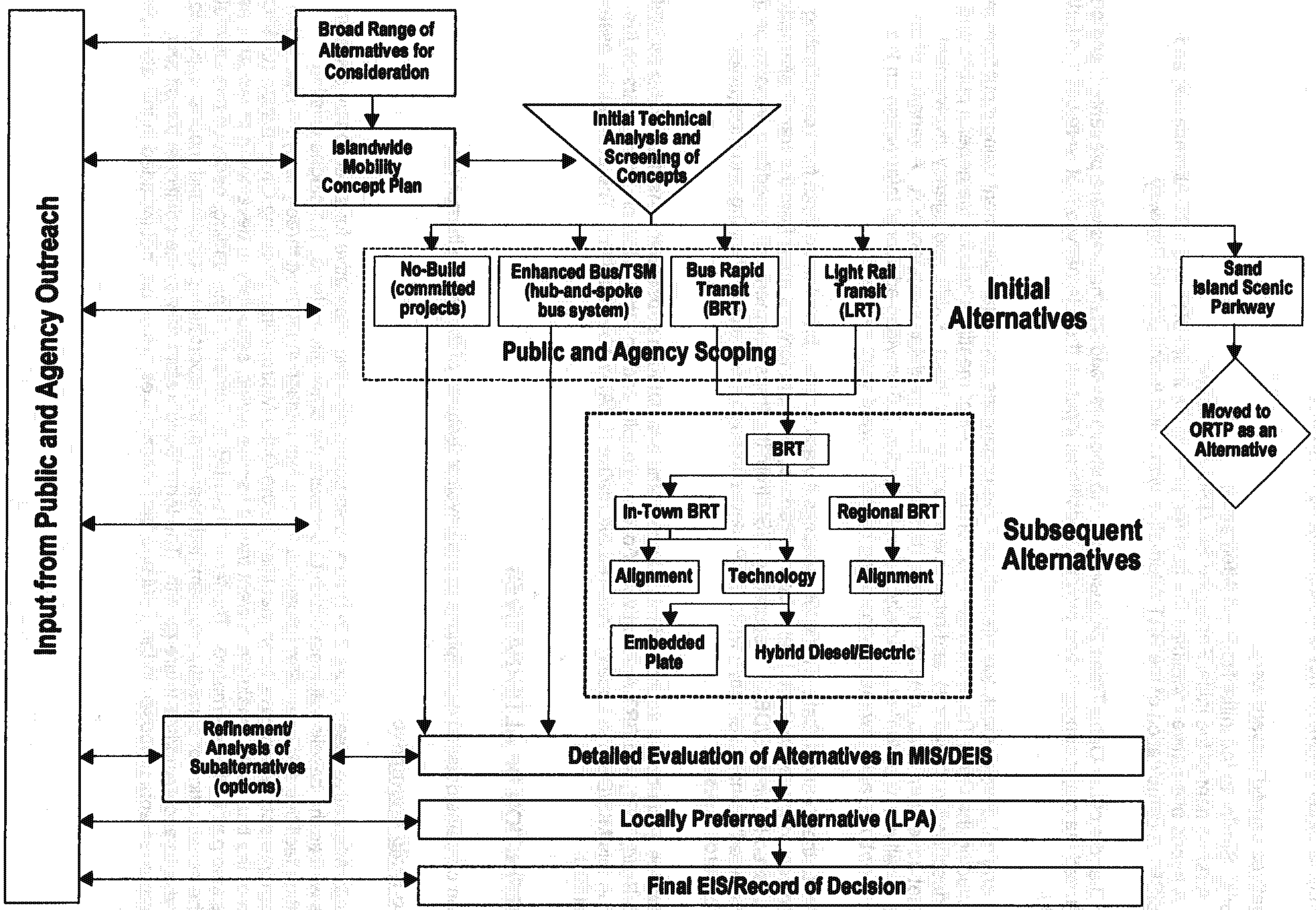
- The No-Build Alternative contains "committed" projects, generally those programmed for implementation within the next three years.
- Transportation System Management, or TSM, refers to a package of relatively low to moderate cost measures designed to make more efficient use of the existing transportation infrastructure. The Enhanced Bus/TSM Alternative reconfigures the present predominately radial bus route network to a hub-and-spoke network (discussed more fully below).
- The BRT Alternative built on the TSM Alternative, and included bus priority measures and a trolley system between Downtown Honolulu and Waikiki.
- The LRT Alternative analysis considered the costs and impacts of introducing a new mode, at-grade light rail system. Three alignment alternatives were reviewed. The base alternative ran between Middle Street and UH-Manoa. A second alternative extended from Middle Street to Pearlridge, and a third extended still farther to Waipahu. An alignment along Nimitz Highway fronting the Airport was also compared to an alignment on Salt Lake Boulevard.
- The concept for a direct connection between Keehi Interchange and Kakaako via Sand Island was developed to provide a more direct and scenic gateway entry to Waikiki and Kakaako for visitors and others from the Airport and points Ewa. This is called the Sand Island Scenic Parkway, or SISP.

Transportation Demand Management (TDM) measures were included in all the alternatives being developed. TDM measures are strategies that reduce or shift the time of travel by private automobile, and include such measures as vanpooling (subsidized vehicles used for commuter ride-sharing), road pricing (toll roads), and parking constraints or surcharges. The same TDM assumptions are incorporated in all of the alternatives, such as continued growth of the vanpool program and growth in bicycle and pedestrian travel.

The initial alternatives above (No-Build, Enhanced Bus/TSM, BRT and LRT and the SISP concept) were described in the Environmental Impact Statement Preparation Notice (EISPN) and Notice of Intent to Prepare an EIS (NOI), both of which were published in April, 1999. These are formal public notifications that are part of the environmental review process, and are discussed in more detail in Chapter 1.

After publication of the EISPN and NOI, public comments were reviewed and detailed technical analyses were performed to evaluate these alternatives. This included route alignment engineering, travel demand forecasting, environmental studies, cost estimating, and preliminary financial studies. Based on these technical studies and the comments received on the EISPN, the initial alternatives were refined to enhance their efficiency, cost-effectiveness, and ability to support mobility, land use and quality of life goals.

Section 2.6 contains a discussion of the comments pertaining to alternatives that were received in response to the EISPN. The best features of the initial alternatives were combined to create improved alternatives. A new BRT Alternative was developed as a hybrid, containing the best features of the initial BRT and LRT Alternatives. The LRT Alternative was dropped because subsequent analyses revealed that BRT using



Alternatives Development And Screening Process

Figure 2.1-1

electric-powered vehicles could accomplish virtually all of the objectives of LRT at substantially less cost. In addition, highway alternatives to the Regional and In-Town BRT and LRT systems were identified and subsequently eliminated from further consideration as alternatives.

The alternatives carried forward were:

1. No-Build: Similar to the initial No-Build Alternative;
2. TSM: A refinement of the initial Enhanced Bus/TSM Alternative;
3. BRT: A hybrid alternative containing the best features of the initial BRT and LRT Alternatives; and
4. BRT/SISP: A combination of the BRT Alternative with Sand Island Scenic Parkway.

In Rounds 3 and 4 of the Oahu Trans 2K meetings, the above revised alternatives were presented, and public input confirmed the major concepts and provided additional input on the alternatives that were used to further refine them.

Since their original development, the alternatives have undergone continual refinement using input from many sources including the Oahu Trans 2K meetings, formal "scoping" meetings held for the general public and agencies (described in Chapter 1), and other agency and public input. Public and agency involvement activities that have been conducted to date are discussed in more detail in Appendix A. A variation of an alternative is called an "option" or a "subalternative". Section 2.6 provides additional information on the evaluation of options, and how the options being carried forward were selected.

Subsequent to the Round 4 Oahu Trans 2K meetings it was decided, based upon input from coordinating public agencies, to move the Sand Island Scenic Parkway element forward apart from the transit alternatives being considered in this MIS/DEIS. Separating SISP from the transit element will expedite a decision on the "Locally Preferred" transit alternative while SISP moves through the regional planning and then project development processes.

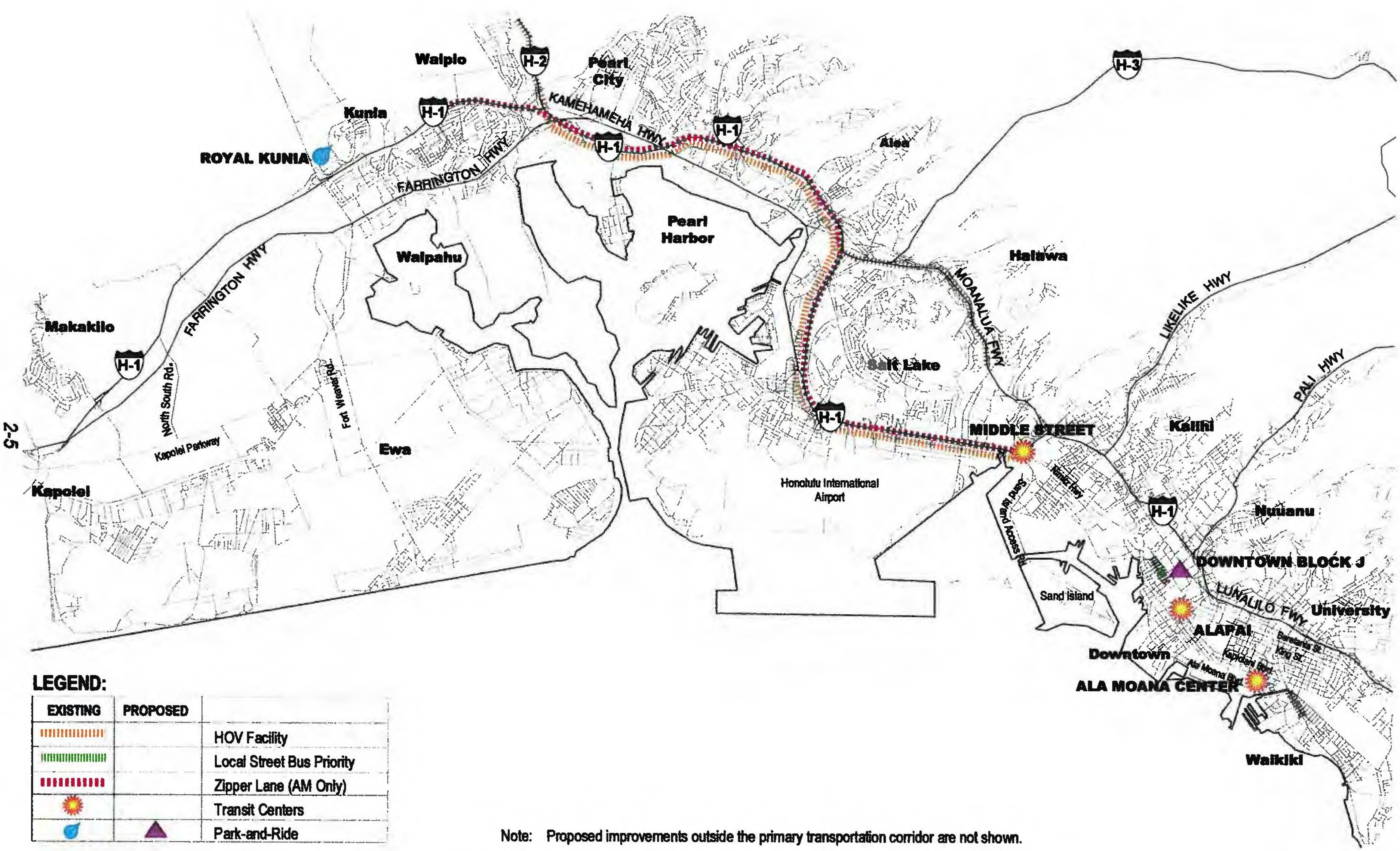
The alternatives described in the rest of this Chapter, and evaluated in subsequent chapters of this MIS/DEIS are the No-Build, TSM, and BRT Alternatives. Following public and agency review and comments on the evaluation in this MIS/DEIS, a Locally Preferred Alternative (LPA) will be identified. The LPA will be assessed in the Final EIS.

2.2 DEFINITION OF ALTERNATIVES

This section contains detailed descriptions of the physical features of the three alternatives.

2.2.1 No-Build Alternative

The No-Build Alternative (see Figure 2.2-1) serves as both a possible alternative for selection by decision makers as well as the baseline against which to compare the other alternatives. It includes existing transportation facilities and near-term (projected for implementation in the next three years) transportation improvement projects which have been identified by the Oahu Metropolitan Planning Organization (OMPO). Expansion of the bus fleet to maintain current transit service levels, especially in developing areas such as Kapolei, is also part of this alternative. The term "No-Build" is somewhat misleading, because this alternative includes the construction of currently programmed near-term transportation projects and modest expansion of transit service to accommodate future growth. The term "Build" refers only to the additional transit and highway improvements proposed in the TSM and BRT Alternatives, which are not included in this alternative.



Note: Proposed improvements outside the primary transportation corridor are not shown.

N

Scale: 0 1.25 2.50 mi

Scale: 0 2.0 4 km

No-Build Alternative

Figure 2.2-1

1) Committed Transportation Improvement Projects

The No-Build Alternative includes the committed near-term projects already identified in OMPO's 2000-2002 Transportation Improvement Program (TIP) and other highly probable projects. Projects considered committed are consistent with the Oahu Regional Transportation Plan (ORTP). Projects needed for the natural expansion of bus service as Kapolei develops are also included.

In the Ewa region, committed projects include the new Kapolei Parkway (in TIP) and North-South Road (in TIP), plus a new interchange between the H-1 Freeway and North-South Road (in TIP). Farrington Highway (Fort Barrette Road to Fort Weaver Road) (not in TIP but necessary for a mature roadway network in Kapolei) and Puuloa Road (Kamehameha Highway to Salt Lake Boulevard) (in TIP) would be widened from two to four lanes. Other major committed projects include widening Salt Lake Boulevard from two to four lanes from Lawehana Street to Ala Lilikoi Street (in TIP), adding a Koko Head-bound lane to the H-1 Freeway in Kalihi (in TIP), and completing the conversion of Punchbowl Street to two-way operation (likely to occur).
Figure 2.2-1A shows the location of these committed projects.

The No-Build Alternative includes implementation of the State and City bicycle master plans (shown later in Section 3.2.4) and various programmed pedestrian improvements. The No-Build Alternative, and all of the other alternatives, capture the intent to create a more bicycle and pedestrian-friendly environment. These pedestrian and bicycle improvements are part of the baseline condition included in all of the alternatives.

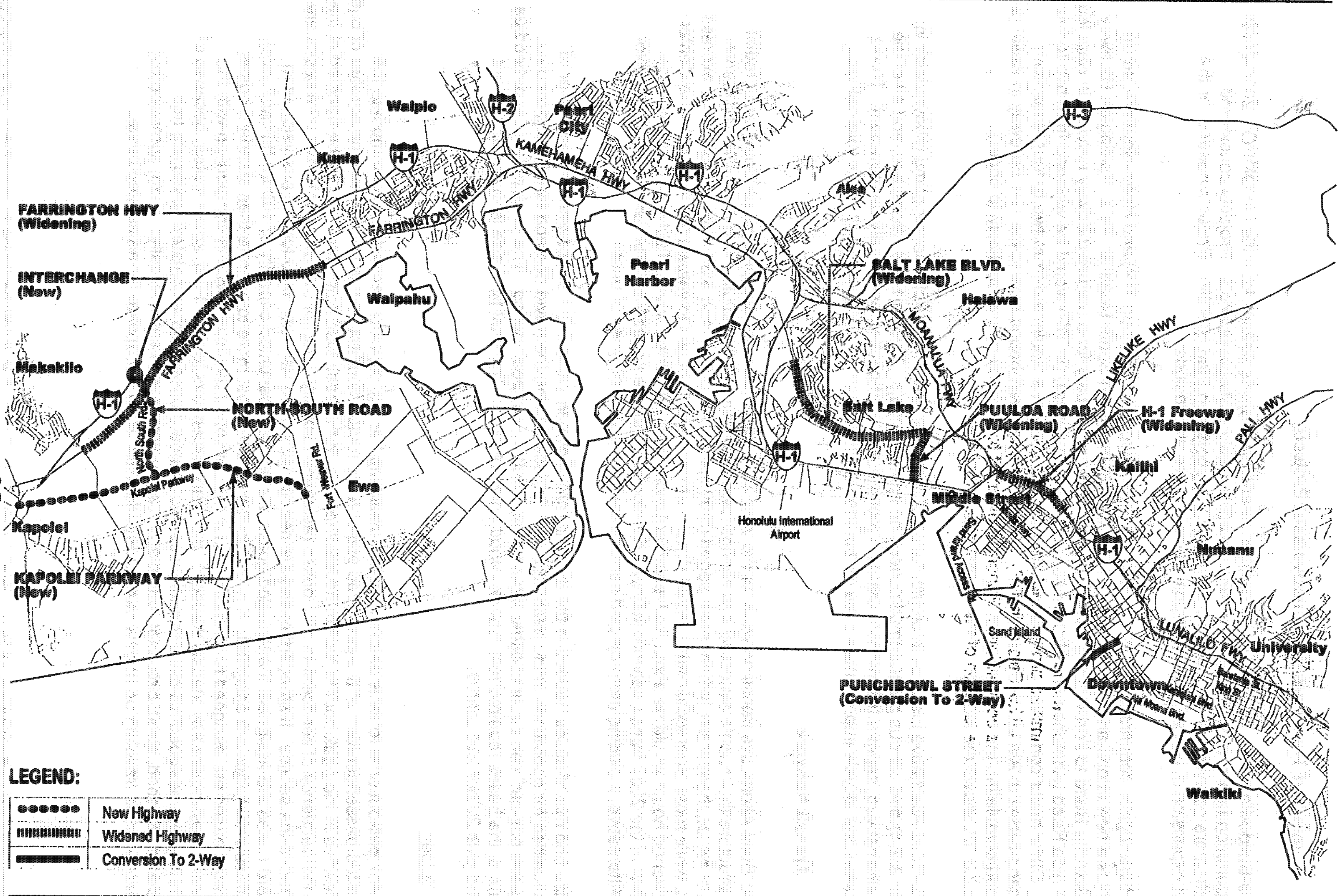
2) Transit Network

The No-Build Alternative transit network for the year 2025 would maintain the present predominantly radial route structure that orients almost all bus service towards Downtown Honolulu. The Alapai Transit Center would serve as the primary hub for peak-period (6:00 A.M. to 8:00 A.M. and 3:30 P.M. to 6:00 P.M.) express routes, while most other local routes would continue to operate through Downtown to the Ala Moana Center. Bus revenue hours would be about twelve percent more than the current level. Table 2.2-1 presents an overview of the 2025 transit network that was developed to handle projected travel demand under the No-Build Alternative, including the projected number and distribution of types of buses.

The size and mix of buses needed in the fleet that are shown in Table 2.2-1 are based on the number of buses needed for operations in the peak period as projected using the travel demand forecasting models. This "peak pull-out" can occur in either the morning or afternoon peak period. The peak pull-out is defined as the sum of the buses required in the peak period on each route. The total fleet size is the peak pull-out demand plus 20 percent spares.

Methodology

The peak pull-out on a route is determined by calculating the bus capacity needed to accommodate the forecasted passenger load at the peak load point on the route. The first step is to calculate the number of bus trips needed in the peak hour to accommodate the load. If the peak load point demand can be handled at the assumed frequency of service with mini buses (assumed capacity of 42 for this analysis), then mini buses are assigned to the service. If standard buses are needed (assumed capacity of 70 for this analysis), then standard buses are assigned; if articulated buses are needed (assumed capacity of 100 for this analysis), then articulated buses are assigned. Since articulated buses cost more to operate than standard buses, articulated buses are assigned to a route only if more than one bus trip is saved in comparison with the number of trips required by standard buses. There are exceptions to this: First, some routes, because of topography, are assigned hill-climber minibuses and standard buses and articulated buses are not considered. Second, some circulator routes are assigned minibuses automatically. Third, some routes, particularly those traveling on narrow streets, are identified as inappropriate for articulated buses.



No-Build Alternative Highway Elements

Figure 2.2-1A

TABLE 2.2-1
NO-BUILD ALTERNATIVE 2025 FIXED-ROUTE BUS NETWORK

Route Structure	
Circulator Routes	24
Local Routes	27
Express Routes	26
Limited-Stop Routes	1
TOTAL	78
Fleet Size (including spares)	
Minibus	77
Standard 12-meter (40-foot) Bus	388
Articulated Bus	76
TOTAL	541
Daily Trips (weekday)	
A.M. Peak Period	1,284
Off-Peak	1,698
P.M. Peak Period	1,223
Daily Operations (weekday)	
Revenue Bus Kilometers	89,620
Revenue Bus Miles	55,690
Revenue Bus Hours	4,150
Daily Ridership Forecast (weekday)	
Total Linked Trips	286,700

Source: Parsons Brinckerhoff, Inc.

If the demand at the peak load point is sufficiently low that even minibuses at the coded frequency of service provide too much capacity, then less frequent service (i.e. a fewer number of bus trips) may be assigned. However the frequency is not lowered below what is considered minimum service for the type of route.

If the demand at the peak load point is too high to be accommodated by an articulated bus at the frequency of service assumed in the travel demand model, then more frequent service (i.e. a larger number of bus trips) is assigned.

Once the number of bus trips and equipment is defined for a route, the number of vehicles that is required is calculated, based on the roundtrip travel time for the route, including layover time.

Definitions

Circulator Routes: Circulator bus routes provide mobility within neighborhoods, and connections to more regional bus routes. The No-Build Alternative includes a set of circulator bus routes, developed from 18 routes currently classified as urban collector and suburban feeder routes, plus six new circulators to serve the growing Kapolei and Ewa areas. Urban collector routes generally provide service within neighborhoods every 15 to 30 minutes during peak periods and every 30 to 60 minutes during off-peak periods. Suburban feeder routes generally operate every 60 minutes.

Local Routes: The existing urban and suburban trunk routes would continue to provide local service throughout Oahu. Urban trunk lines provide concentrated service through Honolulu, creating combined peak-period headways of less than five minutes along several major streets. Suburban trunk routes provide direct but multi-stop connections between the Primary Urban Center (PUC) and communities in Ewa, Central Oahu, Windward Oahu, and East Honolulu. They operate every 10 to 20 minutes during peak periods and every 20 to 30 minutes during off-peak periods.

Express Routes: Express routes between suburban communities and Honolulu/Kapolei during peak commute periods would continue to supplement local service. Express routes provide direct, non-stop connections between outlying suburban neighborhoods and major activity centers within the PUC and Kapolei. All express bus service is scheduled during or around peak periods.

Limited-Stop: The existing CityExpress! (Route A) would continue to provide limited stop service every 7.5 minutes between Middle Street and the University of Hawaii (UH), and every 15 minutes between Waipahu and Middle Street. The CountryExpress! (Route C) would also maintain its limited stop service between Makaha, Kapolei, and Downtown Honolulu, using the H-1 Freeway between Kapolei and Kalihi. A trip between Kapolei and Downtown would last roughly 35-minutes. Route C would continue to run every 30 minutes, 7 days a week.

Table 2.2-2 shows the transit centers and park-and-ride facilities incorporated into the No-Build Alternative. A hierarchy of regional, community and neighborhood transit centers would be established.

TABLE 2.2-2
NO-BUILD ALTERNATIVE TRANSIT CENTERS AND PARK-AND-RIDES

Regional Transit Center	Community Transit Center	Neighborhood Transit Center	Park-and-Ride Facility
Alapai	Middle Street	None	Wahiawa
Ala Moana Center			Mililani Mauka
			Royal Kunia
			Hawaii Kai
			Downtown Block J

Source: Parsons Brinckerhoff, Inc.

Regional transit centers would be large-scale facilities serving multiple trip purposes and would meet the needs of larger geographic areas of the island. These facilities would typically serve a variety of transit services including circulator, express and local bus routes. Typical amenities include numerous off-street bus bays around a waiting area, information kiosks, restrooms, commercial services, and kiss-and-ride areas. Many would also include park-and-ride lots.

Community transit centers would be medium-sized facilities that meet the needs of a number of nearby neighborhoods. These facilities would primarily serve passengers transferring between different community circulators and one or more local and express services. A community transit center would typically be located off-street and proximate to larger-scale commercial activities such as shopping centers. Features typically include multiple bus bays around a sheltered structure, seating, route signage and information, and vending and other small-scale commercial services.

Neighborhood transit centers would be small facilities designed to meet the transit needs of nearby residents. They would primarily serve passengers transferring between neighborhood circulator routes and one or more local or express routes. Ideally a neighborhood transit center would be located near other neighborhood services such as grocery stores, dry cleaning, and other convenience functions. Key features would include bus turnout lanes, shelter for waiting transit patrons, lighting, sidewalks and bicycle racks.

3) Transit Technology

The No-Build Alternative assumes the continued use and expansion of the existing bus fleet, which presently consists mostly of 12-meter (40-foot) standard diesel buses and 18.3-meter (60-foot) articulated diesel buses. The technologies in the No-Build Alternative are minibuses, and standard and articulated buses with conventional diesel propulsion.

While minibuses could use alternative fuel sources, including electric batteries or propane, standard and articulated buses, particularly the ones on long-haul routes, would need to be diesel or hybrid diesel/electric because of the mountainous terrain and limited range of battery-powered vehicles. Hybrid diesel/electric buses are electrically-propelled vehicles in which the electricity is produced by an on-board generator (alternator) powered by a diesel engine.

4) Park-And-Ride Lots

Intermodal access to the transit network would continue to be provided at four existing park-and-ride lots (Wahiawa Armory, Mililani Mauka, Royal Kunia, and Hawaii Kai). The 400-stall Block J parking structure to be constructed Downtown as an intercept facility is also assumed under the No-Build Alternative.

5) Maintenance Facilities

The 2025 bus fleet would be accommodated at the Kalihi-Palama (existing) and Pearl City (scheduled for completion in 2001) Bus Maintenance Facilities. To meet forecasted transit demand, the mix of equipment would change to the distribution shown in Table 2.2-1.

6) Vanpool

Vanpool Hawaii is an existing program that subsidizes the use of 7-passenger vans as a traffic alleviation measure. In 1998, the program supported 134 vehicles on Oahu; increasing to over 150 vans carrying about 900 passengers in 1999. Continued growth in the number of vans on Oahu is expected. For a $50 fee per passenger per month, vanpool participants receive the use of a 7-passenger van. Participating drivers are expected to recruit at least three other passengers within four months of being assigned a van. The program pays for all of the operational and maintenance expenses, including insurance, except for fuel and parking. The driver can use the van as a personal vehicle after commuting hours and on weekends. The program is currently funded with Federal Highway Administration (FHWA) and State matching funds. Passenger revenues are returned to the State to offset its costs. In 1998, the vanpool program cost $1.8 million, and realized $423,500 in revenues.

The Hawaii Department of Transportation (HDOT) currently administers the vanpool program through a contract with a private operator. HDOT considers the vanpool program to be a demonstration project and is not interested in running the program permanently. Since the City could administer the vanpool program, management of the Oahu component of the vanpool program by the City is included as part of the No-Build and other alternatives. Since the combination of grants and participant revenues fully fund the vanpool program, the transfer of vanpool administration to the City would not impose any financial obligation on the City.

7) Mitigation Measures Requiring Permanent Construction

Mitigation measures would be implemented for the committed roadway projects. Because the detailed impacts have not yet been identified, many of these mitigation measures have not yet been developed. Since the committed projects and their associated mitigation measures are included in all of the alternatives, the mitigation measures for the committed projects would be constant in all alternatives, and would not help discriminate among them.

2.2.2 Transportation System Management (TSM) Alternative

TSM strategies are low to moderate cost improvements designed to increase the efficiency of the existing transportation infrastructure. TSM measures typically include elements such as traffic engineering and signalization, transit operational changes and modest capital improvements. Besides being a potential alternative for selection by decision makers, the TSM Alternative serves as a benchmark against which more extensive build alternatives can be evaluated for their cost-effectiveness.

The TSM Alternative is an intermodal alternative. Its centerpiece is reorientation of the present bus route structure from a radial service pattern to a hub-and-spoke network (see Figure 2.2-2). The objectives of the hub-and-spoke bus network are to reduce overall travel times, improve schedule reliability, improve operational efficiency and improve off-peak service. Other benefits of a hub-and-spoke network are expansion of corridor capacity and improved transit network connectivity. While a hub-and-spoke system can increase the number of transfers, this is mitigated by having timed-transfers and lower overall travel times.

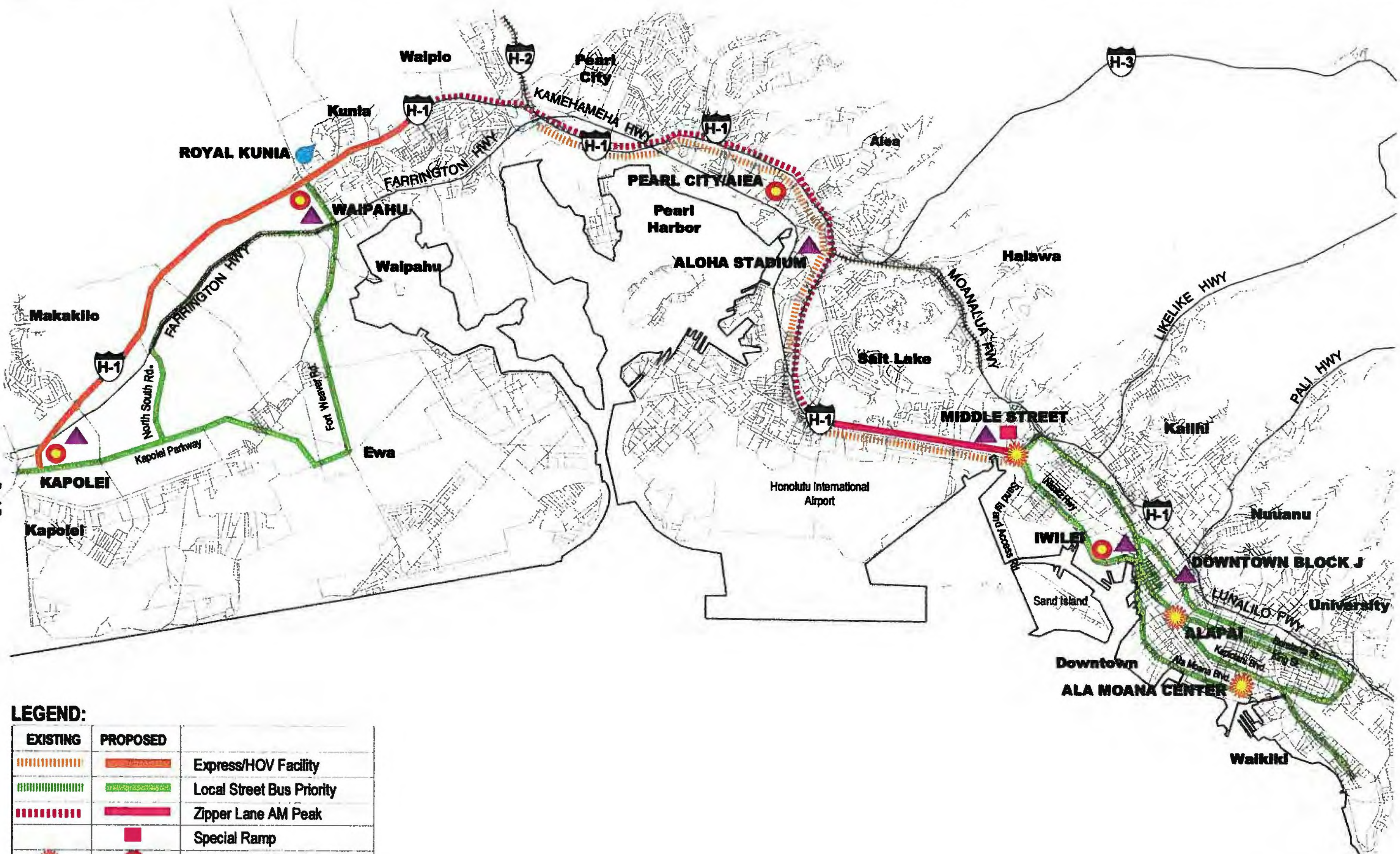
Hub-and-spoke networks provide an integrated system of convenient and accessible circulator, local and express routes, organized around transit centers. The bus routes are the "spokes" of the hub-and-spoke system, and the transit centers are the "hubs" where people make intermodal and intramodal transfers. There would be a hierarchy of neighborhood, community and regional transit centers, each drawing from an increasingly larger service area. Frequent express and limited-stop buses would run between the regional transit centers. Circulator routes provide service between a transit center and a neighborhood or commercial district. The circulator buses would be smaller vehicles providing mobility within neighborhoods, and delivering transit patrons to a transit center for connections to line haul routes. Local routes would link multiple transit centers and provide service along major streets.

Intermodal access to the hub-and-spoke network would be provided by parking lots and garages at certain transit centers and stand-alone park-and-ride facilities. Supplementing the existing park-and-ride lots (Wahiawa, Mililani Mauka, Royal Kunia, and Hawaii Kai), transit centers with park-and-ride facilities would include Waianae, Kapolei, Waipahu, Middle Street, Iwilei, and Kaneohe. New park-and-ride facilities would be located at Aloha Stadium and Downtown at Block J. Each facility would accommodate 100 to 750 parking spaces. Table 2.2-3 shows the transit centers incorporated into the TSM Alternative.

TABLE 2.2-3
TSM ALTERNATIVE TRANSIT CENTERS AND PARK-AND-RIDE FACILITIES

Regional Transit Center	Community Transit Center	Neighborhood Transit Center	Park-and-Ride Facility
Alapai	Waianae	Wahiawa Town	Wahiawa
Ala Moana Center	Waipahu	Mililani Town	Mililani Mauka
Kapolei	Iwilei	Kailua	Royal Kunia
Pearl City/Aiea	Kaneohe		Hawaii Kai
Middle Street			Aloha Stadium
			Downtown Block J

Source: Parsons Brinckerhoff, Inc.



LEGEND:

EXISTING	PROPOSED	
		Express/HOV Facility
		Local Street Bus Priority
		Zipper Lane AM Peak
		Special Ramp
		Transit Centers
		Park-and-Ride

Note: Proposed improvements outside the primary transportation corridor are not shown.

N

Scale: 0 1.25 2.50 mi

Scale: 0 2.0 4 km

TSM Alternative

Figure 2.2-2

Table 2.2-4 summarizes the 2025 Transit Network for the TSM Alternative.

TABLE 2.2-4
TSM ALTERNATIVE 2025 FIXED-ROUTE BUS NETWORK

Route Structure	
Circulator Routes	30
Local Routes	21
Express Routes	29
Limited-Stop Routes	2
TOTAL	**82**
Fleet Size (including spares)	
Minibus	58
Standard 12-meter (40-foot) Bus	444
Articulated Bus	99
TOTAL	**601**
Daily Trips (weekday)	
A.M. Peak Period	1,440
Off-Peak	1,952
P.M. Peak Period	1,388
Daily Operations (weekday)	
Revenue Bus Kilometers	102,560
Revenue Bus Miles	63,730
Revenue Bus Hours	4,220
Daily Ridership Forecast (weekday)	
Total Linked Trips	296,500

Source: Parsons Brinckerhoff, Inc.

1) Committed Transportation Improvement Projects

The TSM Alternative incorporates the same committed near-term projects included in the No-Build Alternative. The TSM Alternative includes the committed near-term projects already identified in OMPO's 2000-2002 Transportation Improvement Program (TIP) and other highly probable projects. Projects considered committed are consistent with the Oahu Regional Transportation Plan (ORTP). Projects needed for the natural expansion of bus service as Kapolei develops are also included.

In the Ewa region, committed projects include the new Kapolei Parkway (in TIP) and North-South Road (in TIP), plus a new interchange between the H-1 Freeway and North-South Road (in TIP). Farrington Highway (Fort Barrette Road to Fort Weaver Road) (not in TIP but necessary for a mature roadway network in Kapolei) and Puuloa Road (Kamehameha Highway to Salt Lake Boulevard) (in TIP) would be widened from two to four lanes. Other major committed projects include widening Salt Lake Boulevard from two to four lanes from Lawehana Street to Ala Lilikoi Street (in TIP), adding a Koko Head-bound lane to the H-1 Freeway in Kalihi (in TIP), and completing the conversion of Punchbowl Street to two-way operation (likely to occur).

The TSM Alternative also includes implementation of the State and City bicycle master plans and various programmed pedestrian improvements. This Alternative captures the intent to create a more bicycle and pedestrian-friendly environment.

2) Transit Network

Under the TSM Alternative, the existing radial bus route structure would be converted to a hub-and-spoke system. The present long suburban trunk routes to Downtown would be converted to shorter circulator and local routes serving regional transit centers. Connections between local, express, and limited-stop services would be made at the regional transit centers. The community and neighborhood transit centers would also enhance access to the transit network by providing a convenient location for timed-transfers to longer distance routes.

Circulators

The TSM Alternative includes 30 circulator routes, including the 18 existing urban collector and suburban feeder routes. Five existing urban and suburban trunk routes in Ewa, Waipahu, Pearl City, and Salt Lake would become circulators to feed improved limited-stop and express services. Seven new circulator routes would link the Kapolei and Waipahu Transit Centers with adjacent communities. Circulators in commercial areas would generally offer service every 15 to 30 minutes, but neighborhood circulators could have up to one hour headways. Circulators would be scheduled to facilitate transfers with limited-stop and express services running between transit centers.

Local Routes

The 21 local routes in the TSM Alternative would be developed primarily from existing urban and suburban trunk routes. To access improved express and limited-stop services between transit centers, most of the existing suburban routes from Ewa and Central Oahu would terminate at the Waipahu, Pearl City/Aiea, or Middle Street Transit Centers where patrons would transfer to express services into Downtown. Routes from Windward Oahu would end at Ala Moana Center. In general, local routes would provide peak-period service every 5 to 15 minutes, and off-peak service every 15 to 30 minutes.

Express Routes

The TSM Alternative includes 29 express routes that would provide direct service between suburban communities and major destinations in Kapolei and the PUC, primarily during peak periods. Targeted to long distance commuters, most express routes would operate only in the direction of peak commuter movements, although some would operate inbound and outbound during the same peak period. The Alapai Transit Center would remain the primary hub for peak-period express routes between suburban communities and Downtown Honolulu, and most of these services would operate every 10 to 30 minutes during the peak period. Lower-demand routes would operate two to four trips per day.

Consistent with the vision of Kapolei as a major employment center by 2025, new express services would operate every 20 to 40 minutes throughout the day to and from Kapolei.

Limited-Stop Services

The existing CityExpress! (Route A) from Waipahu to UH-Manoa via Pearlridge would continue to provide fast, frequent cross-town service through Downtown Honolulu. Service to UH-Manoa would be provided every 15 minutes from Waipahu and every 8 minutes from Middle Street. Route A would be supplemented by other limited-stop service through the entire PUC, including the new CountryExpress! (Route C) that provides fast service from Makaha to Downtown Honolulu. Route C would operate every 30 minutes every day. A trip between Kapolei and Downtown would last roughly 35 minutes.

3) Transit Technology

Similar to the No-Build Alternative, the transit technologies provided in the TSM Alternative are minibuses and 12-meter (40-foot) standard and articulated buses. While minibuses could use alternative fuel sources, including electric batteries or propane, standard and articulated buses, particularly the ones used on long-haul routes, would need to be diesel or hybrid diesel/electric because of the mountainous terrain and limited range of battery-powered vehicles.

4) Bus Priority/Express Improvements

To give priority to buses and other transit vehicles, special lane and traffic signal improvements would be provided on key segments of congested arterial streets. In the TSM Alternative there would be over 70.6 kilometers (43.9 miles) of bus priority lanes in the PUC and Ewa to provide faster and more reliable bus operations.

The proposed bus priority measures include the following:

- Semi-exclusive bus lanes would be placed on King Street and Beretania Street, between Middle Street and Waialae Avenue. (Semi-exclusive bus priority lanes are lanes that would be reserved for buses, although vehicles turning into and out of driveways and turning right at intersections would be permitted to use them.) These bus priority facilities would generally operate only during peak periods.
- In-town bus priority lanes (bus priority lanes are lanes with signal priority for buses and other treatments that would favor buses, without restricting lane use) would be placed on Middle Street, King Street, Beretania Street, Kapiolani Boulevard, Ala Moana Boulevard, and Kuhio Avenue.
- In Ewa, bus priority lanes would be incorporated into Kapolei Parkway, North-South Road and a section of Farrington Highway between Fort Barrette Road and Kunia Road.
- A mauka-bound queue jump lane (a queue jump lane is a short exclusive lane that allows buses to move to the head of a line of traffic) would be provided on Fort Weaver Road between Farrington Highway and the H-1 Freeway.
- Preferential bus treatments, including queue jump lanes and traffic signal priority systems, would be provided on Kamehameha Highway between Waimano Home Road and Moanalua Freeway.
- A new ramp at the Keehi Interchange would allow buses and other vehicles with multiple occupants to descend directly from the H-1 Koko Head-bound viaduct to the Middle Street Transit Center.
- The existing A.M. Koko Head-bound zipper lane would be extended by 4.8 kilometers (3.0 miles) from the Pearl Harbor Interchange to Nimitz Highway.
- Fort Weaver Road between Geiger Road and Farrington Highway would be widened to accommodate new express lanes for buses and vehicles carrying three or more persons.

5) Maintenance Facilities

The 2025 bus fleet would be maintained at the Kalihi-Palama (existing) and Pearl City (scheduled for completion in 2001) Bus Maintenance Facilities. Expansion would be required at the Kalihi-Palama facility or construction of a third smaller facility would be needed to accommodate the larger fleet. The preferred expansion area is makai of the existing Kalihi-Palama Bus Maintenance Facility, but a site at Fort Shafter (Shafter Flats) could also be used.

6) Mitigation Measures Requiring Permanent Construction

Mitigation measures would be implemented for the committed roadway projects. Because the detailed impacts have not yet been identified, many of these mitigation measures have not yet been developed. Since the committed projects and their associated mitigation measures are included in all of the alternatives, the mitigation measures for the committed projects would be constant in all alternatives, and would not help discriminate among them.

No mitigation measures that could entail permanent construction are anticipated.

2.2.3 Bus Rapid Transit (BRT) Alternative

The BRT Alternative is a multi-modal alternative that provides a more balanced transportation system than the present automobile-dominated situation. A hub-and-spoke bus network similar to the TSM Alternative would connect with the Regional and In-Town BRT systems, integrating the hub-and-spoke network with a fast, high-capacity transit system spanning the primary transportation corridor (see Figure 2.2-3). The In-Town BRT system would provide high capacity, frequent, in-town transit service spanning Honolulu's Urban Core (Middle Street, through Downtown Honolulu, to UH-Manoa and Waikiki). The Regional BRT system would include bus priority facilities (express lanes) on the H-1 Freeway, creating an H-1 Freeway BRT Corridor, and special ramps for BRT vehicles to facilitate movement between the H-1 Freeway BRT Corridor and selected transit centers. The BRT Alternative incorporates a very aggressive level of transit service to draw people out of single-occupant automobiles.

The Regional BRT system would complement the In-Town BRT system. Through integrated planning, route duplication would be reduced, system capacity would be increased and schedule reliability would be improved. These operational attributes are key ingredients of effectiveness. Together, the Regional and In-Town BRT systems would provide an integrated intermodal system enhancing mobility within the primary transportation corridor, and between the primary transportation corridor and other parts of the island.

1) Committed Transportation Improvement Projects

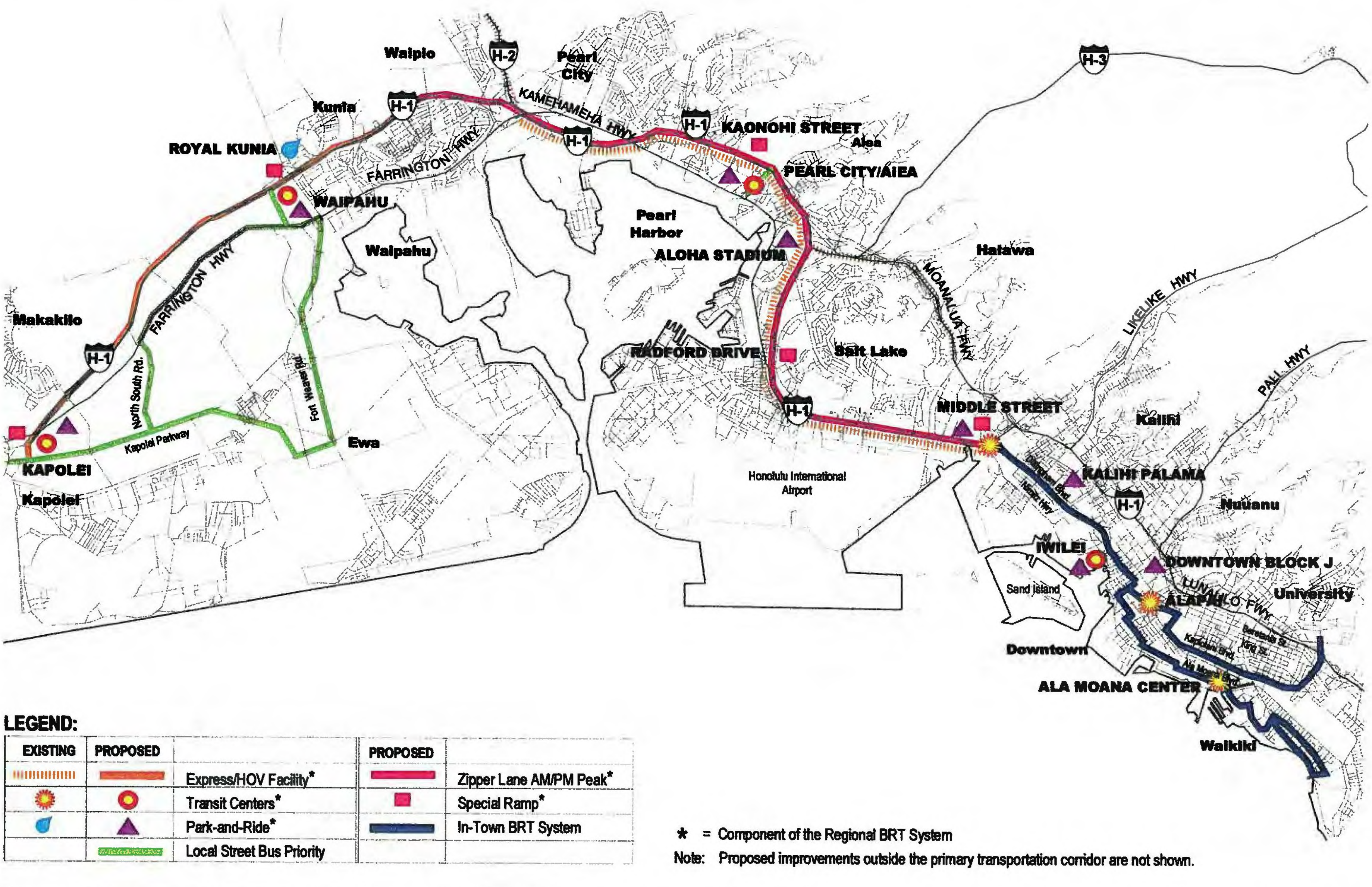
The BRT Alternative incorporates the same committed near-term projects included in the No-Build Alternative. The BRT Alternative includes the committed near-term projects already identified in OMPO's 2000-2002 TIP and other highly probable projects. Projects considered committed are consistent with the ORTP. Projects needed for the natural expansion of bus service as Kapolei develops are also included.

In the Ewa region, committed projects include the new Kapolei Parkway (in TIP) and North-South Road (in TIP), plus a new interchange between the H-1 Freeway and North-South Road (in TIP). Farrington Highway (Fort Barrette Road to Fort Weaver Road) (not in TIP but necessary for a mature roadway network in Kapolei) and Puuloa Road (Kamehameha Highway to Salt Lake Boulevard) (in TIP) would be widened from two to four lanes. Other major committed projects include widening Salt Lake Boulevard from two to four lanes from Lawehana Street to Ala Lilikoi Street (in TIP), adding a Koko Head-bound lane to the H-1 Freeway in Kalihi (in TIP), and completing the conversion of Punchbowl Street to two-way operation (likely to occur).

The BRT Alternative also includes implementation of the State and City bicycle master plans and various programmed pedestrian improvements. This Alternative also captures the intent to create a more bicycle and pedestrian-friendly environment.

2) Transit Network

Integration of the Regional and In-Town BRT systems would occur through an islandwide network of transit centers. Four regional transit centers (Kapolei, Pearl City/Aiea, Middle Street, and Alapai) would provide high-capacity transfer points for patrons to access the Regional and In-Town BRT systems. The Waianae, Waipahu, and Kaneohe community transit centers would enhance connections to local and express buses into Downtown, while community transit centers on the In-Town BRT alignment (Iwilei and Ala Moana Center)



* = Component of the Regional BRT System

Note: Proposed improvements outside the primary transportation corridor are not shown.

BRT Alternative

Figure 2.2-3

would provide mauka-makai connections with the In-Town BRT system. Enhanced local circulation and access to the BRT systems would be provided at four neighborhood transit centers (Wahiawa Town, Mililani Town, Kailua, and Kaimuki). Table 2.2-5 shows the transit centers incorporated into the BRT Alternative. Also shown in Table 2.2-5 are seven park-and-ride facilities that would be part of this alternative. Each park-and-ride facility would accommodate 100 to 1,000 parking spaces.

TABLE 2.2-5
BRT ALTERNATIVE TRANSIT CENTERS AND PARK-AND-RIDE FACILITIES

Regional Transit Center	Community Transit Center	Neighborhood Transit Center	Park-and-Ride Facility
Alapai	Waianae	Wahiawa Town	Wahiawa
Kapolei	Waipahu	Mililani Town	Mililani Mauka
Pearl City/Aiea	Iwilei	Kailua	Royal Kunia
Middle Street	Ala Moana Center	Kaimuki	Hawaii Kai
	Kaneohe		Downtown Block J
			Aloha Stadium
			Kalihi-Palama

Source: Parsons Brinckerhoff, Inc.

As with the TSM Alternative, the existing radial network of bus routes would be reconfigured to a hub-and-spoke configuration. Local bus routes through the Urban Core would be modified to minimize overlap with the In-Town BRT system. A summary of the 2025 Transit Network for the BRT Alternative is provided in Table 2.2-6.

TABLE 2.2-6
BRT ALTERNATIVE 2025 FIXED-ROUTE BUS NETWORK

Route Structure	
Circulator Routes	33
Local Routes	19
Express Routes	26
Limited-Stop Routes	2
TOTAL	**80**
Fleet Size (including spares)	
Minibus	85
Standard 12-meter (40-foot) Bus	546
Articulated Bus	99
In-Town BRT Vehicles	38
TOTAL	**768**
Daily Trips (weekday)	
A.M. Peak Period	2,325
Off-Peak	2,942
P.M. Peak Period	2,145
Daily Operations (weekday)	
Revenue Bus Kilometers	140,390
Revenue Bus Miles	87,230
Revenue Bus Hours	5,650
Daily Ridership Forecast (weekday)	
Total Linked Trips	333,000

Source: Parsons Brinckerhoff, Inc.

Circulator Routes: Circulator bus routes would provide access from transit centers into neighborhoods and commercial districts. Circulator routes would include existing urban collector and suburban feeder routes, and new routes to serve Kapolei and Waipahu. Certain local routes would be converted into circulators to feed the In-Town BRT system. New circulator routes would provide frequent service from the transit stop on the Koko Head side of Waikiki to the Kapahulu neighborhood and Kapiolani Park. Circulator routes in rural and suburban areas would connect to express and local services, as they do today. In-town circulators would generally operate every 15 to 30 minutes, but some neighborhood circulators could have up to one-hour headways.

Local Routes: The BRT Alternative includes local bus routes that connect suburban communities with the In-Town BRT system. Connections to the In-Town BRT system would occur at the Middle Street Transit Center for bus service from Ewa and Central Oahu; at the Union Mall Transit Stop for bus service from Windward Oahu; and at the University/King Transit Stop for bus routes from East Honolulu. Peak-period service would generally be provided every 5 to 15 minutes, with off-peak service every 15 to 30 minutes.

Express Routes: Express buses provide rapid point-to-point service, typically between suburban and downtown areas. Express buses can perform limited collection and distribution functions in suburban and downtown areas, but travel directly between these areas in the line-haul portion of the trip.

During peak periods, express routes would supplement local services from suburban communities to Downtown and Kapolei. Express service from Ewa and Central Oahu would use the H-1 Freeway BRT Corridor to connect to the In-Town BRT system at the Middle Street Transit Center. Express routes from Windward Oahu and East Honolulu would continue to serve the Alapai Transit Center and UH-Manoa Transit Stop. Most express services would operate every 10 to 30 minutes during peak periods, although some express routes serving rural areas would operate less frequently (50- to 75-minute headways during peak periods). Consistent with the vision of Kapolei as a major employment center, in addition to the CityExpress! (Route A) and CountryExpress! (Route C), new express service would be provided between Kapolei and Pearl Harbor, Waikiki, Mililani and Wahiawa. This restructured network would replace six existing express routes to Aloha Stadium, Pearl City, Mililani Mauka, Waipahu, and Kalihi.

3) Regional BRT System

The BRT Alternative would create an H-1 BRT Corridor consisting of new express and zipper lanes, allowing express buses from Ewa and Central Oahu to bypass peak period traffic congestion on their way to Downtown. Access-controlled ramps would be provided for BRT vehicles to easily move between selected transit centers and the H-1 BRT Corridor. Other 3+ high occupancy vehicles could also travel on the H-1 BRT Corridor.

H-1 BRT Corridor

There are four elements to the H-1 BRT Corridor: H-1 zipper lane extension, new afternoon zipper lane, new express lanes, and new on/off ramps to access the zipper and express lanes. These elements would create an H-1 BRT Corridor, a continuous, fast corridor between Kapolei and Middle Street for BRT vehicles. The elements of the H-1 BRT Corridor are:

1. The existing zipper lane provides a morning peak period inbound contraflow lane for vehicles with three or more occupants between Managers Drive in Waipahu and the Pearl Harbor Interchange. Under the BRT Alternative, the existing zipper lane would be extended an additional 4.8 km (3.0 miles), from Radford Drive, onto the H-1 airport viaduct, to Keehi Interchange (Nimitz Highway), creating an 18.4 km (11.4 mile) long morning peak period zipper lane.
2. An outbound, afternoon peak period contraflow zipper lane would be built for vehicles with three or more occupants. The outbound zipper lane would be created by providing a second movable barrier that would replace the existing fixed median barrier on the H-1 in some places. The new afternoon peak period

zipper lane on the Koko Head-bound side of the freeway would provide a 10.5 km (6.5-mile) Ewa-bound zipper lane between Radford Drive and the Waiawa Interchange.

3. An express lane for vehicles with 3 or more occupants would be added on the inside median of the H-1 Freeway in each direction between Kapolei and Managers Drive.
4. Special ramps would allow Regional BRT buses to use the zipper lane and for these buses to easily move between the H-1 BRT Corridor and selected transit centers. These special ramps are described below.

   Kapolei: A ramp between the H-1 BRT Corridor and a proposed overpass at Wakea Street would serve Kapolei, facilitating access to the H-1 BRT Corridor during peak periods.

   Waipahu: A new transit center located about 0.40 kilometer (0.25 mile) Ewa of the Kunia Interchange would be connected to the H-1 BRT Corridor with reversible ramps. The ramps would descend to a new underpass, providing access to the transit center on the makai side of the freeway.

   Kaonohi Street: Ramps on both sides of the Kaonohi Street overpass would lead directly to and from the H-1 BRT Corridor. In the morning, Koko Head-bound buses would be able to exit the H-1 BRT Corridor, stop at Pearlridge Center, and then re-enter the BRT Corridor to proceed to Downtown or the Middle Street Transit Center. This flow would be reversed during the afternoon rush hour to accommodate Ewa-bound buses. Kamehameha Drive-In is one of several sites being considered for the Pearl City/Aiea Transit Center. If located here, the Kaonohi Street ramps would provide access for buses using the transit center.

   Radford Drive: The Radford Drive overpass would be connected to the H-1 BRT Corridor by a reversible ramp, allowing buses to exit the zipper lane in the morning and enter the zipper lane in the afternoon rush hours.

   Middle Street: This ramp would provide a connection from the H-1 BRT Corridor to the Middle Street Transit Center. A single lane would descend from the left side of the existing H-1 Koko Head-bound viaduct, just past the Nimitz Highway express lane off-ramp.

The contra-flow zipper lane and reversible ramp elements of the H-1 BRT Corridor would operate in the direction of peak traffic flow. Transit service would be provided in the reverse peak direction, but the contraflow lane and reversible ramps could only be used by vehicles traveling in the peak direction.

Conceptual engineering design drawings for these elements are contained in Appendix B.

Design Exceptions

Because of right-of-way limitations and roadway constraints in the H-1 corridor where the Regional BRT is proposed, it is not possible to meet all desirable design standards in the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 1994. This is sometimes the case with projects that involve modifications to existing facilities and does not preclude these projects from being eligible for federal funding.

AASHTO, in cooperation with the Federal Highway Administration (FHWA), sponsored a research project which produced design guidelines for high occupancy vehicle and bus rapid transit facilities. The product of this research, National Cooperative Highway Research Program (NCHRP) Report 414, HOV Systems Manual, 1998, includes suggested reduced design standards when desired design standards cannot be met. These reduced design standards have been accepted by FHWA on other projects through design exceptions.

Locations on the Regional BRT alignment where design exceptions may be required are shown in Table 2.2-7. For the most part, these design exceptions would be for reduced lane widths or the use of shoulder lanes for traffic lanes.

TABLE 2.2-7
REGIONAL BRT H-1 FREEWAY IMPROVEMENTS REQUIRING DESIGN EXCEPTIONS

Section	Existing Conditions	Proposed Conditions	AASHTO Minimum Standards	NCHRP "Reduced" Standards
Kapolei to Managers Drive (express lanes) (9.7 km, 6.0 miles)				
Median shoulder width	10'	5'	10'	2'
Ramp right-side shoulder width	–	4'	8'	4'
Managers Drive to Halawa Interchange (P.M. zipper lane) (8.0 km, 5.0 miles)				
Lane width	11'	11'	12'	11'
Median shoulder width	2'	2'	10'	2'
Zipper lane left shoulder width	–	4'	10'	2'
Right-side shoulder width	none w/ shld. lane		10'	4'
Bridge structural capacity	no increase in load		Load Factor Design	
Ramp right-side shoulder width	–	4'	8'	4'
Halawa Interchange to Radford Drive (P.M. zipper lane) (1.3 km, 0.8 miles)				
Zipper lane left shoulder width	–	6'	10'	2'
Zipper lane right-side shoulder width	–	9'	10'	8'
Radford Drive to Keehi Interchange (extended A.M. zipper lane) (8.0 km, 5.0 miles)				
Zipper lane left shoulder width	–	7'	10'	2'
Zipper lane right-side shoulder width	–	4.5'	10'	8'[1]
Lane width	12'	11'	12'	11'
Ramp exit location	–	left side		right side
Ramp terminal	–	Transit Center	local street	

Source: Parsons Brinckerhoff, Inc.
Note:[1] Proposed barrier distance of 6.9 meters (22.5'), which is greater than NCHRP "Reduced" distance of 6.7 meters (22'),

Modifications to Interstate H-1

Implementing the Regional BRT improvements will require modifications of Interstate Route H-1 at various locations as follows:

Kapolei to Waiawa Interchange:

- The 9.1-meter (36-foot)-wide median area between Kapolei and Managers Drive would be reconstructed to provide express lanes in both directions.
- Between the existing Paiwa Street zipper lane crossover and Waiawa Interchange, about 3.0-meter (10-feet) of widening on the mauka side of the freeway would be required to provide an outbound express lane. This lane would connect to the existing HOV lane on the Koko Head side of the interchange.
- At the Kapolei ramp, the outside shoulder areas would be widened by approximately 3.0-meter (10-feet) to provide horizontal clearance for the structure.

- At the Kunia Road ramp, the inbound roadway would be realigned by about 6.1 meters (20 feet) to provide horizontal clearance for the structure.

Waiawa Interchange:

- Between the existing Interstate Route H-2 zipper lane crossover and the Pearl City viaduct, the median area and the makai side of the freeway would be widened by about 6.1 meters (20 feet) to provide P.M. zipper lane crossover facilities.
- The Interstate Route H-2 inbound roadway and bridges would be widened on the Koko Head side by about 3.7 meters (12 feet) to provide a P.M. zipper lane.

Waiawa Interchange to Halawa Interchange:

- Between the Moanalua Road undercrossing and Halawa Interchange, the makai side of the freeway would be widened by about 0.6 meters (two feet) to provide a P.M. zipper lane. Additional widening at various spot locations may also be desirable to provide breakdown areas.
- At the Kaonohi Street ramp, the makai side of the freeway would be widened by approximately 4.0 meters (13 feet) to provide horizontal clearance for the structure. The reconstructed width would decrease the farther away from the structure. However, portions of the Waimalu Viaduct would need to be widened.

Halawa Interchange to Keehi Interchange:

- At the Radford ramp both sides of the freeway would be widened by approximately 1.8 meters (six feet) to provide horizontal clearance for the structure. The median area would also be reconstructed to provide a P.M. zipper lane crossover.

All of the above widenings will be done within the existing H-1 right-of-way except for portions of the widening along the Waimalu viaduct to accommodate the proposed Kaonohi Street ramps.

Transit Technology for the Regional BRT System

The technology for the Regional BRT vehicles would be standard and articulated buses with conventional diesel or hybrid diesel/electric propulsion.

Transit Centers

Intermodal access (e.g., automobile, pedestrian, bicycle) and intramodal access (e.g., connections between feeder and line haul transit routes) to the Regional and In-Town BRT systems would occur at transit centers and park-and-ride lots (see Table 2.2-5). Transit centers with parking would include Waianae, Kapolei, Waipahu, Pearl City/Aiea, Middle Street, Iwilei, and Kaneohe. New park-and-ride facilities would be located at Kalihi-Palama, Aloha Stadium, and Downtown Block J, a project proposed at the mauka end of Bishop Street. Existing park-and-ride lots are located at Wahiawa, Mililani Mauka, Royal Kunia, and Hawaii Kai.

Maintenance Facilities

Storage and maintenance of the Regional BRT transit fleet (and the regular bus fleet) would occur at the Kalihi-Palama (existing) and Pearl City (scheduled for completion in 2001) bus maintenance facilities. In addition, a new bus maintenance facility would be required.

Even with a new third bus facility, the Kalihi-Palama facility would need to be expanded. This expansion would be coordinated with development of the Middle Street Transit Center/Park-and-Ride Lot. The preferred expansion site is adjacent to and makai of the Kalihi-Palama facility, but a site at Fort Shafter (Shafter Flats) would also be feasible.

The new third facility could be at the Fort Shafter site, a site near Leeward Community College, or a site on the windward side of the island. Since the third maintenance facility will not be needed until 10 - 12 years following initial implementation of the project, options for the third site would be explored more fully in the future.

4) In-Town BRT System

The In-Town BRT system would be an 18.7 km (11.6 mile) high-capacity transit system providing frequent service and direct access to major activity destinations and residential neighborhoods through Honolulu's Urban Core. Transit centers and park-and-ride lots along the route would provide convenient connections between the In-Town BRT system and circulator, local, and express buses.

Along much of the system's length, In-Town BRT vehicles would operate at-grade in exclusive transitway lanes along major arterial streets. However, at certain locations, the In-Town BRT system would operate either in semi-exclusive lanes (lanes could be used by vehicles making turns) or in mixed traffic.

Starting at the Ewa terminus, the system would extend 4.5 kilometers (2.8 miles) from the Middle Street Transit Center to Downtown along Dillingham Boulevard. From Downtown, one branch of the system would run 6.0 kilometers (3.7 miles) to UH-Manoa via South King Street to Thomas Square, head makai on Ward Avenue, and then along Kapiolani Boulevard to University Avenue. A second branch would connect Downtown Honolulu with Kakaako and Waikiki. The Kakaako/Waikiki branch would be 8.2 kilometers (5.1 miles) long.

An In-Town BRT vehicle would take 8 minutes to travel from Middle Street to Downtown Honolulu. From Downtown, it would take 13 minutes to reach UH-Manoa. In-Town BRT services would operate every 2 minutes during peak periods from Middle Street to Downtown, and every 4 minutes during peak periods on the branch segments.

Along most of its length, the In-Town BRT system would run in a transitway in the median of existing arterial roads (e.g., Kapiolani and Dillingham Boulevards). On Kalakaua Avenue in Waikiki and a few other locations (e.g., when on one-way streets), the system would run along the curb. In general, running the In-Town BRT system in the roadway median avoids conflicts with vehicles making right-hand turns and turning into and out of driveways, resulting in greater safety and faster speeds for the In-Town BRT vehicles. Under circumstances such as one-way streets, or absence of driveways or side streets, curb running is acceptable. Thus, curb running was selected on the makai side of Kalakaua Avenue in Waikiki because it is a one-way street with few driveways.

Transit stops would have different configurations in median-running sections than in curb-running sections. In curb-running areas, the transit stop would resemble current bus stops with raised boarding areas where space permits, and increased amenities including enhanced shelters, seats, and landscaping.

Median transit stops would have raised platforms in the median of the street, typically 30.5 centimeters (13 inches) higher than the street, 2.4 meters (8 feet) wide and 48.8 meters (160 feet) long. The platforms would be accessed by well-marked, signal-controlled, safe, pedestrian crosswalks. The platforms would be accessible to persons with disabilities by ramps from the crosswalk to the raised platforms.

The system would be designed for accessibility by disabled riders and in compliance with the Americans with Disabilities Act.

Platforms would be provided with a sheltered waiting area, seats, lighting and safety railings so that transit patrons would wait in safety and comfort for the next In-Town BRT vehicle. Some of the stops could also be provided with signs indicating the waiting time until the next vehicle. Ticketing machines could be provided to minimize the fare transactions conducted onboard the vehicle. Figure 2.2-4 shows typical median and curb transit stops for the In-Town BRT system.

Middle Street to Downtown Branch

Route

The route begins at the Middle Street Transit Center, and proceeds along the center median of Dillingham Boulevard through Kalihi. The reconfigured cross section would have a transitway lane and a vehicular lane in each direction. Left-turn lanes would still be provided at Puuhale Road, Kalihi Street, Waiakamilo Road, Kohou Street, Kokea Street, Alakawa Street, and Akepo Lane. At Kaaahi Street, the route turns makai to reach the proposed Iwilei Transit Center located behind the former Oahu Railway and Land Company (OR&L) Station building. From the Iwilei Transit Center, the route proceeds mauka on Iwilei Road and turns Koko Head onto the mauka side of North King Street. The route then uses the Hotel Street transit mall and continues through Downtown before turning makai down Richards Street.

Proposed Transit Stops

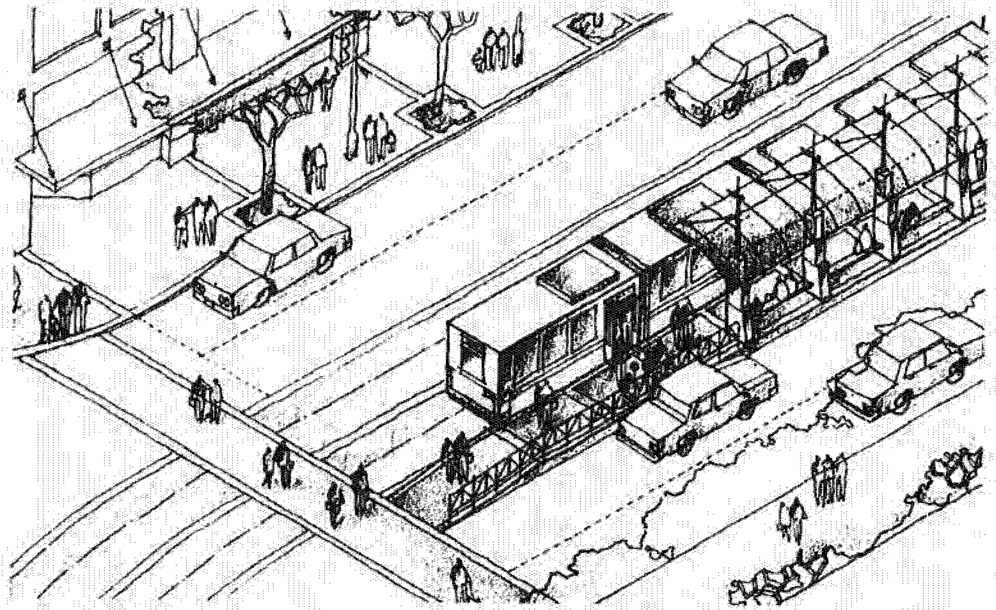
- Middle Street Transit Center: The preferred location of this transit center would be adjacent to and makai of the existing Kalihi-Palama Bus Maintenance Facility. However, an alternate site at Fort Shafter (Shafter Flats) is also an option.
- Kalihi: This transit stop would be located at Dillingham and McNeill Street (Dillingham Shopping Plaza).
- Honolulu Community College: This transit stop would be located just Ewa of Alakawa Street.
- Iwilei Transit Center: Five sites for transit centers are being studied. All of the sites are located near the former OR&L Station building, and would serve Dole Cannery.
- Chinatown: This transit stop would be located between Kekaulike and Maunakea Streets, and serve Chinatown.
- Union Mall: This transit stop would be located at Fort Street and Union Mall and would serve the Central Business District.

University Branch

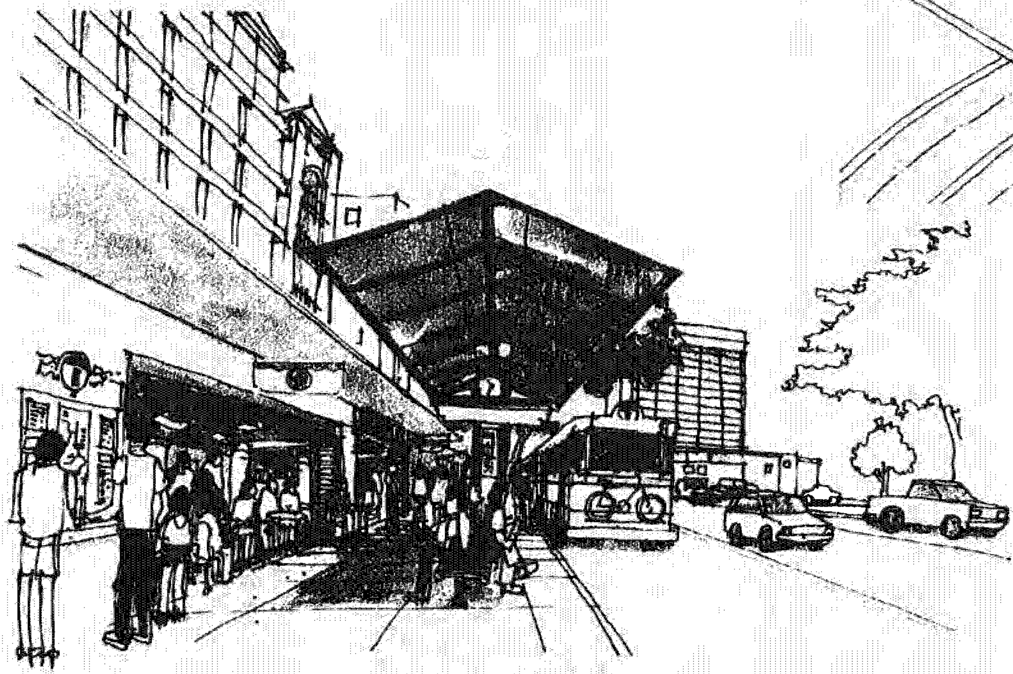
Route

After running on Richards Street for one block, the UH-Manoa branch would turn onto the curbside lanes of South King Street and continue on to Ward Avenue. At Ward Avenue, the alignment would turn makai to Kapiolani Boulevard. The transitway would operate in the center median along Kapiolani Boulevard to Atkinson Drive. On Kapiolani, between Atkinson Drive and Kalakaua Avenue, the BRT vehicles would operate in mixed traffic as they transition from the median transitway lanes to curbside lanes. From Kalakaua Avenue to Isenberg Street, BRT vehicles would be in curb lanes shared with general purpose traffic. Between Isenberg Street and University Avenue, the BRT vehicles would transition from curb lanes to median transitway lanes. For most of the way along University Avenue, the BRT vehicles would be in exclusive median lanes.

On Kapiolani Boulevard, left-turn lanes for motorists would be provided at Ward Avenue, Kamakee Street, Piikoi Street, Kaheka Street, Atkinson Drive, McCully Street, Isenberg Street, and University Avenue. On University Avenue, left-turn bays would be maintained at Date Street, King/Beretania Streets, Varsity Place, and Dole Street. The route would terminate in a counter-clockwise turnback loop at Sinclair Circle.



Median Transit Stop
(Exclusive Lane)



Curb Transit Stop
(Semi-Exclusive Lane)

Typical In-Town BRT Transit Stops

Figure 2.2-4

Proposed Transit Stops

- Iolani Palace: This transit stop would provide convenient access to the Post Office, Hawaii State Library, Honolulu Hale, the State Capitol and Iolani Palace.
- Alapai Transit Center: Modifications to the existing Alapai Transit Center would enable connections between the In-Town BRT system and express buses to Windward Oahu and East Honolulu.
- Thomas Square/ Neal Blaisdell Center (NBC): This transit stop would provide service to the Honolulu Academy of Arts, Thomas Square, Kakaako, Straub Medical Center and NBC.
- Pensacola: This transit stop would serve McKinley High School, Kakaako and nearby residential areas.
- Ala Moana/Keeaumoku: This transit stop would serve existing and future developments in the Keeaumoku area, and Ala Moana Center.
- Convention Center: This transit stop would be located on Kapiolani Boulevard at Atkinson Drive and Kalakaua Avenue. The Koko Head-bound platform would be located just Ewa of Atkinson Drive, while the Ewa-bound platform would be located Ewa of Kalakaua Avenue.
- Isenberg: This transit stop would serve the McCully/Moiliili residential area.
- University/King: This transit stop would be located mauka of King Street in front of Varsity Theater and Puck's Alley.
- UH-Manoa: This transit stop, and the Koko Head terminus of the University Branch, would be located at Sinclair Circle to serve the UH campus and nearby residential areas.

Kakaako/Waikiki Branch

Route

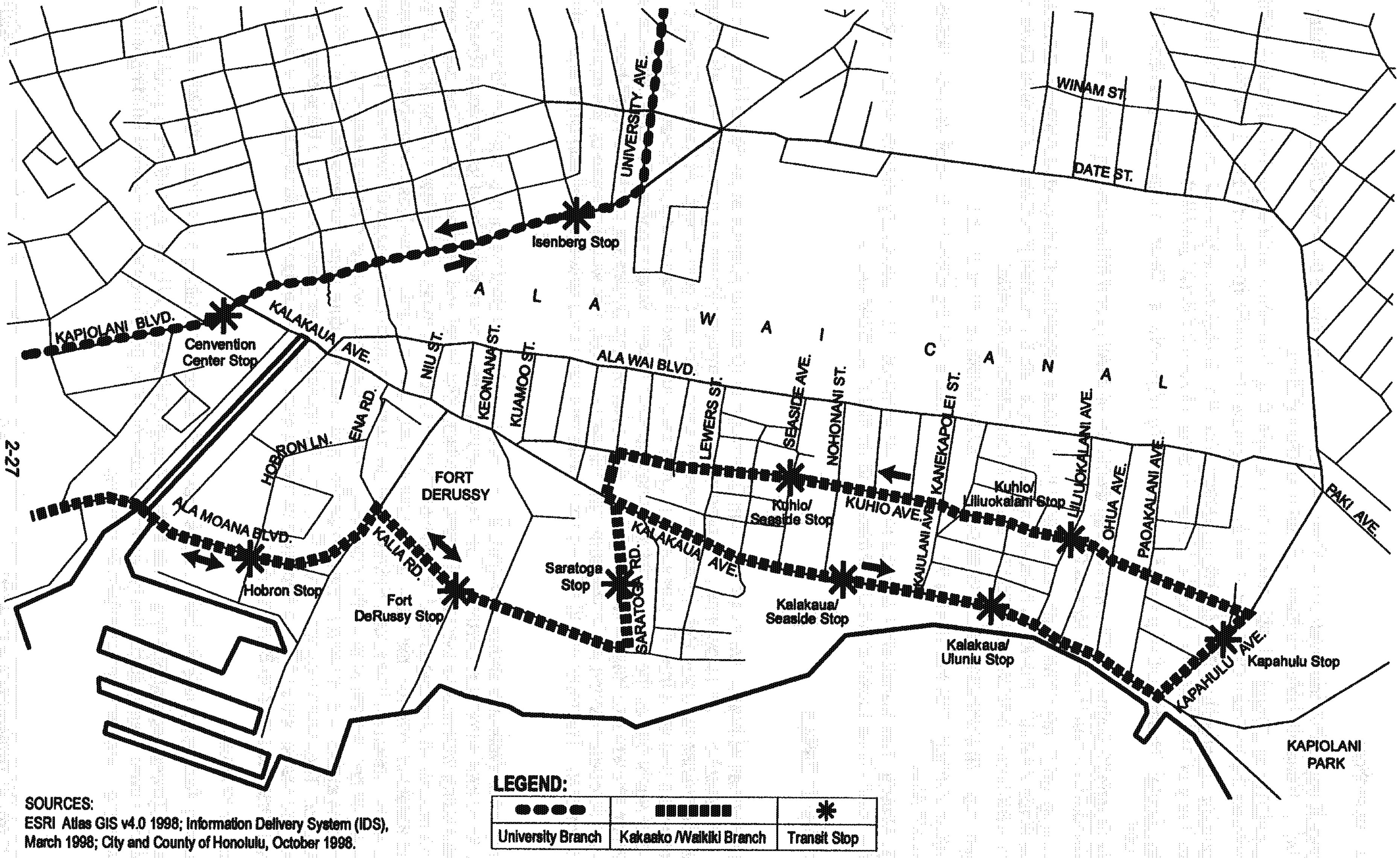
The Kakaako/Waikiki branch would extend from Downtown to Kapahulu Avenue at the Koko Head end of Waikiki, via Kakaako. From Downtown, the branch would run through Kakaako, just mauka of Ala Moana Boulevard on Halekauwila and Pohukaina Streets with a transition at South Street. At Kamani Street, the alignment would transition from Pohukaina Street and continue Koko Head on Auahi Street. At the Koko Head end of Auahi Street, the route would turn onto the short Queen Street segment to rejoin Ala Moana Boulevard and head Koko Head towards Waikiki. Along Ala Moana Boulevard, the Koko Head-bound vehicles would operate along the makai curb, while Ewa-bound vehicles would operate on the mauka side of the center median. The route would return to the center median lanes between Atkinson Drive and Kalia Road.

The alignment in Waikiki is shown on Figure 2.2-5. From Ala Moana Boulevard, the route would turn makai on Kalia Road and enter Fort DeRussy. The route would continue along Kalia Road to Saratoga Road, with Kalia Road being widened by two lanes between the Hale Koa Hotel and Saratoga Road. The alignment would turn mauka on Saratoga Road, which would also require widening. At the intersection of Saratoga Road and Kalakaua Avenue, the route would split into a one-way couplet. The Koko Head-bound transitway would be in the makai curb lane of Kalakaua Avenue, turning mauka onto Kapahulu Avenue. The Kapahulu terminus would be a transit stop on the Koko Head side of Kapahulu Avenue, but the transit stop improvements at this site would be limited to shelter and street furniture improvements restricted to the sidewalk area. The return loop would turn Ewa onto Kuhio Avenue, and the Ewa-bound transitway would be located on the mauka side of Kuhio Avenue's center median. The alignment would turn onto the Ewa side of Kalaimoku Street to return to Saratoga Road.

Proposed Transit Stops

The following discussion lists the transit stops that would be provided along the Kakaako/Waikiki Branch:

- Aloha Tower/Federal Building: This transit stop at Richards and Halekauwila Streets would serve Aloha Tower Marketplace, the Restaurant Row complex, the Prince Kuhio Federal Building and other nearby government and commercial centers.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

In-Town BRT Alignment in Waikiki

Figure 2.2-5

- Cooke Street: This transit stop on Pohukaina Street would serve the Ewa end of the Victoria Ward retail and commercial areas, and Kakaako.
- Kamakee: This transit stop would be located on Auahi Street and would provide access to the Victoria Ward developments and Kewalo Basin.
- Ala Moana Park: This transit stop would be located mauka of the park and across from Ala Moana Center.
- Hobron: This transit stop would be located on Ala Moana Boulevard, serving the Hobron residential area and several hotels.
- Fort DeRussy: This transit stop would be located on Kalia Road across from the Hilton Hawaiian Village Hotel.
- Saratoga: This transit stop would be located near the Waikiki Post Office at the Koko Head end of Fort DeRussy.
- Kalakaua/Seaside: This Koko Head-bound transit stop would be adjacent to the Royal Hawaiian Shopping Center.
- Kalakaua/Uluniu: This Koko Head-bound transit stop would be located near the Hyatt Regency Hotel, in front of the Duke Kahanamoku Statue.
- Kapahulu: This on-street transit stop would be located on the Koko Head side of the intersection of Kuhio and Kapahulu Avenues. Construction would be limited to shelter and street furniture improvements restricted to the sidewalk area.
- Kuhio/Liliuokalani: This Ewa-bound transit stop would be located in the vicinity of the Prince Kuhio Hotel.
- Kuhio/Seaside: This Ewa-bound transit stop would be located in the vicinity of the Waikiki Trade Center.

To give transit the priority necessary to make it an attractive alternative to the private auto, some lanes along the proposed In-Town BRT alignment will need to be converted from general purpose lanes to transit only lanes. This will result in an increase in the person-carrying capacity of these streets yet will result in a reduced number of lanes for general purpose traffic. Table 2.2-8 summarizes the proposed redistribution of lanes.

TABLE 2.2-8
PROPOSED DISTRIBUTION OF LANES WITH BRT ALTERNATIVE

	NUMBER OF LANES			
	Existing		Proposed	
Location	General Purpose	Transit	General Purpose	Transit
Dillingham Boulevard				
Middle St. - Laumaka St.	7+1 turning	0	5+1 turning	2
Laumaka St. - Kaaahi St.	4+1 turning	0	2+1 turning	2
Kaaahi Street				
Dillingham Blvd. - Iwilei Rd.	2	0	2	2
N. King Street				
Iwilei Rd. - Hotel St.	4	2	4	2
Hotel Street				
N. King St. - Richards St.	0	2	0	2
Richards Street				
Hotel St. - King St.	2	0	1	1
S. King Street				
Richards St. - Mililani St.	5	0	4	1
Mililani St. - Alapai St.	6	0	5	1
Alapai St. - Ward Ave.	5	0	4	1

TABLE 2.2-8 (CONTINUED)
PROPOSED DISTRIBUTION OF LANES WITH BRT ALTERNATIVE

	NUMBER OF LANES			
	Existing		Proposed	
Location	General Purpose	Transit	General Purpose	Transit
Ward Ave.				
S. King St. - Kapiolani Blvd.	4+1 turning	0	4	2
Kapiolani Blvd.				
Ward Ave. - Atkinson Dr.	6	0	4	2
Atkinson Dr. - Kalakaua Ave.	6+1 turning	0	5+3 turning	0
Kalakaua Ave. - University Ave.	6+1 turning	0	6+1 turning	0
University Ave.				
Kapiolani Blvd. - Sinclair Circle	6+1 turning	0	4+1 turning	2
Richards St.				
S. King St. - Queen St.	4	0	2	2
Queen St. - Halekauwila St.	2	0	2	2
Halekauwila St.				
Richards St. - South St.	2	0	2	0
South St.				
Halekauwila St. - Pohukaina St.	4	0	2	2
Pohukaina St.				
South St. - Kamani St.	2	0	2	2
Kamani St.				
Pohukaina St. - Auahi St.	2	0	2	2
Auahi St.				
Kamani St. - Ward Ave.	3	0	2	2
Ward Ave. - Queen St.	4	0	2	2
Queen St.				
Auahi St. - Ala Moana Blvd.	4	0	3	2
Ala Moana Blvd.				
Queen St. - Kalia Rd.	6+1 turning	0	4+1 turning	2
Kalia Rd.				
Ala Moana Blvd. - Paoa Pl.	5	0	3	2
Paoa Pl. - Maluhia St.	4	0	2	2
Maluhia St. - Saratoga Rd.	2	0	2	2
Saratoga Rd.				
Kalia Rd. - Kalakaua Ave.	4	0	2	2
Kalakaua Ave.				
Saratoga Rd. - Kaiulani Ave.	4	0	4	0
Kaiulani Ave. - Kapahulu Ave.	3	0	3	0
Kapahulu Ave.				
Kalakaua Ave. - Kuhio Ave.	4	0	2	1
Kuhio Ave.				
Kapahulu Ave. - Kalaimoku St.	4+1 turning	0	3+1 turning	1
Kalaimoku St.				
Kuhio Ave. - Kalakaua Ave.	2	0	2	1

Source: Parsons Brinckerhoff, Inc.

5) Transit Technology for the In-Town BRT System

The selection of a transit technology that best harmonizes with the densities in Honolulu's Urban Core is a key decision. The technology must maximize beneficial impacts, such as facilitation of desired urban land use patterns and improvement of the quality of urban life, while minimizing adverse impacts. To help identify appropriate candidate technologies, ten criteria were established from community input and technical evaluation. These criteria are:

- Right-of-Way (ROW): Selected technologies must not require a new dedicated ROW or grade separation because urban Honolulu has insufficient space for a new dedicated ROW, and a grade-separated system was previously proposed but did not obtain the required City Council support. Suitable technologies must be able to operate at-grade on existing streets and highways. While vehicles may operate in exclusive lanes, the technology must permit at-grade cross traffic and pedestrian crossings.
- Line Capacity: Selected technologies must have the capacity to move more than 3,000 passengers per hour per direction because travel demand forecasting indicates that this is the approximate line haul requirement in 2025.
- Emissions and Noise: Air pollution emissions from selected technologies must be substantially lower than the 2004 EPA regulations provided in Table 2.2-9 below. Once adopted, the EPA's 2004 regulations will apply to all transit vehicles, including those powered by diesel engines. Noise emissions must not exceed those of a conventional light rail vehicle or trolley bus with electric propulsion.

TABLE 2.2-9
EPA URBAN BUS ENGINE STANDARDS (G/BHP-HR)

Year	HC	CO	NOx	PM
2004 Proposed	0.5	15.5	2.5 (NMHC) or 2.4 NOx	0.05

Source: EPA, 1999.
Notes: HC – Hydrocarbons, CO – Carbon Monoxide, NOx – Nitrogen Oxide, PM – Particulate Matter, g/bhp-hr – grams per brake horsepower-hour, NMHC - Non-Methane Hydrocarbons

- Service Proven: Selected technologies must either show sufficient maturity, or the technology must be in an advanced stage of development. If the technology is not yet "proven in revenue service", the risk associated with implementing a developmental technology must be carefully weighed.
- Affordability: Selected technologies must have system costs per unit length not exceeding that of an at-grade light-rail line of $37 million per kilometer ($60 million per mile).
- Safety: Selected technologies must meet local and national life/safety requirements.
- Accessibility: Selected technologies must comply with Americans with Disabilities Act (ADA) requirements.
- Visual Impact: Selected technologies must not require an overhead guideway or overhead contact system (overhead wires, or catenaries) for wayside propulsion that disrupts mauka-makai views.
- Flexibility: Selected technologies must have the capability to be re-routed around blockages, and not preempt parades and other activities along the alignment.
- Sense of Permanence: Selected technologies must represent a substantial government commitment to a specific alignment in order to evoke the desired land use response from land developers.

The technologies currently under consideration have the following features: (1) rubber tired, (2) low floor, (3) driver operated, (4) located at-grade in a reserved right-of-way (street lane), (5) able to be crossed by pedestrians and other traffic, (6) single articulated, (7) capable of operating under their own power for at least short distances to avoid disruptions in the transitway, and (8) electric powered. Technologies rejected from further consideration are presented in Section 2.6 with the basis for their elimination.

The requirement for electric power is driven by concerns about air and noise emissions. Electric power would be provided either from power modules embedded in the street (embedded plate technology), or on-board hybrid electric propulsion in which a diesel engine powers an alternator which produces electricity. The electricity is stored in a battery, and the power is distributed by electric cable to "hub motors", which are electric motors located on each wheel. In this manner, it is possible to eliminate the drive train, facilitating a "low floor" configuration.

Overhead wires (catenaries) would not be required under either technology option.

This MIS/DEIS has been prepared to permit either option to be selected later in the project development process by reflecting the 'worst case' impacts of these two technologies. The degree to which the lesser impact technology would reduce impacts is also discussed in the MIS/DEIS.

The technologies under consideration are now described.

Embedded Plate Systems

An embedded plate system is a form of wayside traction power delivery in which a power strip is embedded in the roadway or installed in a track. The power strip does not cause electric shocks if touched by persons or by crossing traffic.

One design, STREAM by Ansaldo/Breda (an Italian firm), employs a segmented power strip that is embedded in the street. Each segment of the power strip is energized only when the power collector below the transit vehicle is in contact with the segment. At all other points, the power strip is not energized, and therefore poses no hazard to pedestrians or other surface traffic crossing the alignment. The energized segment is always underneath the vehicle, and within its boundaries.

When the vehicle leaves the transitway lanes with the power strip, it shifts automatically to on-board batteries that are kept charged. The batteries are able to power the vehicle after it leaves the transitway, allowing the vehicle to cross difficult intersections, make tight turns, move during emergencies, and maneuver during maintenance. Since the batteries are charged during normal operation, the vehicle does not need to stop for the batteries to be changed or charged.

Another design, by Wamplfier (a German firm), employs "inductive power transfer" (IPT), the same electrical principle as in a transformer. Insulated rails embedded in the road surface carry an electric current that induces a current in power pickups on board the vehicle. In contrast to STREAM, no surface contact is required. The pick-up on the vehicle captures a magnetic field generated by the power strip in the road. Power is received as alternating current that is rectified on board to become direct current.

With batteries on-board the vehicle, the power strip could be interrupted at intersections and other areas where its placement would be difficult or expensive. The batteries would provide power to cross areas without a power strip. IPT could also be used to charge the batteries of a transit vehicle at transit centers or stops.

Hybrid Propulsion

A hybrid propulsion system is one in which a propane or diesel engine onboard the transit vehicle drives a generator (alternator) that produces electric power to charge batteries. In addition, the batteries are also charged during braking by operating the motors as generators (regenerative braking), which converts the kinetic energy of the vehicle into electrical energy that is stored in the battery.

Current is drawn from the batteries to run electric propulsion motors that drive the wheels, and the internal combustion engine is not directly coupled to the wheels. The configuration is similar to diesel/electric locomotives that have been in service for many years.

One advantage of this technology is that regardless of the speed of the vehicle, the internal combustion engine can be operated constantly at its most efficient speed and load. Running the engine at maximum efficiency maximizes fuel economy while minimizing air and noise emissions. Further, the size of the engine may be reduced. The spurt of higher electric power needed for acceleration is taken mainly from the batteries. The batteries can also be used to move the bus if there is a problem with the engine or alternator.

Diesel engine technology has advanced recently to reduce emissions, particularly in aspiration (i.e., getting air into the cylinders more efficiently), precise control of the fuel to the engine, and exhaust after-treatment. These developments, together with being able to operate the diesel engine at its most efficient speed and load, contribute to its lower exhaust emissions in comparison to conventional diesel technology.

It is expected that the emissions from diesel/electric hybrids will be significantly lower than the criteria presented earlier in Table 2.2-9, although the exact performance is still being established by government regulators.

By using electric motors to move the bus it is possible to eliminate the transmission, drive shafts, and other mechanical linkages that drive the wheels on conventional vehicles. Some designs use "wheel-hub motors" which are motors built into the hubs of the wheels. Each of the wheels can be independently suspended. Therefore, wheel-hub motors facilitate the design of articulated, low-floor buses because there is no need for the under the vehicle drive shaft and axles required for standard buses. Also, the wheels in both body sections of an articulated bus can be powered by electric motors, and the power plant can be located in the rear of the vehicle.

The net result of eliminating the transmission and drive linkages, reducing the size of the engine, and adding the on-board electric alternator and batteries, is an overall weight similar to a typical articulated diesel bus.

Five hybrid propulsion buses manufactured by Orion with Lockheed Martin have been in revenue service in New York City for over two years. NYC Transit has 125 more of these vehicles on order. CiViS by Matra/Renault, GLT by Bombardier, and TransLohr by Lohr of Strasbourg also have hybrid propulsion vehicles under various stages of development. None of these manufacturers, however, are supplying exactly the vehicle identified in the BRT Alternative.

Final Technology Selection for In-Town BRT

The transit industry is in an era of rapid change in propulsion system technology. While the candidate technologies are in various stages of development and none are yet fully proven in revenue service, a decision on technology need not be made at this point. During the next year or so it is anticipated that both the embedded plate and hybrid diesel-electric technologies will advance to a state where they will be considered service proven. At that time, a decision on technology may be made.

The final selection of the technology for the In-Town BRT system would be based on a detailed evaluation of the technology options. The designs, and test/demonstration results of each technology would be evaluated against specific performance and functional requirements for the In-Town BRT system. These requirements would be provided to the manufacturers and they would be asked to provide the City with design data and test/demonstration results, as well as prepare written comments on the City's requirements.

An Industry Review would then be undertaken. Separate meetings would be held with each participating manufacturer to review their comments on the City's requirements and discuss the City's questions. Following these meetings and site visits, a technology would be selected.

6) Maintenance Facilities

Storage and maintenance of the In-Town BRT transit fleet would occur at the Kalihi-Palama (existing) Bus Maintenance Facility. Reconfiguration of the service bays would be necessary to accommodate the In-Town

BRT vehicles, and the facility would need to be expanded. This expansion would be coordinated with development of the Middle Street Transit Center. The preferred expansion site would be adjacent to and makai of the Kalihi-Palama Bus Maintenance Facility. However, a site at Fort Shafter (Shafter Flats) is an option.

7) Mitigation Measures Requiring Permanent Construction

The BRT Alternative would require the same mitigation measures that would be provided for the TSM and No-Build Alternatives, these being standard construction mitigation measures like noise, dust and sediment and erosion control. In addition, the following permanent mitigation measures would be constructed under this alternative:

- Neighborhood parking would be provided at new facilities to be identified, either as low impact parking decks or as surface lots; and
- Noise mitigation would be required in certain areas along the H-1 BRT corridor.

8) Other Bus Priority Treatments

Performance of the Regional and In-Town BRT systems would be augmented by a variety of bus priority treatments. In the Ewa region, over 31.5 kilometers (19.6 miles) of semi-exclusive bus priority lanes would be developed along Kapolei Parkway, North-South Road, and Farrington Highway. They would be used by buses during peak hours, but would be open to vehicles turning into driveways and crossing streets.

A new roadway would be provided adjacent to Kunia Road between Farrington Highway and the H-1 Freeway to provide direct access to the H-1 BRT Corridor. Fort Weaver Road would be widened in each direction between Geiger Road and Farrington Highway to accommodate new express lanes for buses and high occupancy vehicles.

Semi-exclusive lanes would be established along Kaonohi Street between Kamehameha Highway and the H-1 Freeway to enhance movement between Pearlridge Center and the H-1 BRT Corridor. Other bus priority treatments, including queue jump lanes and traffic signal priority measures, would be implemented on Kamehameha Highway between Waimano Home Road and Moanalua Freeway.

In-town bus priority treatments would be implemented along the King and Beretania Streets couplet.

9) Other Features

From Kapiolani Boulevard/Atkinson Drive to Koko Head of University Avenue, the A.M. and P.M. peak period contraflow lanes would be preserved and would operate as at present. At the Atkinson Drive intersection, there would be a total of three left-turn only lanes during the A.M. peak period. On Atkinson Drive, between Kapiolani and Ala Moana Boulevards, the A.M. and P.M. peak period contraflow lane would be maintained.

2.3 CAPITAL COSTS

This section presents capital cost estimates of the three alternatives (see Table 2.3-1). The costs of the "committed" projects (the standard set of near-term projects that are included in all three alternatives) are not included in these costs.

TABLE 2.3-1
CAPITAL COST SUMMARY
(MILLIONS OF 1998 DOLLARS)

Project Component	No-Build	TSM	BRT
Bus & TheHandi-Van Acquisition	$316.9	$365.3	$421.8
Regional Bus Rapid Transit	$0.0	$153.4	$264.8
In-Town Bus Rapid Transit	$0.0	$0.0	$373.7
Total	**$316.9**	**$518.7**	**$1,060.3**

Source: Parsons Brinckerhoff, Inc.

2.3.1 Methodology

Cost estimates were prepared in 1998 dollars. Components include site preparation, facilities construction, purchase and installation of systemwide facilities and equipment (including vehicles), restoration of adjacent infrastructure, engineering design, construction management, owner administration, taxes, and contingencies. Land acquisition costs have not been included as specific sites for some of the facilities have not yet been determined. Sites could be on government property or property which is donated.

The accuracy of the cost estimates, while appropriate for comparative evaluation in this MIS/DEIS, has been limited by the level of design detail available for the project. Order of magnitude estimates are referred to as conceptual cost estimates, since they are based on conceptual design rather than detailed design. Also, it should be understood that the cost estimates are applicable to the concepts described earlier in this Chapter. If features of the concepts change, the cost estimates would need to be adjusted accordingly.

Unit costs were derived from historical data from comparable transit systems, such as the BRT system in Orlando, Florida, and the recently completed H-3 Freeway project. Costs are based on in-place costs, including labor, construction, permanent equipment, and permanent materials. Prices for highly specialized systemwide components, such as vehicles, traction power supply and distribution, and fare collection equipment, are based on composite industry prices from recent transit projects. To account for differences between Hawaii and mainland costs, a Hawaii adjustment factor was applied to items such as the price of materials and the cost of labor.

By combining unit costs with quantities developed from conceptual engineering drawings, a conceptual estimate was developed with an accuracy of plus or minus 25 percent; i.e., actual project costs should not exceed nor under-run estimates by more than 25 percent. Potential variances are accounted for through appropriate contingencies.

In subsequent phases of the project, the level of detail will increase, the accuracy of the cost estimates will improve, and the contingency will decrease.

Basic assumptions used in developing the capital cost data are:

- Estimates were prepared using 1998 dollars;
- No premium time on labor costs was included;
- Normal productivity rates as historically experienced were utilized;
- Adequate experienced craft labor is assumed to be available; and
- For certain transit elements, a 1.228 adjustment factor (RS Means, Heavy Construction Cost Data, 12th Annual Edition, 1998) is used to adjust mainland costs to Hawaii costs.

Typical facility costs are based on a conceptual scope developed for each work item. Costs are developed by combining the costs of components applicable to a typical cross-section into one unit cost. These parametric unit costs have detailed unit price development backup to substantiate the parametric unit costs. Special facility costs were developed based on a conceptual design relating to the unique facility under consideration. Systemwide elements are those elements necessary for operation, but whose costs can only be partly allocated to a specific geographic segment of the system (e.g., vehicles, storage and maintenance facilities, and so forth).

Once the typical and special facility and systemwide element costs have been determined, they are subject to add-on factors. Add-on factors cover engineering, management, insurance, and contingencies. They are referred to as add-on factors because they are added to the unit costs.

After the cost data is developed, it is put into a cost stream format that relates the cost directly to the plan and profile drawings, and assists in summarizing costs.

Capital costs were developed for each alternative utilizing both "bottom up" and "top down" estimating approaches. However, most of the unit costs were developed using a "bottom up" approach, meaning the cost of each major category of work is determined by totaling the cost of their component parts. Based on the conceptual design, the quantities of the major work elements are defined. Unit prices for each major work element are developed and combined with the estimated quantities to determine the cost of each major category of work, such as transit stops, park-and-ride lots, direct access ramps, transit guideways, transit platforms, and so forth. The advantage of this approach is the ability to adjust costs with changes in project scope, and a higher level of confidence.

The "top down" method uses data on similar projects divided by some measure such as route meters, and the results applied as a unit cost. As an example, the cost of the bus maintenance facility in this estimate is derived from data from other similar projects and therefore is a "top down" unit cost. Drainage work, traffic control, street lighting, landscaping, utility relocation, and vehicles are among the other "top down" unit costs used in the estimate.

The unit prices include contractor-supplied insurance. On many major projects, the owner supplies the insurance or assumes management risks in order to reduce costs.

Management, design and construction support add-ons include the costs of program and design management, preliminary engineering, final design, and construction administration and management. This category also includes system start-up costs, as these activities are interrelated with the engineering and construction work. The allowance used was 20 percent, and it was applied to all capital cost categories except right-of-way acquisition, relocation, and buses. Generally, 10 percent is for engineering and design; five percent is for program management; and five percent is for construction management and inspection.

Agency costs include costs incurred by the implementing agency in administrating and reviewing the engineering and management consultants involved in the project. Force account costs include the services of other government agencies that may be required to support the project. The agency and force account cost is 5 percent of all capital cost categories.

A contingency was included in the capital cost estimate to account for unforeseen items, quantity fluctuations and variances in unit costs as the project progresses. This percentage would be reduced as the project progresses, and reflects the degree of risk associated with the level of engineering data presently available. The contingency has been set at 25 percent for this project phase and is applied to all capital cost categories except right-of-way acquisition, relocation, and buses. A lesser contingency, 10 percent, was applied to BRT vehicles.

The cost of the applicable general excise tax mandated by the State of Hawaii is included as a percentage (4.167) of the total capital cost of all categories.

2.3.2 Results

Table 2.3-1 shows the capital cost estimates for the transit portion of the three alternatives, by project component. They span a range from about $317 million for the No-Build Alternative, to $1.06 billion for the BRT Alternative. These cost estimates exaggerate the initial capital costs since they reflect the replacement of the entire bus, TheHandi-Van, and BRT vehicles over the 25 year analysis period of the DEIS. Initial costs (first 10 years) in 1998 dollars would be $135.5 million for the No-Build Alternative, $299.5 million for the TSM Alternative, and $767.7 million for the BRT Alternative.

2.4 OPERATING AND MAINTENANCE COSTS

This section presents estimates of annual operating and maintenance (O&M) costs for the transit (fixed-route bus) elements of the three alternatives. The operating and maintenance costs of the "committed" projects (the standard set of near-term projects that are included in all three alternatives) are not included in these costs, and other DTS and HDOT O&M costs are not reflected (e.g., costs of coning contraflow lanes, maintaining traffic signals and bus priority measures) and operating and maintaining TheHandi-Van fleet. The costs of operating reversible ramps and the addition to the existing zipper lanes are included in the estimates. The costs of City administration of the Vanpool Hawaii program are assumed to equal the direct revenues and federal funding (i.e. break-even operation as defined under FTA's Capital Cost of Contracting policy). The costs are for the forecast year 2025, assuming full development of each alternative, and are expressed in 1998 dollars.

2.4.1 Cost Estimation Methodology

Costs are produced using an estimation methodology for bus supply characteristics, calibrated to existing conditions in Honolulu. The inputs to the estimation are prepared by the travel demand forecasting models and consist of passenger loading assigned to the bus routes, as coded for the travel demand forecasting models, for the A.M. peak period, the P.M. peak period and the off-peak period, and the estimated running time and distance for each bus routes. The bus supply estimation methodology takes these inputs and estimates the frequency of bus service and number of vehicles, either standard buses, minibuses or articulated buses, needed to accommodate the estimated demand during each of these three time periods. It further estimates the vehicle hours and miles that would be provided for the entire day. These daily estimates are then expanded to an annual estimate and used to estimate annual bus operating costs. Annual operating and maintenance costs are estimated as a function of three variables: annual revenue vehicle miles, annual revenue vehicle hours, and bus fleet size. A unit cost has been estimated for each variable. Based on experience elsewhere, different unit costs are used for standard bus (including minibuses) and articulated bus revenue vehicle miles and fleet size. Annual costs are estimated using the following equation:

$$\begin{aligned}\text{Annual O\&M Cost} = {} & \$\,52.318 \times \text{Annual Revenue Vehicle Hours} \\ & + \$\,1.544 \times \text{Annual Standard Revenue Vehicle Miles} \\ & + \$\,2.145 \times \text{Annual Articulated Revenue Vehicle Miles} \\ & + \$\,49{,}185 \times \text{Standard Bus Fleet Size} \\ & + \$\,58{,}413 \times \text{Articulated Bus Fleet Size.}\end{aligned}$$

Annual revenue vehicle hours, annual revenue vehicle miles, and fleet requirements are estimated directly for the operating plan assumed for each.

AR00047387

O&M costs for articulated buses are estimated to be the same as described above increased by an additional 8.4 percent. This 8.4 percent is the O&M cost differential that King County Metro Transit in Seattle has found between normal articulated buses and the dual-power articulated buses which operate in the Downtown Seattle Transit Tunnel. These buses operate both on diesel power and electric power, with electric power picked up via trolley poles. These more-complicated buses are being used as a surrogate for the additional O&M costs that might be associated with embedded plate or diesel/hybrid vehicles.

2.4.2 Results

Table 2.4-1 presents the annual O&M costs in 1998 dollars using the methodology described above. TheHandi-Van operations are not included in these costs.

TABLE 2.4-1
ANNUAL OPERATING AND MAINTENANCE COST SUMMARY, 2025[1]
(MILLIONS OF 1998 DOLLARS)

Alternative	Bus O&M Cost	In-Town BRT O&M Cost	Total Project O&M Cost
No-Build	$125.1		$125.1
TSM	$137.4		$137.4
BRT	$163.7	$12.3	$176.0

Source: Parsons Brinckerhoff, Inc.
Note: 1) Not including TheHandi-Van operations

As indicated in Table 2.4-1, O&M costs for the No-Build Alternative in 2025 would be about $125 million (in 1998 dollars). This compares to current operating costs for the existing bus system of about $102 million, not including TheHandi-Van operations. This increase is due to an increase in the constant dollar, per unit cost of providing bus service.

Comparing the TSM Alternative to the No-Build Alternative, it can be seen that O&M costs would increase to about $137 million due to the increase in the bus fleet.

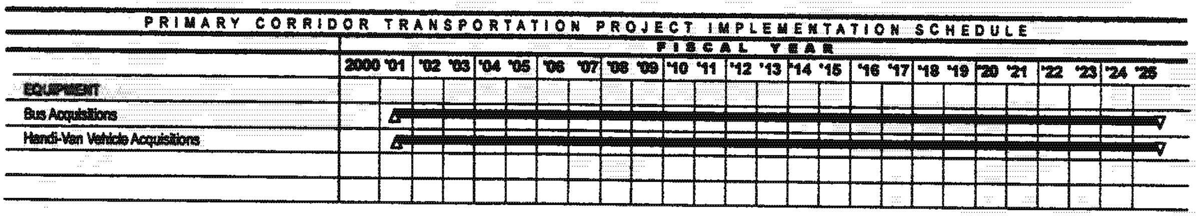
The O&M cost for the BRT Alternative includes two components, the cost of bus service and the cost of the In-Town BRT service. The bus O&M cost in the BRT Alternative also includes an additional $750,000 per year, which would be the added cost of operating an extended zipper lane and a P.M. as well as a A.M. zipper lane on H-1.

2.5 IMPLEMENTATION SCHEDULE

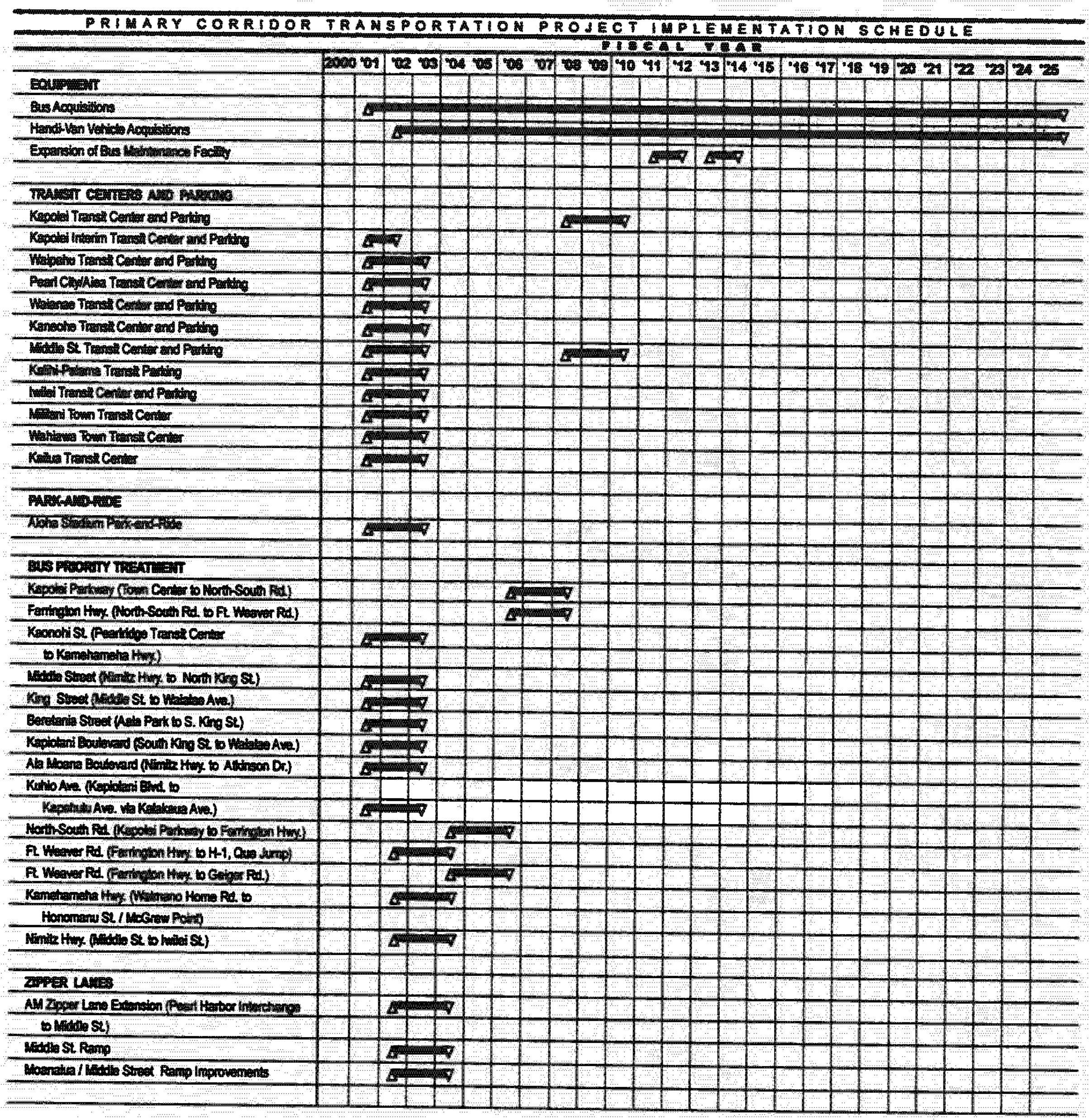
This section presents the proposed implementation schedule for the alternatives. The schedule of the "committed" projects (the standard set of near-term projects that are included in all three alternatives) is not shown. The proposed schedules for each alternative are shown in Figures 2.5-1A and 2.5-1B.

The No-Build Alternative schedule consists of an ongoing, regular program of bus acquisition from the present through 2025. These acquisitions would both retire older vehicles, and increase the fleet size. Vehicle types would include those for TheBus and the TheHandi-Van programs.

No-Build Alternative

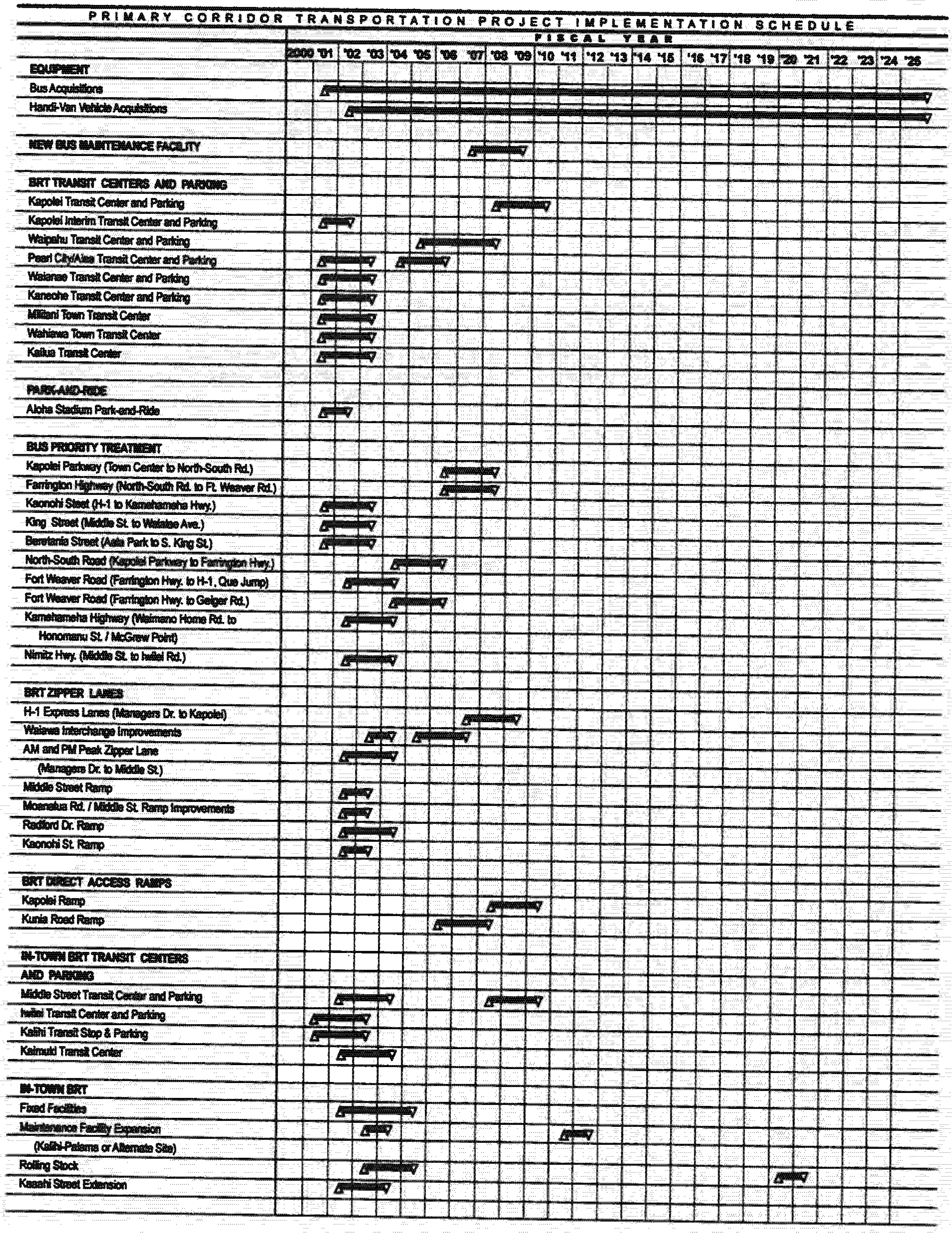


TSM Alternative



No-Build Alternative TSM Alternative	Primary Corridor Transportation Project Implementation Schedule	Figure 2.5-1A

BRT Alternative



BRT Alternative	Primary Corridor Transportation Project Implementation Schedule	Figure 2.5-1B

The TSM Alternative also includes an ongoing program of bus acquisition from the present through 2025, but adds the following elements:

- Expansion of a bus maintenance facility between 2011 and 2014;
- Development of 12 transit centers and park-and-ride facilities, primarily between 2001 and 2003. The permanent transit center in Kapolei and expansion of the Middle Street Transit Center would be constructed between 2008 and 2010;
- Implementation of fourteen bus priority measures, primarily between 2001 and 2008, with most being implemented by 2004; and
- Construction of a zipper lane extension and Middle Street ramp between 2002 and 2004.

The following factors were considered when developing the overall project schedule for the BRT Alternative:

- Cash flow analysis;
- Geographically distributing project benefits at each phase of construction;
- Minimizing construction-phase impacts in one area at one time by geographically distributing the work at each phase of construction; and
- Synergies among different project elements.

Based on these considerations, the BRT project elements would be implemented as a series of manageable, discrete projects. All of the Regional and In-Town BRT systems would be in place and providing travel benefits within nine years and many of the key elements would be open and operating within five years. At each stage of project development, including the initial phases, the elements in place at that time would work with each other to improve transportation service. Benefits would start accruing immediately, and the level of benefit would increase as more components are added through time.

The resulting schedule for the BRT Alternative includes the following time frames for the major project elements:

- Development of 12 transit centers and park-and-ride facilities from 2001 through 2004, with the balance to be developed from 2004 through 2010. The initial phase of transit center development would establish the basic system and allow for reconfiguration of the bus route system to a hub-and–spoke configuration. Kapolei would initially be served with an interim transit center that would be developed in the initial group, and a permanent regional transit center would be developed and open by 2010, when additional development has occurred in the area.
- Initial construction would include a regional transit center at Middle Street, a community transit center in Iwilei, as well as community and neighborhood transit centers at dispersed locations around the island, including Kaneohe, Mililani, Wahiawa, Waianae and Kailua.
- Development of BRT zipper lanes and associated ramps from 2002 through 2010. The initial development in 2002 and 2004 would enable the Regional BRT system to begin operation, and would include zipper lane extensions and special ramps for Regional BRT vehicles at Middle Street, Radford Drive and Kaonohi Street. The Kunia Road ramp would be open in 2008, and the Kapolei ramp in 2010. Refinements of the Regional BRT system include extending the P.M. peak express lane to H-2 at the Waiawa Interchange which would open in 2007. Construction of the express lanes from the end of the zipper lane at Managers Drive to Kapolei would occur between 2007 and 2009.
- Development of the In-Town BRT system between 2002 and 2005. Transit stops, transit centers, and the transitway would be developed together to achieve a completely functional In-Town BRT system by 2005.
- Bus acquisitions from the present through 2025. The initial fleet of In-Town BRT vehicles would be ordered, manufactured and delivered in 2003 and 2004, with the testing and start-up occurring in 2005. The rolling stock of the In-Town BRT system would be replaced in 2020 to 2021.

2.6 SCREENING OF ALTERNATIVES

The MIS/DEIS alternatives have evolved over the course of the study through an iterative process. A wide-range of options was progressively analyzed in increasing detail until it was winnowed down to the "best fit" alternatives described in Section 2.2. The evolution was based on conceptual engineering and cost analysis as well as public and agency review and comment. This Section summarizes the results of the various iterative steps in the development and screening of the alternatives:

- Section 2.6.1 describes the major alternatives that were eliminated early on. The initial alternatives, as presented in the project's Environmental Impact Statement Preparation Notice (EISPN) and Notice of Intent to Prepare an EIS (NOI) were No-Build, Enhanced Bus/TSM, BRT and LRT with three LRT sub-alternatives (LRT 1, 2 and 3). Comments were received in response to the EISPN, and responses to those comments that addressed alternatives are also listed in Section 2.6.1.
- Section 2.6.2 discusses the alternative alignments for the In-Town BRT that were rejected.
- Section 2.6.3 sets forth the criteria for selection of the transit technology for the In-town BRT system and describes the candidate technologies no longer under consideration.

2.6.1 Alternatives Considered and Eliminated

Two alternatives often studied by other communities considering major transportation investments were eliminated early on by the public for Honolulu's primary transportation corridor because they were deemed not responsive to the purpose and need statements in Chapter 1 and the stated goal of the City Council from the outset of the study which was to keep the project affordable. These alternatives were a fully grade-separated transit alternative, and an all-highway alternative to transit. The public input and analytical process that led to elimination of these alternatives is discussed.

1) Fully Grade-Separated Transit Alternative

Advantages of a fully grade-separated transit alternative are:

- It would be completely buffered from the existing surface road network and its congestion, allowing transit vehicles to move quickly on a dedicated right-of-way, free from interference with any other transportation system; and
- It would not create a significant impediment to the operation of the surface road system.

A fully grade-separated transit system would offer the maximum performance possible with transit, and therefore provide transit patrons with the highest level of service.

Grade separation of a transit system in the primary transportation corridor could be achieved with an elevated guideway, an underground subway, or some combination of the two. Fully grade-separated transit systems for Honolulu have been seriously considered twice in the past three decades. In both instances, extensive analysis produced a strong and credible case for grade-separated transit investments. Nonetheless, the proposals ultimately were not built due to lack of sufficient support by the public and/or elected officials.

The concerns that led to the rejection of the most recently proposed elevated rapid transit system were primarily two: (1) its high cost and (2) its physical and visual impacts.

Previous studies have shown that construction of a subway through Honolulu's urban core would be prohibitively expensive. The extreme disruption of existing underground utilities and constant dewatering made necessary by a high water table and poor soils would drive construction costs to unacceptable levels (approaching $ 3 billion in 1998 dollars for a 19.0 km (11.8-mile) system along the presently proposed In-Town BRT alignment). While an elevated guideway would be less costly than a subway, such a system would still be substantially more expensive and visually more obtrusive than an at-grade system. The elevated system proposed most recently was abandoned when elected policymakers would not approve a local funding mechanism that required an increase in taxes. A 19.0 km (11.8-mile) elevated rapid transit system along the presently proposed In-Town BRT alignment would cost on the order of $1.6 billion in 1998 dollars. By comparison, the In-Town BRT system costs are estimated at approximately $375 million in 1998 dollars.

Public input received in hundreds of Vision Team and Oahu Trans 2K meetings and workshops attended by thousands of Oahu residents revealed widespread agreement that while an elevated transit system might serve the goals of improving in-town mobility and strengthening connections between communities, such a system would not foster livable communities. The predominant sentiment among thousands of participants was that a grade-separated transit system would be unacceptably: (1) intrusive on the visual environment; (2) divisive of communities; and (3) too expensive. These shortcomings were judged by public participants to outweigh the recognized benefits of a grade-separated system, i.e., high speed and capacity, increased reliability and reduced negative impact on the surface road system.

Honolulu's failure to complete the proposed elevated transit system less than a decade ago, and extensive public input into the current process, confirmed that a grade-separated system could not, because of its high costs, visual obtrusiveness, and community divisiveness, gain the level of local public and/or official acceptance necessary to sustain such an investment. All of the transit alternatives considered in the MIS/DEIS are therefore based on at-grade operation.

2) Highway Alternative to Transit Considered and Rejected

This section addresses the use of a highway solution to address the project's purposes and needs. The intent of the highway alternative is to provide people-carrying capacity comparable to the Regional and In-Town components of the transit system, and link the same origins and destinations.

<u>Highway Alternative to the Regional Transit System</u>

The Regional components of the TSM and BRT Alternatives enhance people-carrying capacity by designating some lanes for exclusive use by high occupancy vehicles (2+ occupants) and express lanes (for use by vehicles with 3+ occupants) in the H-1 Corridor from Kapolei to Middle Street. For the highway alternative, many of the features in the Regional transit system, including lane-use priority for 2+ and 3+ vehicles would be maintained. New express lanes for vehicles with 3 or more occupants would be constructed within the median of the H-1 Freeway in each direction between Kapolei and Managers Drive. An outbound, afternoon peak period contraflow zipper lane would be installed between Waiawa Interchange and Radford Drive and be available to vehicles with three or more occupants. The A.M. zipper lane, the A.M. HOV/express lanes, and the P.M. HOV lanes currently in operation would be maintained. Unlike the Regional BRT system, however, the proposed bus priority ramps, the Pearl City/Aiea Transit Center, the Middle Street Transit Center, and the extension of the A.M. zipper lane would not be provided. Ramp improvements at Waiawa Interchange and between the Aloha Stadium park-and-ride and H-1 would be needed. The cost of the highway only component from Kapolei to Middle Street in 1998 dollars would be approximately $110 million, in comparison to $240 million for the Regional BRT system (exclusive of bus acquisitions and the cost of a new bus maintenance facility).

<u>Roadway Alternative to the In-Town Transit Spine</u>

The In-Town BRT system provides improvements that substantially increase people-carrying capacity, and links Middle Street, Iwilei, Downtown, Kakaako, Waikiki and the UH-Manoa areas. To service commuter demands from the Ewa side of Oahu and travel demands from Iwilei, Downtown and Kakaako communities, a highway alternative was developed that includes a two-lane viaduct on H-1. Additionally, North King Street would be widened to 6 lanes as proposed in the ORTP.

(1) Middle Street to Kalihi, Iwilei, Downtown and Kakaako Improvements

The H-1 Viaduct, North King Street and other local roadway improvements listed below would provide comparable people-carrying capacity to the In-Town BRT system:

- Construct a two-lane H-1 viaduct (one lane in each direction separated by a median barrier) beginning about 1,000 feet before the tunnel under North King Street to just past the Vineyard Boulevard exit. The viaduct would be aligned along the side slope makai of H-1 (see Figure 2.6-1).
- Widen H-1 by one lane in each direction from the new viaduct to Punchbowl Street.
- Widen North King Street to six lanes between Middle Street and Liliha Street (ORTP project).
- Improve the North King Street/Liliha Street/Dillingham Boulevard intersection by adding lanes.
- Widen Liliha Street to six lanes from North King Street to H-1 (ORTP project).
- Extend Queen Street and Pohukaina Street to Pensacola Street and convert to a one-way couplet (ORTP project).
- Reverse the one-way couplet direction of Pensacola Street and Piikoi Street.

These improvements from Middle Street to Downtown and Kakaako would cost approximately $880 million in 1998 dollars.

(2) Improvements to Access Waikiki

The In-Town BRT system also provides service to Waikiki and the University of Hawaii at Manoa. To service Waikiki, the highway alternative would require an additional Koko Head-bound lane on H-1 between Ward Avenue and Punahou Street, a new interchange at McCully Street, a two lane viaduct on McCully Street between H-1 and Waikiki, and various other interchange and highway improvements. The Piikoi Street Koko Head-bound on-ramp would be closed, thereby reducing the traffic volume on the H-1 segment between Ward Avenue and McCully Street. The elements to enhance access to Waikiki via roadway improvements are as follows:

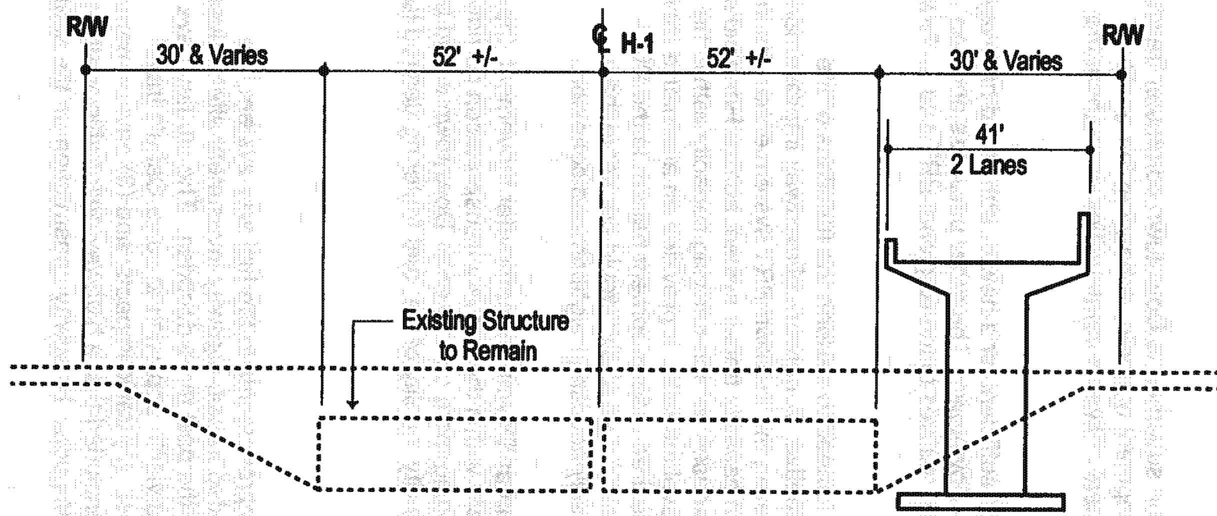
- Widen H-1 Ewa-bound by one lane between the Ward Avenue on-ramp to the Punahou Street off-ramp. Close the Piikoi Street on-ramp.
- Close the Lunalilo Street Ewa-bound on-ramp. Convert Magellan Avenue between Ward Avenue and Prospect Street to one-way operation. Construct Magellan Avenue braided on-ramp to connect just past the Pali Highway off-ramp.
- Construct a new H-1 interchange at McCully Street.
- Reconstruct the King Street Ewa-bound on-ramp (see discussion of Manoa interchange improvements that follow).

These improvements to access Waikiki would cost approximately $270 million in 1998 dollars.

(3) Improvements to Access UH-Manoa

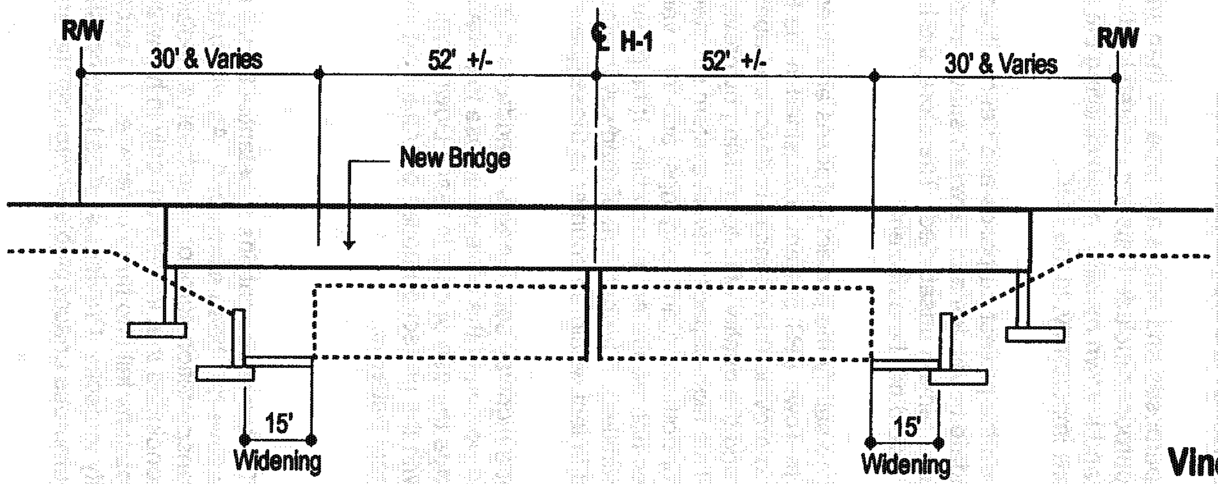
Manoa interchange and other highway improvements are proposed in the highway only alternative to service the UH-Manoa area. In the Ewa-bound H-1 direction, traffic conditions would be improved by closing the Lunalilo Street Ewa-bound on-ramp, eliminating the weave problem that creates congestion and backs up traffic beyond the Manoa interchange. A replacement on-ramp would be provided at Magellan Street, just prior to the Punchbowl on-ramp. These improvements would have operational benefits in the University to Downtown Ewa-bound H-1 segment. Proposed roadway access improvements to the UH-Manoa area include:

- Close the Bingham Street Koko Head-bound and Wilder Avenue Ewa-bound off-ramps (to be replaced by the new McCully Street interchange).



Note:
Existing R/W Location varies.

Kahauiki Interchange (Middle Street) to Vineyard Boulevard



Vineyard Boulevard to Punchbowl Street

NOT TO SCALE

Improvements to H-1 Between Middle Street and Punchbowl Street

Figure 2.6-1

- Construct Koko Head-bound collector-distributor (C-D) road starting just past the Bingham Street off-ramp. Redirect the University Avenue and King Street off-ramp traffic onto this road.
- Reconstruct the University Avenue loop on- and off-ramps to connect to the C-D road.
- Construct new Lower Campus Road Koko Head-bound on-ramp and connect to new C-D road.
- Reconnect the new C-D road to H-1 just past the King Street off-ramp.
- Braid Ewa-bound University Avenue off-ramp with new two-lane King Street on-ramp
- Reconstruct University Avenue on-ramps to merge with H-1 just prior to the existing Wilder Avenue off-ramp (to be closed).

These improvements to access UH Manoa would cost approximately $170 million in 1998 dollars.

The cost of the in-town highway component in 1998 dollars would be approximately $1.43 billion, in comparison to approximately $614 million for the Regional and In-Town BRT system. It would therefore be significantly more expensive.

Consistency with Project Purposes and Needs

The project's purposes and needs are broader than satisfying the suburban to Downtown commuter travel market. The purposes include fostering desired land use development patterns, enhancing the quality of in-town living and in-town mobility, and facilitating the development of livable communities throughout the island, but more importantly, in the PUC.

Therefore, given the project purposes and needs, it would not be sufficient for a new or enhanced highway to just accommodate travel demand between suburban areas and Downtown. The other purposes and needs of the project would remain unsatisfied. Therefore, the highway alternatives to the Regional BRT and In-Town BRT systems would not be sufficient.

For a highway to satisfy the project purposes and needs, it would need to perform the functions of the Regional and In-Town BRT systems contained in the BRT Alternative. A network of roadway improvements that attempts to provide this capacity is described above. However, the In-Town BRT system enhances in-town mobility and the quality of in-town living by providing a high capacity transit system across Honolulu's Urban Core. This high-capacity transit system substantially increases person-carrying capacity within the Urban Core, for both short and long trips, and for a variety of travel markets. It provides an alternative travel mode that does not require an automobile. It helps support a desired redevelopment pattern in the PUC (livable communities). The network of roadway improvements described above would not serve these purposes, and in fact would be counter to these goals by adversely affecting neighborhood cohesion.

Assuming that a highway solution was to address only the suburban/Downtown commuter movement, thereby addressing the portion of the project purpose to enhance capacity within the primary transportation corridor, it would encourage the use of cars to reach Downtown. Encouraging more cars to enter Downtown would be inconsistent with the project purposes of enhancing in-town mobility, quality of life, and fostering desired land use development patterns.

Conclusion

While the BRT Alternative contains substantial transit related improvements to the highway system, the highway alternative has been eliminated. As with grade-separated transit, highway investment alternatives in the primary transportation corridor have been well-studied over the past three decades. The studies have consistently concluded that investment only in highways is not a viable approach to solve Oahu's travel needs. The reasons fall into three categories: (1) excessive cost; (2) traffic impacts; and (3) environmental and community impacts. Previous studies have consistently concluded that a highway only traffic solution would bring numerous unacceptable environmental and social impacts. Roadway construction on the scale to provide the capacity of the In-Town BRT system would adversely affect neighborhood cohesion, create substantial residential and business displacements, create visual intrusions, increase noise impacts, modify existing surface transportation patterns, and create major disruptions during construction.

Development in the primary transportation corridor is very dense and potential routes for new highways are few. Construction and land acquisition costs for highways sufficient to meet the demand of commuters between Leeward and Central Oahu and the PUC would be astronomical. Any widening of the H-1 Freeway between Middle Street and University Avenue would also require rebuilding of overpasses and access ramps. Similarly, double-decking would be too expensive in both construction and environmental costs. The network of roadway improvements described above would cost approximately $1.43 billion and would be substantially more costly than $614 million (excluding bus acquisition and maintenance facility costs) for the comparable BRT components that they would have "replaced".

Even if it were practical to construct sufficient new highway infrastructure to meet commuter demand, it would be virtually impossible to expand the capacity of Downtown surface streets to efficiently absorb the increased traffic. Based on the projected growth in travel, the City and State would need to construct 13 freeway lane miles and eight principal arterial lane miles annually just to keep congestion at the present level. This is the equivalent of building a new H-3 Freeway every 5 years.

As with grade-separated transit, highway only alternatives also were eliminated early on because there was insufficient public support to sustain them. As described in Appendix A, Oahu Trans 2K used a multi-stage process of public input, followed by professional analysis and proposals, followed by more public dialogue and refinement of the proposals. The results of this process were summarized in the Islandwide Mobility Concept Plan, that called for a balanced transportation plan in which public transit, bicycles and walking play larger roles.

Oahu Trans 2K revealed a clear community consensus that an important goal of any transportation program in the primary transportation corridor must be to foster livable communities. This consensus included general agreement that extensive widening and/or double-decking of roads through existing neighborhoods is not an acceptable alternative to increasing people-carrying capacity with a higher level of transit. Elimination of these options, in effect, eliminates any highway only alternative, because any such alternative would require one or the other.

3) Comments on the Initial Alternatives from Responses to the EISPN

The initial No-Build, Enhanced Bus/TSM, BRT and LRT alternatives were described in the project's EISPN and NOI. No responses were generated by the NOI. Some of the comments received in response to the EISPN pertained to alternatives. Comments on the alternatives from the agency and public scoping meeting duplicated the comments received in response to the EISPN. Table 2.6-1 lists the alternatives suggested for consideration by the public and government agencies commenting on the EISPN, and how those suggestions have been addressed in project planning.

2.6.2 Alignment Screening for the In-Town BRT System

Numerous alignment options were considered between the termini at Middle Street, UH-Manoa and Waikiki. These options were generated and screened by the project technical staff through an intensive process that included extensive community outreach, and meetings with stakeholders. Options were located in existing street rights-of-way, but varied in terms of which streets would be used for the In-Town BRT system. During the screening process, alignment options were contrasted with each other based on their ability to meet project purposes and needs (Chapter 1), ridership potential, and available right-of-way. Alignment options were then further refined through additional public input and more detailed technical studies. The currently proposed alignment for the In-Town BRT system is described in Section 2.2.3.

TABLE 2.6-1
EISPN COMMENTS RELATING TO ALTERNATIVES

Comment	Commentor	Response
Address Highway Alternatives	FHWA	1) The BRT Alternative is a combined highway and transit alternative. A highway only alternative is not sufficient to satisfy project purposes and needs, as addressed elsewhere in Section 2.6.1. 2) A highway alternative is inconsistent with the public's vision for the island's transportation system, as documented through the Oahu Trans 2K process. 3) Highway alternatives are being addressed in the ORTP Update.
Ensure multi-modal Alternatives – more than just cars and buses	FHWA, DBEDT-Office of Planning	The TSM and BRT Alternatives are multi-modal alternatives.
Identifying stand-alone components of Alternatives	SDOT	The components of the alternatives are described in Chapter 2.
Use of chartered/subsidized vehicles at peak hours	SDOT; Douglas Meller	TDM measures such as those proposed are incorporated in all alternatives. For example, all of the alternatives include a vanpool component (use of subsidized vehicles at peak hours) and subscription buses (such as LOTMA).
Ferry Alternative	DBEDT-Office of Planning	A ferry system does not represent a comprehensive alternative that satisfies all of the project's purposes and needs. While a ferry system may become an important element of the total transportation system, a ferry system alone could not serve existing or future travel demand in the primary transportation corridor.
TDM Alternatives – regulate parking fees, etc.; road pricing	DBEDT-Office of Planning; Douglas Meller; Bruce Plasch	TDM measures are included in the alternatives, but are not expected to fully address projected increases in travel demand in the primary transportation corridor.
Incentive and education programs on alternative transportation (e.g. various forms of HOV); disincentives on single-occupant private automobile transportation	Hawaii Bicycling League; Life of the Land	1) DTS and SDOT will continue to promote multi-modal transportation (e.g., SDOT will continue to promote the zipper lane and the vanpool program, and DTS will continue to promote its limited stop transit services, City Express! and Country Express!). 2) By using existing street capacity as a dedicated transitway, the BRT Alternative would create incentives for the increased use of multiple-occupant vehicles along the alignment of the In-Town BRT system.

TABLE 2.6-1 (CONTINUED)
EISPN COMMENTS RELATING TO ALTERNATIVES

Comment	Commentor	Response
Alternative with emphasis on servicing/improving access to Leeward areas, rather than getting to and from PUC	Leeward Oahu Transportation Management Association (LOTMA)	1) All of the alternatives include provisions for enhancing mobility within the Ewa area through increasing roadway connectivity and capacity, and enhanced transit service. The TSM and BRT Alternatives increase transit accessibility within, and to Kapolei/Ewa through the use of a "hub-and-spoke" bus network configuration. 2) All of the alternatives support the development of Kapolei as both a residential and employment center. 3) All of the alternatives would improve transit service along the Waianae coast. 4) Travel demand forecasting indicates that there will still be substantial travel between the PUC and other parts of the island, and within the PUC.
Segments of previously-indicated roadways for priority treatments do not appear to be included (e.g., Kamehameha Highway from Wahiawa to Radford Drive)	LOTMA	These measures are included in the No-Build, TSM, and BRT Alternatives.
Alternative without Sand Island	LOTMA; Douglas Meller	The No-Build, TSM and BRT Alternatives do not include SISP.
Use double-decker buses	Hawaii Bicycling League	For reasons of operational efficiency and handicap accessibility, using longer articulated buses is a better way of increasing passenger capacity per vehicle than adding a second level of seating.
Why is an extension to Kahala not included?	Outdoor Circle; Life of the Land	The analysis of future travel demand and existing infrastructure capacity indicates that the major shortfall in transportation capacity extends from the PUC to the Ewa area.
Alternative focusing on safety measures to increase pedestrian, bicycle, disabled access. Such an alternative would increase demand for transit and other alternative transportation modes.	Life of the Land	The TSM and BRT Alternatives are multimodal alternatives that increase pedestrian, bicycle and disabled access to transit and other alternative modes.
Do not create alternate freeway routes out of local streets	Hawaii Bicycling League	The highway alternative was considered and rejected as discussed elsewhere in Section 2.6.1.
Enhanced Bus Alternative that increases both bus and auto efficiency	Life of the Land	The TSM and BRT Alternatives enhance bus and auto efficiency to varying degrees.

TABLE 2.6-1 (CONTINUED)
EISPN COMMENTS RELATING TO ALTERNATIVES

Comment	Commentor	Response
Enhanced Bus Alternative that increases only bus efficiency, making buses more attractive than cars	Life of the Land	The TSM and BRT Alternatives enhance bus and auto efficiency to varying degrees. The BRT Alternative does less to increase car efficiency than the TSM Alternative. In the TSM Alternative, at some intersections, conditions for automobiles would be better than for transit vehicles.
Commuter-based Dedicated Bicycle Lane Alternative	Life of the Land	Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives.
Alternative eliminating some bus stops for more efficiency	Douglas Meller	Both the City Express! and Country Express! services are limited-stop bus services, and more limited stop services will be provided under the TSM and BRT Alternatives.
Alternative promoting carpooling, and use of other unused equipment and capacity	Bruce Plasch	The TSM and BRT Alternatives include incentives for HOV vehicles (carpooling), and other measures to enhance the operational efficiency of the existing transportation network including private sector transit services (using unused equipment and capacity).
Two separate, linked Express Bus systems: one to Honolulu and one to Kapolei, with circulator buses	Life of the Land	These features are included in the TSM and BRT Alternatives.
Expansion of plans to elevated rail (1992 plan)	Life of the Land	A fully grade-separated transit system was considered but rejected, as discussed elsewhere in Section 2.6.1.
Employer Trip Reduction (ETR) plans	Life of the Land	These and other TDM measures are included in all of the alternatives.
Including express buses from outside PUC in a plan for PUC is beyond scope	Life of the Land	The PUC is so important in terms of islandwide trip generation and trip attraction that transportation planning for the PUC cannot be limited to only the PUC. Connections between the PUC and other parts of the island must also be considered.
Use of electric vehicles	Life of the Land	The BRT Alternative includes the use of electric powered vehicles.

Source: Parsons Brinckerhoff, Inc.

1) Alignment Options

The following discussion summarizes the major alignment options considered but rejected from further consideration. Figure 2.6-2 shows the location of these alignment options.

- North King Street: Greater business disruptions, greater traffic impacts, and fewer land use development opportunities in comparison to Dillingham Boulevard.
- South Beretania Street: Too far mauka to serve the heart of Downtown, less land use development potential in comparison to Kapiolani Boulevard, narrow at Koko Head end.
- King Street, Koko Head of Ward Avenue: Extensive impact to on-street parking in an area with many small business frontages requiring auto access. Less growth shaping opportunity.
- Alakea Street: Richards Street alignment interfered less with access to buildings and affects a lesser roadway. Alakea Street alignment would impact a critical mauka-makai roadway and interfere with bus routes.
- Ilalo Street: An alignment for the Downtown/Kakaako/Waikiki Branch makai of Ala Moana Boulevard using Ilalo Street was considered as an alternative to the Halekauwila/Pohukaina alignment. The Halekauwila/Pohukaina alignment is preferable in terms of compatibility with land use development plans by HCDA and would be less disruptive to traffic flow on Ala Moana Boulevard.
- Nimitz Highway Koko Head of junction with Sand Island Access Road: Nimitz Highway is more of a regional highway facility than Dillingham Boulevard (higher speed, more through traffic, more control of access, etc.) Also, there is more opportunity to attract ridership on Dillingham Boulevard than on Nimitz Highway.
- Ala Wai Boulevard: With right-side loading, passengers would be required to cross Ala Wai Boulevard to get to the transit stop. Also, it is removed from the densest areas of trip generation in Waikiki.

2) BRT Alternative – Terminus of University Branch

Two options for the terminus of the University Branch were considered in addition to the proposed terminus at Sinclair Circle, as follows:

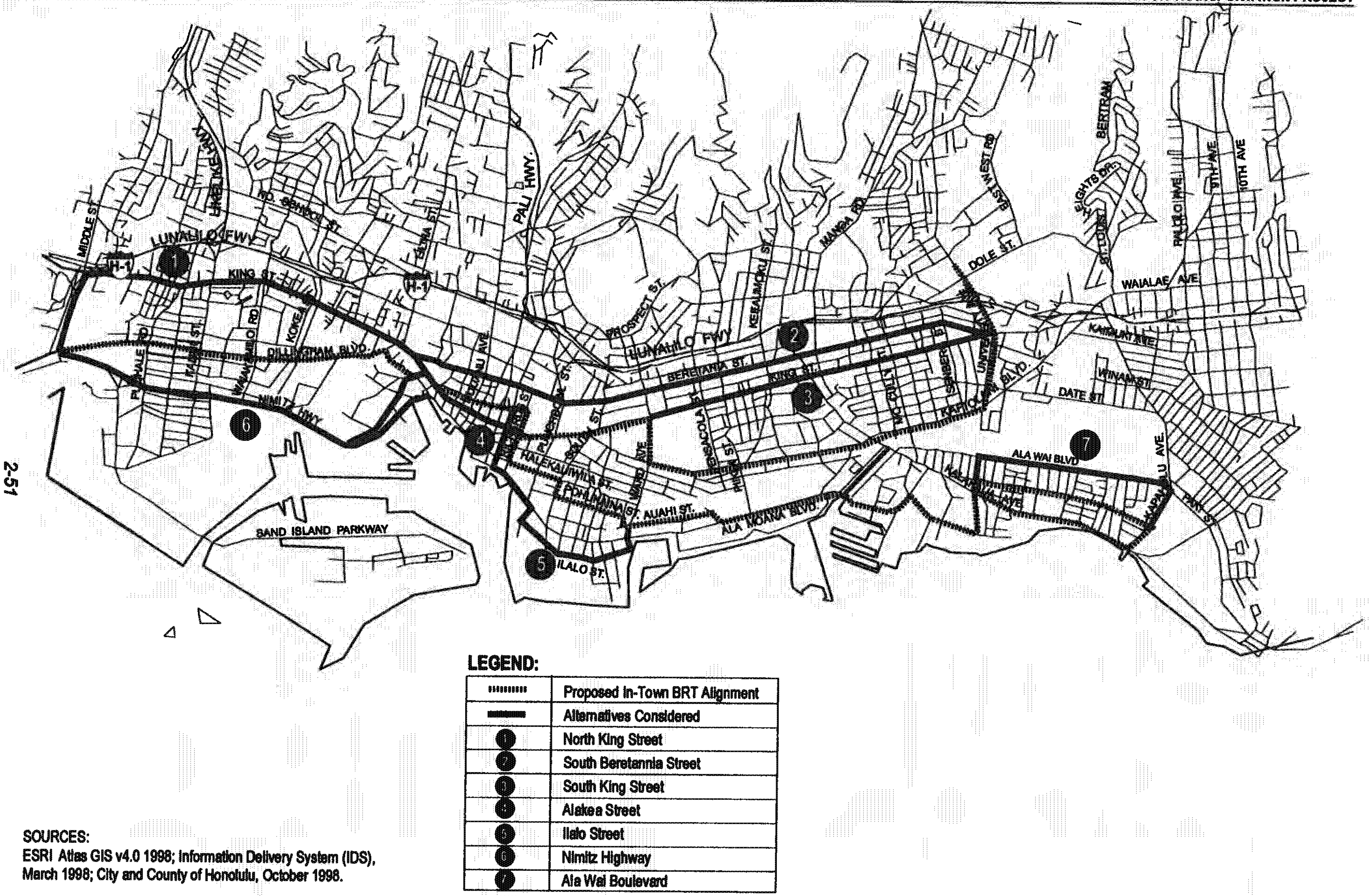
- Lower Campus: There is no available right-of-way for a transit stop or turnaround due to the narrowness of Varsity Place. The proposed terminus at Sinclair Circle serves the main campus better. Therefore this option was dropped.
- Varney Circle: This option would bring the In-Town BRT system onto campus. Distances from the transit stop to most destinations at UH-Manoa would be decreased in comparison to the Sinclair Circle terminus, however, penetrating the campus with a transitway is inconsistent with master plans for UH-Manoa. Also, there would be a significant added cost for virtually no ridership gain. Therefore this option was dropped.

2.6.3 Evaluation of Technologies for the In-Town Transit Segment

1) Overview of Technologies

The purpose of this Section is to explain the basis for rejecting technologies not presently under consideration for the In-Town segment of the transit spine. Section 2.2.3 presents the technology selection criteria. In summary, they are:

- Right-of-Way (ROW): Selected technologies must not require a new dedicated ROW or grade separation because urban Honolulu has insufficient space for a new dedicated ROW, and a grade-separated system was previously proposed but did not obtain the required City Council Support. Suitable technologies must be able to operate at-grade on existing streets and highways. While vehicles may operate in exclusive lanes, the technology must permit at-grade cross traffic and pedestrian crossings.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Alternate Alignments Considered For In-Town BRT

Figure 2.6-2

- Line Capacity: Selected technologies must have the capacity to move more than 3,000 passengers per hour per direction because travel demand forecasting indicates that this is the approximate line haul requirement in 2025.
- Emissions and Noise: Air pollution emissions from selected technologies must be substantially lower than the 2004 EPA regulations provided below. Once adopted, the EPA's 2004 regulations will apply to all transit vehicles, including those powered by diesel engines. Noise emissions must not exceed those of a conventional light rail vehicle or trolley bus with electric propulsion.
- Service Proven: Selected technologies must either show sufficient maturity, or the technology must be in an advanced stage of development. If the technology is not yet "proven in revenue service", the risk associated with implementing a developmental technology must be carefully weighed.
- Affordability: Selected technologies must have system costs per unit length not exceeding that of an at-grade light-rail line of $37 million per kilometer ($60 million per mile).
- Safety: Selected technologies must meet local and national life/safety requirements.
- Accessibility: Selected technologies must comply with Americans with Disabilities Act (ADA) requirements.
- Visual Impact: Selected technologies must not require an overhead guideway or overhead contact system (overhead wires, or catenaries) for wayside propulsion that disrupts mauka-makai views.
- Flexibility: Selected technologies must have the capability to be re-routed around blockages, and not preempt parades and other activities along the alignment.
- Sense of Permanence: Selected technologies must represent a substantial government commitment to a specific alignment in order to evoke the desired land use response from land developers.

Many conventional and emerging technologies were compared against these criteria. These technologies are described in more detail in <u>Product 1-6 Technical Paper Assessing the Capabilities of Selected Transit Technologies</u> (July, 1999) and <u>In-Town BRT Technology Report</u> (April, 2000) and include:

- Rail Rapid Transit;
- Commuter Rail;
- Light Rail Transit (LRT);
- Monorail;
- Automated Guideway Transit (AGT), including Automated People Movers;
- MAGLEV (magnetically levitated vehicles);
- Light-Duty Bus;
- Standard Bus;
- Conventional Trolley Bus (with overhead wires—"catenary");
- Tram-on-Tires (large multi-articulated bus-type vehicle, some with catenaries);
- Articulated Diesel-Powered Bus;
- Articulated Hybrid-Powered Electric Bus; and
- Articulated Electric Bus Powered from Embedded Power Plates

Based on the screening criteria, the following technologies were eliminated as candidates for the In-Town transit segment:

- Light-Duty Bus: does not provide adequate capacity for the line haul requirement of the In-Town segment.
- Tram-on-Tires operated in driverless mode: not considered safe for operation at-grade in mixed traffic, hence requires dedicated ROW.
- Conventional Trolley Bus: requires overhead catenary wires with negative visual impact.
- Rail Rapid Transit: too expensive, and requires grade separation and exclusive ROW.

- Commuter Rail: too expensive, and requires exclusive ROW.
- Light Rail Transit: A detailed comparison of LRT technology with modern electric bus technology is provided later in this Section. While this technology was included in the initial alternatives, it was later rejected because of the relatively high costs associated with track work and utility relocation. In the end most LRT performance could be achieved with electric bus technology at a substantially reduced cost.
- AGT: requires grade separation and exclusive ROW.
- Monorail: requires grade separation and exclusive ROW.
- MAGLEV: too expensive, technology not sufficiently mature, and requires grade separation and exclusive ROW.
- Standard and/or Articulated Low-Floor Diesel-Powered Buses: would not meet project emission and noise goals for the In-Town transit spine.

Propulsion systems using Compressed Natural Gas (CNG) were also eliminated due to the unavailability of and lack of infrastructure for natural gas on Oahu.

The technologies currently under consideration are: (1) rubber-tired, (2) low floor, (3) driver operated, (4) located at-grade, typically in a street lane, (5) able to be crossed by pedestrians and other traffic, (6) single articulated, (7) capable of operating under their own power for at least short distances to avoid disruptions in the transitway, and (8) electric powered.

The requirement for electric power is driven by concerns about air and noise emissions. Electric power would be provided either from a touchable power strip embedded in the street (embedded plate technology), or on-board hybrid electric propulsion in which a diesel engine powers an alternator which produces electricity. The electricity is stored in a battery, and the power is distributed by cable to electric "hub motors", located on each wheel. In this manner, it is possible to eliminate the drive train, facilitating a "low floor" vehicle configuration.

The resulting candidate technology options for the In-Town BRT vehicle are:

- Articulated low-floor hybrid-powered electric bus; and
- Articulated low-floor electric bus powered by an embedded plate power collection system.

Since both of these are emerging technologies the impact analyses in the MIS/DEIS are designed to permit either option to be selected at a later date. The degree to which each technology would produce different impacts is discussed in the MIS/DEIS where there would be a difference.

Fuel cell technologies were also considered, but the commercial availability of fuel cells is not expected to be soon enough for application in Honolulu.

2) Detailed Comparison of Light Rail and Electric Bus Technologies

At the time the EISPN and NOI were issued, both LRT and BRT were under consideration for the Urban Core. Subsequent to the issuance of the EISPN and NOI, and the scoping process, technical analysis led to a decision to drop the LRT option. Analysis showed that BRT technology could provide the service characteristics required in the Urban Core at a much lower cost than LRT. Moreover, considering the specific conditions and goals of this project, BRT was determined to be superior to LRT in critical ways – so much so that further study of LRT was deemed to be unjustified.

The following discussion amplifies the comparison between LRT and BRT technologies.

Similarities

a) Performance: Speed, Capacity and Noise

Both LRT and BRT technologies would have similar performance characteristics, especially when applied to the central, highly urbanized section of the Urban Core. At in-town speeds, both would have similar acceleration rates; and nominal emergency braking rates would also be similar.

While LRT technology could be configured to provide far greater peak line capacity through the use of multi-vehicle trains, ridership estimates for the corridor indicate that both LRT and BRT technologies would meet the capacity needs for the foreseeable future.

From the perspective of noise and vibration impacts, especially at the proposed operating speed in the range of 56 kilometers per hour (35 mph), no significant differences would exist between the two technologies. Speeds in the range of 56 to 64 kilometers per hour (35 to 40 mph) represent a "break point," above which steel wheels on steel rails would be somewhat quieter than comparable electric-powered rubber-tired vehicles, and below which slower speeds would slightly favor rubber tires over steel wheels.

The noise differences are not large, however, and vehicles of both technologies would run more quietly than diesel buses. In sharp curves, rubber tires have an advantage because wheel squeal could occur with steel-wheeled vehicles.

b) Sense of "Permanence"

The major transit investment should not only be compatible with, but reinforce, the City's growth shaping goals. To achieve this, the transit system should be seen as a permanent, form-giving component of the mobility system that serves the Urban Core.

For the transit system to achieve a sense of permanence, it should have formal transit stops, be fixed in a permanent alignment, and be designed to be compatible with the varied communities through which it passes. If designed properly, a transit system that would use either steel-wheeled or electric-powered rubber-tired vehicles could achieve this objective.

c) Alignment Flexibility

Both technologies would have the ability to traverse relatively sharp curves and steep grades. BRT vehicles could make tighter turns than LRT vehicles, however based upon the proposed alignment in the Urban Core, no apparent constraints exist which would strongly favor one technology over the other.

d) Exclusive Street-Level Alignment

The most important performance features both technologies could achieve would be higher average speeds, higher frequency service, greater ultimate capacity, and far more reliable service than buses or streetcars in mixed traffic. This would be accomplished by providing, as much as possible, an exclusive lane for the transit vehicles in both directions of travel, preferably in a median alignment.

e) Power Source

Both the LRT and BRT technologies recommended for the In-Town system would be powered by electric motors. LRT technologies require wayside power delivery systems. While the traditional form of wayside power supply for an LRT system is overhead wires, the recommended wayside power distribution system would be a relatively new in-street buried electric power distribution and collection technology referred to as "embedded plate". Embedded plate technology could also be used for the BRT vehicles. Hybrid diesel/electric buses do not require a wayside power delivery system, since the power is generated on-board.

f) Achieving Positive Separation From Traffic

Both vehicle technologies could operate in mixed traffic or could be configured to operate in exclusive lanes so that automobiles, trucks, bikes and buses only cross the tracks at traffic signal-controlled intersections.

If mixed traffic were to be allowed with through and turning automobiles on the transitway, the operation would become very slow and unpredictable – analogous to a streetcar or conventional bus. The travel time, ridership, and urban design advantages would be largely lost. Therefore, to the maximum extent possible, both technologies should be separated from adjacent lanes by positive protection, consisting of curbs.

g) Level Boarding

Both technologies would use either partial or 100 percent low-floor vehicle designs, which speeds ingress and egress for all passengers, and facilitates accessibility for physically-disabled individuals. With floor heights as low as 28 centimeters (11 inches) to approximately 61 centimeters (24 inches), these vehicles would allow the system to use stations with relatively low, unobtrusive platforms, and still provide level passenger loading without steps.

Differences

In all the important ways just described, both LRT and BRT technologies could meet the requirements for the transit spine, and could do so attractively and efficiently. Differences, however, exist and those have been considered.

a) Station Interface and Accessibility

An advantage at stations would exist if vehicles operating in the exclusive section of the system were guided.

Through positive guidance, it is possible to control the interface between a LRT vehicle and the station platform such that the platform-to-vehicle floor gap (both horizontal and vertical) would be within the limits specified by the Americans with Disabilities Act (ADA) for wheelchair accessibility.

For LRT vehicles, level boarding would be achieved from the guidance provided by steel rails embedded in the street and vehicle suspension characteristics designed to meet the gap requirements.

Conceptually, a similar capability could be obtained for BRT vehicles using a guided technology.

With non-guided vehicles, it is possible to have the vehicle operator steer the bus to a berthing position and equip the vehicle with a relatively simple on-board ramp which would deploy to bridge the remaining gap. This is successfully done on a number of existing transit systems.

b) Operating Labor/Training of Vehicles

Higher-capacity vehicles and the ability to form trains would give LRT systems a potential operating labor advantage over BRT systems because one vehicle operator could be responsible for far more passengers.

Travel demand forecasts for this project, however, showed that entraining LRT vehicles would not be necessary, even during peak periods.

c) System Expansion Capability

Both the bus transitway and LRT system could be extended beyond the initial 19 kilometers (11.8 miles) to Pearlridge or the Waiawa area without having to change the headways or go to entrained vehicles.

If in the future (beyond 2025) the additional capacity needed is so large as to require multiple units, this capability can be achieved by entraining LRT vehicles, whereas BRT vehicles cannot be entrained.

d) Ridership Difference

Because the standard LRT vehicles can carry 30 to 40 percent more passengers per vehicle than articulated electric buses, and can be entrained, fewer vehicles are needed to serve the same level of ridership.

While positive from an operating cost standpoint, it results in less frequent service being needed with LRT vs. BRT systems. The service frequency difference resulted in approximately 20 percent fewer riders projected to use the LRT vs. BRT system.

e) Capital Cost Difference

The most significant cost differentiators would be the trackwork for the LRT system, and the transit vehicles.

Embedded trackwork for an LRT system is estimated to cost substantially more per mile to supply and install than the high capacity, high-quality paving needed for a BRT transitway (in the range of $8-12 million more per mile). Over approximately 19 kilometers (11.8 miles), the cost differential would be $94-142 million.

Vehicle cost differences would be less straightforward to estimate since a wide range of vehicle costs exists, depending on whether standard or customized vehicles are specified and which features are chosen. In general however, for the type of vehicles viewed as best suited to serve the transit spine, the cost differences could be as much as $2 million per vehicle, with electric buses being less expensive than LRT vehicles. Even considering that fewer LRT vehicles would be required than electric buses (due to the per vehicle capacity differential) there would still be a substantial total cost savings in rolling stock with electric buses.

Mitigating this cost differential, however, is the useful life of the transit vehicles. Potential BRT vehicles span a range, but generally require replacement at the standard replacement interval for buses of 12 to 15 years. In contrast, LRT vehicles would require replacement at the standard LRT interval of 25 to 30 years. The longer useful life of the LRT vehicles would over time offset the greater initial cost for LRT vehicles.

f) Cost Summary

The total BRT system construction cost savings assuming the embedded plate technology would be on the order of 35 percent, compared to a comparable LRT system when trackwork, life cycle vehicle costs and other fixed facility savings are considered. The cost difference would be slightly greater if the comparison was between LRT and BRT systems using hybrid diesel/electric vehicles.

Evaluation of BRT and LRT Technologies

The following evaluation criteria were used to evaluate the performance of LRT vs. BRT systems:

1) mobility;
2) growth-shaping and land use;
3) quality of life and livability;
4) capital and operating/maintenance costs;
5) and cost-effectiveness.

In the following comparison the physical alignment and station locations would be the same for both technologies. The only differences between them would be the technology used and the associated operating and performance characteristics (i.e. vehicle capacities, frequency of service, etc.).

a) Criterion One: Improve Mobility

Ridership would be different on an LRT vs. BRT system because of the difference in the frequency of service. Because of larger size of standard LRT vehicles, the headways on an LRT system would be longer to serve the same number of passengers. Because of the less frequent service on an LRT system, some passengers would find an LRT system less attractive than a BRT system with shorter headways. Therefore, ridership projections for the BRT option were forecast to be almost 20 percent greater than on the LRT alternative because of the more frequent service.

b) Criterion Two: Growth-Shaping

Both LRT and BRT systems in a transitway with similar transit stops would impart a sense of "permanence" to help catalyze transit-oriented development along the alignment. Quantifying the difference is not possible since there are very few arterial BRT installations in the world similar to what is being proposed for Honolulu. Also the track record of BRT systems is too short to be able to observe the evoked land use response. The perception of "permanence" (a permanent government commitment to a particular alignment) is likely to be greater with an LRT system because of the increased level of fixed investment in the alignment (e.g., investment in trackwork). Therefore, the evoked land use response may be somewhat greater from an LRT system than a BRT system.

c) Criterion Three: Quality of Life and Livability

Quality of life was evaluated from the perspective of the amount of noise and air pollution which would be experienced by people along the In-Town transit alignment. Livability was assessed from the standpoint of visual orientation, streetscape, and scale; in other words, a sense of place.

Noise Levels

The passby noise of an LRT vehicle operating at 48 kilometers per hour (30 mph) at a distance of 15 meters (50 feet) is 78 dBA in comparison to a BRT vehicle, which has a passby level of 75 dBA. This is a difference of 3 dBA, which is a "perceptible" to "noticeable" change in noise level. Therefore, the passby noise from an electric bus would be somewhat quieter than the passby noise from an LRT vehicle.

Although LRT vehicles are electric-powered, wheel squeal due to steel wheels running on steel rails in areas with tight turning radii could generate noise.

Vibration impacts could also occur with the LRT technology, although these impacts would be mitigated.

In sum, electric bus technology would have slightly lower noise levels than LRT technology due to the use of rubber tires. Vibration impacts would also be less.

Air Quality

LRT vehicles and electric buses powered by embedded plate technology would emit no air pollutants at street level. Hybrid diesel/electric buses would emit minimal levels of air pollutants because the diesel generator would be operating at peak efficiency from an environmental perspective.

d) Criterion Four: Capital and Operating Costs

Capital costs for the In-Town BRT system would be 35 percent less than with an LRT system on the same alignment. This cost difference even reflects the need to replace buses on a 12 year replacement cycle while LRT vehicles have a 30 year useful life. The added cost for the LRT option reflects the high costs of trackwork, yards and shops. Vehicle costs would actually be somewhat less for the LRT option when the less frequent replacement cycle and smaller fleet requirements are taken into account.

Annual systemwide transit operating and maintenance costs were also estimated for each alternative for the forecast year 2025. Operating and maintenance costs would be essentially the same for the LRT and BRT options.

e) Criterion Five: Cost-Effectiveness Analysis

Cost-effectiveness analysis compares the ridership gains with the costs for each alternative. This analysis has become an important part of the federal procedures for analyzing major transit projects. A project's cost-effectiveness index (CEI) is determined by a formula that measures the project's net cost per new passenger that would be attracted to a build alternative relative to the TSM Alternative . Therefore, when two project alternatives are compared in terms of their CEIs, the one with the lower index represents the more cost-effective of the two.

The CEI for the BRT option is very competitive compared to other national projects competing for funding. The cost per new rider gained with the LRT would be 2.8 times as costly as with the BRT. As a result, the CEI for the LRT option would be substantially less competitive in competing for FTA New Starts funds than the BRT Alternative.

f) Summary of Evaluation Findings

The BRT option would be the most advantageous in meeting the islandwide and in-town mobility needs while supporting all of the livability goals because it has the highest ridership. The cost-effectiveness of the BRT option would be competitive with projects currently recommended for funding by FTA. The LRT option would be substantially less competitive. Therefore, the LRT option was eliminated because most of the performance of an LRT system could be achieved at a substantial cost savings with low-floor, electric-powered, articulated bus technology. Additionally, advanced bus technologies (embedded plate and hybrid diesel/electric) offer the quality of life benefits (e.g., reduced or no air and noise emission levels) previously associated only with LRT technology. In summary, a BRT system provides the features needed for Honolulu at substantially lower cost than an LRT system.

Primary Corridor Transportation Project

Chapter 3.0
Affected Environment

CHAPTER 3 AFFECTED ENVIRONMENT

3.0 CHAPTER OVERVIEW AND ORGANIZATION

This Chapter describes the existing social and natural environmental conditions in the primary transportation corridor. It is a requirement of both the National Environmental Policy Act (NEPA) and the State Environmental Impact Statement (EIS) Law that current conditions in the area potentially affected by a project be described in order to benchmark them. Only after the existing conditions are understood may an assessment be made of the impacts that the No-Build, Transportation System Management (TSM) and Bus Rapid Transit (BRT) Alternatives could create. Chapter 4 discusses the impacts of these alternatives on the transportation system; Chapter 5 discusses the impacts of these alternatives on other aspects of the environment.

Because of the size and diversity of the primary transportation corridor, this section focuses on parameters that:

- are most pertinent to consider for a transportation project;
- were identified for particular attention through the scoping process;
- represent particularly sensitive resources;
- would be affected differentially by the alternatives (and therefore would assist in selecting among them); or
- are required by law to be assessed.

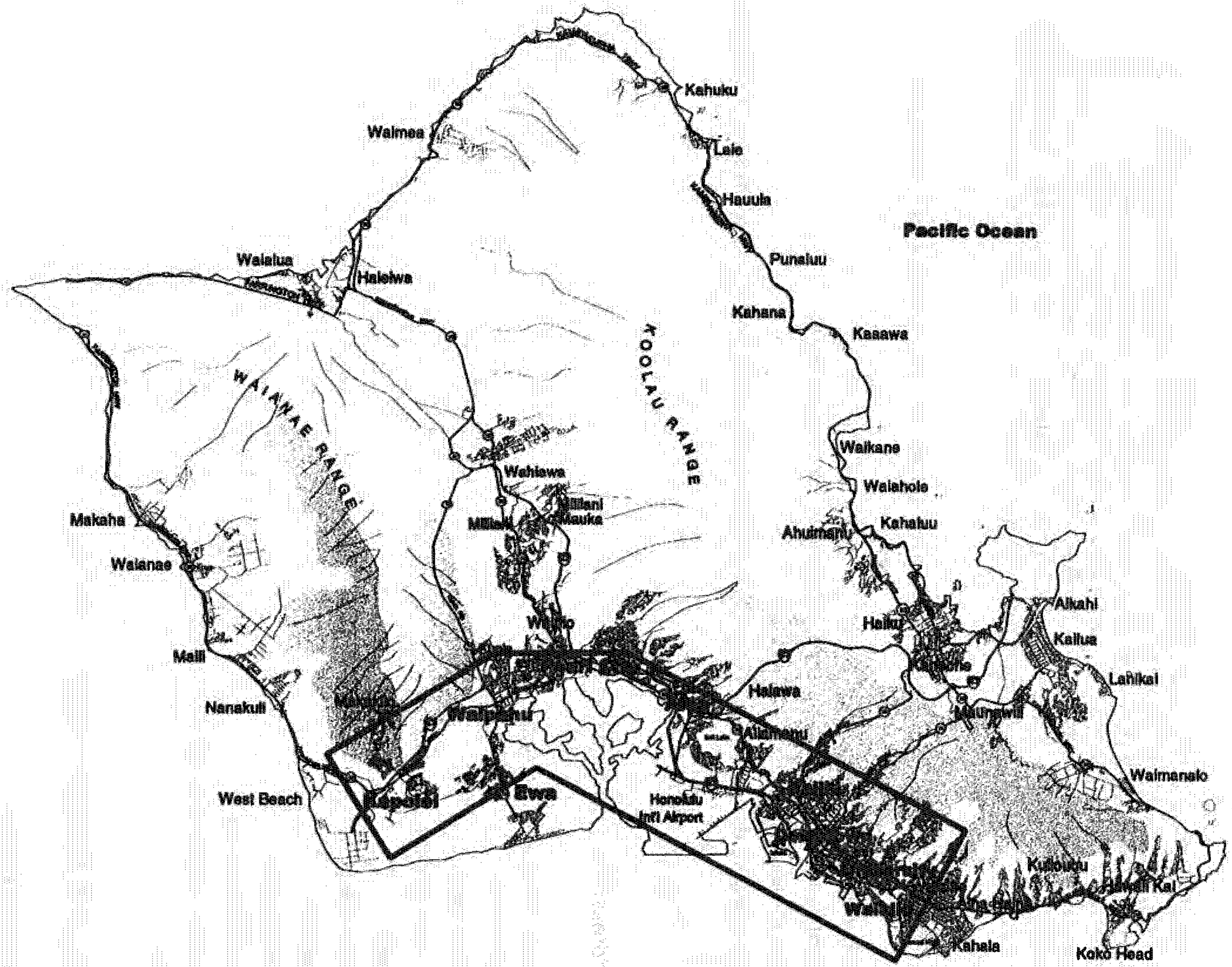
Disciplines addressed in this Chapter include:

- Land Use and Economic Activity
- Transportation
- Neighborhoods
- Visual and Aesthetic Conditions
- Air Quality
- Noise and Vibration
- Ecosystems
- Water Resources
- Hazardous Materials
- Historic and Archaeological Resources
- Parklands

3.1 LAND USE AND ECONOMIC ACTIVITY

3.1.1 Regional Summary

Oahu is 71 kilometers (44 miles) long and 48 kilometers (30 miles) wide, containing almost 153,748 hectares (380,000 acres) of land surrounded by a coastline of 180 kilometers (112 miles). Because much of the land is mountainous, only about 54 percent of the total area is potentially developable (see Figure 3.1-1). The island is the most populous in the Hawaiian Archipelago, and comprises the City and County of Honolulu. Based on



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N

Scale: 0 2 4 mi
Scale: 0 4 8 km

Primary Transportation Corridor Study Area

Figure 3.1-1

State land use classifications, 25 percent of Oahu is classified as Urban, 35 percent is classified as Agriculture, and the remaining 40 percent is classified as Conservation.

3.1.2 General Study Area

The primary transportation corridor is by far the most urban region on Oahu and in the State, supporting over 60 percent of the island's population and over 80 percent of all employment. The City and County of Honolulu divides Oahu into eight Development Plan Areas (DP Areas), each with specific land use objectives and development requirements as discussed below. Figure 3.1-2 illustrates the DP Areas.

1) Primary Urban Center (PUC) DP Area

The PUC extends from Pearl City at the Ewa end to Waialae-Kahala at the Koko Head end, and is bounded on the north by the Koolau Mountain Range and on the south by the coastline (see Figure 3.1-2). The Fiscal Year 1998 Development Plan Annual Review (September 1, 1998) shows that approximately 16 percent of the 26,300 hectares (65,000 acres) within the PUC is designated for residential use; four percent is designated for commercial/industrial use; 12 percent is designated for public facilities, including parks; 54 percent is designated for preservation; and 14 percent is used by the military.

The PUC is by far the most populated DP Area. In 1990, its resident population was 432,000, or close to 52 percent of the island total. In the 1980s, population in other parts of the island increased at a faster rate than in the PUC. This is due in part to a substantial increase of affordable housing in the Ewa and Central Oahu DP Areas during this period, shifting population growth from the PUC to these outlying regions.

In 1990, 156,400 residential units, or 57 percent of the island total, were in the PUC. The housing stock of this DP Area is diverse, varying from single-family dwellings to high-rise apartment buildings. The density of units in the PUC is higher than in any of the other DP Areas.

2) Ewa and Central Oahu DP Areas

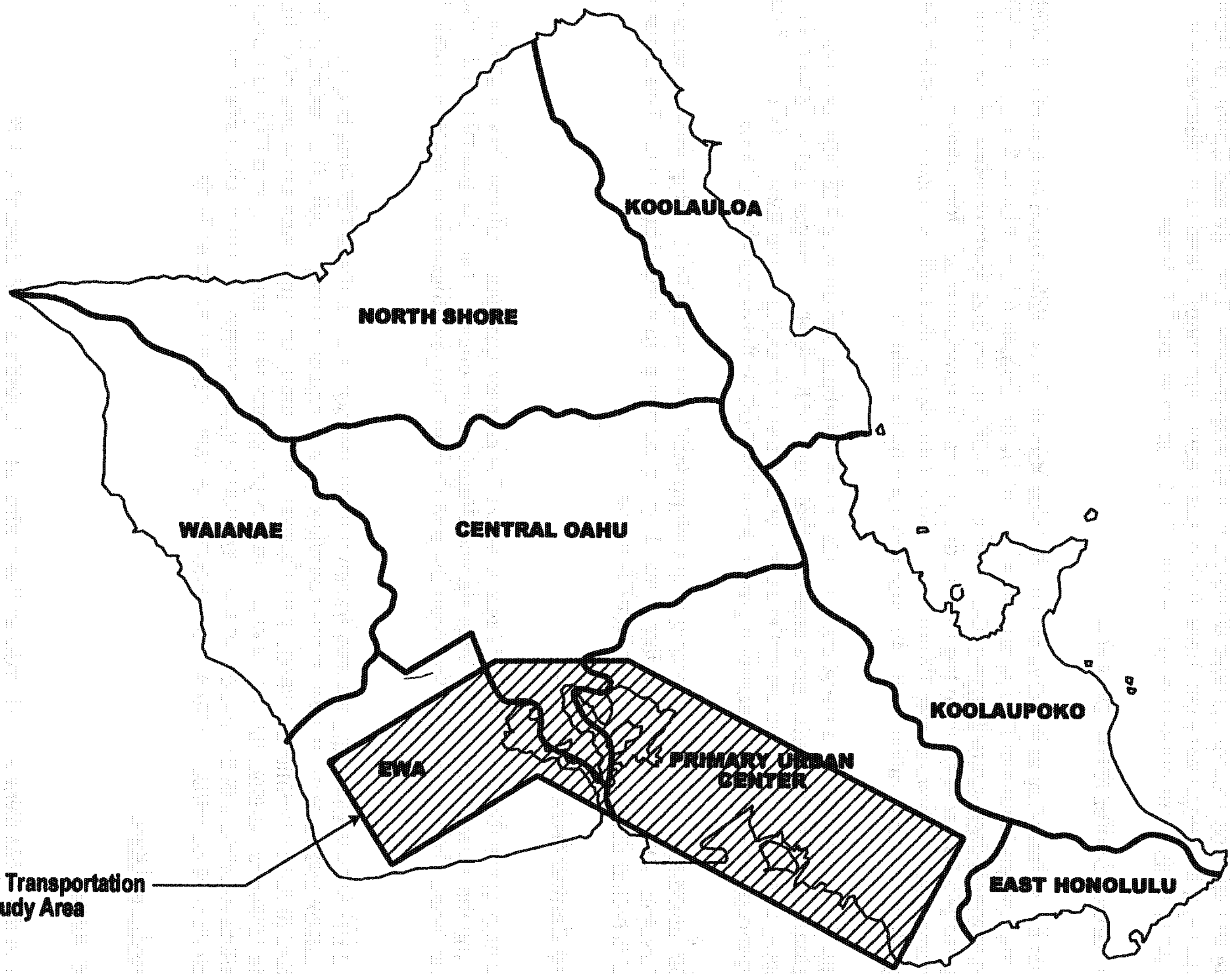
The southern portion of the Central Oahu DP Area is within the primary transportation corridor, including Waipahu Town and the surrounding Kunia, Waikele and Waipio communities. The Central Oahu DP Area contains the wide fertile plateau between the Waianae and Koolau Ranges previously in extensive agricultural use.

Much of the Ewa DP Area is within the primary transportation corridor. Much of this DP Area is a low elevation plain that extends from sea level at the coastline to an elevation of only about 30.5 meters (100 feet) 4.8 to 8 kilometers (three to five miles) inland. Like Central Oahu, the Ewa region was once one of Oahu's prime sugarcane cultivation areas, but is now experiencing urban growth as the State, and City and County of Honolulu support development of the region as the "secondary urban center" of Oahu. Diversified agricultural activities, as well as park construction have also begun on certain abandoned cane fields.

3.1.3 Corridor Land Uses

1) PUC DP Area

The PUC features the most diverse land uses on the island (see Figures 3.1-3A through 3.1-3C). Developable areas in the valleys and on the Koolau ridges support primarily single-family residential uses, such as the neighborhoods of Manoa, Pacific Heights, Nuuanu, Kalihi Valley, Halawa Heights, Newtown, Pearl City Uplands, and Pacific Palisades. Multi-family residential areas are predominantly in Waikiki, McCully-Moiliili, Kaheka, Makiki- Punchbowl, upper Downtown, Kalihi-Palama, Salt Lake, and Pearlridge.

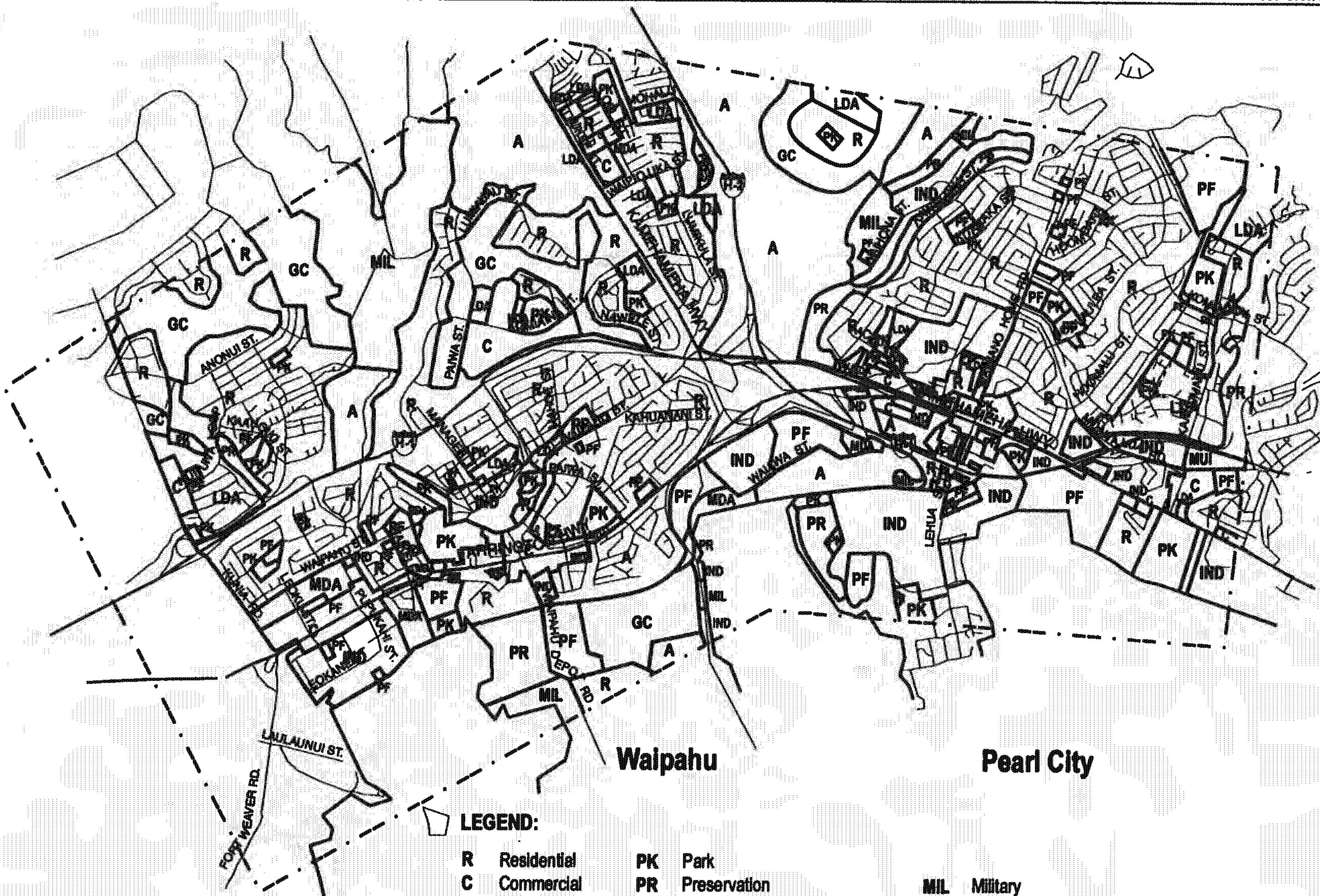


SOURCES:
ESRI Atlas GIS v4.0 1998; City and County of Honolulu, Department of Planning & Permitting.

N
Scale: 0 2 4 mi
Scale: 0 4 8 km

Development Plan Areas

Figure 3.1-2



LEGEND:

R	Residential	PK	Park		
C	Commercial	PR	Preservation	MIL	Military
A	Agricultural	PF	Public Facility	MUR	Mixed Use Residential
GC	Golf Course	LDA	Low Density Apartments	MUC	Mixed Use Commercial
IND	Industrial	MDA	Medium Density Apartments	MUI	Mixed Use Industrial

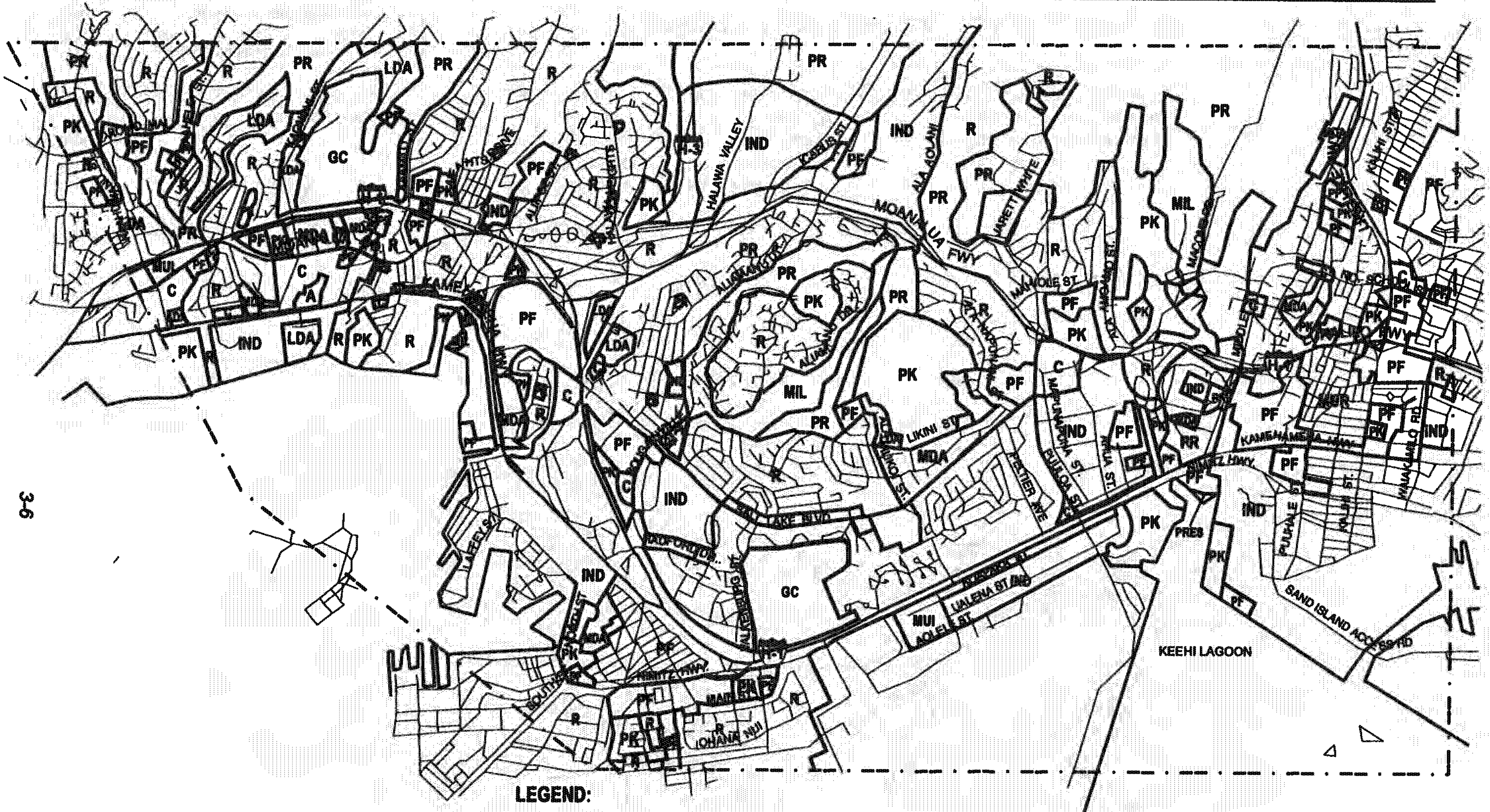
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Development Plan Land Use: Waipahu - Pearl City

Figure 3.1-3A



LEGEND:

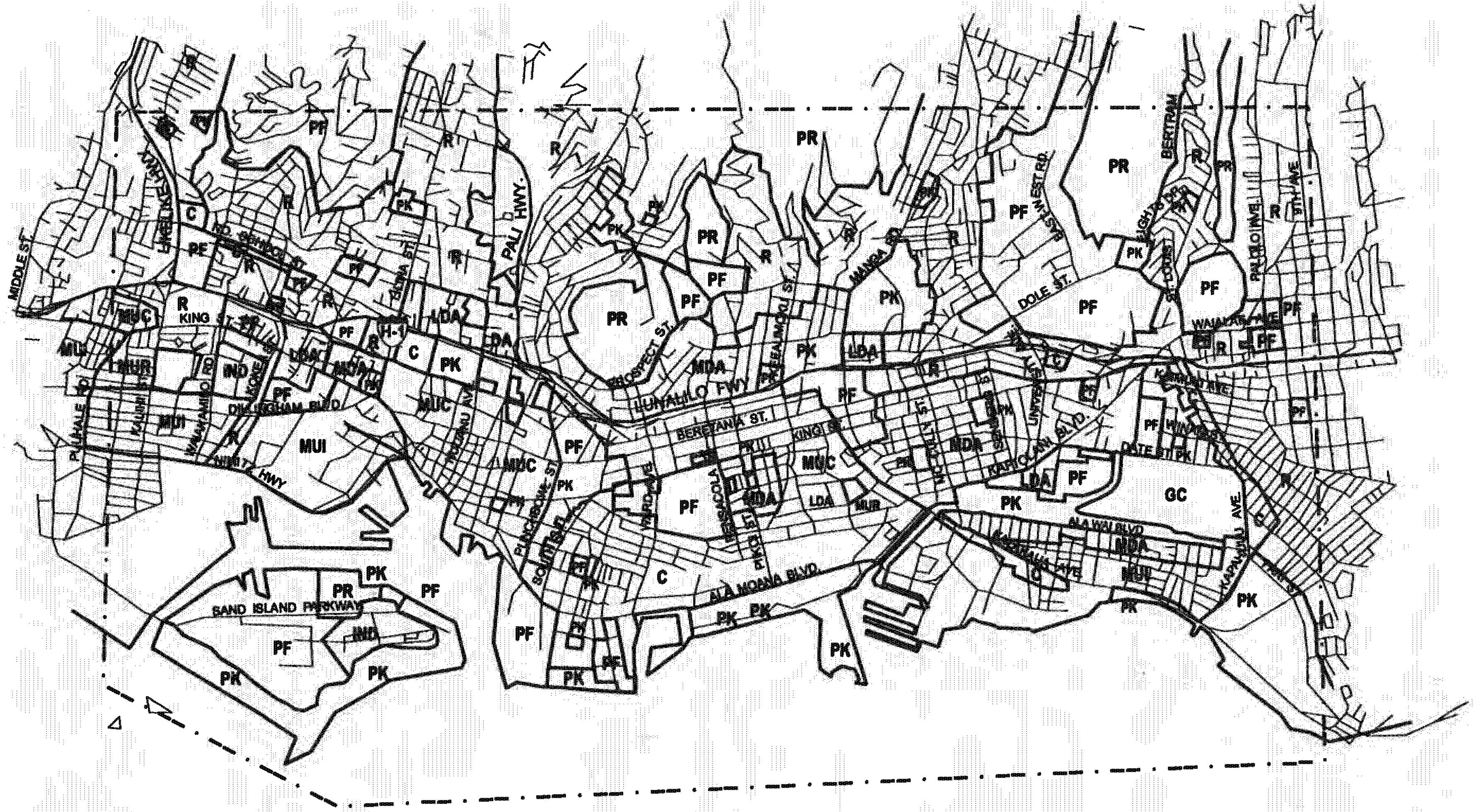
R	Residential	PK	Park		
C	Commercial	PR	Preservation	MIL	Military
A	Agricultural	PF	Public Facility	MUR	Mixed Use Residential
GC	Golf Course	LDA	Low Density Apartments	MUC	Mixed Use Commercial
IND	Industrial	MDA	Medium Density Apartments	MUI	Mixed Use Industrial

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Development Plan Land Use: Aiea - Fort Shafter

Figure 3.1-3B



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

LEGEND:

R	Residential	**PK**	Park		
C	Commercial	**PR**	Preservation	**MIL**	Military
A	Agricultural	**PF**	Public Facility	**MUR**	Mixed Use Residential
GC	Golf Course	**LDA**	Low Density Apartments	**MUC**	Mixed Use Commercial
IND	Industrial	**MDA**	Medium Density Apartments	**MUI**	Mixed Use Industrial

N

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Development Plan Land Use: Kalihi - University

Figure 3.1-3C

Industrial uses are mainly located in Kakaako, Iwilei, Kalihi-Kalihi Kai, Sand Island, Mapunapuna, the Airport, Pearl Harbor, and Halawa and Waiawa Valleys.

The PUC remains the center of government, business, economic, and cultural activities in the State. The PUC contains most of the major employment centers on the island, such as the Honolulu International Airport, and Sand Island and Mapunapuna industrial districts; Downtown Honolulu including the adjacent Capitol District; and Waikiki. In 1990, the PUC contained about 390,000 jobs, or 77 percent of the total civilian employment on the island.

The PUC also contains a substantial military presence, mostly in the western portion. Pearl Harbor Naval Complex, Hickam Air Force Base, Tripler Army Medical Center, and Fort Shafter are the main military installations. Combined employment at these installations is 23,046 (State Databook, 1998).

Office, retail, service, and government centers are located primarily between Kalihi-Palama and Kaimuki, an area constituting the urban core of Honolulu ("Urban Core"). The Urban Core is extremely diverse in terms of land uses: low to high-density residential; small to large-scale commercial and industrial establishments; and recreational facilities ranging from small neighborhood parks to large regional parks, such as Ala Moana and Kapiolani Parks. This area contains Chinatown, the island's central business district (Downtown Honolulu), the State Capitol, City Hall (Honolulu Hale), and the State's largest visitor accommodation and activities center, Waikiki. A smaller commercial area is located on the western side of the PUC, between Aiea and Pearl City.

2) Central Oahu DP Area

Central Oahu DP Area land uses include prime agricultural lands, military installations, and a few major residential communities. Over the last two decades, the land use focus of Central Oahu has been residential development, although there is a small high technology park near Mililani. Most of the new housing has been developed in master planned communities of Mililani, Waipio, Waikele and Kunia.

Waipio, Waikele and Kunia are relatively new suburban communities of single-family and low-density townhouses. All three contain large commercial shopping centers: Waipio Shopping Center, Royal Kunia Shopping Center, and Waikele Shopping Center. The latter two draw shoppers from other parts of the island, and tourists.

Waipahu is one of central Oahu's oldest communities, generally bounded by Waiawa Interchange to the east, Pearl Harbor West Loch to the south, the H-1 Freeway to the north and Fort Weaver Road to the west. While originally a set of plantation villages built around the Waipahu Sugar Mill and segregated by ethnicity, since the end of the Second World War, Waipahu has transformed into suburban and commercial land uses. Today, the northern part of Waipahu is predominantly single-family residential, and the southern portion along Farrington Highway is mixed-use commercial, light industrial and low- to medium-density apartments. The commercial uses consist of strip malls and car dealerships along the highway.

Mililani has a population of approximately 40,000 residents as well as a regional shopping center and several community shopping centers. It is immediately outside the primary transportation corridor. However, most of the workers who live there are commuters who use the corridor on a daily basis.

3) Ewa DP Area

Ewa has experienced rapid residential growth within new master planned communities. The oldest community in the region is Ewa Villages, which was built in the 1890s and consisted of eight villages housing immigrant plantation workers, segregated by national origin. Ewa Villages is currently undergoing redevelopment to provide newer housing and commercial uses. Ewa Beach, Honokai Hale, and Makakilo were developed from the 1950s through the 1970s, and both are still expanding. Newer communities include

West Loch, Ewa Gentry and the Villages of Kapolei. Newer communities consist mostly of single-family residences or low-density townhouses.

The City of Kapolei, located in the western portion of the Ewa DP Area, is being developed as the "second city" of Oahu. Existing land uses include a community shopping center, a 16-screen movie theater complex, a 30-hectare (73-acre) regional park, an office complex, a bank office building, and a State office building. A State Public Library is planned. A City and County Civic Center is under construction, and a new police station has recently opened. Other employment areas in Ewa include Kalaeloa (formerly Barbers Point Naval Air Station), Campbell Industrial Park, and Ko Olina resort. Campbell Industrial Park, located just west of the primary transportation corridor, contains approximately 190 businesses on 553 hectares (1,367 acres), including the State's two petroleum refineries, large warehouses and distribution facilities. Ko Olina, also west of the corridor, is a 405-hectare (1,000-acre) resort that includes a premier hotel, four sandy lagoons, a golf course and clubhouse, and a marina. Townhouse developments are presently under construction, and substantial further growth for Ko Olina is planned.

Agriculture in the Ewa DP Area continues despite urban encroachment. Since the end of sugarcane cultivation in the early-1990s, small-scale leased farms cultivating diversified agricultural crops have begun to operate in old sugarcane fields between Waipahu and the Villages of Kapolei.

3.1.4 Proposed Development Projects

The City of Kapolei, the area from Pearl City to Aloha Stadium, and the area from Middle Street to Kapahulu and Waialae Avenues (the "Urban Core") contain many projects in the planning or construction phases. Table 3.1-1 shows proposed development projects in the primary transportation corridor. As they are implemented, these projects will influence adjacent land uses.

3.1.5 Plans and Policies

1) State Plans, Policies and Controls

Land Use Plans and Controls

Hawaii State Plan

The Hawaii State Plan (June 1991) consists of comprehensive goals, objectives, policies and priorities in all areas of government functions. These functions include the protection of the physical environment, the provision of public facilities, and the promotion and assistance of socio-cultural advancement.

State Land Use Commission

Chapter 205, Hawaii Revised Statutes (HRS), involving the State Land Use Commission (SLUC), regulates land use by establishing four categories: Urban, Agriculture, Conservation, and Rural. The intent of the land classification is to accommodate growth while retaining important natural resources. Each district has specific land use objectives and development constraints.

Most of the lands within the primary transportation corridor are Urban. However, part of the Ewa DP Area within the corridor has an Agriculture designation. On Oahu, the City and County of Honolulu administers land uses within Urban districts, with the following exceptions:

- State lands, such as lands controlled by the State of Hawaii Department of Transportation (e.g., portions of Honolulu Harbor, Honolulu International Airport and State roadway facilities) or the Hawaii Department of Land and Natural Resources (e.g., submerged lands and state parks);
- Areas controlled by the military;

TABLE 3.1-1
PROPOSED DEVELOPMENT PROJECTS WITHIN THE PRIMARY TRANSPORTATION CORRIDOR

Ewa DP Area
- Kalaeloa/Barbers Point Harbor expansion (UC)
- Kapolei Business Park (UC)
- City of Kapolei expansion (office buildings, civic center, commercial, etc.) (UC)
- Redevelopment of Barbers Point Naval Air Station (general aviation airport, regional park, etc.)
- Build out of the Villages of Kapolei (UC)
- East Kapolei
- Oceanpointe (formerly Ewa Marina)
- Build-out of Ewa Gentry (UC)
- Build-out of Ewa Villages (UC)

Central Oahu
- Redevelopment of Waipahu Sugar Mill site (UC)
- Build-out of Royal Kunia (UC)
- Build-out of Waikele
- Waiawa by Gentry

Pearl Harbor
- Manana redevelopment, including Pearl City Junction
- Retail expansion of Pearl Highlands Center
- Ford Island redevelopment
- Aiea Sugar Mill site redevelopment
- Kamehameha Drive-In Theater site reuse
- Redevelopment makai of Kamehameha Highway between Waimalu and Kalauao Streams

Honolulu (Urban Core)
- Various high-rise housing projects in Waikiki
- King Kalakaua Plaza, Phase II (commercial, Waikiki)
- Kalia Tower at the Hilton Hawaiian Village (new hotel tower, Waikiki) (UC)
- Various senior housing projects in McCully/Moiliili
- Entertainment complex at Ala Moana Center
- Kapiolani Akahi Continuing Care Retirement Community (UC) at Makaloa/Keeaumoku St.
- Nordstrom department store at Ala Moana Center
- Victoria Ward shopping mall (encompassing Ward Center)
- Various high-rise housing projects in Kakaako
- Kakaako Makai redevelopment
- Various housing projects in the Punchbowl area
- Bank of Hawaii office tower
- Block J redevelopment high-rise housing complex
- Aloha Tower complex expansion

Source: City and County of Honolulu Department of Planning and Permitting, 1999.
Note: Includes Committed, Under Construction (UC), and Anticipated Developments as Indicated by the City and County of Honolulu Department Planning and Permitting.

- The Kakaako Community Development District, which is administered by the Hawaii Community Development Authority (HCDA), a State authority; and
- The Aloha Tower area controlled by the Aloha Tower Development Corporation (ATDC), a State entity.

Coastal Zone Management

The objectives and policies of the Hawaii Coastal Zone Management (CZM) Program are intended to protect and manage Hawaii's valuable coastal areas and resources. Pursuant to 15 CFR 930.32, federally permitted, licensed or assisted activities undertaken in or affecting Hawaii's coastal zone must be consistent with the objectives and policies of the CZM program. The primary transportation corridor is in the CZM area.

Kakaako Community Development District Plans

Kakaako, the area east of Downtown Honolulu bounded by South Street to the west (Ewa), Kapiolani Boulevard to the north (mauka), Piikoi Street to the east (Koko Head) and the coastline to the south (makai), is a special development district under the management of the Hawaii Community Development Authority (HCDA), a State agency established for long-range community planning and development. HCDA has developed major redevelopment plans for this district, which are in various stages of implementation. These redevelopment plans are intended to make Kakaako a major activity node for residential, industrial, office, maritime and other land uses. The <u>Kakaako Community Development District Plan</u>, adopted in 1982, serves as the basis for guiding public and private development activities in Kakaako.

For planning purposes, the district has been divided into Mauka and Makai areas, demarcated by Ala Moana Boulevard.

The <u>Makai Area Plan</u>, originally prepared and adopted in 1983, was revised in 1998. The basic land use premise of the plan is that substantial portions of the 89-hectare (221-acre) Makai Area should be set aside for public enjoyment and access to the waterfront. According to the plan, the overall vision is "to create an active area through a variety of new developments, including an expansive waterfront park, maritime uses along the harbor, restaurants, seafood markets and entertainment along Kewalo Basin, a children's museum and a theater for performing arts, a world-class aquarium, and commercial development of the interior areas" (<u>Makai Area Plan</u>, August 1998).

HCDA's development strategy incorporates commercial activities, parks, restoration of the former Ala Moana Pump Station for a restaurant and Hawaiian music venue, and the inclusion of other public facilities in Kakaako Makai. As part of this strategy, current projects include infrastructure improvements to Ilalo Street and relocation of the City corporation yards out of Kakaako.

The <u>Mauka Area Plan</u> addresses 121 hectares (300 acres) north of Ala Moana Boulevard, and was revised in 1997. The overall goal of the <u>Mauka Area Plan</u> echoes that of the <u>Kakaako Community Development District Plan</u>, which is to guide private and public development in the revitalization of Kakaako. Recent improvements to Kamakee Street from Kapiolani Boulevard to Queen Street improved circulation in the Mauka Area. Higher density development, including additional medium-to-high density residential uses, are envisioned for the Mauka Area.

Aloha Tower Development Plan

The State's Aloha Tower Development Corporation (ATDC) is responsible for the redevelopment of nine hectares (22 acres) of pier area fronting Downtown Honolulu. The ATDC developed a four-phased master plan in the late 1980s for Piers 5 to 14. The proposed plan includes maritime facilities, restaurants, retail shops, offices, a hotel, and residential condominiums. Thus far, only the first phase, redevelopment of Piers 8 to 10, has been completed. Phase One consists mainly of the Aloha Tower Marketplace development, which includes restaurants and retail stores. A planning feasibility study is underway to replace the current master plan.

Honolulu Waterfront Master Plan

The Honolulu Waterfront planning area encompasses approximately 628 hectares (1,550 acres) adjoining Honolulu Harbor. The <u>1989 Honolulu Waterfront Master Plan Final Report</u> (<u>HWMP</u>) (1989), prepared for the Office of State Planning (now the Office of Planning in the State Department of Business, Economic Development and Tourism), included a variety of mixed use developments in the harbor vicinity, and a Sand

Island Parkway, including a tunnel between Sand Island and Kakaako. Portions of this Plan have been updated by the Oahu Commercial Harbors 2020 Master Plan.

State Transportation Plans

Oahu Commercial Harbors 2020 Master Plan

The State Department of Transportation (HDOT) Harbors Division prepared the Oahu Commercial Harbors 2020 Master Plan (OCHMP) (May 1997), a long-range plan for all of the commercial harbors on the island: Honolulu Harbor, Kalaeloa Barbers Point Harbor, and Kewalo Basin. The OCHMP updated separate 2010 plans prepared for Honolulu and Kalaeloa Barbers Point Harbors. The OCHMP addressed issues and needs relating to the maritime industry exclusively (e.g., cargo and passenger movements and fishing), unlike the HWMP, which addressed additional waterfront issues, such as commercial development and landside recreation.

Major port facility improvements recommended for Honolulu Harbor include a new container terminal at the former Kapalama Military Reservation, improving Kalihi Channel to establish a second harbor entrance, a cruise ship terminal at Pier 2, expansion of the Young Brothers interisland terminal at Piers 39 and 40, a roll-on, roll-off (RORO) automobile terminal at Piers 31 to 33, an excursion vessel passenger terminal at Piers 26 and 27, and berths at Piers 19 and 20 for cruise ships. Recommended roadway improvements include a perimeter roadway around Honolulu Harbor, and a roadway tunnel under Kalihi Channel (in association with deep-draft improvements to Kalihi Channel) to replace the Sand Island Bridge.

Statewide Cruise Facilities Study (Needs Assessment)

This HDOT (Harbors Division) study assessed existing and projected levels of passenger cruise ship activity in Hawaii, in part to help the State determine cruise ship infrastructure and facility requirements for each county. Recommendations included construction of a cruise ship terminal at Pier 2 in Honolulu Harbor, and development of interim cruise ship facilities at Piers 19 and 20. Physical improvements on the neighbor islands were also recommended.

Honolulu International Airport Master Plan – 2010

The Honolulu International Airport Master Plan – 2010 (State of Hawaii, Department of Transportation, Airports Division, August 1994) largely focuses on facility development within the boundaries of the airport. While there is some discussion of roadway improvements, including roads in the vicinity of the airport, such improvements are limited to street level changes, and will not directly impact the grade-separated H-1 traffic.

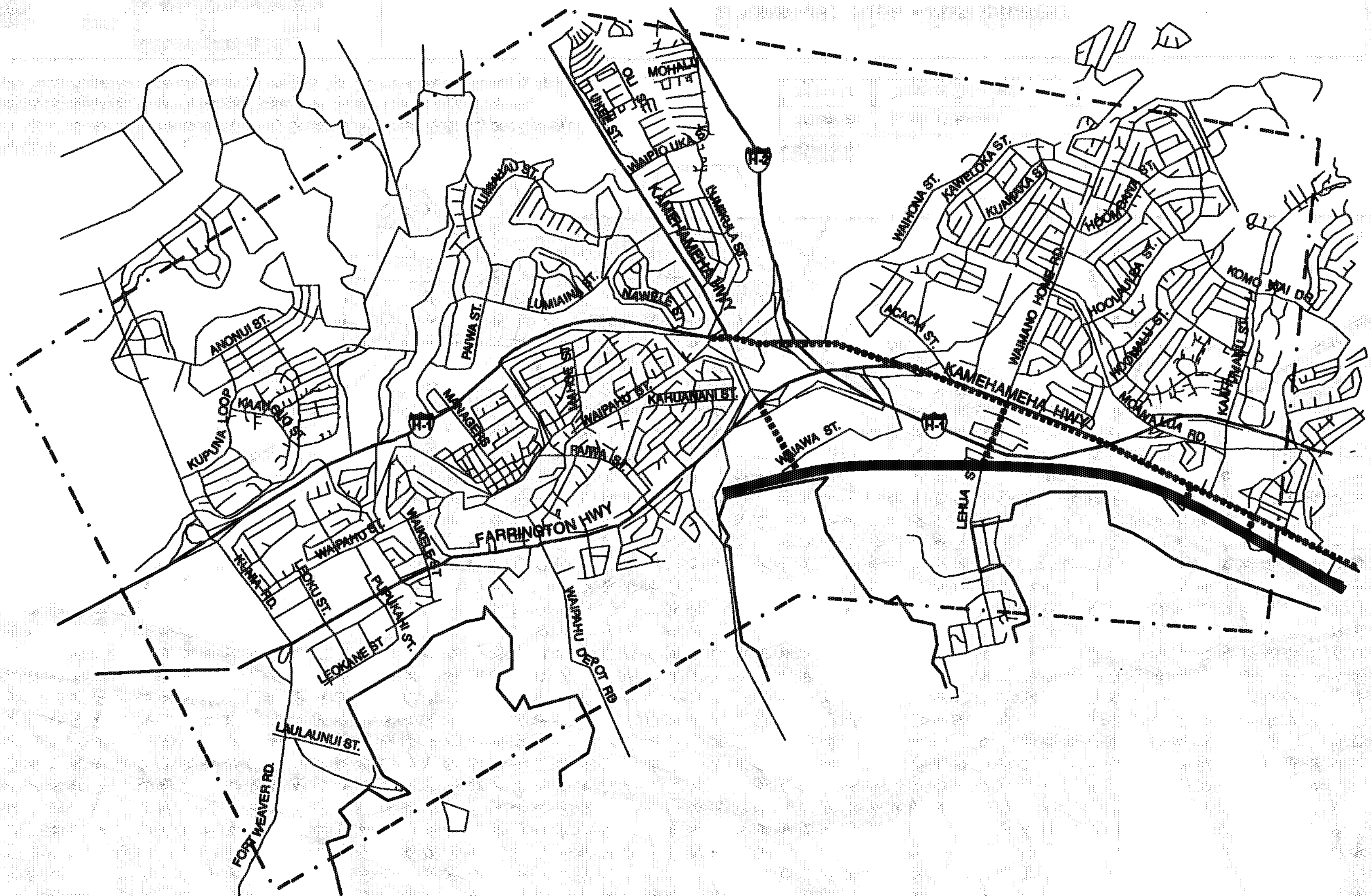
Bike Plan Hawaii

Bike Plan Hawaii (April 1994) recommended improvements to the State's bikeway systems. This Plan serves as guidance to the HDOT and county transportation agencies when roadways are built or modified. The Honolulu Bicycle Master Plan (April 1999), prepared by the City and County of Honolulu, recently supplemented this plan (the County plan is discussed more fully below). Figures 3.1-4A through 3.1-4C show existing and future bikeways, according to Bike Plan Hawaii and the Honolulu Bicycle Master Plan.

Recreational Plans

State Comprehensive Outdoor Recreation Plan (SCORP)

First prepared in 1966, the SCORP is updated every 5 years by the State Parks Division of the Department of Land and Natural Resources (DLNR). The December 1996 statewide plan provides the planning assumptions and technical basis for developing and operating recreational facilities. This document identifies existing federal and state outdoor recreational facilities, and an assessment of future demand for recreation resources and programs. Surveys and interviews conducted in conjunction with this plan in 1996 indicated that there is increasing demand for additional and safe bicycling and pedestrian corridors statewide. While demand for ocean recreational facilities will continue, future development of marinas and recreational harbors will most likely have to be carried out by private developers (p. 4-13, SCORP 1996).



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Honolulu Bicycle Master Plan - Helber Hastert & Fee Planners, Bicycle Federation of America, Engineering Concepts, Inc. & David Cheever Marketing, April 1999.

LEGEND:

▬▬	Existing Bikeways
▪▪▪▪▪▪	Proposed Bikeways

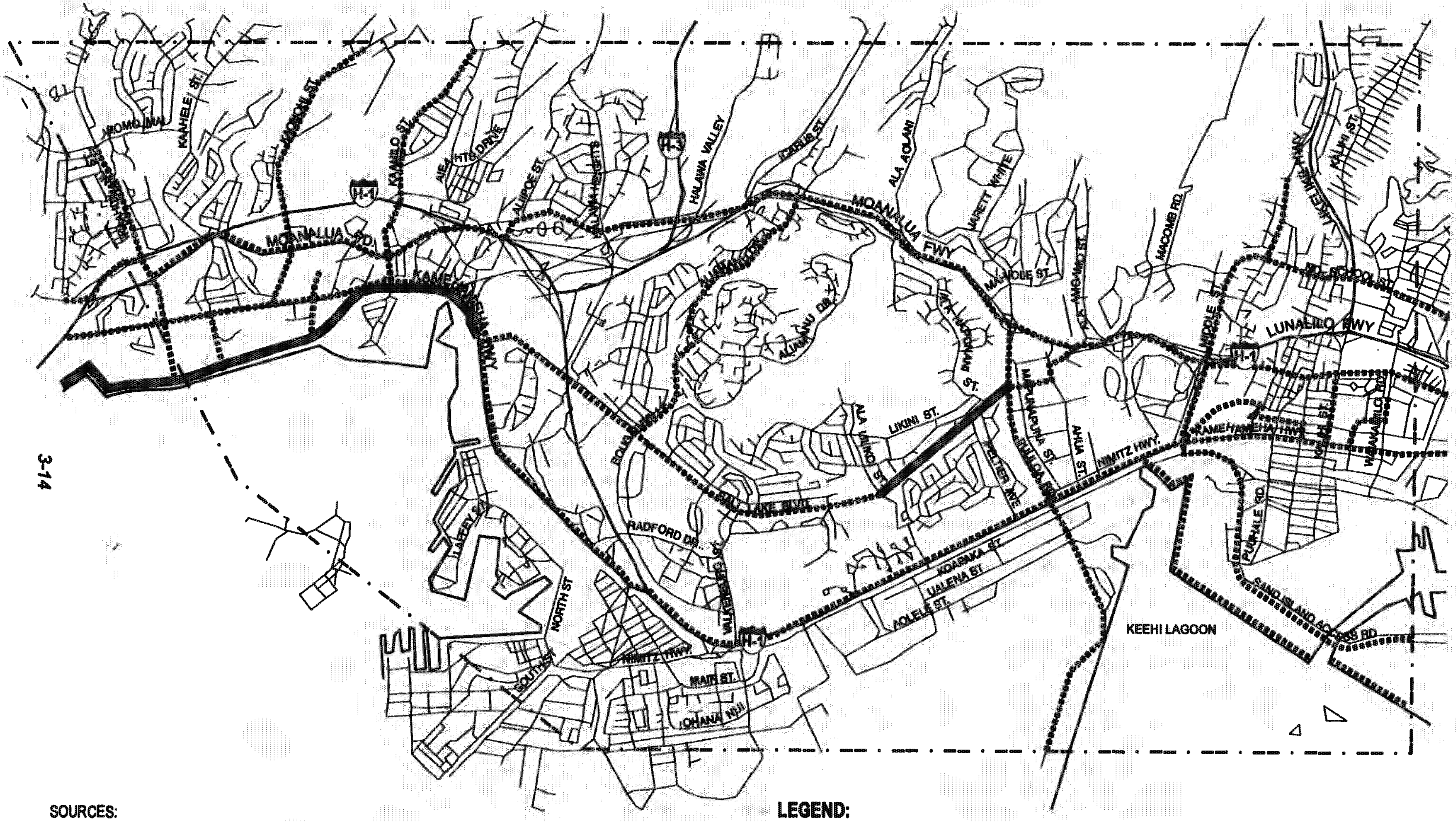
N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Bikeways: Waipahu - Pearl City

Figure 3.1-4A



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Honolulu Bicycle Master Plan - Helber Hastert & Fee Planners, Bicycle Federation of America, Engineering Concepts, Inc. & David Cheever Marketing, April 1999.

LEGEND:

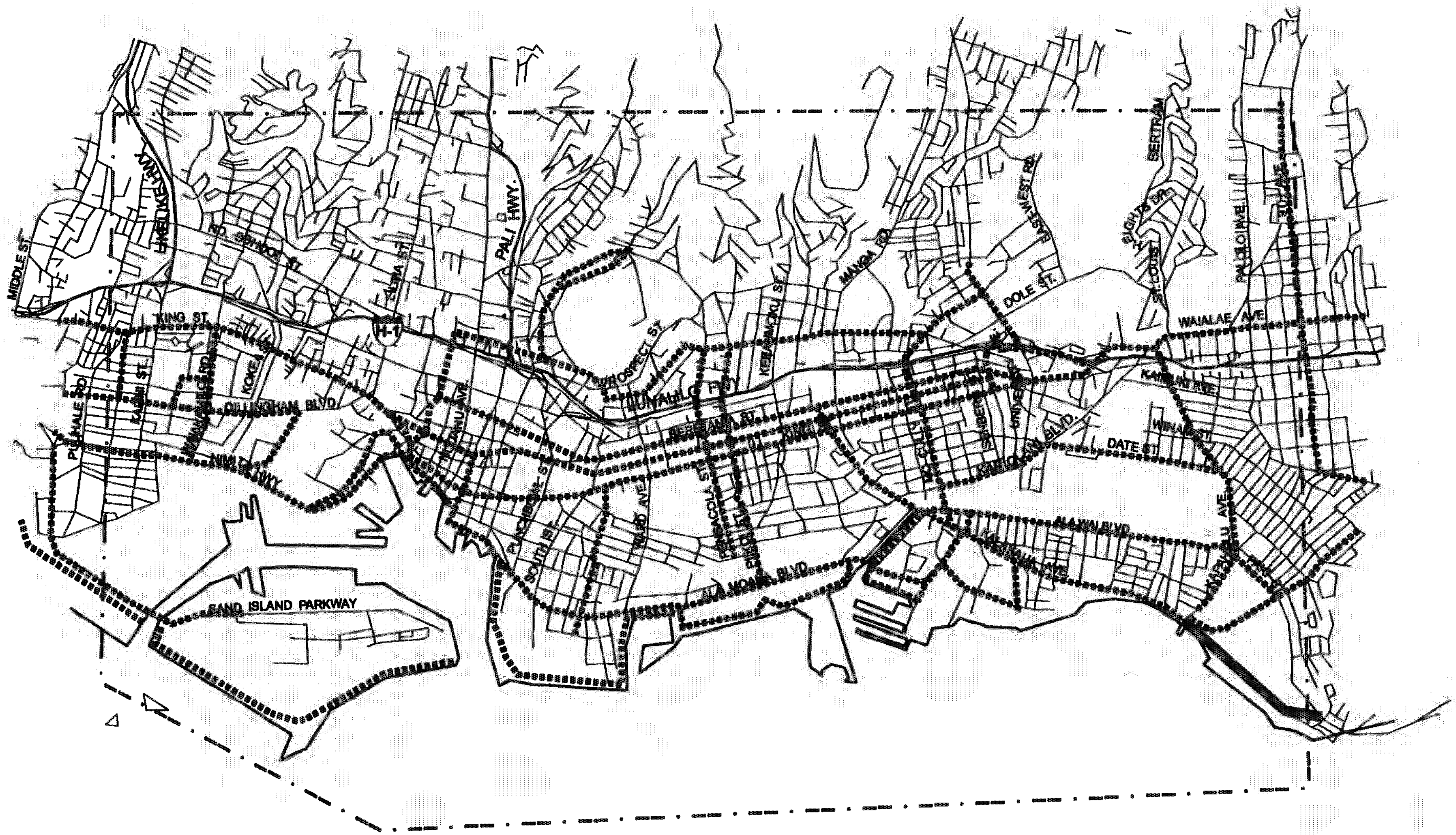
▬	Existing Bikeways
▪▪▪▪▪▪▪▪	Proposed Bikeways

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Bikeways: Aiea - Fort Shafter

Figure 3.1-4B



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Honolulu Bicycle Master Plan - Helber Hastert & Fee Planners, Bicycle Federation of America, Engineering Concepts, Inc. & David Cheever Marketing, April 1999.

LEGEND:

▬	Existing Bikeways
▪▪▪▪▪▪▪	Proposed Bikeways

N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Bikeways: Kalihi - University

Figure 3.1-4C

Educational Institution Plans

UH Manoa Master Plan

The Long Range Development Plan, University of Hawaii, Master Plan 1994 Update (Prepared by Group 70 International for University of Hawaii – Community Colleges Physical Facilities Planning and Construction Office, April 1994) is a facility plan for the University of Hawaii's Manoa campus. The Master Plan is reviewed and approved by the UH Board of Regents, and serves as a basis for infrastructure improvements and capital program funding requests. The 1994 Update of the UH Manoa Campus long range development plan proposes to enhance the "sense of place" on the campus by locating both pedestrian and vehicular gateways at key access points to campus. The UH plans to construct a pedestrian gateway at the intersection of Campus Road and University Avenue, and a landscaped mall continuing to a "town center" at Varney Circle.

Leeward Community College and West Oahu Campus Master Plan

The purpose of the Leeward Community College Long Range Development Plan, Final Environmental Assessment (LRDP) (Prepared by Group 70 International, for University of Hawaii – Community Colleges Physical Facilities Planning and Construction Office, March 1999) is to develop a plan for the physical site and facilities uses within the West Oahu campus and improve the transportation linkage to the surrounding community, among other goals. Most plans specified in the LRDP are aimed at improving on-site facilities. There is some discussion of ways to improve the access to and from the campus that is currently limited to Waiawa Road and Ala Ike Road on the makai side of H-1, near the Farrington Highway interchange.

2) Military Installation Planning

Pearl Harbor

The Department of the Navy prepared the Pearl Harbor Naval Complex Master Plan (October 1991), a comprehensive planning document, to guide the development of the Pearl Harbor Naval Station and surrounding auxiliary facilities. Also noteworthy is the development of a master plan for Ford Island, known as the Ford Island Concept Plan (1998). This master plan envisions approximately $600 million of investment in residential, tourist, military and other land uses on Ford Island through public/private partnerships.

Fort Shafter Complex

The U.S. Army's Fort Shafter is another military facility within the study corridor and the Fort Shafter Installation Master Plan (1985) describes the planning framework for this facility. Currently, there are 4,080 bachelor and family housing units within the Fort Shafter complex, which consists of Fort Shafter, Tripler Army Medical Center (TAMC) and Aliamanu Military Reservation (AMR). Most military housing at Fort Shafter is located on the mauka side. There are no new units programmed between now and the year 2005. The Fort Shafter Installation Master Plan is being updated (phone conversation, Daniel Bow, Chief, Real Property Planning Branch, Directorate of Public Works, April 5, 1999).

Armed Forces Recreation Center – Fort DeRussy

A Master Plan, prepared by the University of Southern Mississippi (1988) for the U.S. Army and approved by the Secretary of the Army (1988) recommended improvements to Fort DeRussy placing greater emphasis on its recreational mission. An EIS for the Master Plan was prepared and received approval in 1991. The facility has subsequently been redeveloped to fulfill its primary mission of recreation and most Army reserve functions have been moved to Fort Shafter. The improvements included extensive landscaping of the Army post, construction of the second hotel tower, construction of a 1,300-stall hotel parking structure, and realignment and widening of Kalia Road.

AR00047427

Hickam Air Force Base

The Comprehensive Plan - Future Land Use Plan, Hickam Air Force Base, Oahu, Hawaii (October 1988) guides land use planning and future development of the base. New facilities are not planned near Nimitz Highway.

Kalaeloa (former Barbers Point Naval Air Station) Reuse

The naval air station was closed in 1999. A master plan designates various mixed uses to be developed over time. The redeveloped area would support about 3,390 jobs including the general aviation airport, the National Guard and lands for Hawaiian Homelands use.

3) City and County of Honolulu Plans and Policies

General Plan of the City and County of Honolulu

The General Plan (revised 1992) includes broad statements on the objectives and policies of the City and County of Honolulu with regard to overall physical and economic development of the island, as well as the health and safety of the island's residents. The General Plan directs population growth and new residential development primarily to the PUC and Ewa, while limiting growth in other areas.

Development Plans

The City and County of Honolulu prepared a Development Plan (DP) for each of the eight DP Areas. A general overview of the DP Areas can be found in Section 3.1.2. Past Development Plans (DPs) consisted of detailed (by parcel) land use and public facilities maps. In 1992, the Revised Charter of the City and County of Honolulu was amended to require DPs to "consist of conceptual schemes for implementing and accomplishing the development objectives and policies of the General Plan and serve as a policy guide for more detailed zoning maps and regulations and public and private sector investment decisions."

The PUC Development Plan (PUC DP) is currently being revised and is undergoing public review. Until the revision is adopted, the previously approved PUC DP remains in force. According to the PUC DP (Revised Ordinances of Honolulu, 1990, Chapter 24, Article 2), the PUC shall accommodate relatively intensive commercial, governmental, residential, and recreational functions while safeguarding and adding to the existing amenities of the City's urban environment.

The Ewa Development Plan (Ewa DP) (adopted in August 1997) was the first to be updated consistent with the 1992 Charter Amendments. The Ewa DP consists of vision statements, community design principles and guidelines; and conceptual mapping of open space networks, public facility networks, and urban land uses. The vision for Ewa is the development of a "Secondary Urban Center" on Oahu to provide opportunities for urban development and residential growth. The Ewa DP projects over 38,000 housing units located primarily in master planned communities in the Ewa area by 2020. Substantial job growth is also estimated, with over 52,000 jobs in the Ewa DP Area by 2020. The City of Kapolei would have over 25,000 jobs in office, retail and government; Campbell Industrial Park and parcels adjacent to Kalaeloa Barbers Point Harbor would support more than 7,000 jobs; and the redeveloped Kalaeloa area would support approximately 3,390 jobs. Kapolei has already become the headquarters for some State agencies, which have relocated from Downtown, and a further shift in government jobs to Kapolei is expected. The City and County Civic Center is under construction, and a new police station has opened in Kapolei.

A Public Draft of the Central Oahu Development Plan (Central Oahu DP) was presented to the Planning Commission in the fall of 1999. It has been revised and is undergoing further review by the Department of Planning and Permitting (DPP). A final draft is expected to be submitted to the Planning Commission in summer 2000.

Under the Revised Charter (1992), the Department of Planning and Permitting (DPP) administers zoning. The City and County of Honolulu Land Use Ordinance (LUO) is the local zoning code, and zoning is required to be in conformance with the Development Plans, which are policy guidelines. Zoning designations within the study area are shown in Figures 3.1-5A through 3.1-5F.

The LUO includes Special Districts and zoning designations (see Figures 3.1-5A through 3.1-5F). The study area contains the Chinatown, Hawaii Capital, Punchbowl, Thomas Square, and Waikiki Special Districts. The Special District ordinance outlines specific objectives and design controls for each special district, such as guidelines for architectural controls, building heights, landscaping, and preservation of visual resources and historic structures.

Special Management Area

The 1975 Shoreline Protection Act designated a shoreline Special Management Area (SMA), and Hawaii Revised Statutes (HRS) Chapter 205A outlines special controls, policies, and guidelines for development within the SMA. This Act gave the counties authority to issue permits for development proposed within the SMA. For the City and County of Honolulu, DPP is the agency that administers the SMA use permit program.

The City Council acts on major SMA permits (those with capital costs over $150,000 within the SMA). Figures 3.1-6A through 3.1-6D show the SMAs within the study area.

Honolulu Bicycle Master Plan

The City and County has developed a bicycle facility master plan for the PUC. The Honolulu Bicycle Master Plan was completed in April 1999, and includes the following concepts to improve bicycling in the PUC:

- Bike-Friendly Route from Pearl City to Kahala: a bicycle-friendly route providing connections between Pearl City and Kahala (across urban Honolulu), tailored to the more experienced cyclist;
- College Access Network: bikeway improvements on roadways leading and adjacent to colleges and universities; and
- Lei of Parks: A system of bikeways linking regional and local parks from Aloha Tower to Diamond Head.

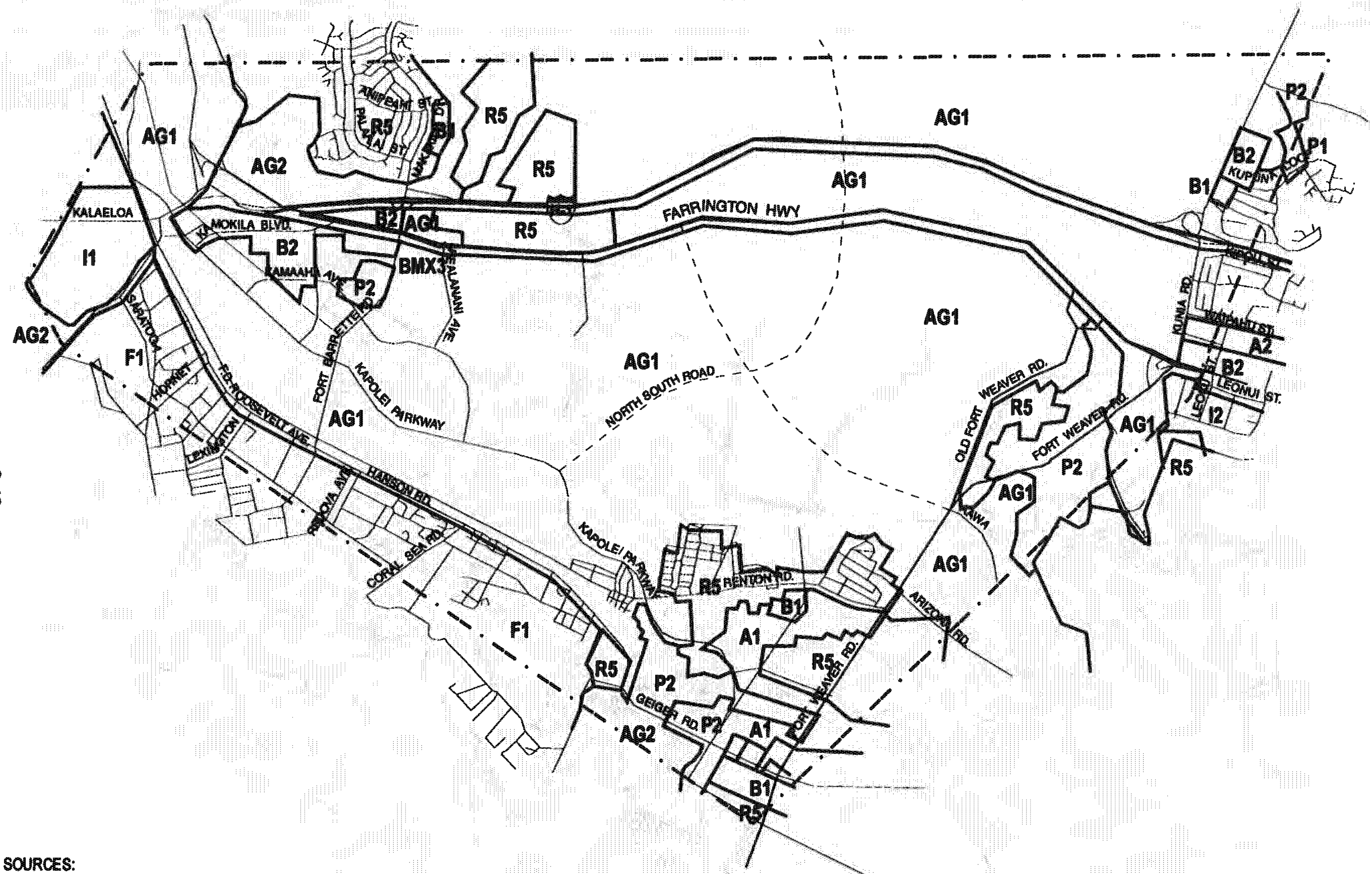
Traffic Calming Program

The City and County of Honolulu Department of Transportation Services (DTS) is leading a community-based program that identifies streets, usually in residential areas, that have problems with speeding and/or excessive cut-through traffic. After identification of appropriate areas, DTS is working with communities to implement traffic calming measures on these streets. Traffic calming is intended to modify driver behavior by re-designing the street so that vehicle speeds are reduced. Slower traffic has other benefits, such as improved safety for other motorists, pedestrians and bicyclists, and reduced traffic noise. In addition, with appropriate design, traffic calming measures can also enhance neighborhood identity.

Hub-and-Spoke Bus Route Revision Program

This program is a major overhaul of the existing bus service operations. Starting with Leeward Oahu, the program goal is to convert the existing, primarily radial bus route architecture into a hub-and-spoke system that connects the different networks throughout the island. Anticipated changes include:

1. Expanding existing express bus service which is currently limited to peak commuting hours to an all-day operation, and
2. Initiate neighborhood shuttle services.



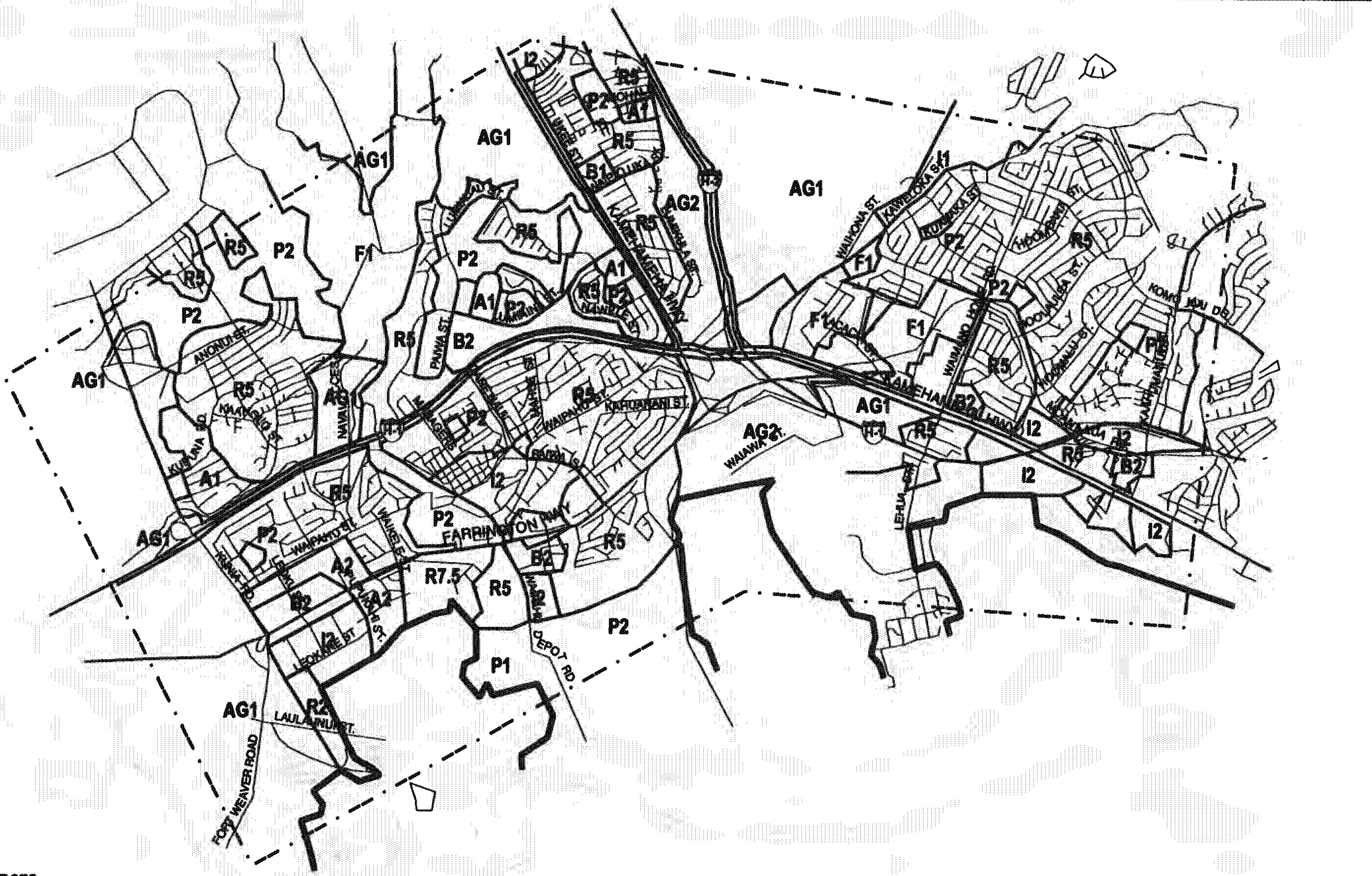
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

* Zoning map designations can be found on Figure 3.1-5F.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Zoning Map: Kapolei - Ewa

Figure 3.1-5A



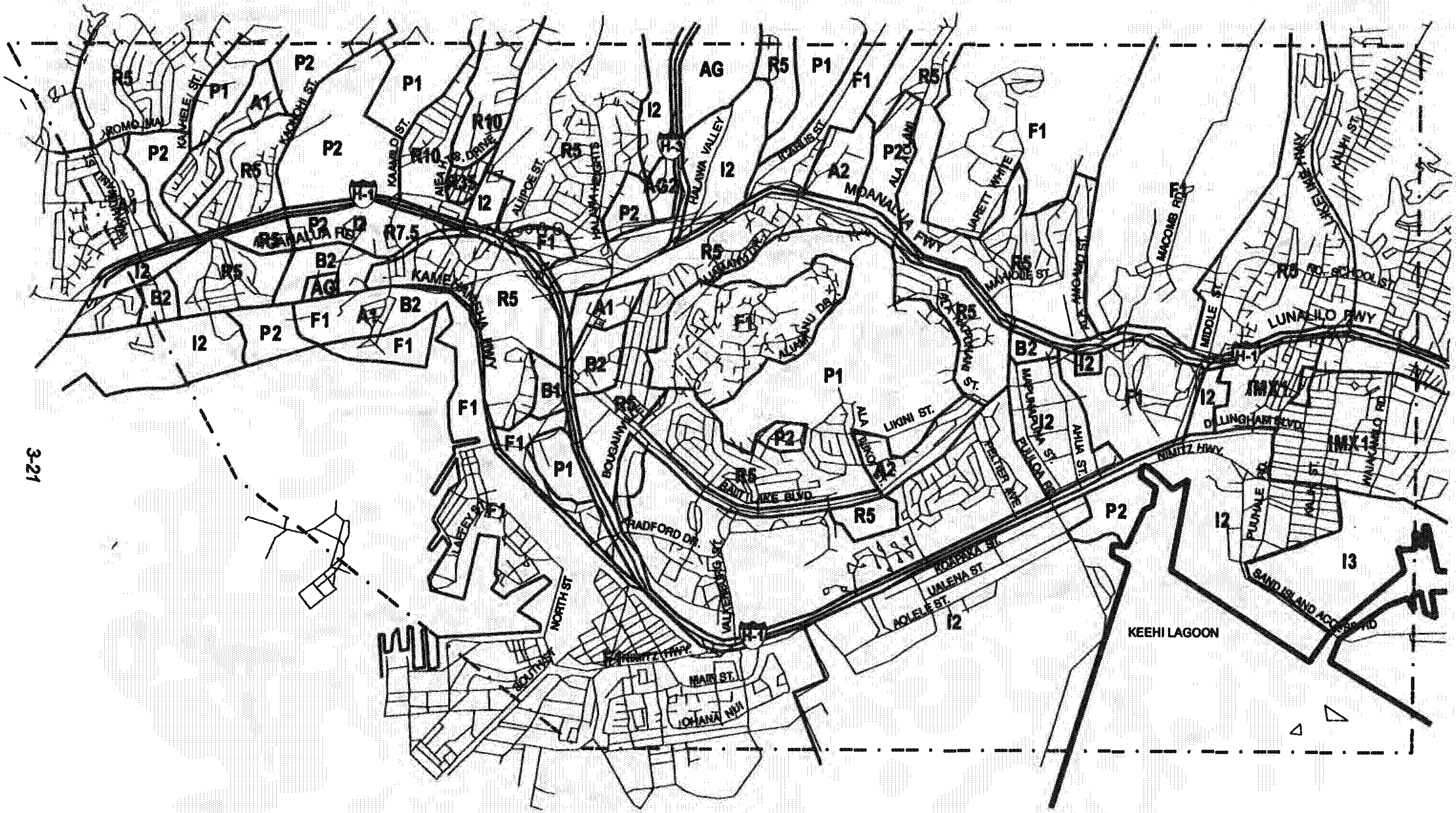
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

* Zoning map designations can be found on Figure 3.1-5F.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

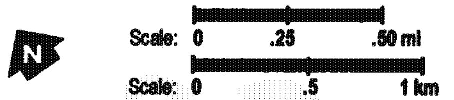
Zoning Map: Waipahu - Pearl City

Figure 3.1-5B



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

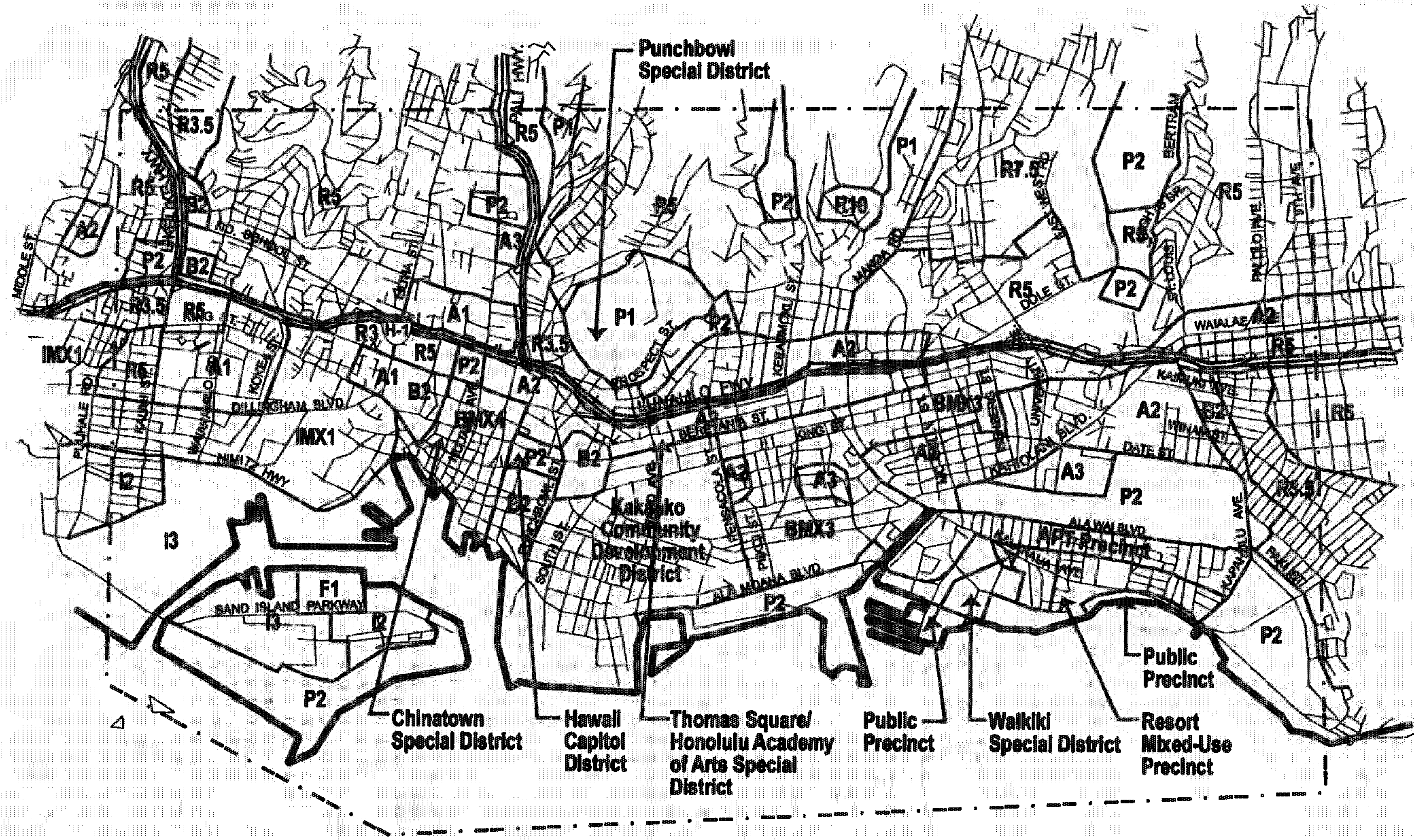
* Zoning map designations can be found on Figure 3.1-5F.



Zoning Map: Aiea - Fort Shafter

Figure 3.1-5C

AR00047432



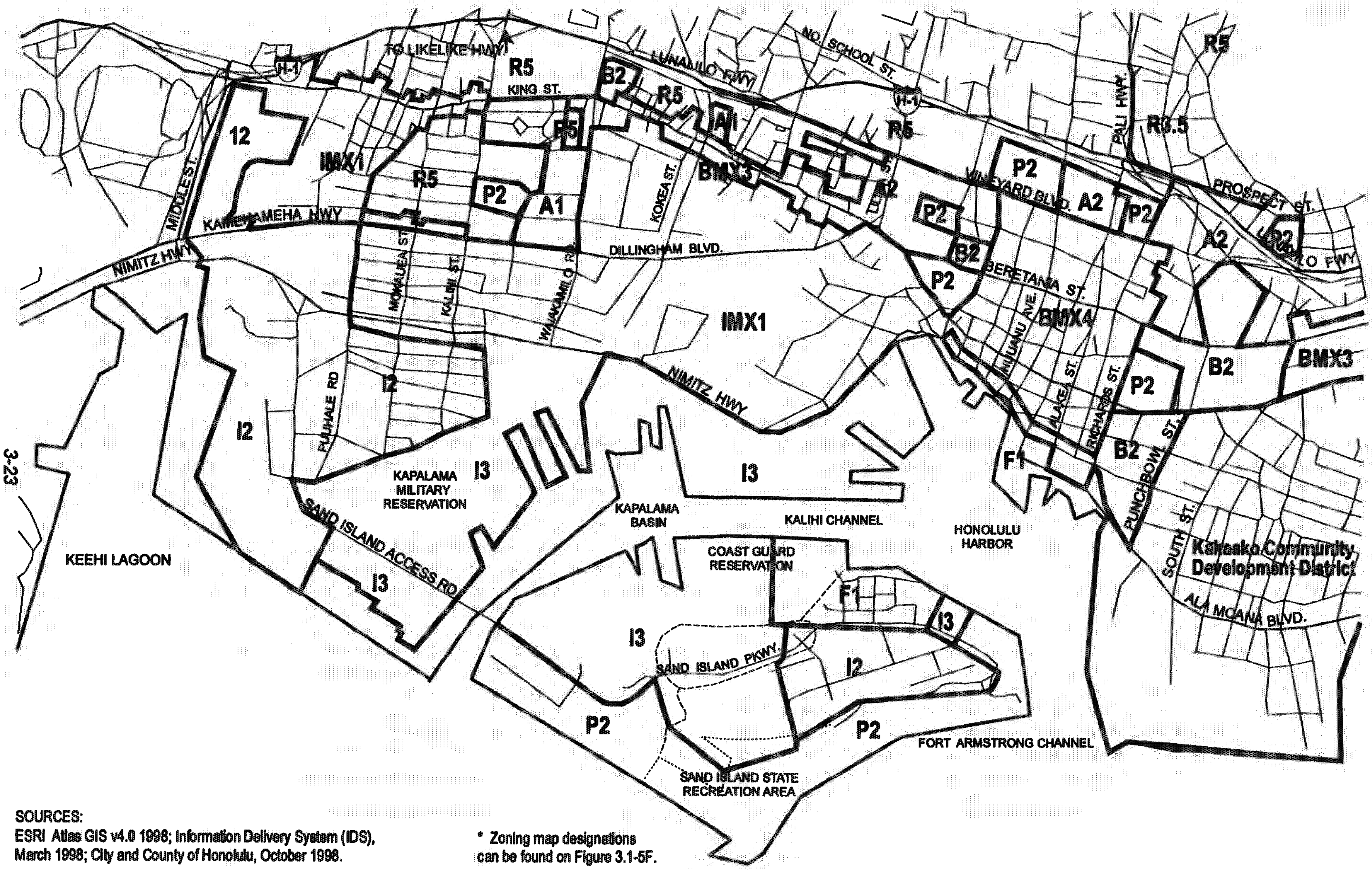
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

* Zoning map designations can be found on Figure 3.1-5F.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Zoning Map: Kalihi - University

Figure 3.1-5D



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

* Zoning map designations can be found on Figure 3.1-5F.

Scale: 0 .50 1.0 mi
Scale: 0 .80 1.6 km

Zoning Map: Downtown - Kalihi - Sand Island

Figure 3.1-5E

1.	P2	General Preservation
2.	AG1	Restricted Agricultural
3.	AG2	General Agricultural
4.		Country Districts
5.	R2 & R10	Residential
6.	R7.5 & R5	Residential
7.	A1	Low Density Apartment
8.	A2	Medium Density Apartment
9.	A3	High Density Apartment
10.	AMX1	Low Density Apartment Mixed Use
11.	AMX2	Medium Density Apartment Mixed Use
12.	AMX3	High Density Apartment Mixed Use
13.		Resort Districts
14.	B1	Neighborhood Business
15.	B2	Community Business
16.	BMX3	Community Business Mixed Use
17.	BMX4	Central Business Mixed Use
18.	I1	Limited Industrial
19.	I2	Intensive Industrial
20.	I3	Waterfront Industrial
21.	IMX1	Industrial Commercial Mixed Use
22.	F1	Military and Federal

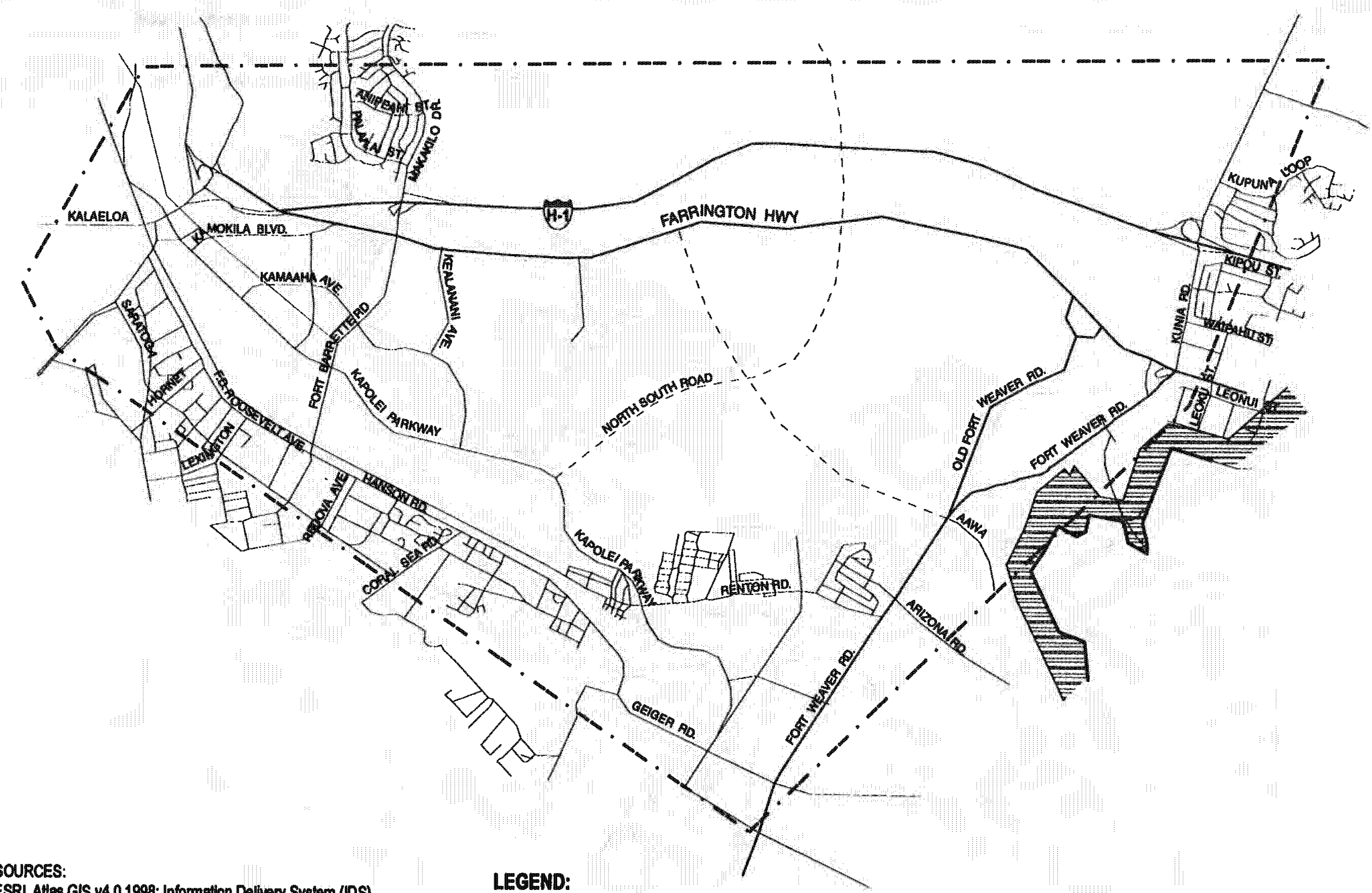
SPECIAL DISTRICTS

23. Hawaii Capitol Special District
24. Punchbowl Special District
25. Chinatown Special District
26. Thomas Square / Honolulu Academy of Arts Special District
27. Waikiki Special District

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; Planning Department, City and County of Honolulu, October 1998.

Zoning Map: Legend

Figure 3.1-5F



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

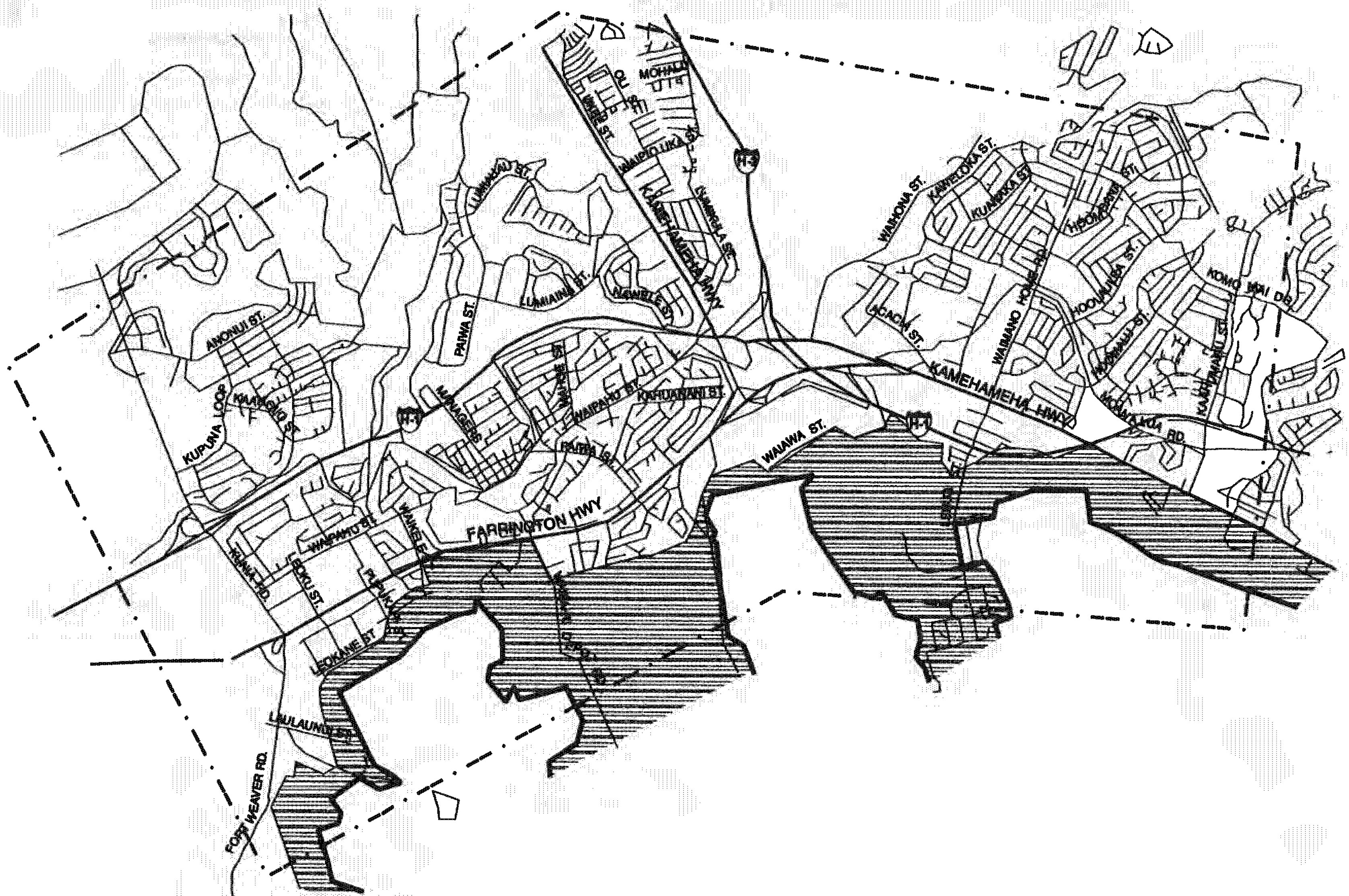
LEGEND:
Special Management Area

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

N

Special Management Area: Kapolei - Ewa

Figure 3.1-6A



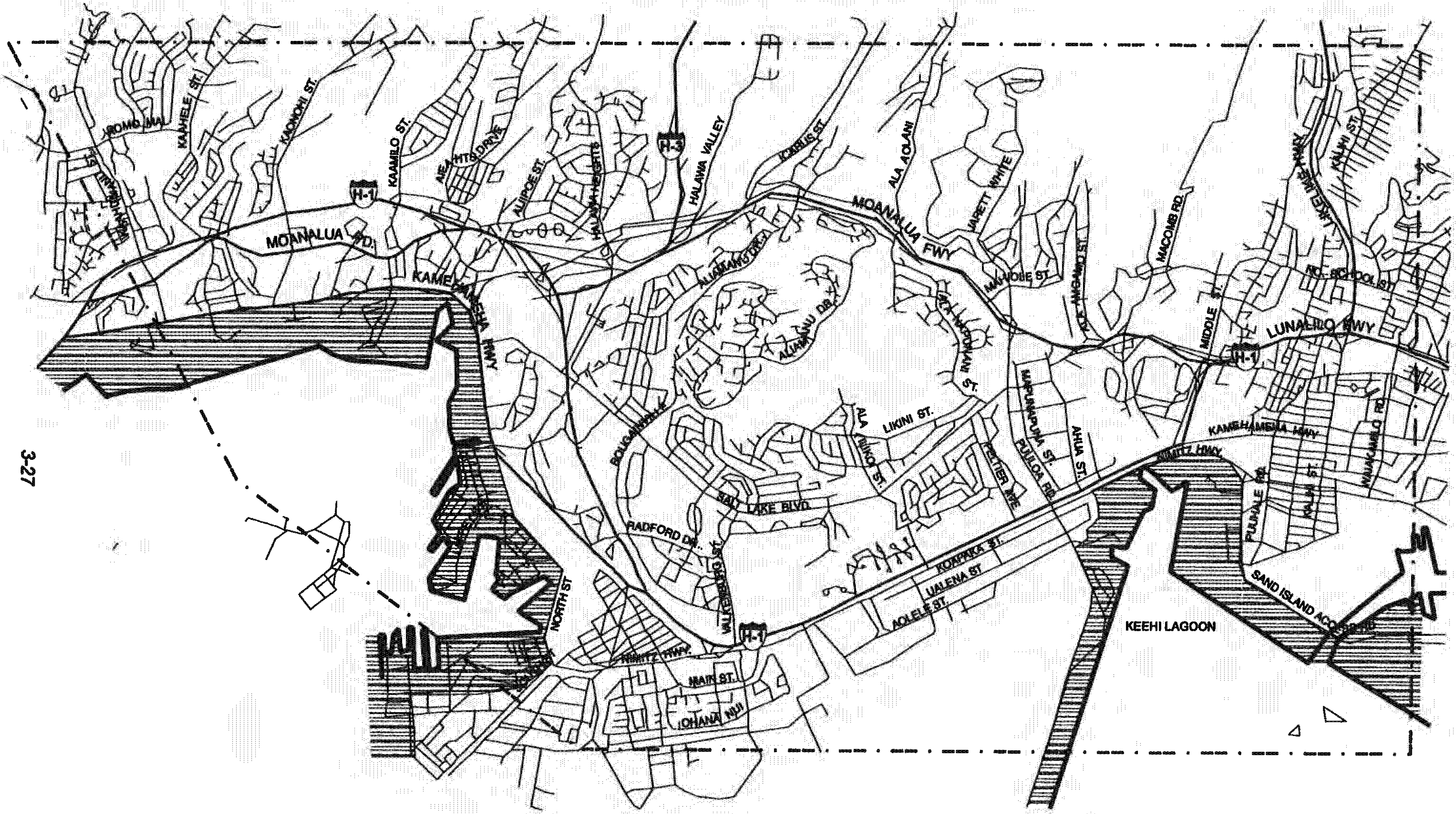
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

LEGEND:
Special Management Area

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Special Management Area: Waipahu - Pearl City

Figure 3.1-6B



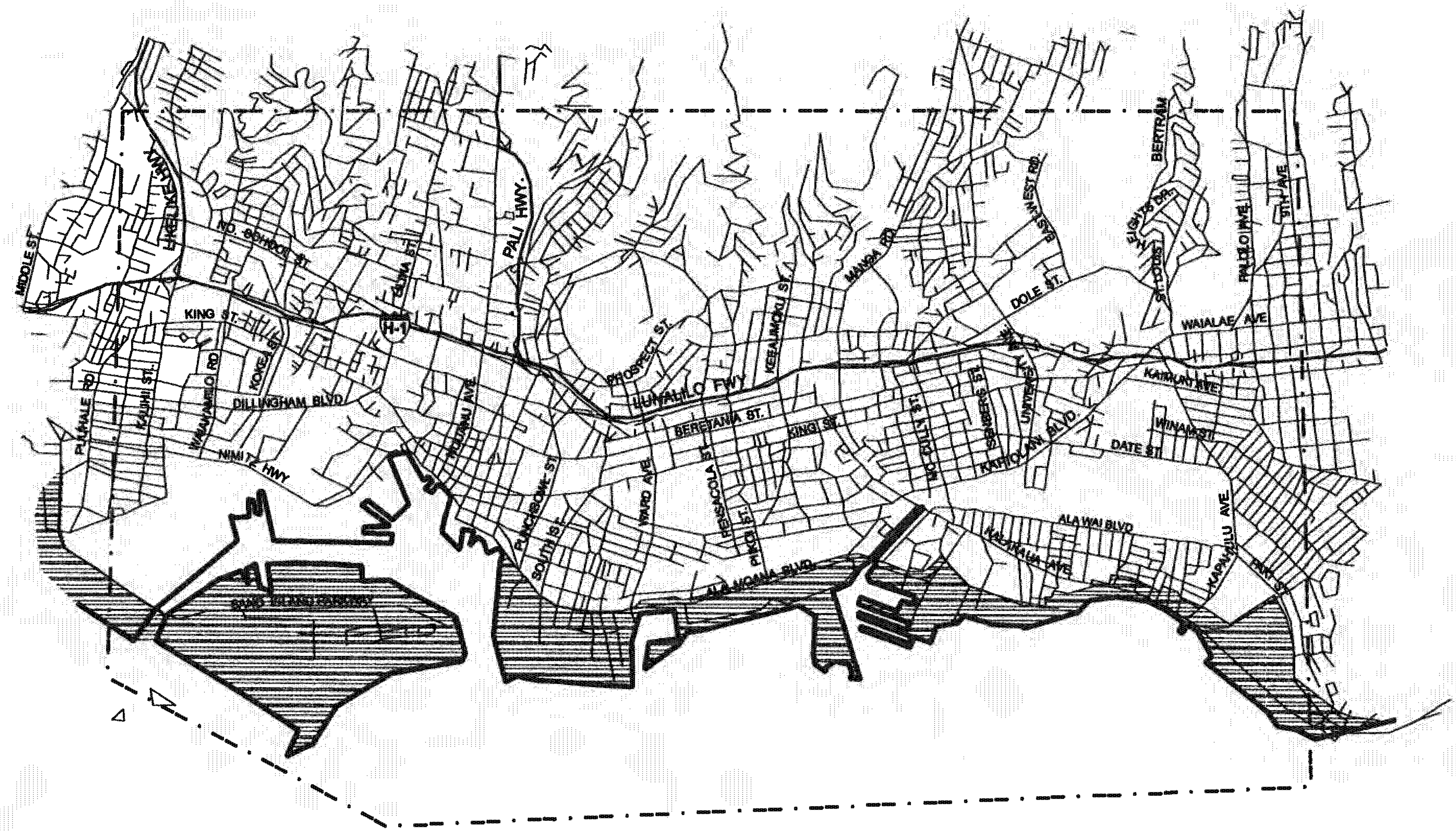
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Special Management Area: Aiea - Fort Shafter

Figure 3.1-6C



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

LEGEND:

Special Management Area

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Special Management Area: Kalihi - University

Figure 3.1-6D

AR00047439

4) Oahu Metropolitan Planning Organization

The Oahu Metropolitan Planning Organization (OMPO) is a joint State of Hawaii and City and County of Honolulu organization. It is authorized to prepare the Oahu Regional Transportation Plan (ORTP). The ORTP has many functions, including the identification of facilities and programs to meet increased travel demands on Oahu. The most recent update of the ORTP was adopted in November 1995, and addressed needs through 2020. An update of the ORTP through 2025 is in progress.

3.1.6 Population and Employment Trends

The State Department of Business, Economic Development, and Tourism (DBEDT) develops population and employment forecasts for the entire island; the City and County's Department of Planning and Permitting then steps down the islandwide "control total" to subareas of the island.

1) Population Trends and Projections

Table 3.1-2 contains DBEDT's year 2025 population projections and DPP's summarized distribution of the island totals by subareas as of January 1999. These forecasts were used in the MIS/DEIS analyses. In February 2000 DBEDT revised its year 2025 population forecast for Oahu downward by about 5 percent (1,029,800 as opposed to 1,083,600) and employment upward by about 4 percent. A sensitivity analysis was performed to determine the effect of these revised population and employment forecasts on the projected travel demand. As presented later in Section 4.2.5, the net effect on vehicle and transit trips would be insignificant. Therefore it was deemed unnecessary to alter the analyses and conclusions in this document.

TABLE 3.1-2
PROJECTED POPULATION SUMMARY

		Forecast	
	1997	**2025**	**Change From 1997**
PUC DP			
Waikiki	20,300	22,600	2,300
Other PUC	404,500	491,300	86,800
Ewa	67,700	127,500	59,800
Other	381,900	442,200	60,300
Total	**874,400**	**1,083,600**	**209,200**

Source: Department of Planning and Permitting, City and County of Honolulu, January 1999.
Note: This forecast has recently been revised downward to 1,029,800 by DBEDT.

The State and City have a development policy that encourages growth in the PUC and Kapolei, in part to minimize suburban sprawl and the associated costs of extending public infrastructure and services into presently undeveloped areas. The goal of preserving open space ("keep the country country"), given the limited land area of Oahu, is not only a governmental policy, it is a widespread public sentiment frequently repeated during the public outreach activities that have been conducted during project planning.

Therefore, consistent with the goal of concentrating new growth in the PUC and Kapolei/Ewa, the majority of the population growth between now and 2025 is forecasted to occur in the primary transportation corridor. As shown in Table 3.1-2, the fastest growing area will be Ewa. More than 127,000 people will be living in the Ewa area in 2025, a growth of up to 88 percent in 28 years. The PUC also will experience significant growth, increasing by 29,600 to 89,000 people. The Central Oahu population is projected to increase from 130,544 in 1997 to 164,935 in 2025, a gain of 26 percent (Department of Planning and Permitting, City and County of Honolulu, 1999).

2) Employment

Accompanying the growth in population will be an increase in employment. Employment increased at an average annual rate of 4.13 percent from 1970 to 1990. As shown in Table 3.1-3, according to the September, 1999 DBEDT forecast the number of jobs on Oahu is projected to increase by approximately 117,000 jobs between the years 1997 and 2025. About 45 percent of these new jobs will be located in the PUC. A second area for employment growth is expected to occur in Ewa/Kapolei and Waipahu (Department of Planning and Permitting, City and County of Honolulu, January 1999).

TABLE 3.1-3
PROJECTED EMPLOYMENT SUMMARY [1]

		Forecast	
	1997	**2025**	**Change From 1997**
PUC DP			
Waikiki	38,000	40,100	2,100
Other PUC	326,400	375,600	49,200
Ewa	15,300	48,800	33,500
Other	89,600	12,600	32,000
Total	**469,300**	**586,100[2]**	**116,800**

Source: Department of Planning and Permitting, City and County of Honolulu, January 1999.
Notes: [1]Excludes construction employment, which totaled 24,800 in 1997 and is projected at 26,200 in 2025.
[2]The 2025 non-construction employment forecast has recently been revised upward to 608,700 by DBEDT.

Major employment centers in the primary transportation corridor are:

- Pearl Harbor;
- Pearlridge Center;
- Honolulu International Airport;
- Industrial districts in Pearl City, Halawa Valley, the Airport area, Mapunapuna, Kalihi, Iwilei and Kakaako;
- Downtown Honolulu and the Capitol District;
- Ala Moana Center and the surrounding area;
- Waikiki; and
- University of Hawaii at Manoa.

Major employment centers outside or near the primary transportation corridor are Ko Olina Resort, Campbell Industrial Park and Kalaeloa (former Barbers Point Naval Air Station).

The trade, service and government (military, federal, State and County) sectors are the major employment categories, representing 76 percent of all jobs on the island. This distribution of employment among sectors is not anticipated to change in the near future.

Despite the growing popularity of telecommuting and other trends in the nature of the workplace, future employment is forecast to be centralized in the PUC and Ewa (Kapolei).

3.2 EXISTING TRANSPORTATION CONDITIONS

This section presents a summary of the characteristics of the existing transportation system in the study area.

3.2.1 Highway Network

Oahu's road network is heavily constrained by topography (major roadway facilities in the study area are shown in Figure 3.2-1). Roadways are primarily located in the coastal areas between the mountains and ocean. The dominant highways, with the exception of H-2 and H-3 Freeways and Likelike and Pali Highways, generally parallel the coastline and carry Ewa-Koko Head traffic. Oahu has three state freeways:

- H-1 Freeway, extending from Ewa to Waialae/Kahala;
- H-2 Freeway, servicing traffic between Mililani/Wahiawa and Pearl City; and
- H-3 Freeway, carrying traffic between Windward Oahu and Pearl Harbor.

Average daily traffic (ADT) indicates the level of roadway usage at representative points on the roadway. The H-1 Freeway is the most traveled freeway on Oahu, with ADT of 228,645, measured at Kaonohi Street (traffic in both directions). ADT on H-2, south of Kipapa Bridge, is 79,331. The lowest ADT is 35,071, recorded on H-3, north of Halawa Interchange. (HDOT. Traffic Survey Data, Island of Oahu. 1998.)

Route 78 (Moanalua Road) serves as an H-1 Freeway bypass from the Kahauiki Interchange in Kalihi to the Halawa Interchange. It then continues as an arterial roadway, nearly parallel to Kamehameha Highway, winding through Aiea and ending in Pearl City at Waimano Home Road. Motorists traveling between Kahala and Hawaii Kai use Kalanianaole Highway. Pali and Likelike Highways traverse the Koolau Mountains, connecting the downtown area with Windward Oahu (Kailua and Kaneohe). Additional roads carry regional and local traffic.

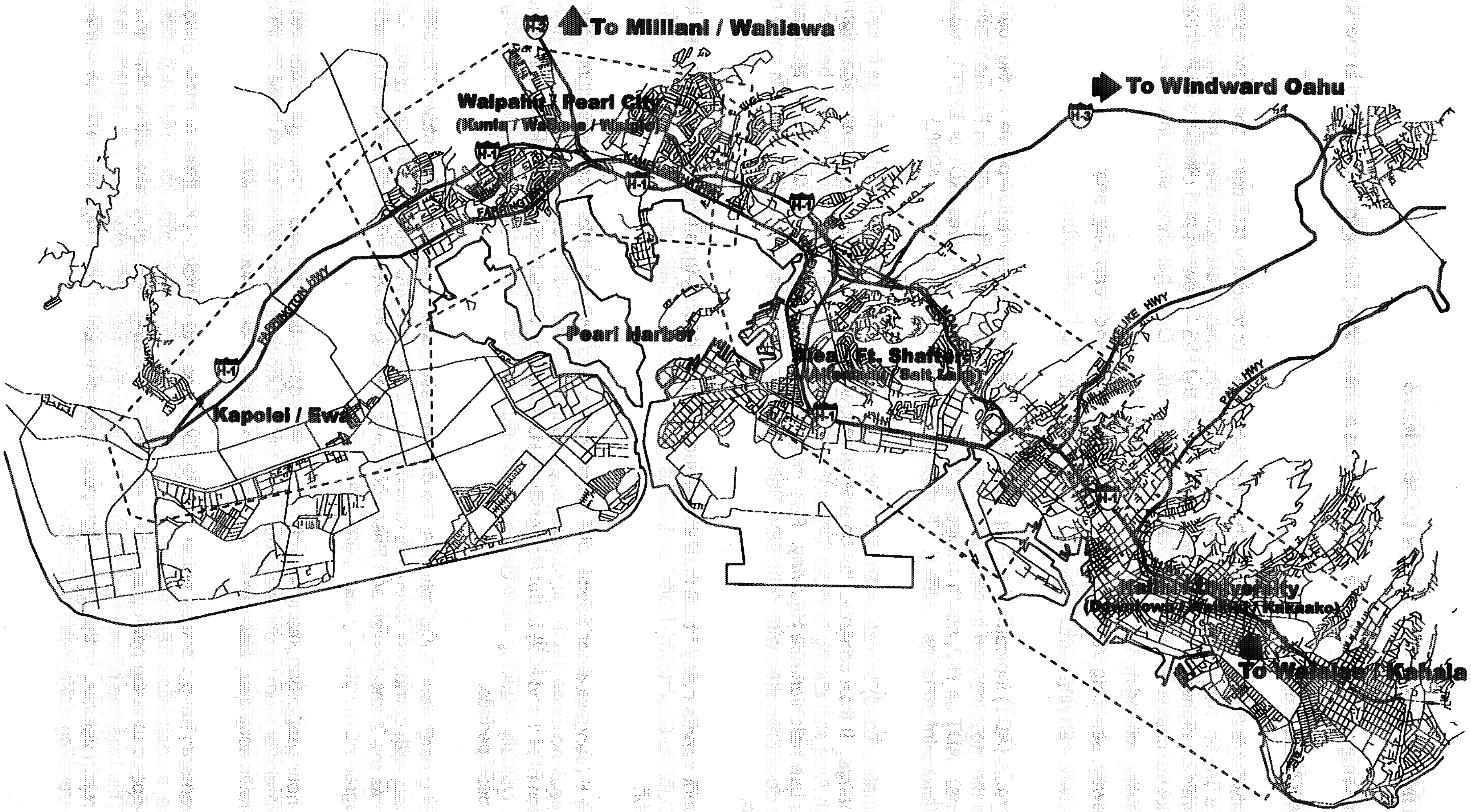
This road network serves many travel markets, including home to work trips from residential areas in Central and Leeward Oahu to Downtown, Honolulu International Airport to Waikiki, and goods distribution from Honolulu Harbor.

Level of Service F (congested conditions) with characteristic stop-and-go traffic, is common during the morning and afternoon peak hours on the major roadways, particularly on the H-1 Freeway from the Waiawa Interchange (near the junction of H-1 and H-2) to the University of Hawaii area. Signalized routes, like Nimitz Highway, also are congested, typically requiring more than one traffic signal cycle to clear intersections and with long vehicle queues during peak periods.

Based on existing peak hour traffic volumes, the transportation corridors Ewa of Downtown Honolulu are the most constrained, with corridor deficiencies ranging from 2,500 to 4,000 vehicles per hour (vph). Other corridors, such as the Trans-Koolau and East Honolulu corridors, experience peak period congestion but not to the same degree as the primary transportation corridor.

To avoid peak-hour congestion, many motorists have shifted their time of travel, resulting in extended peak traffic hours. Weekday morning and afternoon peak traffic conditions typically last two to three hours each. Mid-day weekend traffic conditions also can resemble the weekday peak period conditions.

Recent improvements have provided better mobility for buses and vehicles with three or more passengers. The zipper lane, a contra-flow freeway lane created by using movable concrete barriers, has created a relatively high-speed morning peak period lane on the H-1 Freeway between Waiawa Interchange and Keehi Interchange. This lane has helped reduce travel time between these interchanges, but vehicles in the zipper lane must still rejoin vehicles in the general purpose lanes at Keehi Interchange and face the same delays as other vehicles traveling Koko Head from there.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .75 1.50 mi
Scale: 0 1.25 2.5 km

Existing Highway System

Figure 3.2-1

Physical constraints make the addition of highway capacity within the primary transportation corridor very difficult, particularly in the segment between Middle Street and Downtown. Given the difficulty of adding roadway capacity within this corridor, more innovative approaches to accommodating future growth in travel are needed.

3.2.2 Transit Network

The City and County of Honolulu has an extensive fixed-route bus system (TheBus) that provides islandwide service and is described in the following sections.

1) Bus Routes and Operations

TheBus system began service in March 1971 with a fleet of 67 buses. The active bus fleet for FY 1999 includes 525 vehicles, with 452 buses operating on over 75 routes during peak periods. Almost all buses are equipped with bicycle racks and encourage multi-modal travel.

During the weekdays, morning service begins at 3:16 a.m. and night service ends at 1:54 a.m. On Saturdays and Sundays, TheBus system operates from 3:51 a.m. to 2:03 a.m.

The current bus network consists of five route types:

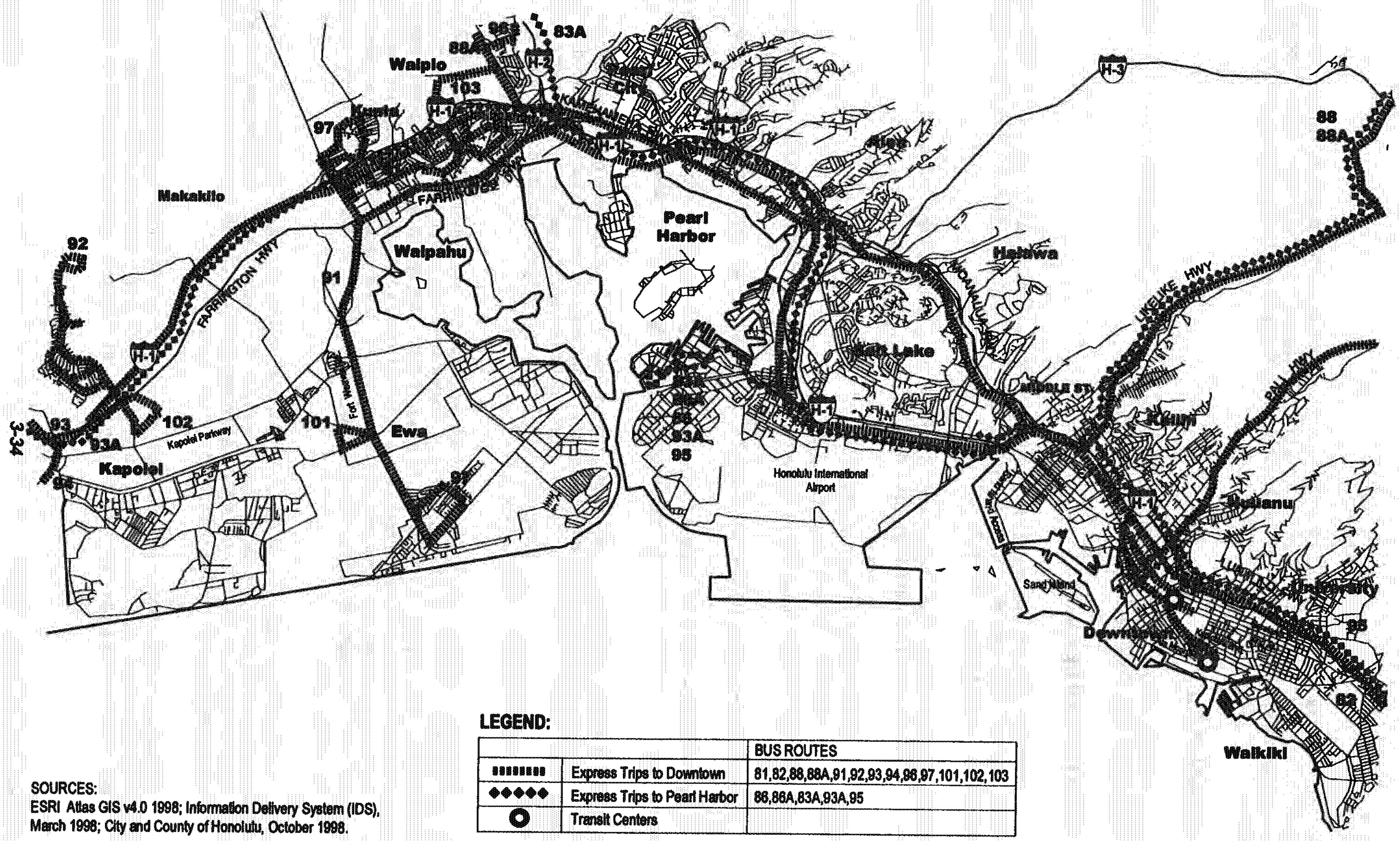
- Urban Trunk – routes serving the downtown area;
- Urban Collector – routes connecting downtown neighborhoods to urban trunk routes and downtown destinations;
- Suburban Trunk – routes providing direct service between suburban neighborhoods and the downtown area;
- Suburban Feeder – routes connecting smaller suburban neighborhoods to suburban trunk routes; and
- Express – routes providing limited stop service from suburban areas to the downtown area.

Besides serving different parts of the island, each route type provides different levels of service, with the urban trunk routes providing the highest levels of service and the express routes providing a limited number of trips during peak periods only. With the exception of the suburban feeders, nearly all routes provide direct access to the downtown area. This high level of service benefits passengers with limited wait times and provides multiple options for passengers traveling in the downtown area.

Figures 3.2-2A through 3.2-2D show the major existing bus routes. Routes 1 through 32, exclusive of Route 11, serve the central urban area of Honolulu. Route 11 and Routes 47 through 65 provide bus service between Central Honolulu and the outlying suburban and rural areas of Oahu. Routes 70 through 77 provide feeder and shuttle bus service within selected communities of suburban and rural Oahu. Routes numbered 80 and higher provide peak-period express service between suburban residential communities and major employment and activity centers (i.e., Downtown, University of Hawaii at Manoa, Waikiki, and Pearl Harbor). Routes A and C are new limited stop routes.

Service frequency varies with route. In general, during the peak periods, five routes operate at 10-minute or shorter headways, and 18 other routes operate at headways of 30 minutes or less. Actual service to patrons along major portions of trunk routes is more frequent, since several routes operate on the same street. Routes with peak period headways of 60 minutes or longer are Routes 70 and 72.

During the peak period, TheBus system is approaching capacity and, in recent years, average operating speeds have declined. Reduced speeds diminish the attractiveness of transit as an alternative to the private automobile, and congestion reduces transit schedule reliability. In Downtown, particularly on King and Beretania



LEGEND:

		BUS ROUTES
▪▪▪▪▪▪▪▪	Express Trips to Downtown	81,82,88,88A,91,92,93,94,96,97,101,102,103
◆◆◆◆◆	Express Trips to Pearl Harbor	88,88A,83A,93A,95
O	Transit Centers	

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

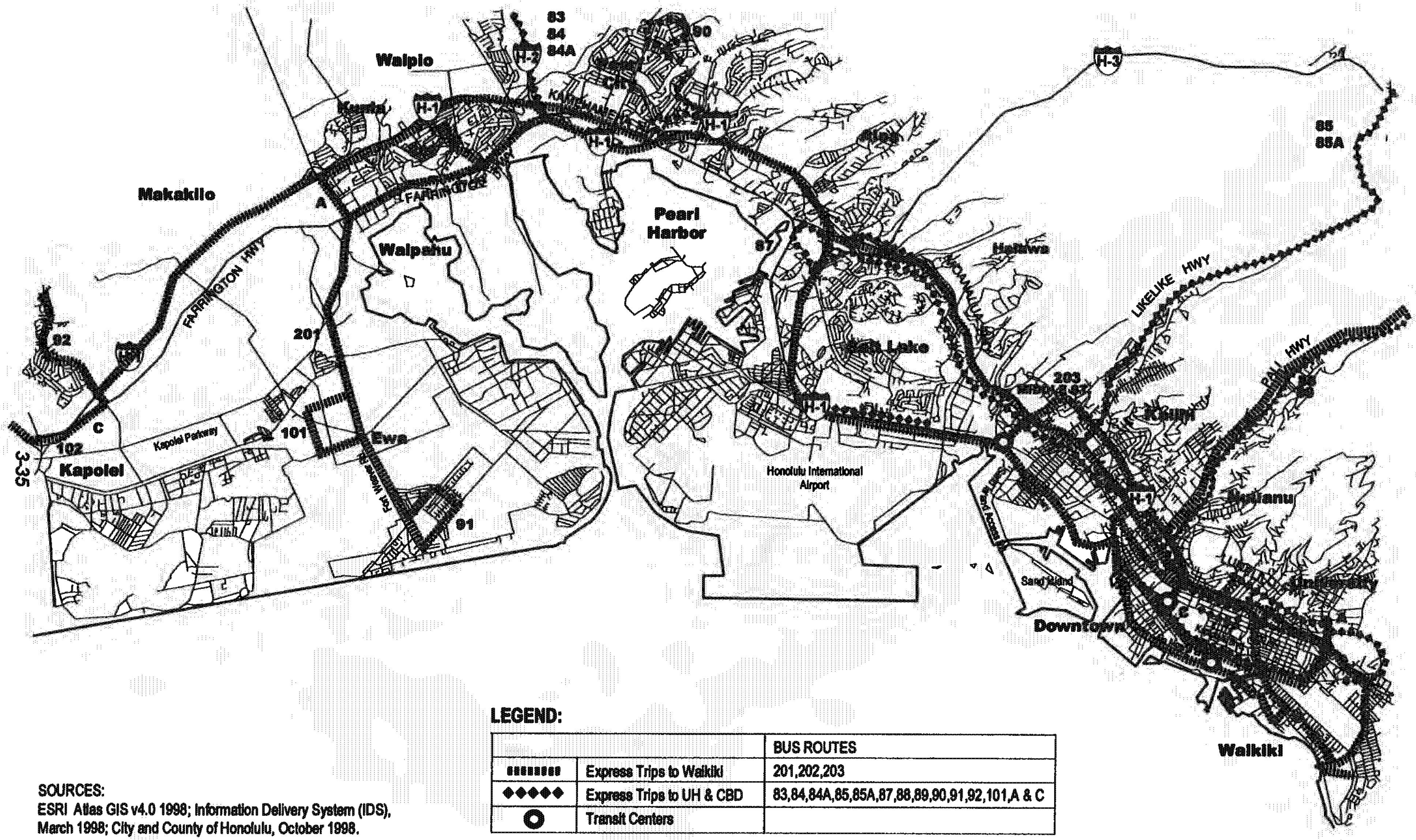
Scale: 0 1.25 2.50 mi

Scale: 0 2.0 4 km

N

Existing Express Bus Routes: Downtown / Pearl Harbor

Figure 3.2-2A



LEGEND:

		BUS ROUTES
■■■■■■■■	Express Trips to Waikiki	201,202,203
◆◆◆◆◆	Express Trips to UH & CBD	83,84,84A,85,85A,87,88,89,90,91,92,101,A & C
⭘	Transit Centers	

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

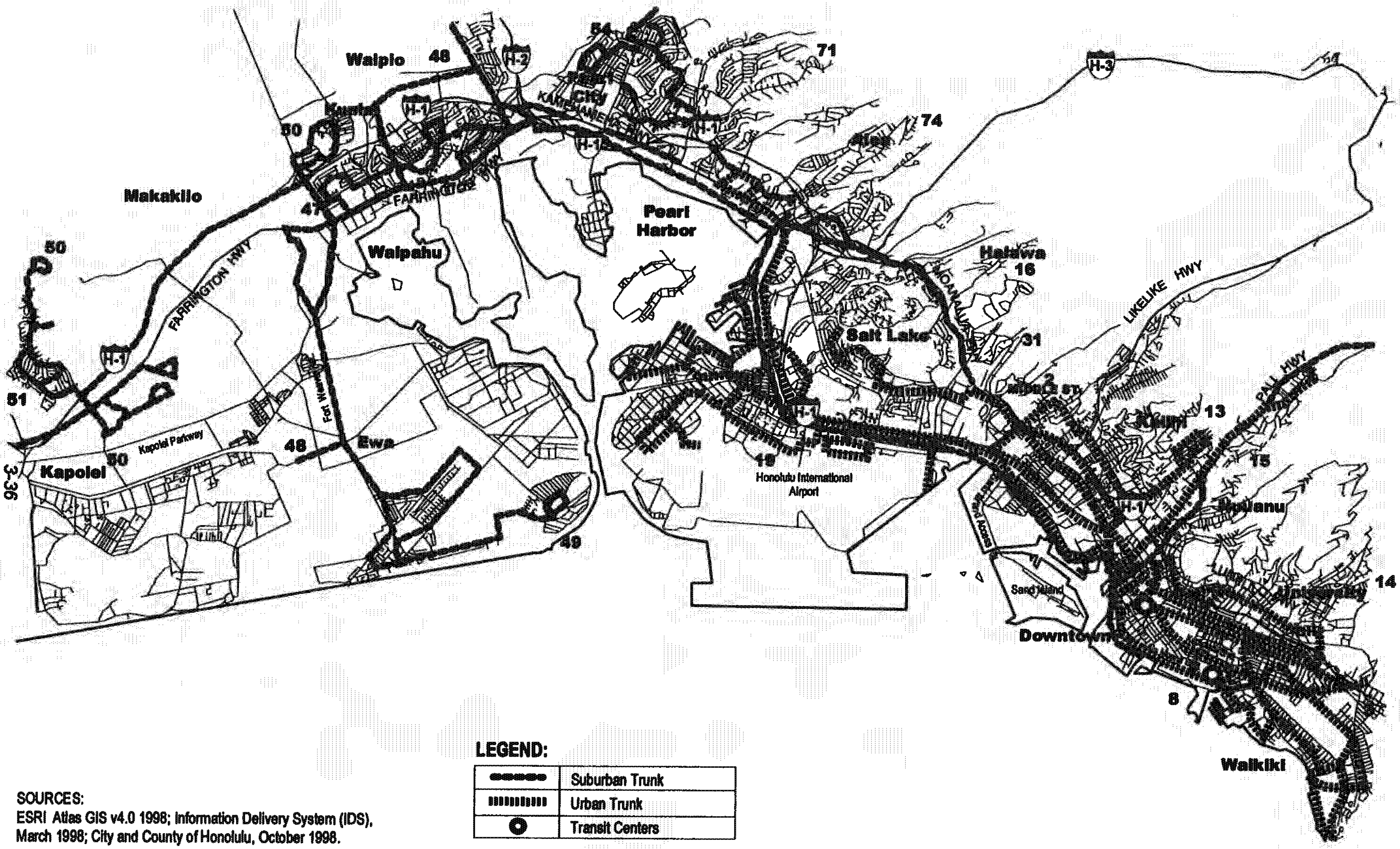
N

Scale: 0 1.25 2.50 mi

Scale: 0 2.0 4 km

Existing Express Bus Routes: UH, Downtown and Waikiki

Figure 3.2-2B



LEGEND:

●●●●●	Suburban Trunk
▮▮▮▮▮	Urban Trunk
⊙	Transit Centers

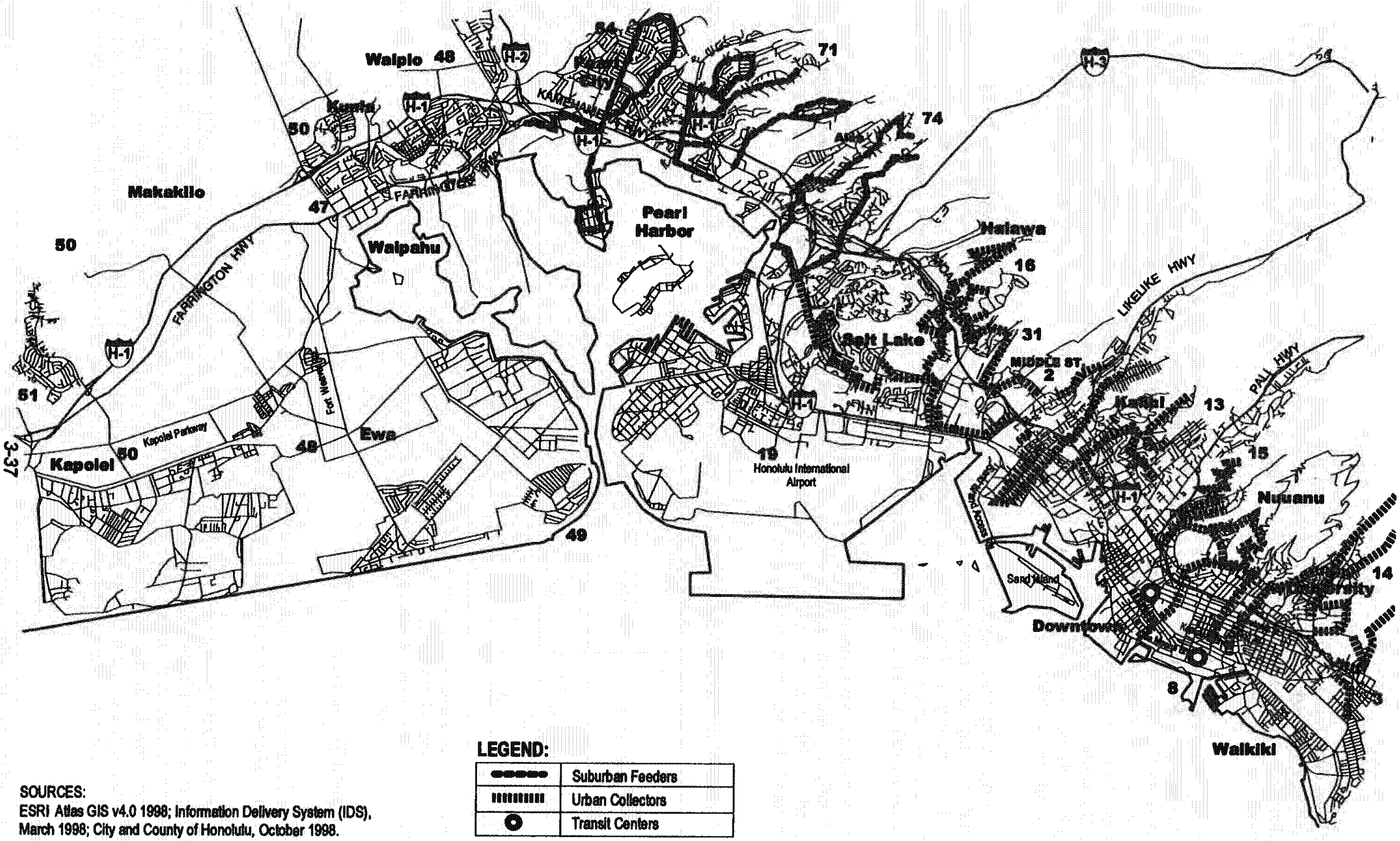
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

N

Scale: 0 1.25 2.50 mi
Scale: 0 2.0 4 km

Existing Local Bus and Trunk Routes: Suburban Trunk and Urban Trunk

Figure 3.2-2C



Existing Local Bus & Trunk Routes: Suburban Feeders and Urban Collectors

Figure 3.2-2D

Streets, peak-hour bus volumes exceed 75 buses per hour. If bus volumes increase into the 80 to 100 buses per hour range, additional declines in bus speeds can be expected. Closely spaced bus stops are also contributing to the decline in bus speeds. The declines in average operating speeds have been most pronounced for all route types except express.

As presently structured, the existing bus system operates largely as a "radial" system, with most routes directed Downtown. Most bus routes are oriented to get people into and out of the PUC. A radial system is appropriate for trips to and from Downtown, but is not ideal for other combinations of origin and destination, such as from one suburban area to another. Also as a result of the radial bus network configuration, the major Ewa-Koko Head streets in Downtown carry not only the urban trunk routes but also urban collector routes. Duplication of service along these corridors provides greater convenience for passengers with buses passing through more frequently. However, this duplication is operationally not efficient and results in slower travel through the corridor.

To improve operating efficiency, special lanes have been constructed and/or designated for use only by buses and other high occupancy vehicles (HOV). Priority-lane operations include the Kalakaua Avenue bus lane, the H-1 Freeway HOV/bus lane, the Hawaii Kai Drive/Kawaihae Street bus lane, the Kalanianaole Highway HOV/bus lane and the Moanalua Freeway HOV/bus lane. Within Downtown, the half-mile-long Hotel Street Transit Mall also facilitates bus operations.

Table 3.2-1 shows the number of daily trips, the revenue hours and estimated daily boardings by route type. Approximately 51 percent of the total estimated daily ridership uses an urban trunk service along the Ewa-Koko Head arterials of the central portion of the PUC. However, all suburban trunk routes have ridership levels ranked in the top 25 for the system.

TABLE 3.2-1
SUMMARY OF BUS ROUTE TRIPS, REVENUE HOURS AND ESTIMATED DAILY BOARDINGS

Route Type	Daily Trips		Revenue Hours		Estimated Daily Boardings	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Urban Trunk	1,483	41%	1,539.80	41%	121,327	51%
Urban Collector	662	18%	393.15	11%	29,942	13%
Suburban Trunk	1,002	28%	1,385.33	37%	69,778	30%
Suburban Feeder	223	6%	106.55	3%	3,096	1%
Express	258	7%	280.20	8%	11,800	5%

Source: Technical Paper on Current Transit Quality of Service in the Primary Corridor, Parsons Brinckerhoff Inc., March 1999.
Note: The new limited stop routes, Route A, CityExpress! and Route C, CountryExpress! offer 7-day, all day service.

2) Transit Travel Times

On TheBus system, there is a large difference in travel times for peak hours and off-peak hours. Table 3.2-2 provides examples of the travel time differences between peak and off-peak trips.

According to the Technical Paper on Current Transit Quality of Service in the Primary Corridor (March 1999), the existing bus system traveling through Downtown Honolulu is convenient, having many bus choices and frequent service. However, such a high level of service is limited to travel within Downtown during peak periods. For example, limited stop express buses from outlying areas are not available during off-peak hours, requiring passengers to catch local buses with longer travel times. Passengers must also transfer more often at central downtown stops to catch the buses to their final destinations. In general, the furthest distances take the most time to travel not only because of the distance itself, but also because there are more bus stops during the trip.

TABLE 3.2-2
ESTIMATED TRAVEL TIMES (MINUTES)

Origin	Destination	Express Routes – Peak	Non-Express Routes – Off-Peak
Ewa	Downtown Honolulu	58	81
Waipahu	Downtown Honolulu	58	80
Makaha	Downtown Honolulu	81	107
Pearl City	Downtown Honolulu	40	46
Kaneohe	Downtown Honolulu	40	55

Source: Technical Paper on Current Transit Quality of Service in the Primary Corridor, Parsons Brinckerhoff Inc., March 1999.

Moreover, current bus scheduling does not coordinate the timing of transfers. As a result, trips requiring transfers often take longer than if they were continuous trips, making bus service less attractive for such trips.

3.2.3 Travel Patterns

Travel on Oahu is generated by resident households, port operations, the airport, other commercial activities, and visitors. Of these travel components, travel by members of resident households represents well over 90 percent of traffic volumes and transit ridership. This section documents current travel patterns of resident households in terms of their geographic orientation, travel purpose, and travel mode.

The information for all travel forecasts has been derived from the travel forecasting procedures maintained by OMPO, the regional transportation planning agency for the island. These procedures simulate the choices made by residents, businesses, and visitors regarding the nature, number, mode, time-of-day, and geographic orientation of trips that are made on a typical weekday. The procedures have been developed based on data obtained in extensive surveys of Oahu households, transit riders, and air passengers.

Estimates using these procedures indicate the amount of travel between different parts of the island, the share of this travel that occurs on different modes (autos, carpools, buses, and walking), and the traffic volumes and transit ridership that result on individual streets and transit lines. The following sections summarize the 1995 estimates using these procedures. The analysis is based on February 28, 1999 land use information prepared by DPP and provides a baseline for comparison with all future-year forecasts.

The summaries are based on a set of 23 planning districts that consist of the 762 small subareas of the island, called "transportation analysis zones" (TAZs), used by computerized travel demand modeling programs. The TAZs for Oahu are the following:

- Downtown
- Kakaako
- Ala Moana
- Beretania
- Makiki
- Waikiki
- McCully
- UH Manoa
- Kaimuki
- Iwilei
- Kalihi
- Airport
- Salt Lake
- Aiea
- Waipahu
- Mililani
- Ewa
- Waianae
- North Shore
- Koolauloa
- Kaneohe
- Kailua
- East Honolulu

The modeling programs estimate the number of trips between each pair of zones and then allocate these zone-to-zone trips to the available travel modes, highway facilities, and transit services. Trips and transit share are analyzed in the "production-attraction" format. Productions are defined to be at the residence while attractions are at the workplace or other non-home location. A worker, who travels from home to work and then returns home makes two trips, both produced at the residence and attracted to the workplace. This format therefore yields summary tables in which predominantly residential areas have many more productions than attractions, while employment areas have many more attractions than productions.

1) Travel by Resident Households

The 1995 travel patterns of permanent Oahu residents were estimated for a typical weekday for travel to/from work and for all other travel purposes, respectively. "Home-based-work" trips are summed across all travel modes. These trips include travel made directly between home and work (and between work and home) but exclude the six to seven percent of work travel that involves an intermediate stop (for shopping or day-care pick-ups, for example). The estimate indicates that about 582,000 work trips are made by Oahu residents on a typical weekday, equivalent to about 290,000 workers making one trip to work and a second to return home. Not all workers travel to work on a typical weekday because of part-time employment, vacations, sick leave, business travel, and shifted work schedules (with two weekdays off rather than the weekend off). Further, some workers make intermediate stops during their work trips and are therefore counted in other types of trips.

Of the 582,000 daily work trips, approximately 105,000 work trips (18 percent) are attracted to jobs in Downtown, by far the largest single employment concentration on Oahu. Large numbers of work trips are also attracted to the Airport/Pearl Harbor area, Kakaako, and Waikiki. Large volumes of work trips are produced in the residential areas within Aiea, Mililani, Kalihi, and Kaneohe.

The estimated distribution of work travel indicates that Downtown tends to be the most common workplace location for residents of the urban core of Oahu. The largest single travel market to jobs in Downtown is from the Kalihi district which is both close to Downtown and heavily populated. Residents of areas that are more distant from Downtown tend to find employment more frequently in their own district (as with Ewa, the North Shore and Koolauloa) or in a significant employment center – often a military base – as with Salt Lake, Mililani, Kaneohe, and Kailua.

Oahu residents make nearly 2,000,000 trips for all other purposes – such as school, shopping, recreation –for all travel modes on a typical weekday. Because these trips are generally much shorter than for work travel, the most likely location of these activities is within the same district as the residence. This effect is particularly true for the larger, outlying districts where more than 60 percent of non-work travel remains within the district (as in Mililani, Waianae, Kaneohe, and Kailua).

2) Travel on Transit Services by Resident Households

This section discusses the 1995 estimated trips using transit services on a typical weekday for work and for all other purposes. The transit trips are "linked" through any transfers made along the way. Thus, the total number of boardings (or "unlinked" trips) on transit buses associated with travel by Oahu residents is approximately 15 percent higher than the number of linked trips. Travel by visitors increases the number of boardings by another 15 percent, almost entirely on bus services within Waikiki and to Ala Moana Center.

Some 85,000 daily work trips use the bus system, approximately 15 percent of all home-based-work trips. As expected, the largest concentration of trips involving transit is to workplaces in Downtown Honolulu. The high share of downtown workers who use transit – 35 percent – presumably results from high parking costs, excellent bus service, and the relatively large number of downtown workers who live in nearby residential areas that also enjoy excellent bus service. Large transit volumes also occur to jobs in Kakaako and Waikiki, while transit carries a much smaller share of workers traveling to areas outside the urban core. The transit share of travel produced from various residential areas is relatively constant, ranging primarily between 13 and 18 percent. These moderate shares are the products of very high transit shares from every residential area to Downtown and the urban core, combined with much lower shares to other areas. Variations in transit shares are tied to the average income and auto-ownership levels of various residential areas (Waikiki, Waipahu, and Iwilei), as well as the presence of nearby military facilities to which transit travel is not competitive (Airport and Mililani).

Approximately 100,000 non-work transit trips are made by Oahu residents on a typical weekday. While Downtown is again the most common single destination for these transit trips, the concentration of non-work transit travel to Downtown is much less pronounced than it is for work trips. This pattern is the result of the nature of non-work travel (generally shorter and to areas closer to home than Downtown) and the households who choose transit for non-work travel (high concentrations of elderly, students, and lower-income persons).

3) Automobile Travel by Resident Households

The estimates for 1995 also show the number of trips that would be made using automobiles, based on auto person travel on a typical weekday for work and for all other purposes. There were approximately 874,000 daily work-related auto person trips in 1995. As expected, the largest number of these trips are attracted to Downtown. Other significant areas attracting work-related auto person trips are McCully, Iwilei, Pearl City/Aiea, and Mililani. Areas producing large shares of work-related trips are Pearl City/Aiea, Waipahu, Mililani, Ewa, Kaneohe, and Kailua. A key pattern to note is that there are significant suburban areas (Pearl City/Aiea, Mililani) attracting work trips as well as the more urban areas (Downtown, McCully, Iwilei).

There were approximately 1,367,000 daily non-work auto person trips in 1995. The larger non-work trip attractors are oriented more toward the suburban areas such as Pearl City/Aiea, Waipahu, Mililani, Kaneohe, and Kailua. Significant non-work attraction areas are Downtown, McCully, and Iwilei. Areas producing non-work auto person trips are Salt Lake, Pearl City/Aiea, Waipahu, Mililani, Kaneohe, Kailua, and East Honolulu.

3.2.4 Bicycle Travel and Pedestrian Facilities

The Honolulu Bicycle Master Plan (April 1999), sponsored by the City and County of Honolulu, and Bike Plan Hawaii (April 1994), a Statewide bike plan, inventoried existing facilities and provided recommendations to enhance bicycle travel (refer to Figure 3.1-4A through 3.1-4C).

About 100,000 bicycles are registered in Honolulu, and 1.3 percent of employees (10,500 persons) bike to work (1990 Census). There are 40 kilometers (24.8 miles) of bikeways within the PUC, the longest being the Pearl Harbor Bike Path extending from near Aloha Stadium to Waipio Peninsula (Waipahu). DTS is installing bicycle racks on downtown sidewalks to make it easier to bike to work, and has already placed bicycle racks on almost all of its buses. Hookups to the bus bicycle racks now exceed 27,000 per month (Oahu Transit Services, Inc. April 2000).

Oahu has a developed pedestrian trail system, several components of which exist entirely or in part within the project area. The study area also contains other areas of concentrated pedestrian activity, including pedestrian malls and public beach accesses. For example, there is heavy pedestrian traffic daily in and around areas such as Downtown, Waikiki, Ala Moana, and University. On Kalakaua Avenue, the City and County of Honolulu is currently widening the sidewalk to enhance the pedestrian experience along Kuhio Beach (Kuhio Beach Park Expansion/ Kalakaua Promenade, Signing and Striping Plan. City and County of Honolulu. Aug 18, 1999). The City and County is also developing the Historic Waikiki Trail that would wind through Waikiki, taking pedestrians to various sites of historic importance (Office of Waikiki Development, Mayor's Office. March 2000).

3.2.5 Parking

The high cost of land and development densities in Downtown Honolulu and Waikiki makes it important to preserve or improve existing parking conditions, either by increasing supply or reducing the demand for spaces. Parking prices indicate that the existing parking spaces are in high demand. A survey of parking costs by the Downtown Planet in November 1999 showed that short-term weekday parking rates in the Downtown/Chinatown area range from 50 cents per half hour to $3.00 for every 20 minutes. Monthly rates can be as much as $275, especially in the center of Downtown, although more outlying parking garages such as those on the edge of Chinatown cost as little as $50. (The Downtown Planet, Week of November 1, 1999.)

Public parking can be categorized as either off-street or on-street. Off-street parking is those spaces available in parking structures or designated parking lots. These parking facilities may be privately or publicly operated. On-street parking refers to curbside spaces that may or may not be marked with meters or painted spaces. Metered parking fees accrue to the City and County of Honolulu.

The availability of parking varies by neighborhood and by street. Most travel destinations tend to have associated off-street parking facilities. Metered and unmetered on-street parking is also available throughout the entire study area, particularly at major destinations such as Chinatown, Downtown, Ala Moana, and Waikiki. In general, parking at major destinations tends to be metered and in higher demand than those at less trafficked areas. On-street parking also tends to be restricted to certain non-peak hours of the day, especially where those spaces are in the curbside lanes of roads with rush hour traffic. In areas of high parking demand, many parking vendors offer off-street parking opportunities to the public, including municipally-operated parking garages.

3.2.6 Loading Zones

Vehicle loading zones are curbside areas set aside for passenger or cargo loading and unloading. They can also include some bus and shuttle stops. Some loading zones are restricted to use only during certain hours of the day, while others are unrestricted.

Loading zones are located throughout the city, but their frequency and sizes vary. Locations with highly used loading zones tend to be in key areas like Downtown and Waikiki. Due to the limited parking opportunities and the frequency of passenger loading and unloading in these areas, loading zones serve an important public function in the congested metropolitan setting. In contrast, most of the project corridor Ewa of Middle Street tends to be less populated and centered around major highways such as H-1, which contain no significant loading zones.

Waikiki in particular has a significant number of loading zones. The existing parking and loading restrictions in Waikiki are shown on the signing and striping plans for Kalakaua, Kapahulu and Kuhio Avenues, contained in DTS Bulletin Number 4 entitled the Kalakaua Avenue Safety and Beautification Project (no date). This bulletin states that the restrictions were initiated on May 26, 1987. In general, private vehicles are restricted from stopping, standing, or parking along Kalakaua Avenue and Kuhio Avenue. Commercial passenger and baggage loading and unloading along curbs are allowed on both sides of Kuhio Avenue and on the makai side of Kalakaua Avenue, except between the hours of 3:30 p.m. and 5:30 p.m. and where prohibited. There is no restriction on loading and unloading in loading bays at any time. Freight loading and unloading is allowed from 10:00 p.m. to 7:30 a.m. on both sides of Kuhio Avenue and from 10:00 p.m. to 9:00 a.m. on the makai side of Kalakaua Avenue. No stopping, standing, loading, or unloading is permitted on the mauka side of Kalakaua Avenue except freight vehicles with permits between the hours of 10:00 p.m. and 9:00 a.m. Kapahulu Avenue has a roughly 200-foot segment on the Ewa side that is restricted to loading and unloading only on Mondays through Saturdays between 7:00 a.m. and 11:00 p.m.

3.3 NEIGHBORHOODS

The primary transportation corridor spans 18 identifiable neighborhoods (see Figure 3.3-1 and Table 3.3-1). These neighborhoods are characterized below by their demographics, community resources, and location relative to the alternatives.

TABLE 3.3-1
POPULATION GROWTH BY NEIGHBORHOOD
(1980 TO 1990)

Neighborhood	Population		Percent Change
	1980	1990	
Diamond Head/Kapahulu/St. Louis Hts.	21,191	20,860	-1.6%
Manoa	22,605	20,834	-7.8%
McCully/Moiliili	26,664	28,466	6.8%
Waikiki	17,384	19,757	13.7%
Makiki/Tantalus/Lower Punchbowl	28,695	29,989	4.5%
Ala Moana/Kakaako/Kaheka	10,032	10,943	9.1%
Nuuanu/Punchbowl/Pacific Heights	16,166	16,221	0.3%
Downtown/Iwilei	8,674	11,752	35.5%
Liliha/Kapalama	21,068	21,235	0.8%
Kalihi/Palama	40,144	40,147	0.0%
Kalihi Valley	17,613	17,798	1.1%
Moanalua	12,948	12,260	-5.3%
Aliamanu/Salt Lake/Foster Village	31,199	37,442	20.0%
Airport/Mapunapuna	28,436	26,734	-6.0%
Aiea/Halawa Heights/Newtown	30,084	32,648	8.5%
Pearl City/Pearl Harbor Complex	42,577	46,758	9.8%
Waipahu	33,927	51,295	51.2%
Ewa/Kapolei	35,585	42,967	20.7%
Total Oahu	**751,091**	**826,596**	**10.0%**

Source: The State of Hawaii Data Book: A Statistical Abstract, State of Hawaii Department of Business, Economic Development and Tourism, 1990 and 1997.

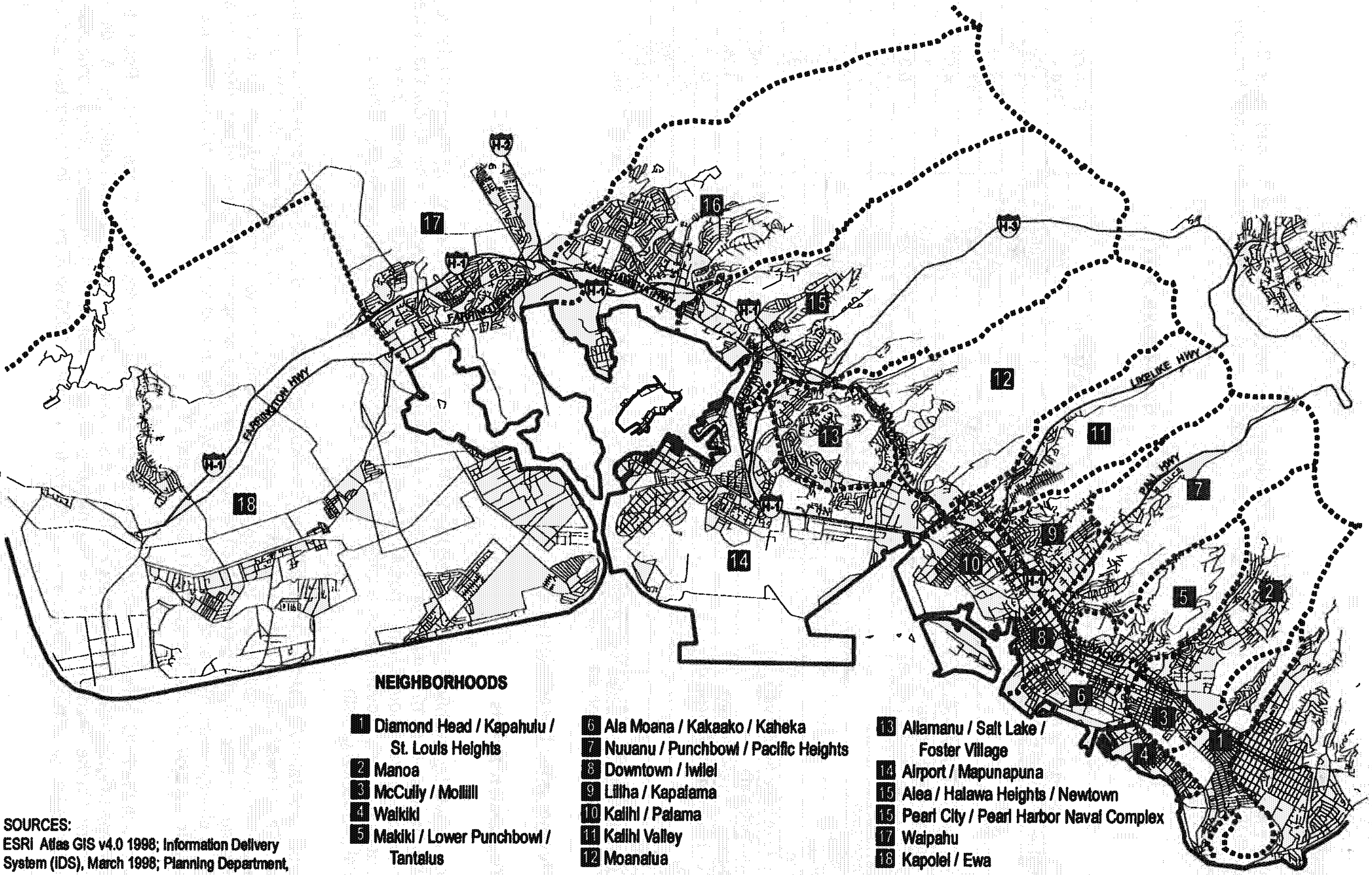
3.3.1 Demographic Description

1) Population Trends

Population growth by neighborhood from 1980 to 1990 is shown in Table 3.3-1. Oahu experienced relatively slow population growth of 10 percent, or an average of about one percent per year. In the 1990s, the average annual growth rate was about one-half percent, based on an estimated 1997 islandwide population of approximately 870,000. Nevertheless, during the 1980s and 90s, certain neighborhoods experienced substantial population growth.

For example, Waipahu/Waikele/Kunia/Waipio and Ewa/Kapolei grew 51 and 21 percent, respectively, during the 1980s. These neighborhoods are in the western part of the corridor where former agricultural land is being converted to urban uses. Housing in Ewa and Central Oahu tends to be more affordable than in the PUC, resulting in a much higher growth rate in these outlying areas compared to the rest of the island. This trend did not change in the 1990s, as most new housing was built in Ewa and Central Oahu in accordance with the approved Ewa DP and the pending Central Oahu DP.

Growth areas in the PUC were clustered in Aliamanu/Salt Lake and Downtown (see Table 3.3-1). Population growth in these neighborhoods resulted mostly from development of high-rise apartment buildings. Moderate growth occurred in the Pearl City, Aiea, Ala Moana/Kakaako, and Waikiki neighborhoods. Neighborhoods that experienced no growth or decreases in population from 1980 to 1990 were mostly in the eastern part of



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; Planning Department, City and County of Honolulu, 1998.

N

Scale: 0 .5 1.0 1.5 2.0mi
Scale: 0 1.0 2.0 km

Neighborhoods

Figure 3.3-1

the PUC, such as Manoa and Diamond Head/Kapahulu/St. Louis Heights, and in the neighborhoods of Kalihi/Palama, Moanalua, and Airport/Hickam/Pearl Harbor Naval Station. Some of these neighborhoods are older communities, contain mostly single-family residences and are in transition from residential to commercial or industrial uses. Also, an aging population characterizes some of the neighborhoods.

2) Ethnicity

Islandwide, Whites made up 32 percent of the population in 1990. They are followed by Japanese (24 percent), Filipino (14 percent), Hawaiian/part Hawaiian (11 percent), and Chinese (8 percent). For a more complete breakdown refer to Table 3.3-2.

Ethnic mix varies by neighborhood. Neighborhoods with proportionately higher populations of White residents are Waikiki, the Airport and Ewa/Kapolei/Makakilo. Waikiki has a high transient population. The Airport neighborhood encompasses mostly Air Force and Navy military housing, and the Ewa/Kapolei/Makakilo neighborhood also includes military housing.

The next largest ethnic group islandwide, Japanese, is quite highly represented in the eastern PUC neighborhoods, such as Manoa, in comparison to the islandwide proportion. This group is also well represented in Liliha/Kapalama, Moanalua, Aiea, and Pearl City. The third largest ethnic group, Filipino, is heavily represented in Kalihi/Palama, Kalihi Valley, Waipahu/Waikele/Kunia/Waipio and Ewa/Kapolei/Makakilo.

Hawaiians and part-Hawaiians are much rarer in the corridor than the groups previously described. The neighborhood with the highest proportion of Hawaiian and part-Hawaiian persons, exceeding the islandwide proportion, is Nuuanu/Punchbowl. The Papakolea homestead area, a Department of Hawaiian Home Lands (DHHL) property, is located in that neighborhood. DHHL is currently developing an addition to Papakolea, called Kalawahine Streamside, which is currently under construction (July 2000). Eventually 97 units will be constructed in Kalawahine Streamside.

3) Households and Families

Household and family characteristics by neighborhood are shown in Table 3.3-3. Seventy-five percent of the households on Oahu are families, which are defined as two or more persons related by blood, marriage, or law living together. Neighborhoods with the highest percentage of families are mainly in the western half of the corridor, Ewa of Moanalua, and include Pearl City, Waipahu and Ewa as well as Moanalua and Airport/Hickam/Pearl Harbor areas. These neighborhoods have higher percentages of low-density housing (see Section 3.3.2), have generally younger inhabitants based on median age, and have larger household sizes.

Neighborhoods with lower percentages of families and smaller household sizes are generally located in the older parts of the central Urban Core, such as McCully/Moiliili, Makiki/Tantalus, Downtown, and Ala Moana/Kakaako. These neighborhoods have higher percentages of multifamily housing (see Table 3.3-4).

Educational attainment among adults in the corridor is similar to the overall Oahu population. However, certain neighborhoods, such as Manoa, Waikiki, and Makiki/Tantalus, substantially exceed the islandwide profile for high school and college graduates. Neighborhoods with a substantially lower distribution of educational attainment compared to the islandwide distribution are Kalihi/Palama and Kalihi Valley.

4) Income

Income by neighborhood is shown in Table 3.3-5. Median household income in 1990 for Oahu was $40,581. Certain neighborhoods in the corridor, such as Manoa and Pearl City, had median incomes substantially

TABLE 3.3-2
ETHNICITY BY NEIGHBORHOOD – 1990

Neighborhood	Race and Ethnicity (Percent of Total Population)								
	White	Black	Chinese	Filipino	Japanese	Other Asian	Hawaiian	Pacific Islander	Other Race
Diamond Head/Kapahulu/St. Louis Heights.	27%	0.4%	13%	3%	41%	4%	8%	1%	1%
Manoa	26%	0.4%	12%	4%	47%	4%	5%	1%	1%
McCully/Moiliili	22%	1%	15%	4%	40%	11%	5%	1%	1%
Waikiki	61%	2%	7%	4%	12%	6%	5%	1%	2%
Makiki/Tantalus	32%	1%	16%	4%	27%	11%	6%	1%	2%
Ala Moana/Kakaako	30%	1%	10%	6%	32%	14%	5%	1%	2%
Nuuanu/Punchbowl	21%	1%	16%	5%	35%	3%	17%	1%	1%
Downtown	27%	2%	16%	12%	16%	14%	8%	2%	2%
Liliha/Kapalama	13%	0.2%	19%	13%	38%	3%	10%	1%	1%
Kalihi/Palama	8%	1%	11%	40%	13%	5%	11%	9%	2%
Kalihi Valley	9%	0.3%	4%	49%	18%	3%	10%	5%	1%
Moanalua	31%	6%	7%	8%	36%	3%	6%	1%	2%
Aliamanu/Salt Lake	32%	8%	7%	20%	16%	6%	6%	3%	3%
Airport/Hickam/Pearl Harbor Naval Station	69%	13%	0.6%	8%	1%	2%	1%	1%	4%
Aiea	29%	3%	6%	14%	31%	4%	9%	3%	2%
Pearl City	21%	2%	6%	14%	43%	4%	7%	2%	2%
Waipahu/Waikele/Kunia/Waipio	17%	2%	3%	36%	23%	2%	10%	4%	2%
Ewa/Kapolei/Makakilo	40%	4%	2%	28%	10%	2%	10%	2%	3%
Oahu	32%	3%	8%	14%	24%	4%	11%	3%	2%

Source: Neighborhood Profiles, City and County of Honolulu Planning Department (now Department of Planning and Permitting), 1996.

TABLE 3.3-3
HOUSEHOLD AND FAMILY CHARACTERISTICS BY NEIGHBORHOOD – 1990

Neighborhood	Median Age	Households (HH)	Families (Percent of HH)	Average HH Size	Educational Attainment (Percent of Persons 25 and Over)	
					High School Graduate or Higher	Bachelor's or Higher
Diamond Head/Kapahulu/St. Louis Heights	38.8	8,040	65%	2.56	81%	27%
Manoa	35.4	6,420	73%	2.79	89%	45%
McCully/Moiliili	35.9	13,428	51%	2.08	81%	28%
Waikiki	42.3	11,445	36%	1.71	88%	29%
Makiki/Tantalus	37.8	14,681	49%	2.03	86%	36%
Ala Moana/Kakaako	42.0	6,218	41%	1.72	78%	26%
Nuuanu/Punchbowl	39.4	5,776	68%	2.78	77%	30%
Downtown	38.7	5,814	43%	1.89	76%	27%
Liliha/Kapalama	41.7	6,683	76%	3.00	70%	22%
Kalihi/Palama	33.1	10,967	76%	3.46	57%	9%
Kalihi Valley	32.7	4,079	88%	4.33	59%	10%
Moanalua	31.5	3,576	94%	3.30	88%	25%
Aliamanu/Salt Lake	29.2	12,029	80%	3.11	85%	23%
Airport/Hickam/Pearl Harbor Naval Station	24.0	5,877	99%	3.40	94%	19%
Aiea	33.0	10,680	76%	2.93	83%	24%
Pearl City	33.0	13,540	87%	3.44	86%	22%
Waipahu/Waikele/Kunia/Waipio	29.6	13,921	85%	3.68	76%	16%
Ewa/Kapolei/Makakilo	27.8	11,449	88%	3.65	80%	16%
Oahu	32.2	265,625	75%	3.02	81%	25%

Source: Neighborhood Profiles, City and County of Honolulu Planning Department (now Department of Planning and Permitting), 1996.

TABLE 3.3-4
HOUSING CHARACTERISTICS BY NEIGHBORHOOD – 1990

Neighborhood	Housing Units	Vacancy Rate (%)	Median Year Built	Units in Structure				
				1 to 2	3 to 9	10 to 49	50+	Other
Diamond Head/Kapahulu/St. Louis Hts.	8,782	6%	1959	54%	11%	19%	14%	1%
Manoa	6,647	4%	1959	74%	6%	15%	3%	2%
McCully/Moiliili	14,046	4%	1969	11%	25%	25%	39%	1%
Waikiki	17,137	34%	1970	1%	4%	24%	67%	5%
Makiki/Tantalus	15,551	5%	1969	14%	12%	38%	36%	1%
Ala Moana/Kakaako	6,761	3%	1969	4%	9%	17%	69%	1%
Nuuanu/Punchbowl	5,955	3%	1962	66%	8%	9%	14%	2%
Downtown	5,995	4%	1967	1%	4%	20%	74%	1%
Liliha/Kapalama	6,826	3%	1958	72%	8%	9%	8%	1%
Kalihi/Palama	11,107	2%	1965	35%	18%	22%	24%	2%
Kalihi Valley	4,146	2%	1960	83%	12%	2%	0%	2%
Moanalua	3,628	2%	1964	62%	22%	12%	4%	0%
Aliamanu/Salt Lake	12,219	2%	1974	39%	11%	22%	28%	1%
Airport/Hickam/Pearl Harbor Naval Sta.	5,974	2%	1955	75%	24%	0%	0%	1%
Aiea	10,871	3%	1971	54%	10%	10%	25%	1%
Pearl City	13,847	1%	1971	81%	9%	4%	5%	1%
Waipahu/Waikele/Kunia/Waipio	14,271	3%	1978	63%	20%	14%	2%	1%
Ewa/Kapolei/Makakilo	11,721	3%	1971	80%	15%	3%	0%	2%
Oahu	281,683	6%	1968	57%	11%	12%	18%	1%

Source: Neighborhood Profiles, City and County of Honolulu Planning Department (now Department of Planning and Permitting), 1996.

TABLE 3.3-5
INCOME AND HOME OWNERSHIP CHARACTERISTICS BY NEIGHBORHOOD – 1990

Neighborhood	Median Household (HH) Income	Families in Poverty (Percent)	Selected Sources of Income (Percent of HH)			Occupancy (Percent)[1]	
			Social Security	Retirement	Public Assistance	Owner	Renter
Diamond Head/Kapahulu/St. Louis Hts.	$39,357	4%	11%	8%	2%	51%	43%
Manoa	$51,866	2%	10%	8%	1%	62%	35%
McCully/Moiliili	$31,974	7%	8%	5%	2%	28%	68%
Waikiki	$26,980	6%	11%	8%	2%	21%	45%
Makiki/Tantalus	$33,623	6%	8%	5%	1%	36%	59%
Ala Moana/Kakaako	$25,162	7%	11%	7%	2%	29%	63%
Nuuanu/Punchbowl	$44,199	4%	11%	8%	2%	57%	40%
Downtown	$25,436	10%	7%	4%	4%	20%	77%
Liliha/Kapalama	$43,164	2%	14%	9%	2%	56%	42%
Kalihi/Palama	$25,647	16%	13%	7%	6%	27%	71%
Kalihi Valley	$39,794	13%	12%	8%	5%	57%	41%
Moanalua	$43,706	2%	8%	7%	1%	42%	57%
Aliamanu/Salt Lake	$38,078	4%	4%	6%	2%	44%	54%
Airport/Hickam/Pearl Harbor Naval Sta.	$29,989	2%	1%	0.5%	0.4%	1%	98%
Aiea	$45,585	4%	8%	8%	2%	57%	40%
Pearl City	$55,053	2%	6%	7%	1%	71%	28%
Waipahu/Waikele/Kunia/Waipio	$46,501	8%	7%	6%	4%	60%	37%
Ewa/Kapolei/Makakilo	$40,679	4%	5%	6%	2%	53%	45%
Oahu	$40,581	5%	8%	7%	2%	49%	45%

Source: Neighborhood Profiles, City and County of Honolulu Planning Department (now Department of Planning and Permitting), 1996.
Note: [1]Does not sum to 100 percent because vacant units are included in the calculation.

higher than this islandwide median. Neighborhoods with moderately high median incomes were Nuuanu/ Punchbowl, Liliha/Kapalama, Moanalua, Aiea and Waipahu/Waikele/Kunia/Waipio.

Neighborhoods with median incomes substantially lower than the islandwide median were Waikiki, Makiki/Tantalus, Ala Moana/Kakaako, Downtown, Kalihi/Palama, and Airport/Hickam/Pearl Harbor Naval Station. However, the first four of these neighborhoods have smaller average household sizes than the Oahu average, partially explaining the lower median household incomes. Although the Airport neighborhood has a low median income level, it consists mostly of military housing, which is a form of in-kind income. The poverty rate of this neighborhood is only two percent, much lower than the Oahu overall rate. Neighborhoods with high poverty rates are Downtown, Kalihi/ Palama, Kalihi Valley and Waipahu/Waikele/Kunia/Waipio. These areas contain low-income and/or public housing units, have a disproportionate number of elderly residents, and are areas where new immigrants have settled. Low-income means a household income at or below the Department of Health and Human Services guidelines.

Neighborhoods with the highest percentages of households receiving social security and retirement incomes tend to be located in the center of the PUC, such as Liliha/Kapalama, Kalihi/Palama, and Kalihi Valley. These neighborhoods contain a large amount of older housing and long-time residents. Neighborhoods in the western portion of the corridor have lower rates of households with social security and retirement incomes. Neighborhoods with higher rates of households receiving public assistance are Downtown, Kalihi/Palama, Kalihi Valley and Waipahu/Waikele/Kunia/Waipio, the same neighborhoods that have higher than average poverty rates.

5) Home Ownership and Stability

Home ownership characteristics are shown in Table 3.3-5. Compared to the national average, Oahu has a lower home ownership rate due to the high cost of housing in Hawaii. Home ownership rates across the neighborhoods of the corridor vary from 71 and 62 percent in Pearl City and Manoa, respectively, to 1, 20, 21 and 27 percent in the Airport area, Downtown, Waikiki and Kalihi/Palama. Neighborhoods with high ownership rates tend to be more stable than neighborhoods with higher proportions of renters because resident turnover tends to be less.

3.3.2 Housing

Housing characteristics by neighborhood are shown in Table 3.3-4. Housing of all types on Oahu increased from about 174,000 units in 1970 to over 280,000 units in 1990, an increase exceeding 60 percent. Most of the housing units are low-density, single-family and townhouse dwellings. In the corridor, low-density neighborhoods are generally clustered in the eastern and western portions. Housing units in central Urban Core neighborhoods are higher densities, and many are in medium to high-rise apartment buildings. These neighborhoods include McCully/Moiliili, Waikiki, Makiki/Tantalus, Ala Moana/Kakaako, Downtown, Kalihi/Palama and Aliamanu/Salt Lake.

Based on the median age of housing units, the older neighborhoods are clustered in the east end of the corridor, whereas the newer neighborhoods are clustered on the west end. Vacancy rates of most neighborhoods ranged from one to three percent in 1990, below the islandwide rate of six percent. Waikiki had a high vacancy rate of 34 percent because of the abundance of rental units held primarily for visitor use.

3.3.3 Community Facilities and Services

Community facilities and services include libraries, shopping centers, churches, police stations, fire stations, schools (public and private), hospitals, and clinics. Parks are discussed in Section 3.11.

Activity centers and growth areas that attract and generate travel exist throughout the study area. Table 3.3-6 lists some of the major activity centers in the corridor by DP AREA.

TABLE 3.3-6
MAJOR ACTIVITY SITES IN THE PRIMARY TRANSPORTATION CORRIDOR

Ewa DP AREA	
City of Kapolei	Kalaeloa(former Barbers Point Naval Air Station)
Central Oahu DP AREA	
Royal Kunia Shopping Center	Waikele Center/Waikele Premium Outlets
Waipahu Town	Waipio
Waikele	Kunia
Primary Urban Center DP AREA	
Leeward Community College	West Oahu College
Pearl Highlands Center	Pearl City Shopping Center
Westridge Shopping Center	Pearlridge Center
Pearl Kai Center	Aloha Stadium
Stadium Marketplace and Mall	Bougainville Center
Salt Lake	Pearl Harbor Naval Base
Arizona Memorial	Hickam Air Force Base
Mapunapuna Industrial Area	Honolulu International Airport
Honolulu Community College	Middle Street Industrial Area
Kalihi Kai Industrial District	Kalihi/Palama
Iwilei Industrial District	Sand Island
Honolulu Harbor	Chinatown
Downtown Financial District	Government centers (Federal/State/City)
Queen's Medical Center	Kakaako
Pali Momi Medical Center	Kaiser Medical Center
Victoria Ward Centers	Neal Blaisdell Center
Kapiolani Business District	Ala Moana Park
Ala Moana Center	Fort DeRussy
Waikiki	Honolulu Zoo
Ala Wai Park	Tokai University Pacific Center
Kapiolani Park	University of Hawaii at Manoa
McCully/Moiliili	Chaminade College

Source: Parsons Brinckerhoff, Inc.

3.4 VISUAL AND AESTHETIC CONDITIONS

An important part of the MIS/DEIS alternatives development and analysis was the consideration given to the possible visual and aesthetic impacts a future system might have on existing visual resources. The visual impact analysis was based on the Federal Highway Administration's (FHWA's) methodology for visual impact assessment as described in their Publication No. FHWA-HI-88-054 guidelines, Visual Impact Assessment for Highway Projects. Three types of visual resources are discussed in this section: sectors/landscape units, coastal views, and other special view opportunities.

3.4.1 Sectors and Landscape Units

For ease of analysis, the project area was divided into sectors and landscape units. A "sector" is defined as a large but recognizable geographic entity having generally consistent land use and visual character. Sectors are comprised of smaller components called "landscape units." Thirteen sectors and 70 landscape units along potential alignments were identified in the primary transportation corridor. These sectors and landscape units are described in more detail in the Environmental Baseline Report (Parsons Brinckerhoff, Inc., June 1999).

Visual impacts were identified based on the visual character and visual quality of the landscape units, and how the alternatives are visually compatible with these units. Visual character refers to certain aesthetic attributes such as form, line, color, or texture. Visual quality is the level at which the landscape unit is vivid (memorable), is intact (free from visual encroachment), or has unity (forms a coherent harmonious visual pattern). For more detail on the methodology for analysis, refer to the Environmental Baseline Report.

Landscape units were ranked by visual field assessments on a 10-point scale with 10 being very high and 0 being very low. Of the 70 landscape units identified in the study area, the units with the highest visual character and quality include the following:

- Hawaii Capital Special District
- Chinatown Special District
- Nimitz Highway portion fronting Downtown Honolulu
- portions of Kapiolani Boulevard between the Hawaii Convention Center and Ala Moana Center
- Ala Moana Boulevard fronting Ala Moana Park
- Kalia Road in Waikiki
- portions of Kalakaua Avenue along Waikiki Beach
- portions of Ala Wai Boulevard parallel to the Ala Wai Canal
- Kapahulu Avenue between Kalakaua and Kuhio Avenues
- University Avenue between H-1 and Bachman Hall
- portions of North and South King Streets from Liliha Street through Chinatown and Downtown

3.4.2 Coastal View Sections

In addition to landscape units, the primary transportation corridor contains several major coastal viewsheds. The Hawaii Coastal Zone Management Program and the City's Special Management Area Use Program both require the consideration of important coastal views.

The Coastal View Study (City and County of Honolulu, Department of Land Utilization, 1987) identifies significant makai and lateral views along Oahu's coastline. The following are those significant makai and lateral views along Oahu's shoreline that also relate to the primary transportation corridor, as listed in the Coastal View Study:

- Ewa Beach Road/Ewa Beach Park (makai views from park)
- Pearl Harbor (makai views of harbor from Kamehameha Highway, at Richardson Park)
- Keehi Lagoon (makai views of lagoon from Lagoon Drive and from Kamehameha Highway)
- Honolulu Harbor (makai views of harbor from Nimitz Highway)
- Kewalo Basin
- Ala Moana Park/Magic Island
- Ala Wai Yacht Harbor
- Kalia Road/Fort DeRussy

- Kalakaua Avenue/Waikiki Beach

3.4.3 Other Special View Opportunities

Special view opportunities were considered by identifying the character and quality of the visual environment. The importance of coastal views and views within special districts was further reinforced. The following view opportunities were considered relative to these viewsheds:

- Residential, Commercial, Institutional, and Industrial Areas: Views of and from various types of buildings and built environments within the viewsheds;
- Koolau and Waianae Mountain Ranges: Views of and from the distant mountains.
- Special Districts: Views of and from special districts designated by the City and County of Honolulu, or non-designated areas of distinctly unique character due to cultural and historical context. Special Districts include Chinatown, Hawaii Capital, Thomas Square, and Waikiki;
- Non-designated Districts: Views of and from neighborhoods that have not been officially designated by the City and County of Honolulu, but nonetheless possess unique identifiable character and fabric. These non-designated districts include the Kalihi-Palama District on North King Street, University of Hawaii-Manoa Campus mauka of Dole Street, and Downtown.
- Pacific Ocean, Pearl Harbor, and Honolulu Harbor: Limited makai views of and from the water adjacent to the study areas.

Specific view opportunities along potential project alignments include:

- Keehi Lagoon
- Kalihi-Palama District
- Downtown
- Hawaii Capital Special District
- Chinatown Special District
- Thomas Square/Honolulu Academy of Arts Special District
- Waikiki Special District
- Hawaii Convention Center
- University of Hawaii - Manoa
- Pacific Ocean, Pearl Harbor, and Honolulu Harbor
- Koolau and Waianae Mountain Ranges

3.5 AIR QUALITY

3.5.1 Relevant Pollutants

Ambient concentrations of air pollution are regulated by both national and State ambient air quality standards (AAQS) (see Table 3.5-1). As indicated in the table, national and State AAQS have been established for particulate matter (PM), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone and lead. The State has also set a standard for hydrogen sulfide.

TABLE 3.5-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	$\mu g/m^3$	Annual 24 Hours	50[1] 150[2]	50[1] 150[2]	50 150[3]
Particulate Matter (<2.5 microns)	$\mu g/m^3$	Annual 24 hours	15[1] 65[4]	15[1] 65[4]	- -
Sulfur Dioxide	$\mu g/m^3$	Annual 24 Hours 3 Hours	80 365[3] -	- - 1300[3]	80 365[3] 1300[3]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours 1 Hour	10[3] 40[3]	- -	5[3] 10[3]
Ozone	$\mu g/m^3$	8 Hours 1 Hour	157[5,6] 235[7]	157[5,6] 235[7]	- 100[3]
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	$\mu g/m^3$	1 Hour	-	-	35[3]

Source: Section 40, Part 50, Code of Federal Regulations.
Chapter 11-59, Hawaii Administrative Rules.

Notes:
[1] Three-year average of annual arithmetic mean.
[2] 99th percentile value averaged over three years.
[3] Not to be exceeded more than once per year.
[4] 98th percentile value averaged over three years.
[5] Three-year average of fourth-highest daily 8-hour maximum.
[6] Implementation of standard currently stayed pending federal court decision.
[7] Standard is attained when the expected number of exceedances is less than or equal to 1.

Particulate matter includes dust, soot, smoke, and liquid droplets. Sulfur oxides, which include SO_2, are colorless gases emitted primarily by burning fossil fuels and volcanic activity. Nitrogen dioxide is a brownish, highly corrosive gas with a pungent odor that is formed from nitrogen oxides emitted by electric utilities, industrial boilers and combustion of fossil fuels. Carbon monoxide is a colorless, odorless and tasteless gas produced by the incomplete combustion of fossil fuels. Ozone is formed in the atmosphere by a chemical reaction of nitrogen oxides and volatile organic compounds in the presence of sunlight. Although an ozone layer in the upper atmosphere shields the earth from harmful ultraviolet radiation, high ozone levels at ground level can cause harmful effects to humans and plants. Lead is a naturally occurring substance that has been used extensively in paint and gasoline. Historically, lead particulates enter the air mainly from vehicle exhaust. The elimination of lead in gasoline sold in the United States has greatly reduced the amount of lead in the air. Hydrogen sulfide is a colorless malodorous gas with the smell of rotten eggs. It is normally generated when sewage is allowed to stand for a long period.

The national AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect public health with an "adequate margin of safety". On the other hand, national secondary standards define levels of air quality necessary to protect public welfare from "any known or anticipated adverse effects of a pollutant". In contrast to the national AAQS, the State AAQS are designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1-hour to 24-hour) AAQS, both national and State standards allow a specified number of exceedances per year. The State

AAQS are in some cases considerably more stringent than comparable national AAQS. In particular, the Hawaii 1-hour AAQS for CO is four times more stringent than the comparable national limit, and the State 1-hour limit for ozone is more than twice as stringent as the national 1-hour standard. Pending court review, the national 1-hour ozone standard will be phased out during the next few years in favor of a new (and more stringent) 8-hour standard.

The pollutants relevant to the project are those related in large measure to motor vehicles, which have historically constituted a major source of ambient air pollution. These pollutants are CO, hydrocarbons, nitrogen oxides and ozone. Lead was a major motor vehicle pollutant until its elimination from gasoline. Carbon monoxide impacts are localized. Even under the worst meteorological conditions, high concentrations of CO under the most congested traffic conditions are limited to a relatively short distance from heavily traveled roadways. Therefore, CO impacts are analyzed on a localized or "microscale" level. Hydrocarbon and nitrogen oxide automotive emissions play a large role in the formation of ozone. Since the chemical reactions are slow and occur as the pollutants diffuse downwind, elevated ozone levels are often found many miles from pollutant sources. Therefore, the impacts from hydrocarbon and nitrogen oxide emissions are generally analyzed on a regional or "mesoscale" level.

3.5.2 Regional Compliance with the Standards

Air pollutants from vehicular, industrial, natural and/or agricultural sources affect the present air quality in the project area. Much of the PM emissions on Oahu originate from area sources, such as agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxide and hydrocarbon emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a substantial share of total nitrogen oxide emissions. The majority of CO emissions are generated by motor vehicles.

The Hawaii State Department of Health (DOH) operates a network of nine air quality monitoring stations at various locations on Oahu. However, each station typically monitors only certain air quality parameters. Seven of the DOH air monitoring stations on Oahu are located within or near the project study area. These include stations at Kapolei, Makaiwa, Pearl City, Liliha, Sand Island, Downtown Honolulu and Waikiki. Table 3.5-2 summarizes annual statistics from these stations for the period 1996 to 1998 based on the most recent data currently available. A brief summary of the air quality monitoring data at these stations is provided below.

Particulate matter of less than 10 microns in diameter (PM-10) is monitored at Kapolei, Pearl City, Liliha and Downtown Honolulu. The maximum annual 24-hour average PM-10 concentrations from 1996 to 1998 ranged from 21 ug/m^3 at the Downtown Honolulu station in 1997 to 103 ug/m^3 at the Pearl City station in 1998. There were no recorded exceedances of the State or national AAQS.

Carbon monoxide is monitored at Kapolei, Downtown Honolulu and Waikiki. During the 1996 to 1998 period, maximum annual 1-hour CO concentrations at these locations ranged from 1.7 to 6.7 mg/m^3, and no exceedances of the State or national 1-hour AAQS were recorded. The 8-hour CO concentrations from 1996 to 1998 reached a maximum level of 3.4 mg/m^3, which is 68 percent of the allowable State limit and 34 percent of the allowable national limit. Although the highest CO concentrations typically occur on sidewalks near traffic-congested intersections, DOH measurements are not made at these locations due to practical constraints. Therefore, the DOH monitoring data may not be entirely representative of the maximum concentrations that occur within public areas.

Ozone is only measured at the Sand Island station. The maximum 1-hour concentration for each year between 1996 and 1998 ranged from 92 to 114 ug/m^3. Several exceedances of the State AAQS were recorded in 1997 and 1998. There were no exceedances of the less stringent national AAQS.

TABLE 3.5-2
AIR QUALITY DATA FOR STUDY AREA MONITORING STATIONS (1996-1998)

Air Pollutant	Kapolei			Makaiwa			Pearl City			Liliha			Sand Island			Downtown Honolulu			Waikiki		
	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
24-Hour Particulate Matter <10 microns in diameter (PM-10)																					
Possible Periods (Day)	61	365	365	NM	NM	NM	366	365	365	366	365	365	NM	NM	NM	366	365	365	NM	NM	NM
Valid Periods (Day)	55	269	359	NM	NM	NM	245	354	359	312	343	358	NM	NM	NM	340	287	353	NM	NM	NM
Highest Value (ug/m^3)	52	26	34	NM	NM	NM	27	45	103	33	28	39	NM	NM	NM	28	21	28	NM	NM	NM
Annual Mean (ug/m^3)	19	13	15	NM	NM	NM	14	14	16	16	15	15	NM	NM	NM	14	8	9	NM	NM	NM
Number times SAAQS exceeded	0	0	0	NM	NM	NM	0	0	0	0	0	0	NM	NM	NM	0	0	0	NM	NM	NM
Number times NAAQS exceeded	0	0	0	NM	NM	NM	0	0	0	0	0	0	NM	NM	NM	0	0	0	NM	NM	NM
1-Hour Carbon Monoxide (CO)																					
Possible Periods (Hour)	8784	8760	8760	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	8784	8760	8760	8784	8760	8760
Valid Periods (Hour)	8220	8649	8044	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	7871	7272	8363	8704	8632	8707
Highest Value (mg/m^3)	1.7	1.8	1.9	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.6	4.1	6.7	5.2	5.9	4.7
Annual Mean (mg/m^3)	0.3	0.3	0.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.9	1.0	0.9	1.2	1.0	1.0
Number times SAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	0	0	0
Number times NAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	0	0	0
8-Hour Carbon Monoxide (CO)																					
Possible Periods (8-Hour)	1098	1095	1095	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1098	1095	1095	1098	1095	1095
Valid Periods (8-Hour)	1049	1085	1004	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1007	912	1047	1097	1083	1088
Highest Value (mg/m^3)	0.7	0.7	0.7	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	2.1	2.1	2.5	3.4	2.7	2.5
Annual Mean (mg/m^3)	0.2	0.3	0.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.9	1.0	0.9	1.2	1.0	1.0
Number times SAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	0	0	0
Number times NAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	0	0	0

Note: NM = Not Measured.

TABLE 3.5-2 (CONTINUED)
AIR QUALITY DATA FOR STUDY AREA MONITORING STATIONS (1996-1998)

Air Pollutant	Kapolei			Makaiwa			Pearl City			Liliha			Sand Island			Downtown Honolulu			Waikiki		
	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
1-Hour Ozone (O_3)																					
Possible Periods (Hour)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	8784	8760	8760	NM	NM	NM	NM	NM	NM
Valid Periods (Hour)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	8263	8702	8688	NM	NM	NM	NM	NM	NM
Highest Value (ug/m^3)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	92	106	114	NM	NM	NM	NM	NM	NM
Annual Mean (ug/m^3)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	27	37	41	NM	NM	NM	NM	NM	NM
Number times SAAQS exceeded	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	13	7	NM	NM	NM	NM	NM	NM
Number times NAAQS exceeded	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	NM	NM	NM	NM	NM	NM
3-Hour Sulfur Dioxide (SO_2)																					
Possible Periods (3-Hour)	2928	2920	2920	2928	2920	2920	NM	NM	NM	NM	NM	NM	NM	NM	NM	2928	2920	2920	NM	NM	NM
Valid Periods (3-Hour)	2785	2845	2723	2838	2769	2877	NM	NM	NM	NM	NM	NM	NM	NM	NM	2528	2378	2617	NM	NM	NM
Highest Value (ug/m^3)	45	61	69	60	43	99	NM	NM	NM	NM	NM	NM	NM	NM	NM	73	22	42	NM	NM	NM
Annual Mean (ug/m^3)	2	2	2	1	1	3	NM	NM	NM	NM	NM	NM	NM	NM	NM	3	2	2	NM	NM	NM
Number times SAAQS exceeded	0	0	0	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	NM	NM	NM
Number times NAAQS exceeded	0	0	0	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	NM	NM	NM
24-Hour Sulfur Dioxide (SO_2)																					
Possible Periods (Day)	366	365	365	366	365	365	NM	NM	NM	NM	NM	NM	NM	NM	NM	366	365	365	NM	NM	NM
Valid Periods (Day)	358	361	343	360	349	362	NM	NM	NM	NM	NM	NM	NM	NM	NM	335	308	335	NM	NM	NM
Highest Value (ug/m^3)	14	20	17	20	16	24	NM	NM	NM	NM	NM	NM	NM	NM	NM	18	7	8	NM	NM	NM
Annual Mean (ug/m^3)	2	2	2	1	1	3	NM	NM	NM	NM	NM	NM	NM	NM	NM	3	2	2	NM	NM	NM
Number times SAAQS exceeded	0	0	0	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	NM	NM	NM
Number times NAAQS exceeded	0	0	0	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	0	NM	NM	NM

Note: NM = Not Measured.

TABLE 3.5-2 (CONTINUED)
AIR QUALITY DATA FOR STUDY AREA MONITORING STATIONS (1996-1998)

Air Pollutant	Kapolei			Makaiwa			Pearl City			Liliha			Sand Island			Downtown Honolulu			Waikiki		
	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998	1996	1997	1998
Lead (Pb)																					
Possible Periods (Day)	NM	NM	NM	NM	NM	NM	NM	NM	NM	61	45	NM	NM	NM	NM	61	45	NM	NM	NM	NM
Valid Periods (Day)	NM	NM	NM	NM	NM	NM	NM	NM	NM	51	34	NM	NM	NM	NM	42	24	NM	NM	NM	NM
Highest Value (ug/m^3)	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.1	0	NM	NM	NM	NM	0	0	NM	NM	NM	NM
Annual Mean (ug/m^3)	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	NM	NM	NM	NM	0	0	NM	NM	NM	NM
Number times SAAQS exceeded	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	NM	NM	NM	NM	0	0	NM	NM	NM	NM
Number times NAAQS exceeded	NM	NM	NM	NM	NM	NM	NM	NM	NM	0	0	NM	NM	NM	NM	0	0	NM	NM	NM	NM
Nitrogen Dioxide (NO_2)																					
Possible Periods (Day)	8784	8760	8760	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Valid Periods (Day)	7610	8494	8006	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Highest Value (ug/m^3)	-	-	-	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Annual Mean (ug/m^3)	2	8	8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Number times SAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Number times NAAQS exceeded	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Source: Hawaii Air Quality Data, 1996, 1997 and 1998, State Department of Health, Clean Air Branch.

Notes: NM = Not Measured.
Possible Periods = the total number of possible sampling periods in the year.
Valid Periods = the total number of valid sampling periods.

Sulfur dioxide (SO_2) is monitored at Kapolei, Makaiwa and Downtown Honolulu. No exceedances of the State or national 3-hour standard were recorded during the 1996 to 1998 period at any of the three sites. The maximum 3-hour SO_2 concentration recorded was 99 ug/m^3 at the Makaiwa station in 1998. This is about 8 percent of the State and national standards. There were also no exceedances of the State or national 24-hour AAQS for SO_2 during the 1996-1998 period. The maximum 24-hour concentration at any of the three locations during the 1996-1998 monitoring period was 24 ug/m^3, which is about 7 percent of the State and national standards.

Ambient lead concentrations were monitored at the Liliha and Downtown Honolulu stations. In 1998, lead was not measured at either station.

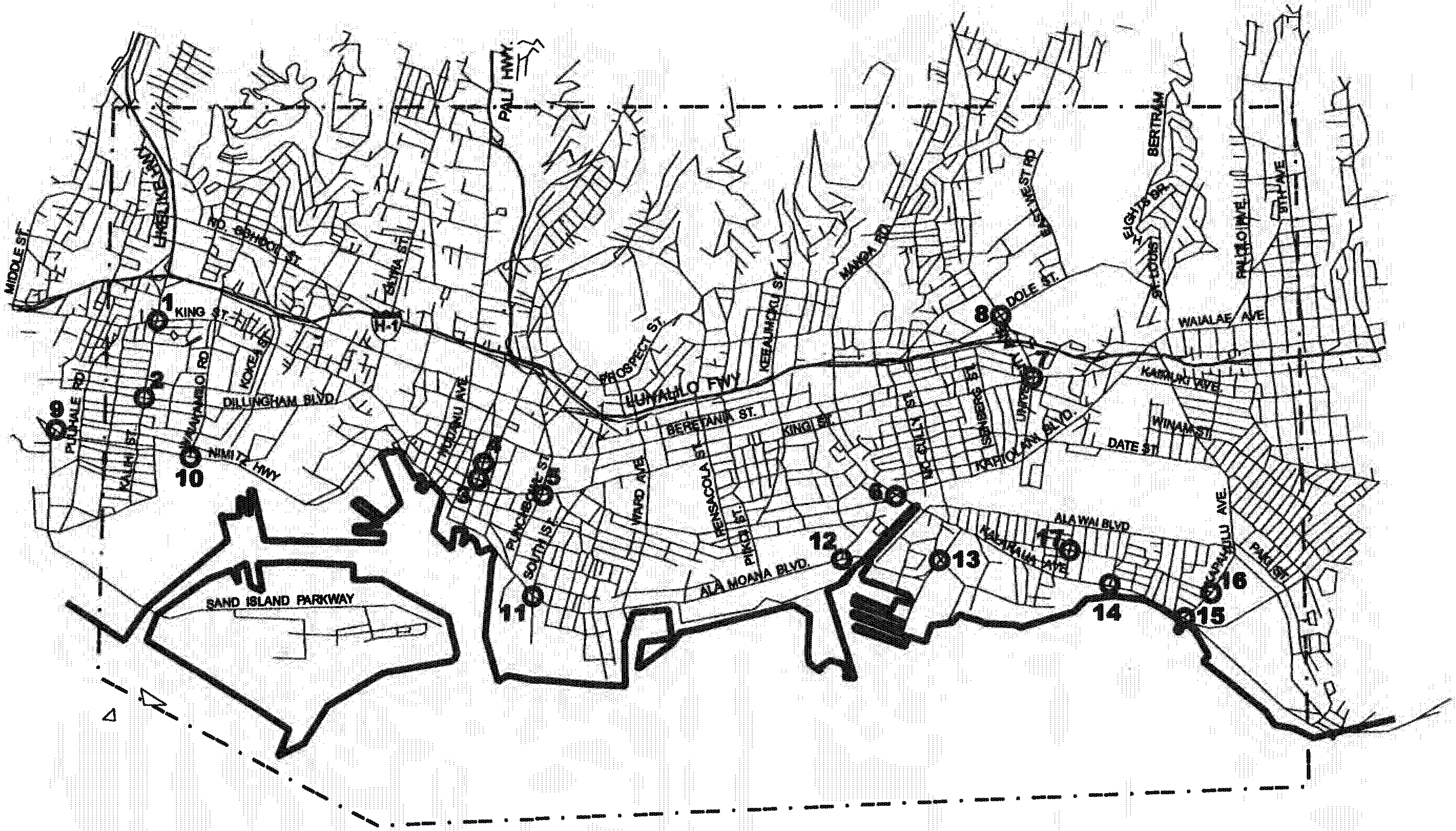
Nitrogen dioxide is only monitored at the Kapolei station. The highest measurements of NO_2 concentrations ranged between 2 and 8 ug/m^3, well within the State and national AAQS. Therefore, no exceedances were recorded.

Based on the discussion above, the State and national AAQS for SO_2, NO_2, lead and PM-10 currently appear to be met in the project area. In fact, the project area, as well as the entire State, is presently an attainment area for all national AAQS. However, the State AAQS for ozone may be exceeded on occasion based on the Sand Island measurements for this parameter. In addition, while CO measurements taken at the monitoring stations suggest that concentrations are in compliance with the State standards, CO concentrations near congested intersections could exceed the State AAQS at times. As indicated in Section 3.5.1, the State standards for ozone and CO are more stringent than the national standards.

3.5.3 Identification of Sensitive Sites

Since areas near congested intersections may have CO concentrations exceeding the State AAQS, representative receptor areas within the project boundaries were identified for analysis. Because of the large scale of this project and the many intersections that could be affected by it, the CO microscale air quality analysis was limited to 17 intersections dispersed across the project area. They were selected based on a qualitative assessment that these could be areas of maximal CO concentrations from existing and future traffic congestion. They are meant to be representative of the locations in the project area expected to experience peak CO concentrations. The selected intersections are listed below, and the locations of these intersections are shown by number on Figure 3.5-1.

1. North King Street at Kalihi Street
2. Dillingham Boulevard at Kalihi Street
3. South King Street at Bishop Street
4. Hotel Street at Bishop Street
5. South King Street at Punchbowl Street
6. Kapiolani Boulevard at Kalakaua Avenue
7. South King Street/Beretania Street at University Avenue
8. University Avenue at Dole Street
9. Nimitz Highway at Sand Island Access Road
10. Nimitz Highway at Waiakamilo Road
11. Ala Moana Boulevard at South Street
12. Ala Moana Boulevard at Atkinson Drive
13. Ala Moana Boulevard at Kalia Road
14. Kalakaua Avenue at Kaiulani Street
15. Kalakaua Avenue at Kapahulu Avenue
16. Kuhio Avenue at Kapahulu Avenue
17. Kuhio Avenue at Seaside Avenue



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

LEGEND:

# O	Location of Intersections that underwent Microscale Analysis

N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Intersections That Underwent Microscale Analysis

Figure 3.5-1

3.6 NOISE AND VIBRATION

3.6.1 Noise and Vibration Metrics and Standards

1) Transit Noise

The Federal Transit Administration (FTA) has developed criteria for assessing noise impacts related to transit projects. The standards outlined in Transit Noise and Vibration Impact Assessment (FTA, 1995) are based on community reaction to noise. The standards evaluate changes in existing noise conditions using a sliding scale. The higher the level of existing noise, the less transit projects are allowed to contribute additional noise.

The basic unit of measurement for noise is the decibel. To better account for human sensitivity to noise, decibels are measured on the "A-scale," abbreviated dBA. In accordance with FTA guidelines, the Draft EIS focuses on average noise conditions over a 24-hour period, in order to account for human sensitivity to noise during the nighttime hours. Noise that occurs at night (between 10:00 p.m. and 7:00 a.m.) is given a ten dBA penalty. This adjusted noise measurement unit is known as a Day Night Equivalent Level (Ldn). A rural area with no major roads nearby would average around 50 dBA (Ldn); a noisy residential area close to a major arterial would average around 70 dBA. Most of the residential areas in the study corridor fall within this range. Figure 3.6-1 provides other typical Ldn values for rural and urban areas.

Some land use activities are more sensitive to noise than others (parks, churches, and residences are more noise sensitive than industrial and commercial areas). The FTA Noise Impact Criteria group sensitive land uses into the following three categories:

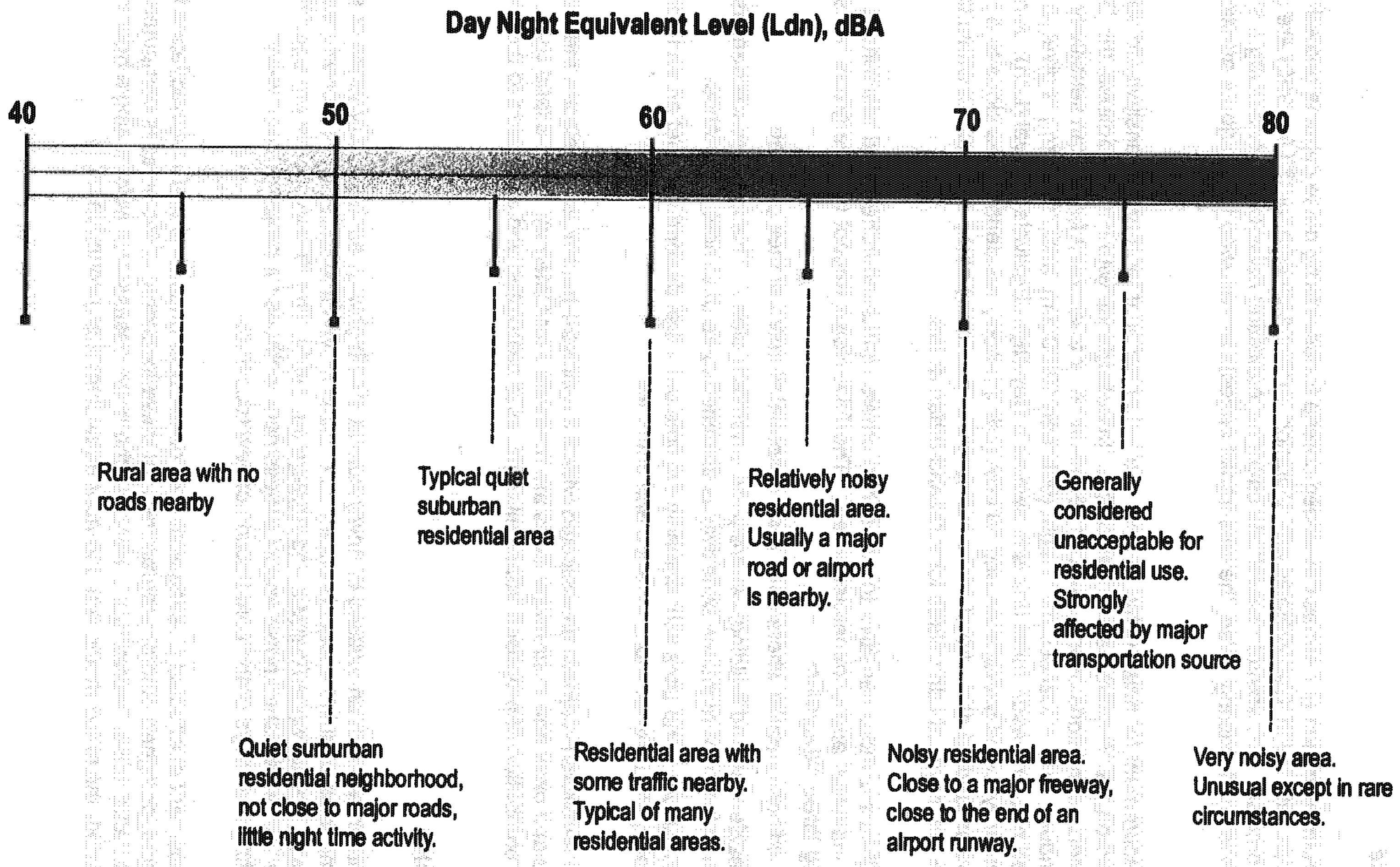
- Category 1: Buildings or parks where quiet is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime uses that depend on quiet as an important part of operations, including schools, libraries and churches.

Representative noise sensitive receptors are selected where existing 24-hour noise levels are measured for Category 2 land uses and peak one-hour noise levels are measured for Category 1 and 3 land uses. At these locations, the noise contribution of proposed transit alternatives is calculated and compared to the measured existing noise level.

2) Highway Noise

For transit projects integrated with an existing or newly-constructed highway, such as HOV lanes or exclusive bus lanes, the determination of noise impact is based on existing FHWA noise prediction procedures and impact criteria (Highway Traffic Noise Analysis and Abatement, 1995). The FHWA criteria are used to maintain consistency with established noise impact assessment methods for projects that involve modifications to existing roadways or the construction of new roadways.

FHWA requires assessment at affected existing activities, developed lands, and undeveloped lands for which development is planned, designed, and/or programmed. At these locations, traffic noise is computed for the hour with the highest traffic noise, "worst hour". Because the noise assessment is for a single hour rather than for a 24-hour period, the noise metric is a one-hour equivalent (Leq) sound level.



SOURCE:
FTA, April 1995

Typical Ldn Values For Rural And Urban Areas

Figure 3.6-1

The FHWA groups noise sensitive land uses into the following exterior and interior categories:

- Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
- Category B: Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, and hospitals.
- Category C: Developed lands, properties, or activities not included in Categories A or B.
- Category D: Undeveloped lands.
- Category E: Indoor activities at receptors where no exterior noise sensitive land use or activities have been identified; and situations where the exterior activities are either remote from the highway or shielded, so that while the exterior activities remain undisturbed, noise nevertheless affects interior activities. These land uses include residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

3) Transit Vibration

In addition to transit noise, there is also the concern for potential impacts of vibration from transit operations. Ground-borne vibration is small but rapidly fluctuating motion transmitted through the ground. Ground-borne vibration diminishes (or "attenuates") over distance. Some soil types transmit vibration quite efficiently; others do not. The response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square (RMS) velocity level in decibel units (VdB). As a point of reference, the average person can just barely perceive vibration velocity levels below 70 VdB. Comparisons of typical ground-borne vibration levels are presented in Figure 3.6-2.

3.6.2 Existing Noise and Vibration Environment

Existing noise levels vary widely along the various alignments, which reflects the variety of current land uses and noise sources within the study area. Noise levels were measured in April and December of 1999 at 29 locations in the study area to characterize the existing noise environment (Figures 3.6-3A and 3.6-3B). The existing noise levels are summarized in Table 3.6-1.

Eleven sites included long-term (24-hour) measurements to characterize noise levels at land uses with nighttime sleep activity such as residences and hotel/motels. The short-term measurement sites represent daytime land uses such as schools and parks. Four of the short-term measurement locations, Sites A through D, were selected to assess the future change in traffic noise levels due to the addition of HOV lanes on H-1, between Managers Drive and Kunia Road. Each measurement location is representative of surrounding noise sensitive land uses.

Ambient vibration levels were not measured as part of this study. The FTA Vibration Impact Criteria were used to identify locations where potential impacts may occur based on existing land use activities.

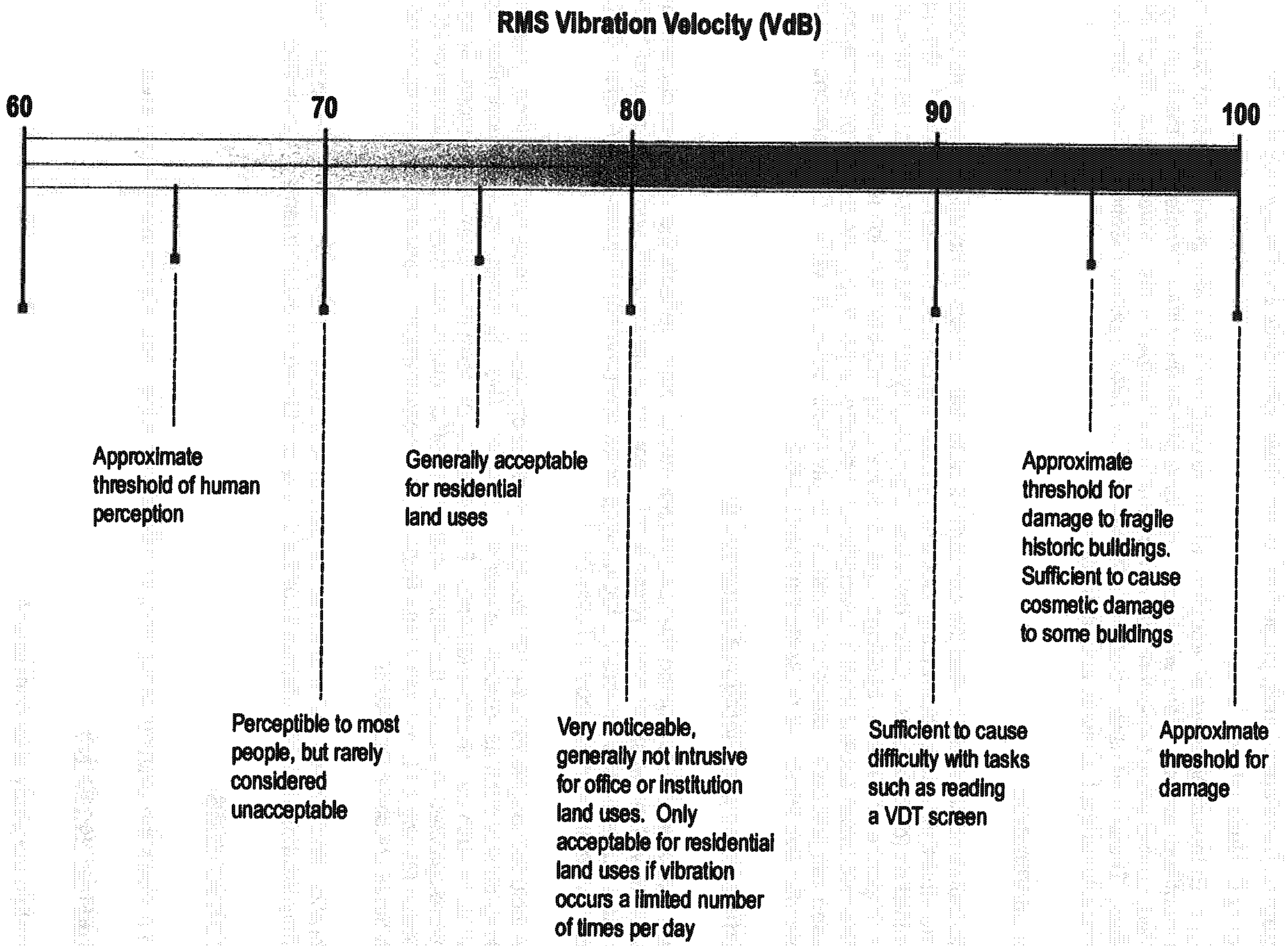
3.7 ECOSYSTEMS

This section reviews the existing vegetation, wildlife, and marine ecosystems in the study area.

3.7.1 Terrestrial Vegetation

Vegetation within the study area consists of:

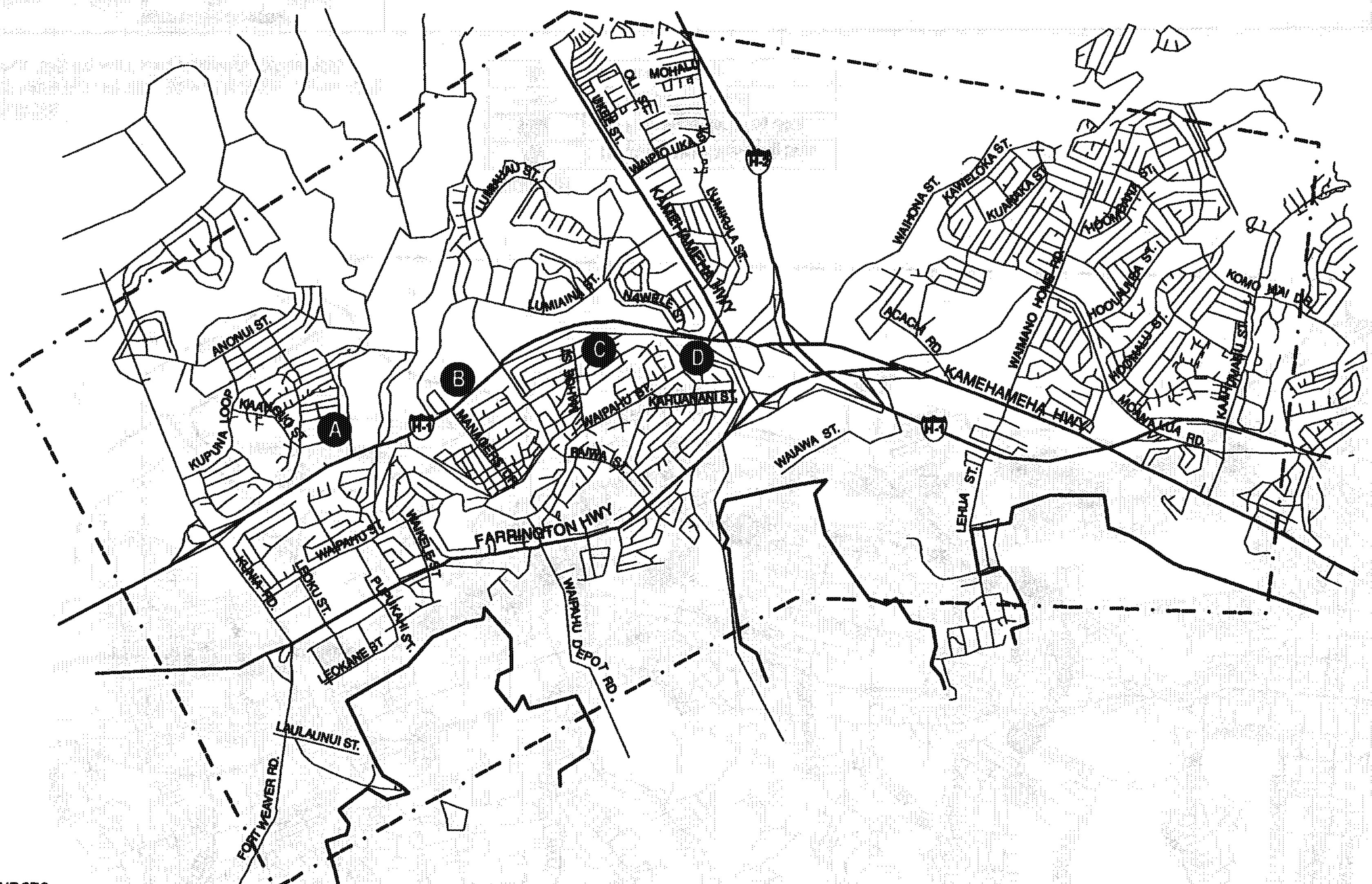
- Maintained plantings, such as roadway medians, shoulders, landscaping of adjacent properties, golf courses, and botanical gardens



SOURCE:
FTA, April 1995

Typical Levels Of Ground-Borne Vibration

Figure 3.6-2



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Parsons Brinckerhoff Quade and Douglas, Inc., 1999.

LEGEND:

●	15 - Minute Noise Monitoring Sites

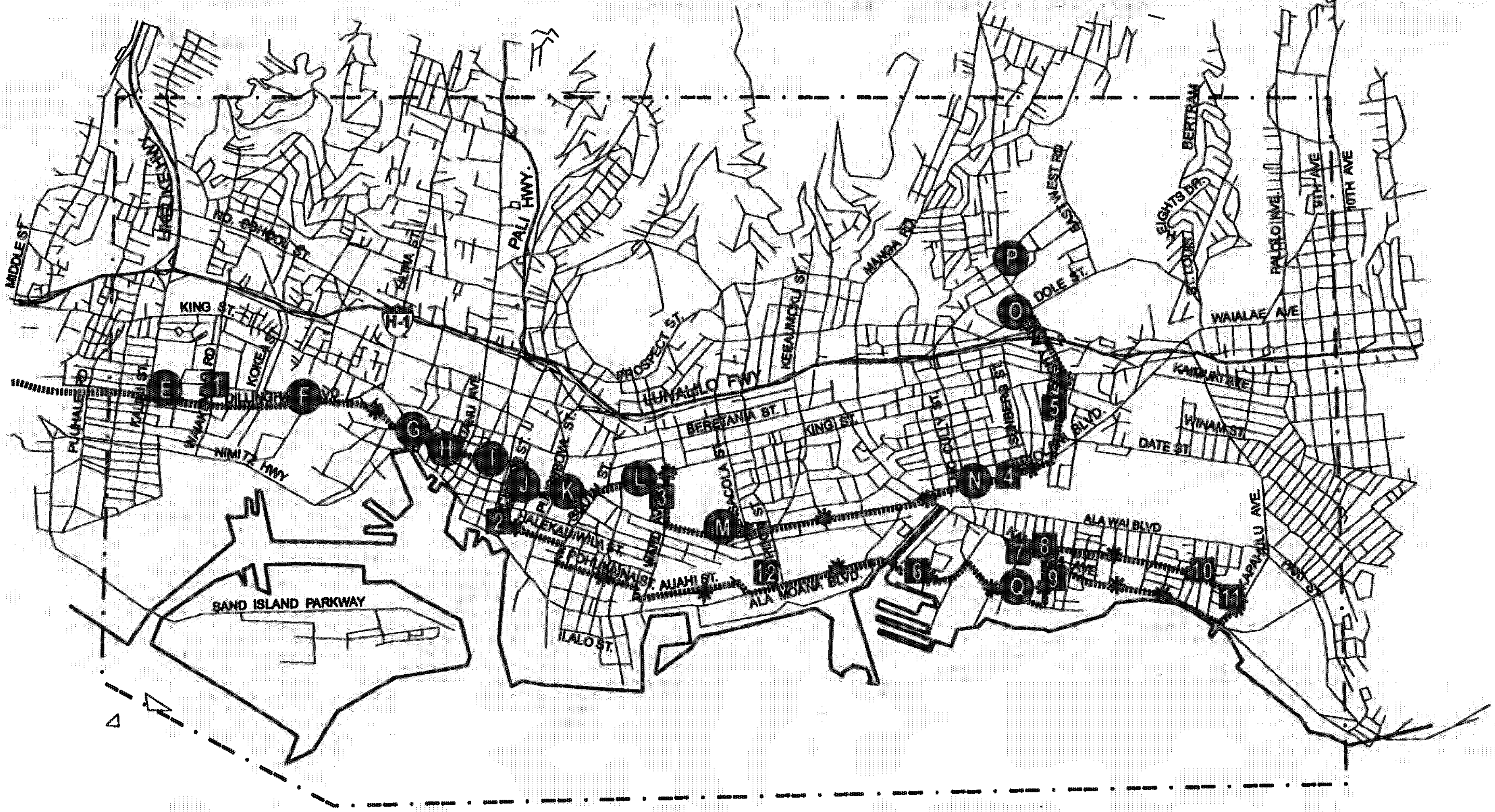
N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Noise Monitoring Sites: Waipahu - Pearl City

Figure 3.6-3A



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

LEGEND:

Symbol	Description
●	15 - Minute Noise Monitoring Sites
■	24 - Hour Noise Monitoring Sites
▪▪▪▪▪▪▪▪	In-Town BRT Alignment
✱	Transit Center/Stop

N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

Noise Monitoring Sites: Kalihi - University

Figure 3.6-3B

TABLE 3.6-1
MEASURED EXISTING NOISE LEVELS

Receiver Location	Land Use Category[1]	Address	
		LONG-TERM 24-HOUR SITES	**Ldn/Leq[2]**
1	FTA 2	Bishop Garden Apartments at 1470 Dillingham Boulevard	66/64
2	FTA 2	Harbor Square Condos on Richards Street at Ala Moana	70/71
3	FTA 2	Royal Court Condominiums, 920 Ward	73/78
4	FTA 2	2386 Kapiolani Boulevard	74/72
5	FTA 2	845 University Avenue	69/71
6	FTA 2	Apartment Building, 1720 Ala Moana	77/75
7	FTA 2	Saratoga Avenue at Post Office	66/63
8	FTA 2	Apartments on Kuhio Avenue between Launiu & Kaiolu	76/78
9	FTA 2	Outrigger Waikiki Islander Hotel	70/76
10	FTA 2	Waikiki Banyan Hotel	72/72
11	FTA 2	Queen Kapiolani Hotel on Kapahulu at Cartwright Road	70/68
12	FTA 2	1350 Ala Moana Boulevard	73/71
		SHORT-TERM 15-MINUTE SITES	**Leq**
A	FHWA B	94-101 Hoikaika Place, off Kaaholo Street	72
B	FHWA B	Mahiko Townhouse in Waikele	68
C	FHWA B	94-1413 Hiapo Street, Waipahu	59
D	FHWA B	94-098 Kaupu Place, Waipahu	64
E	FTA 3	Kalihi Kai Elementary School	69
F	FTA 3	Honolulu Community College	72
G	FTA 3	Aala Park on King Street	68
H	FTA 3	Chinatown Gateway Park at Hotel and Bethel	73
I	FTA 2	Hotel Street at Bishop Street	73
J	FTA 3	Iolani Palace, on Richards	68
K	FTA 3	Iolani Palace, on King	75
L	FTA 2	Straub Hospital	76
M	FTA 3	McKinley HS on Kapiolani, by school track/field	79
N	FTA 3	Ala Wai Community Park	67
O	FTA 3	Buddhist Study Center on University Avenue	70
P	FTA 3	Gartley Hall on Campus Road (University of Hawaii)	63
Q	FTA 3	Fort DeRussy, on mauka side of Kalia Road	66

Source: Parsons Brinckerhoff, Inc.
Notes:
[1] Land use category descriptors:
FTA Category 1 = Buildings or parks where quiet is an essential element of their purpose.
FTA Category 2 = Residences and other buildings where people sleep, such as hotels, apartments and hospitals.
FTA Category 3 = Institutional land uses with primarily daytime and evening use, including schools, libraries and churches.
FHWA Category B = Residential and recreation land uses near noise sources evaluated under FHWA procedures.
[2] Ldn is used for land uses with nighttime sensitivity to noise and for residential areas where FTA rather than FHWA noise procedures are applicable. Peak-hour Leq is used for commercial, industrial, and other land uses that do not have nighttime noise sensitivity.
Locations of monitoring sites are shown on Figures 3.6-3A and 3.6-3B.

- Ruderal (weedy) patches, such as undeveloped properties
- Abandoned agricultural areas, such as the area makai of H-1 near Kapolei
- Cultivated agricultural areas, such as the Pearlridge watercress farm and the diverse agricultural areas in Ewa

According to the U.S. Fish and Wildlife Service (FWS), three federally endangered plant species have been observed within the Ewa area of the study corridor:

- kooloaula *(Abutilon menziesii)*,
- awiwi *(Centaurium sebaeoides)*, and
- ihiihi *(Marsillea villosa)*

In addition, the plant pu'uka'a (*Torulinium odoratum* ssp. *auriculatum)*, a Species of Concern, has been reported within the Ewa portion of the study area.

Many impressive trees and plants are found within the study area. Some of these trees meet the criteria for "Exceptional Trees," which are defined as "a tree or grove of trees with historic or cultural value, or which by reason of its age, rarity, location, size, aesthetic quality, or endemic status has been designated by the city council as worthy of preservation." (Revised Ordinance of Honolulu Section 41-13.2, 1990)

In addition, several streets within the study area contain mature vegetation within medians and streetscapes. These include Dillingham Boulevard, Richards Street, Halekauwila Street, Kapiolani Boulevard, South King Street, and Kalakaua Avenue. Many examples of banyan trees, monkeypods, mahogany trees, palm trees, and other impressive species lie along the corridors.

3.7.2 Freshwater Fish and Terrestrial Wildlife

The study area encompasses mostly urbanized land. Any remaining terrestrial wildlife habitats are generally highly modified and populated with introduced wildlife species. Numerous streams within the corridors provide habitat for species of introduced and indigenous fish, and migrating shorebirds. All streams have been modified in the lower reaches and are of relatively poor ecological quality.

The FWS notes that the Hawaiian hoary bat (*Lasiurus cinereus semotus*), federally listed as endangered, has been sporadically sighted within the Honolulu metropolitan area. The following waterbird species, federally listed as endangered, have been observed in wetland areas within the project area:

- Hawaiian coot (*Fulica americana alai*),
- Hawaiian duck (*Anas wyvilliana*),
- Hawaiian common moorhen (*Gallinula chloropus sandvicensis*), and
- Hawaiian stilt (*Himantopus mexicanus knudseni*).

The State of Hawaii lists the Oahu population of the white tern (*Gygis alba*) as endangered. White terns are a relatively recent bird to the avifauna of Oahu. Prior to the 1960s, they could only be seen with regularity in the Northwestern Hawaiian Islands. Their establishment on Oahu may be due to crowded conditions elsewhere which have forced the birds to search for other roosting and nesting localities. At present the major site used by white terns on Oahu is Kapiolani Park, with some activity scattered elsewhere in urban Honolulu (Bruner, May 1992).

3.8 WATER

This section discusses surface waters (such as lagoons, streams, navigable waters, or harbors), groundwater, floodplains, coastal areas, wetlands, and water-dependent recreation.

3.8.1 Surface Water

The State's general policy is to maintain or improve existing water quality in all State waters. All waters of the State of Hawaii are classified as inland waters or marine waters. Inland waters are fresh waters, brackish waters, or saline waters, including streams, springs, wetlands, estuaries, anchialine pools, and saline lakes. Types of marine waters are embayments, open coastal waters, or oceanic waters. The State has defined water use classifications for inland and marine waters and set water quality criteria for each water use classification.

According to the Hawaii Department of Health (HDOH) administrative rules, inland waters can be either water use Class 1 or Class 2. The water quality in Class 1 waters is to be maintained in their natural states; no waste discharge is allowable. Class 2 waters are those to be protected for recreational use, propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. Marine waters are categorized as Class AA and Class A. Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters. (Hawaii Administrative Rules (HAR), Chapter 11-54, Water Quality Standards.)

The following large coastal surface water bodies are located within or adjacent to the project study area:

- Pearl Harbor
- Keehi Lagoon
- Honolulu Harbor
- Kewalo Basin
- Ala Wai Canal and Boat Harbor

These five water bodies are all highly urbanized and/or altered from their natural state. All have been listed by HDOH as "Water Quality-Limited Segments," as required by the Clean Water Act Section 305(b) and defined by 40 CFR 130.8. Water Quality-Limited Segments are water bodies having pollutants in excess of the established water quality standards, such that they cannot reasonably be expected to attain or maintain state water quality standards without additional action to control sources of pollution.

1) Pearl Harbor

Pearl Harbor is an estuary designated as a Class 2 inland water, with a special set of water quality criteria due to its polluted condition. Pearl Harbor receives flows from a drainage basin of approximately 260 square kilometers (100 square miles). Freshwater inflows create a stratified estuary where a surface layer of brackish water flows out of the main channel with little tidal influence. The abundant rainfall at the heads of the streams that drain into Pearl Harbor results in runoff that transports pollutants from upland forest, agricultural, commercial, industrial, military, and residential lands. Water quality parameters for nitrogen, phosphorus, turbidity, fecal coliform, temperature, and chlorophyll are frequently violated in Pearl Harbor. The narrow entrance channel and the configuration of the lochs retard flushing of the harbor (Hawaii Coastal Zone Management Program, Office of State Planning, June 1996). Siltation is also a major problem, which is addressed by frequent maintenance dredging. Sediments are continuously resuspended by ship traffic.

2) Keehi Lagoon

Keehi Lagoon is a highly modified water body, designated Class A by HDOH. After World War II, seaplane runways were dredged, greatly increasing the volume of the lagoon and retarding flushing. When the Honolulu International Airport (HIA) was built, an additional circulation channel was constructed, which improved water quality, but a gradient of increasing turbidity and plant nutrients exists toward the discharges of Kalihi and Moanalua Streams. Other point source discharges to the lagoon include a drainage canal from

HIA and adjacent industrial areas, and several additional drainage outlets along Lagoon Drive on the more southwesterly shoreline of the lagoon. The currents in Oahu's southern coastal waters move from Honolulu Harbor into Keehi Lagoon. These currents may transport pollutants into Keehi Lagoon and recirculate suspended matter. Various causes, effects and symptoms of water pollution in the lagoon have been documented, including petrochemical contamination of sediments and water, fish kills, and the presence of human enteric viruses. Although circulation in Keehi Lagoon is good, the lagoon regularly experiences violations of water quality parameters for phosphorus and turbidity. Nearly the entire lagoon includes fill material deposited from nearby dredging and from other sources.

In 1943, Kalihi Channel was dredged to the depth of 11-12 meters (35–40 feet) as part of military project to connect Kapalama Basin in Honolulu Harbor with the open ocean. Currently, there are two bridges over the Kalihi Channel effectively blocking ship access to Honolulu Harbor from Keehi Lagoon.

Over 300 vessels (e.g. boats and floating structures) are anchored throughout Keehi Lagoon and are often used as residences. Many of the vessels are not seaworthy and cannot propel themselves under their own power.

3) Honolulu Harbor

Honolulu Harbor is a Class A marine embayment. Honolulu Harbor has had recognized water pollution problems as far back as the 1920s. Two streams, Kapalama and Nuuanu, and numerous ditches and storm drains, contribute runoff to the harbor, along with associated pollutants. Water quality in the Kapalama Basin portion of the harbor is particularly poor because of discharges from Kapalama Stream. The parameters of greatest concern are nutrients, metals, suspended solids, pathogens, and turbidity (HDOH, March 1998). Coliform bacteria, nitrogen, phosphorus, and turbidity levels in the water regularly exceed State water quality standards. In 1978 and subsequent HDOH sampling, heavy metals, chlorinated pesticides, polychlorinated biphenyls (PCBs), chlordane, and dieldrin (a toxic chlorinated organic compound used in insecticides) have been identified in harbor waters.

4) Kewalo Basin

Two major storm drains discharge into Kewalo Basin, a Class A marine embayment. One drain serves Ala Moana Park and Center and the mauka residential and commercial areas. The other drain serves the Ward Avenue-Kakaako District, which consists of mostly light industrial and commercial businesses. All areas support heavy vehicular traffic. Kewalo Basin's design hinders circulation of water in the basin. As a result, the urban pollutants that collect in the basin remain concentrated for extended periods. Street debris, oil, chemicals, nutrients, and heavy metals are transported by urban runoff into Kewalo Basin (Hawaii Coastal Zone Management Program, Office of State Planning, June 1996). Water quality standards have been exceeded for nitrogen, phosphorus, and turbidity (HDOH, March 1998).

5) Ala Wai Canal and Boat Harbor

The Ala Wai Canal is a Class 2 inland water or estuary; the Ala Wai Boat Harbor at the mouth of the Ala Wai Canal is a Class A marine water body. As the connecting point for the Makiki, Manoa, Palolo, and Kapahulu watersheds, the Ala Wai Canal accumulates sediments, nutrients, some heavy metal contaminants, solid waste, and trash (Hawaii Coastal Zone Management Program, Office of State Planning, June 1996). Phytoplankton growth, suspended sediments, and visually objectionable trash discolor water in the canal. In addition, some incidences of bacterial infection have been reported. Water circulation from the point where the Manoa Stream meets the canal to near Kapahulu Avenue is poor. Floating debris collects under the makai side of the McCully Street Bridge, creating an unsightly mess. There is a fish advisory against the consumption of fish from the Ala Wai Canal, as well as other urban streams in Honolulu. Though the Ala Wai Canal flows into the boat harbor, the fish advisory does not mention the boat harbor specifically or other water bodies associated with urban streams.

6) Streams

In addition to the large water bodies discussed above, several streams are located within the study area. Most of these stream channels have been altered in the lower reaches and are not of high ecological quality. These streams include the following:

- Makakilo Gulch
- Makalapa Gulch
- Hunehune Gulch
- Kaloi Gulch
- Honouliuli Gulch
- Waikele Stream
- Kapakahi Stream
- Panakauahi Gulch
- Waiawa Stream
- Punanani Gulch
- Waimalu Stream
- Kalauao Stream
- Drainage canal next to Kalauao Stream
- Aiea Stream
- Halawa Stream
- Moanalua Stream
- Kahauiki Stream
- Kalihi Stream
- Kapalama Stream/Drainage Canal
- Waolani Stream
- Nuuanu Stream
- Pauoa Stream
- Makiki Stream
- Manoa-Palolo Drainage Canal

The water quality in these urban streams is poor. HDOH in May, 1998 placed a health advisory against the consumption of fish from the Ala Wai Canal and other urban streams in Honolulu, due to the detection of organochlorine pesticides and lead in the fish. This advisory is still in effect. (HDOH Fish Advisory, "DOH advises public to not eat fish from Honolulu streams." May 21, 1998).

3.8.2 Groundwater

1) Soil and Geology

Within the study area, coral reefs and eroded volcanic material have formed a wedge of sedimentary rock and sediments, referred to as caprock, which rests on the underlying volcanic rock. Caprock is composed predominantly of coral-algal limestone, interlayed with terrigenous clays and muds. Volcanic ash from the Honolulu volcanic series is often found in the caprock. The caprock is approximately zero to 300 meters (up to 1,000 feet) thick in the study area (Wentworth, 1951).

Underneath the caprock lies the volcanic rock of the Koolau Range in most of the study area. Occasionally, these rocks are exposed towards the Koko Head end and they dominate the central portion. The rocks are mostly volcanic lava flows and pyroclastic deposits. The volcanic rocks exposed towards the Ewa end of the study area near Kapolei are part of the Waianae volcanic series.

There is recent alluvium in the study area, consisting mainly of clayey organic silt with variable amounts of sand, some pockets of gravel and cobbles, and localized thin layers of marine sediments. Low-lying areas were filled during urbanization and are usually underlain by recent alluvium. Often, these areas were originally marshlands. The Downtown Honolulu area consists mainly of silty sand and coral gravel dredged from Honolulu Harbor. It is unconsolidated, with high porosity and permeability.

The central and Ewa portions of the study area are mostly on alluvium and volcanic rock. The volcanic rocks are typical aa and pahoehoe flows. They vary greatly in strength, thickness, hardness, and other engineering properties. There are also pyroclastic deposits that are generally permeable, low in strength, and may be highly weathered. Soil coverage on top of these rocks is generally thin to nonexistent.

2) Aquifers

The Southern Oahu Basal Aquifer (SOBA) is the principal aquifer underlying all of southern Oahu. The portions of the SOBA in the study area are the Pearl Harbor Aquifer Sector and the Ewa Aquifer System. The SOBA occurs as a basal freshwater lens floating on saline groundwater. It is recharged by rainfall that falls on the mauka area of Honolulu and the Leeward Coast. The caprock overlies the SOBA and impedes the escape of groundwater from this basaltic aquifer. Water in the caprock is brackish and not potable. The caprock is less permeable than water-bearing lava flows near the Koolau Range and constitutes a barrier that retards the seaward flow of groundwater. The caprock layer thins with distance from the shoreline and ends at varying distances inland, and the basalt layer is exposed or underlies surficial materials. As a consequence, inland areas of central Honolulu have the highest water tables in southern Oahu.

Beneath the caprock and underlying all of southern Oahu, the SOBA is heavily utilized, containing large supplies of fresh water. The basal groundwater is under artesian pressure; water levels range from three to ten meters (ten to thirty feet) above sea level. Although the capacity of the caprock to store and transmit water is small compared to that of the basalt aquifer, the caprock contains large quantities of water accumulating from rainfall, irrigation return, and leakage upward from the artesian portion of the basalt aquifer. Caprock water is generally of poor quality because of its relatively high chloride content, but it has been developed for agricultural and industrial purposes. Groundwater levels in the caprock in the study area vary with ocean tides and may also be influenced locally by streams. Depths may be as little as two meters (five feet) below ground surface in the Koko Head portion of the study area.

There are numerous injection wells for waste discharge into the caprock in central Honolulu, including those for thermal effluent, car-wash return, and rainwater. Pollutants in these discharges do not reach the SOBA, however, due to upward artesian pressure.

The U.S. Environmental Protection Agency (EPA) has designated the SOBA as the sole or principal source of drinking water for the Pearl Harbor area. Based on Hawaii status codes related to the protection of drinking water, the SOBA is designated as a currently used source of fresh drinking water that is both irreplaceable and highly vulnerable to contamination (Mink and Lau, 1990).

3.8.3 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) indicate several areas within the study area falling within the 100- or 500-year base floodplains. These floodplains are associated with streams, estuaries, canals and tsunami inundation areas. The largest of these floodplain areas occurs Koko Head of Ward Avenue, makai of South King Street, and Ewa of Paoakalani Avenue. This area includes Ala Moana Beach Park, the Ala Moana Center, and Waikiki. The area includes the 100-year base floodplains associated with the Manoa-Palolo Stream and the Ala Wai Canal. It includes areas that would be inundated by worst-case hurricane conditions.

Other flood zones within the study area are associated with streams entering Pearl Harbor. Wailani, Kapakahi, and Waikele Streams form a floodplain where they enter the West and Middle Lochs. Waiawa, Honouliuli, Aiea, and Kalauao Streams all have floodplains associated with them as they enter Pearl Harbor. Additional floodplains occur at the mouth of Pearl Harbor, along much of the Leeward Coast, and along Halawa Stream near Moanalua Highway. Another isolated floodplain occurs at the confluence of Nuuanu and Waolani Streams near the intersection of the Pali Highway and the H-1 Freeway. Floodplains are also associated with Kaloi Gulch, near Kapolei Parkway.

3.8.4 Wetlands

As defined by 40 CFR 230.41(a)(1), wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands in the project study area generally occur in proximity to streams and estuaries. In addition, some smaller, isolated wetlands are associated with irrigation ponds and natural depressions. At this time, no wetlands are suspected to be present within the proposed construction areas. Many of the streams in the study area are concrete-lined, eliminating the potential for wetlands to exist.

Several potential wetland areas designated in the National Wetland Inventory (U.S. Fish and Wildlife Service, 1977) do not meet the three-parameter criteria for wetlands (soils, hydrology, and wetland vegetation). Wetland delineation at potential wetland locations is needed to determine the presence or absence of wetlands.

3.8.5 Navigable Waters

Waters subject to tidal influence are generally defined as navigable. Further, navigability is defined by usage such that non-tidal streams carrying commercial traffic are deemed navigable. Table 3.8-1 lists the streams in the majority of the study area that have been deemed navigable. Coordination with the U.S. Coast Guard will continue. For the purposes of the Department of the Army permitting requirements, the Division Engineer for the U.S. Army Corps of Engineers (ACOE) determines navigability under the authority of 33Code of Federal Regulations (CFR) Part II, Section 329.14(b). The Coast Guard determination does not necessarily affect the ACOE permitting jurisdiction.

U.S. DOT, United States Coast Guard, communication, March 23, 2000.Navigation of all streams in the study area is extremely limited or nonexistent. Most navigation is limited to small recreational boating such as canoes and kayaks.

TABLE 3.8-1
NAVIGABLE WATERWAYS IN THE STUDY AREA

Waterway	Navigable Length	
	Kilometers	Miles
Waiawa Stream	0.16	0.1
Waimalu Stream	0.16	0.1
Waikele Stream	1.67	1.0
Kahauiki Stream	0.74	0.5
Panakauahi Gulch	2.04	1.3
Kapakahi Gulch	0.37	0.2
Kalauao Creek	0.16	0.1
Aiea Creek	0.32	0.2
Halawa Creek	0.32	0.2
Moanalua Stream	1.60	1.0
Kalihi Stream	0.80	0.5
Kapalama Stream	0.80	0.5
Nuuanu Stream	0.80	0.5
Pauoa Stream	Entire length	
Manoa-Palolo Drainage Canal	Entire length	
Ala Wai Canal	Entire length	

Sources: U.S. DOT, United States Coast Guard, letter, June 13, 1989.

3.8.6 Coastal Zone Management (CZM) Areas

The U.S. Department of Commerce in September 1978 approved the Hawaii Coastal Zone Management (CZM) Program with the following goals:

- Protect valuable resources;
- Preserve management options;
- Ensure public access to beaches, recreation areas, and natural reserves; and
- Provide for solid and liquid waste treatment within the Special Management Area (SMA).

In Hawaii, the Department of Business, Economic Development, and Tourism (DBEDT) administers the program. Federally funded activities must receive a consistency determination from the CZM program to assure that they meet the guidelines in the State policy. Hawaii Revised Statutes (HRS) Chapter 205A outlines special controls, policies, and guidelines for development within the area along the shoreline referred to as the Special Management Area (SMA) designated by the 1975 Shoreline Protection Act. This act gave the counties authority to issue permits for development activities proposed within the SMA. For the City and County of Honolulu, the Department of Planning and Permitting (formerly the Department of Land Utilization) is the agency that administers most of the SMA Use Permit program. The City Council has the authority to approve these SMA permits. In addition, the Kakaako area is a Hawaii Community Development District. This district stretches from Honolulu Harbor to Piikoi Street. In this district, the Hawaii Community Development Authority (HCDA) has the authority to approve SMA permits.

3.8.7 Water Recreation

Recreational uses of surface waters within or adjacent to the study area are limited primarily to the ocean and the Ala Wai Canal. The Department of Land and Natural Resources (DLNR), Division of Boating and Ocean Recreation, manages the recreational uses of shore waters and shore areas in accordance with Chapter 13-250-256, Part III, entitled "Ocean Waters, Navigable Streams and Beaches." It divides the coastal areas into segments and specifies what water-based uses are allowed within specific zones. Most of the study area falls within the South Shore Oahu Ocean Recreation Management segment, which includes all ocean waters and navigable streams from Makapuu Point to the west boundary of the Reef Runway of HIA. In addition to swimming and sunbathing, people surf, snorkel, paddle, canoe, sail, cruise, ride jet skis, whale watch, water ski, and fish in this area. The remaining Ewa portion of the study areas falls within a Non-designated Ocean Recreation segment, from Pearl Harbor to Kalaeloa (formerly Barbers Point).

Makai of Ala Moana Regional Park is the Ala Moana Commercial Thrill Craft Zone, which is restricted to commercial operators. Ewa of this zone and makai of HIA is the Keehi Lagoon/Kahakaaulana Islet Commercial Zone, which is the site of commercial thrill craft and other commercial ocean activities. Recreational thrill craft are accommodated in the Reef Runway Zone that parallels the airport's Reef Runway.

Recreational use of the navigable streams in the corridor is minimal. Recreational use of the Ala Wai Canal consists primarily of paddling and fishing. However, as mentioned earlier in this section, the water quality is poor and HDOH has issued a health advisory regarding the consumption of fish from the Ala Wai Canal. (HDOH Fish Advisory, "DOH advises public to not eat fish from Honolulu streams." May 21, 1998)

3.9 HAZARDOUS MATERIALS

Present and historic land uses in the corridor could have produced site contamination. Most contaminated sites are or were associated with the use, transportation, or storage of hazardous materials. Heavy industrial activities and commercial uses such as vehicle service stations and dry cleaning operations are among the types of land uses with the potential to produce site contamination. Site contamination could result from on-site land uses, or contaminants may have migrated from a nearby site to an area involved in one or more of the project alternatives. This section provides preliminary information on documented sources of hazardous materials or contamination in the primary transportation corridor that could affect property acquisition or construction associated with the project.

Twenty-four State, federal and private databases were searched for sites containing hazardous materials in the primary transportation corridor. Sites within a mile of the project numbering 2,590 were recorded in the databases. Table 3.9-1 summarizes the sites identified by database. Some sites are listed in several databases.

TABLE 3.9-1
NUMBER OF SITES BY ENVIRONMENTAL DATABASE

Number of Sites	Databases
0	**National Priority List (NPL),** also known as Superfund: This Environmental Protection Agency (EPA)-supplied list is a subset of CERCLIS (see below) and identifies sites for priority cleanup under the Superfund Program.
0	**Delisted NPL:** The EPA has deleted these sites from the NPL. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) established the criteria used by the EPA for deletion.
1	**Resource Conservation and Recovery Information System (RCRIS-TSD):** RCRIS-TSD (transport, store, dispose) includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

TABLE 3.9-1 (CONTINUED)
NUMBER OF SITES BY ENVIRONMENTAL DATABASE

Number of Sites	Databases
0	**State Hazardous Waste Sites:** Hawaii's equivalent to CERCLIS (see below).
14	**Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS):** This database contains data on potentially hazardous waste sites reported to the EPA by states, municipalities, private companies, etc., pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites either proposed for or on the NPL or are in the screening and assessment phase for possible inclusion on the NPL.
34	**CERCLIS- No Further Remedial Action Planned (CERC-NFRAP):** This database contains sites that have been removed from CERCLIS. These may be sites where, after an initial investigation, no contamination was found, contamination was removed quickly, or the degree of contamination was not serious enough for the site to be placed on the NPL.
5	**Corrective Action Report (CORRACTS):** This database identifies hazardous waste handlers with RCRA corrective action activity.
1	**State Landfill Sites:** This database contains an inventory of solid waste disposal facilities or landfills.
493	**Leaking Underground Storage Tank (LUST):** This database contains records of LUSTs regulated by the Hawaii Department of Health, and the status of repair or remediation. Many LUSTs identified by the database search have been sealed or removed.
978	**Underground Storage Tank – Registered (UST):** USTs are regulated under Subtitle I of RCRA, and must be registered with the Hawaii Department of Health.
2	**RCRA Administration Action Tracking System (RAATS):** This system contains records, based on enforcement actions issued under RCRA, pertaining to major violators. It includes administrative and civil actions brought by the EPA.
392	**Resource Conservation and Recovery Information System (RCRIS) -- small-quantity generators (SQGs):** This system includes selective information on sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA.
39	**Resource Conservation and Recovery Information System (RCRIS) -- large-quantity generators (LQGs):** This system includes selective information on sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA.
6	**Hazardous Materials Incident Report System (HMIRS):** This database contains information on hazardous material spill incidents reported to the U.S. Department of Transportation.
8	**Polychlorinated Biphenyl (PCB) Activity Database System(PADS):** Generators, transporters, commercial storers, and/or brokers or disposers of PCBs are identified, as reported to the EPA.
49	**Emergency Response Notification System (ERNS):** This system records and stores information on reported releases of oil and hazardous substances.
538	**Facility Index System (FINDS):** These records contain both facility information and "pointers" to other sources that contain more detail.
1	**Toxic Release Inventory System (TRIS):** This database identifies facilities that release toxic chemicals to the air, water, and land in reportable quantities under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 313.
0	**Federal Superfund Liens (NPL Liens):** This database compiles a listing of filed notices of Superfund liens.
5	**Toxic Substances Control Act (TSCA):** TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substances Inventory list.

TABLE 3.9-1 (CONTINUED)
NUMBER OF SITES BY ENVIRONMENTAL DATABASE

Number of Sites	Databases
22	**Material Licensing Tracking System (MLTS):** The Nuclear Regulatory Commission (NRC) maintains this system. It lists sites that possess or use radioactive material and are subject to NRC licensing requirements.
0	**Records of Decision (ROD):** Mandating a permanent remedy for NPL sites, these documents provide technical and health information to aid the cleanup of these sites.
0	**Superfund (CERCLA) Consent Decrees (CONSENT):** This database lists sites with Superfund (CERCLA) consent decrees.
2	**Former Manufactured Gas (Coal Gas) Sites:** This list identifies the existence and location of coal gas sites.

Source: Environmental Data Resources, Inc., April 30, 1999.

3.10 HISTORIC AND ARCHAEOLOGICAL RESOURCES

3.10.1 Applicable Legal and Regulatory Requirements

Section 106 of the National Historic Preservation Act is designed to protect resources on, or eligible for, the National Register of Historic Places (NRHP), and establishes guidelines for the identification of resources, analysis of possible effects on historic resources, and agency and public consultation procedures. The Advisory Council on Historic Preservation overseas implementation of the Section 106 review process.

The basic steps in the Section 106 process are: (1) identify historic properties (resources on or eligible for the NRHP); (2) assess effects, and, (3) if necessary, mitigate adverse impacts. This process was changed slightly in recent revisions (May 18, 1999) to the Section 106 regulations (36 CFR 800). This section of the MIS/DEIS describes the efforts regarding the identification of historic properties (districts; buildings and structures; archaeological resources; and traditional cultural properties (TCPs) in the study area.

A resource may be considered eligible for the NRHP if it has "integrity of location, design, setting, materials, workmanship, feeling, and association", and meets any one of the following NRHP criteria:

(A) associated with events that have made a significant contribution to the broad patterns of history;

(B) associated with the lives of persons significant in the past;

(C) embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or

(D) yielded, or may likely yield, information important in prehistory or history.

The Hawaii Register (HR) includes two additional criteria:

- Environmental impact, i.e., whether the preservation of the building, site, structure, district, or object significantly enhances the environmental quality of the State; and
- The social, cultural, educational, and recreational value of the building, site, structure, district, or object, when preserved, presented, or interpreted, contributes significantly to the understanding and enjoyment of the history and culture of Hawaii, the Pacific area, or the nation.

AR00047488

Archeological sites also are afforded protection under Section 106 if they meet the eligibility criteria for the NRHP (described above). A traditional cultural property (or traditional cultural practice) (TCP) can also be eligible for the NRHP. According to the National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties (1994), a TCP is defined generally as a resource that is eligible for the NRHP because of its association with the cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

3.10.2 Description of the Resources

In coordination with the State Historic Preservation Division (SHPD), the following program was conducted to identify historic-period resources (districts, buildings, structures, and objects dating from the post-western contact period) in the study area:

1. research of secondary data sources, such as previous reports, NRHP and HR, to identify known historic properties;

2. windshield survey to identify properties potentially older than 50 years;

3. date research to eliminate properties built after 1960;

4. consultation with SHPD to further screen the list generated during the windshield survey to eliminate properties clearly not meeting the criteria of the NRHP;

5. inventory survey of the refined list developed in Step Four to assess eligibility for the NRHP; and

6. SHPD agreement on assessment of eligibility for the NRHP.

Steps One through Five have been conducted, and Step Six is underway. In coordination with the SHPD, the Area of Potential Effect (APE) would not extend beyond the roadway for many of the elements of the TSM and BRT Alternatives because many of the improvements would be at-grade and within roadway rights-of-way. (The windshield survey, which was Step Two above, was conducted for properties one lot deep from the roadway). The APE is expanded beyond the roadway by at least one lot-deep for the BRT station stops, and new ramps, park-and-ride lots or transit centers, where such facilities might be elevated.

1) Historic Districts

Historic districts in the APE include the Chinatown Historic District, Hawaii Capitol Historic District, and University of Hawaii Historic District. Table 3.10-1 and Figures 3.10-1A and 3.10-1B list and show, respectively, the locations of these districts and other historic, or potentially historic, properties in the study area. Historic properties listed on Table 3.10-1 and shown on Figures 3.10-1A and 3.10-1B are within the APE. In earlier phases of the study, the APE included potential resources one lot deep from the proposed alignment alternatives (see Chapter 2 Alternatives Considered). A reduction of the APE has occurred since then and SHPD has concurred (see Appendix A) with DTS' reduction.

A. Chinatown Historic District

Chinatown is historically significant because it is the oldest part of Downtown Honolulu, with a concentration of original buildings and uses, and is the earliest ethnic community in Honolulu that still maintains a distinctive cultural environment. Buildings of architectural significance were constructed in Chinatown in the first decades of the 20th century, after the Chinatown fire of 1900. These buildings are primarily simple, two- and three-story structures of common materials, but with interesting details and harmonious designs. Typically the buildings abut the front and side property lines, with awnings over the sidewalks. Together, the buildings form a historical environment more significant than the individual structures.

B. Hawaii Capitol Historic District

The Hawaii Capitol Historic District includes most of the important civic buildings in the core of Honolulu (see Figure 3.10-1B). Sources of the following description are Hawaii Register nomination papers from records at the State Historic Preservation Division, Department of Land and Natural Resources. The historic centralization of government in Honolulu has resulted in an unusual concentration of public and private architecture, spanning the years from 1820 (the Mission Frame House) through 1969 (the State Capitol Building).

The government buildings have inspired commercial firms, churches, the YMCA and YWCA, among others, to erect buildings complementing the civic structures. Most of the civic buildings are government-owned, but several are commercial or other institutional buildings. Many resources were specifically listed in the NRHP nomination for this District, including the Iolani Palace and Grounds, Kawaiahao Church and Grounds, Saint Andrew's Cathedral, and the Mission Houses. Several buildings had already been placed on the HR or NRHP individually, even before the Hawaii Capitol Historic District was nominated. There is a wide range of architectural styles in the district, with distinguished examples of Classical Revival, Romanesque, Spanish Mission, Italian Mediterranean, New England Colonial, French Baroque, and Georgian buildings.

The significance of this district resides in its architectural and visual character, its large amount of open space, and its central role in the history of Oahu and the Hawaiian Islands.

C. University of Hawaii Historic District

The University of Hawaii (UH) Historic District is a non-contiguous district that includes the historically significant structures on the Manoa campus (see Figure 3.10-1A). Proposed project elements are not near the two main areas of the campus included in the Historic District: the original quadrangle and a circular drive off Dole Street. Wist Hall and Founders' Gate, two resources which may be within the APE depending on the location of the UH station stop, are physically separated from other resources in the district.

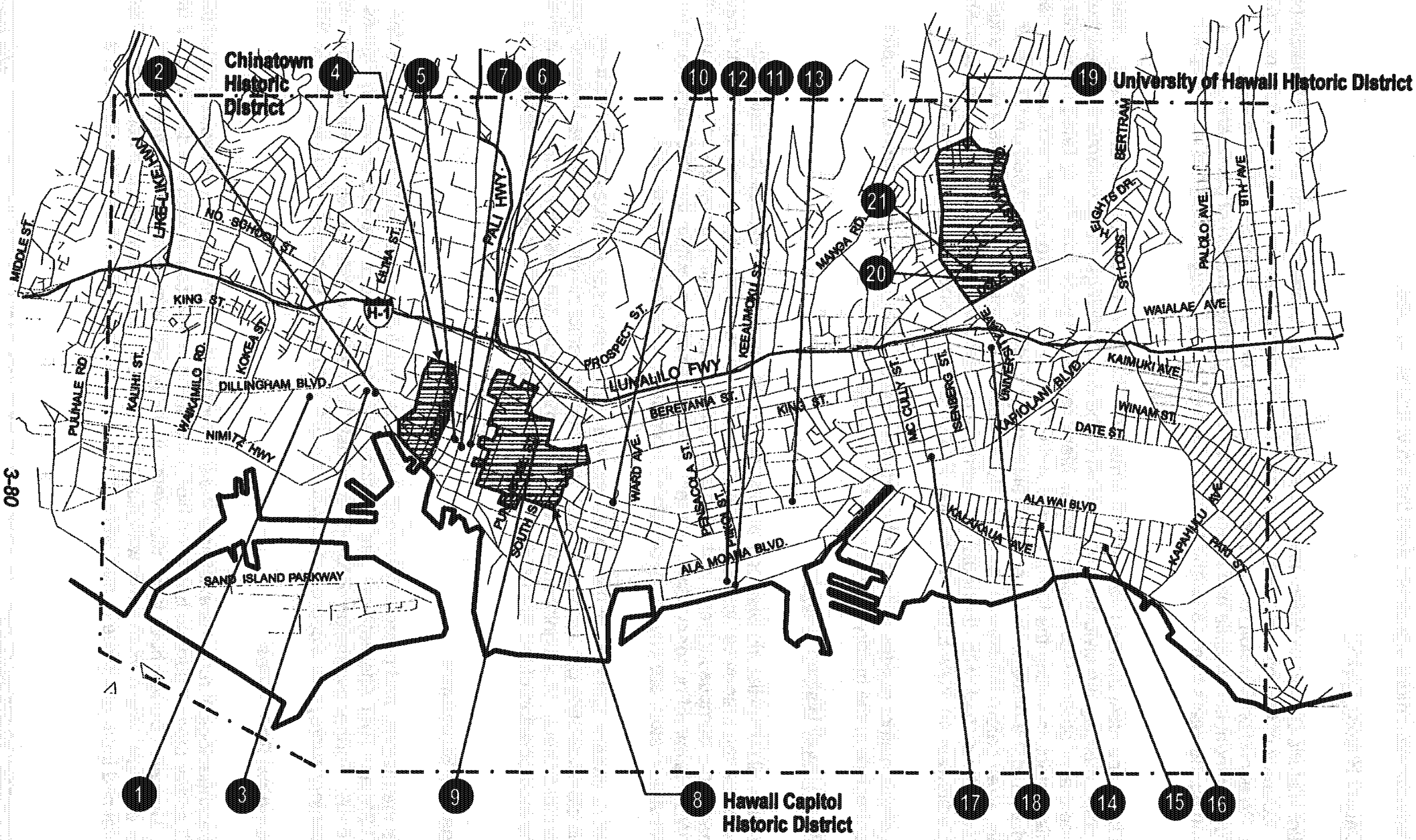
The two arches of Founders' Gate are at the mauka corners of the University Avenue and Dole Street intersection. This classical-style gate was erected in 1932 to commemorate the union of the University and the Territorial Normal School. The significance of both Founders' Gate and Wist Hall (built in 1931) is their relationship to the incorporation of the Normal School into the School (later College) of Education at the University.

2) Buildings and Structures

Table 3.10-1 lists the historic, and potentially historic, buildings, structures and objects in proximity to the elements of the TSM and BRT Alternatives. The locations of these resources are also shown on Figures 3.10-1A and 3.10-1B. Further evaluation of NRHP candidate properties within the APE is being performed based on the inventory surveys, and coordination with the SHPD to reach closure on eligibility for the NRHP.

3) Archaeological Resources

It is unlikely that archaeological remains exist near the soil surface in the project area because most of the project area is fill and/or the soil surface has been highly disturbed in association with the development of urban Honolulu. However, burials have been discovered in the project area, and some of these were unexpected. For example, one human burial was discovered in 1997 during construction activities at Pier 40 in an area of reclaimed land, and three burials were found on a site adjacent to the Middle Street bus



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Mason Architects Inc., May 1999.

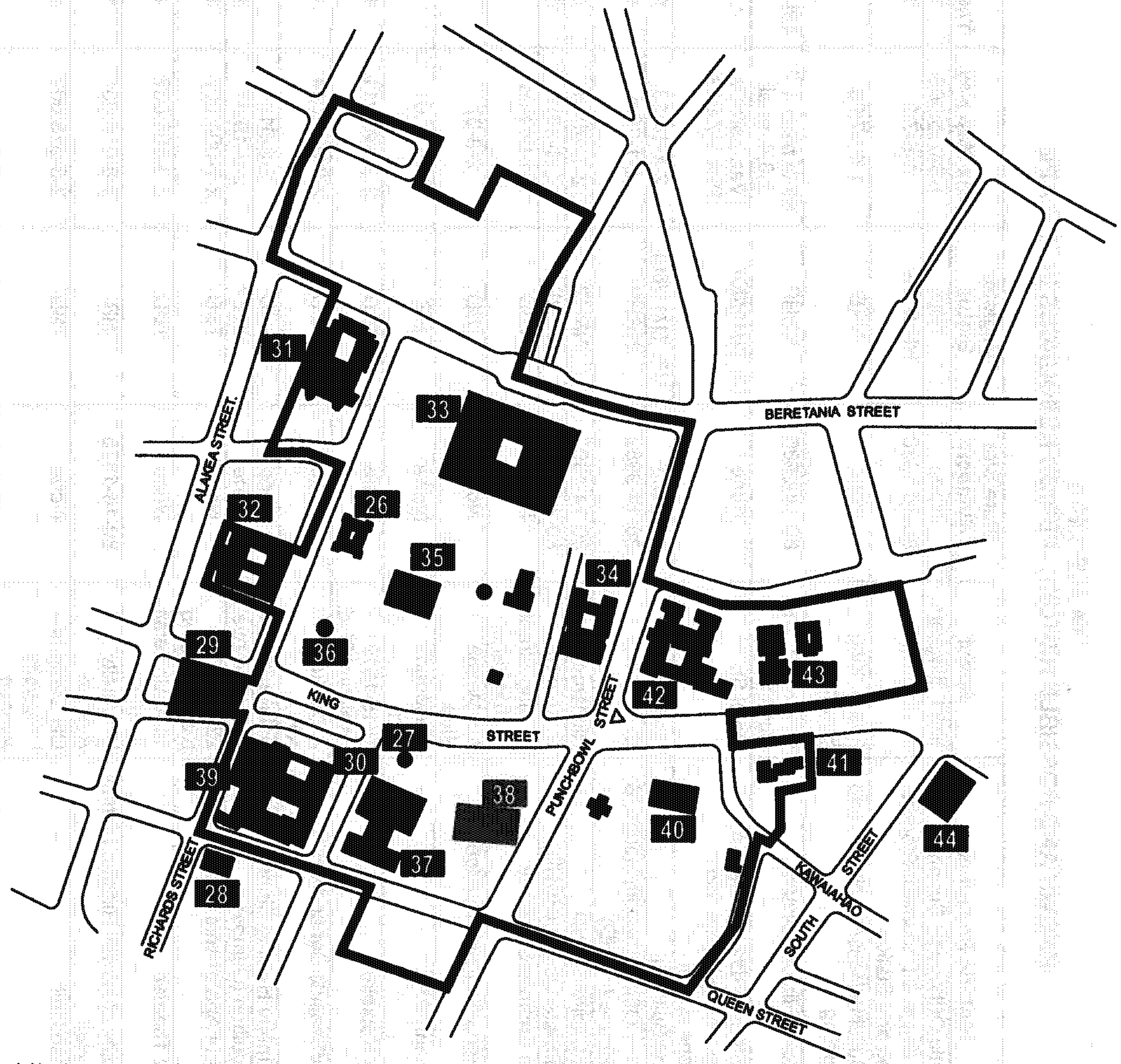
* Numbers correspond to Historic-Period Resources listed on Table 3.10-1

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Historic-Period Resources In The Area Of Potential Effect: Kalihi To University Of Hawaii

Figure 3.10-1A

26 Iolani Barracks
27 Kamehameha Statue
28 Melim Building
29 Hawaiian Electric
30 Armed Services YMCA
31 State Office Building
32 Laniakea YWCA
33 Hawaii State Capitol and Grounds
34 Hawaii State Library
35 Iolani Palace and Grounds (Old Archives and Court House)
36 Iolani Palace Bandstand
37 Ali'iolani Hale
38 Territorial Office Building
39 US Post Office, Custom House and Court House
40 Kawaiaha'o Church and Grounds (Lunalilo's Tomb and Adobe School House)
41 Mission House
42 Honolulu Hale and Grounds
43 Mission Memorial Building and Annex
44 Advertiser Building



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Mason Architects Inc., May 1999.

* Numbers correspond to Historic-Period Resources listed on Table 3.10-1

Scale: 0 .0625 .125mi
Scale: 0 .1 .2km

Historic-Period Resources In The Area Of Potential Effect: Hawaii Capitol Historic District

Figure 3.10-1B

TABLE 3.10-1
KNOWN AND POSSIBLE HISTORIC-PERIOD RESOURCES IN THE APE

Loc. No.	Historic Resource	Street	State Site Number	Register Status[1]	Tax Map Key	Year Built
1	Honolulu Orthopedic Supply	935 Dillingham	None	TBD	1-5-015:006	1955
2	OR&L Office & Document Storage Building and Station	N. King St.	80-14-1380	HR & DE	1-5-7:2	1914
3	Four Building Houses behind Tong Fat Building	393 N. King Street	None	NRE	1-5-07:03	1920
4	Chinatown Historic District	N. King St. and Hotel St.	80-14-9986	NRHP	All of plats 1-7-2,3,4, et al.	1900-1920
5	Hotel Street Sidewalk Features [granite paving blocks and bluestone curbs]	Hotel St.	None	DE (1/11/80)	Var. parcels Plat 1-7-003	Varies
6	Portland Building	Hotel St.	None	DE (1/11/80)	2-1-10:13	1903
7	U.S. Post Office, Custom House, & Court House (HCHD)	S. King St.	80-14-9952	NRHP	2-1-25:4	1871
8	Hawaii Capitol District	Richards St.	80-14-1307	NRHP	2-1-24: all	1969
9	Hawaii State Library (HCHD)	S. King St.	80-14-1307	NRHP	2-1-25:1	1913
10	Roman Catholic Cemetery	S. King Street + Archer Lane	None	TBD	2-1-044:04	–
11	Ala Moana Boulevard Bridge	Ala Moana Blvd.	None	TBD	2-3-37	–
12	Ala Moana Park	Ala Moana Blvd.	None	HR	2-3-37:01	–
13	Bakery Kapiolani	1515-1519 Kapiolani Blvd.	None	TBD	2-3-040:011	1959
14	Angels/Seaside Bar and Grill	2256 Kuhio Ave.	None	TBD	2-6-021:054	1938
15	Kapaemahu Healing Stones	Kalakaua Ave.	None	TBD	2-6-01:8	–
16	Louis Vuitton (Gumps)	Kalakaua Ave.	None	NRE?	2-6-19:57	1929
17	Kapiolani Apartments (8 buildings)	2233-2261 Kapiolani Blvd.	None	TBD	2-7-004:007	1946
18	Varsity Theater	1106 University Avenue	None	TBD	2-8-006:032	1939
19	University of Hawaii Historic District – Wist Hall	University Avenue	80-14-1325	HR	2-8-015:001	1931
20	Bachman Hall	UH Campus – University Avenue	None	TBD	2-8-023:003	1949
21	Sinclair Library	UH Campus – University Avenue	None	TBD	2-8-023:003	1955

Source: Spencer Mason Architects, Inc.
Notes: [1] NRHP Listed on National Register of Historic Places.
NHL Listed on National Register of Historic Places as a National Historic Landmark.
NRE National Register Eligible
HR Listed on Hawaii Register of Historic Places (very likely to be eligible for the National Register).
DE Determined Eligible for the National Register by the Keeper of the NRHP.
CE Considered Eligible for the National Register by concurrence of the SHPO and DTS (date of letter of concurrence given in parentheses).
TBD To be determined at a later date. Inclusion on list based on results of the 1989 Inventory Survey Report for the Honolulu Rapid Transit Program Project and preliminary consultation with the SHPD.
(HCHD): Part of Hawaii Capitol Historic District.
(UHHD): Part of University of Hawaii Historic District.

maintenance facility in 1992. Also, burials were reportedly found in the Fort DeRussy (DLNR, October 13, 1999) and along the Kalakaua Avenue right-of-way (DLNR, December 29, 1999). Unlike the Middle Street and Pier 40 areas, the sandy soil conditions of Fort DeRussy and Kalakaua Avenue make the discovery of burials in these locations not unexpected. Further study would be conducted if required on a site-specific basis.

4) Traditional Cultural Properties or Practices (TCPs)

To identify potential TCPs in the study area, a meeting with the Office of Hawaiian Affairs (OHA) was held on May 21, 1999. To date, no potential TCPs associated with the project have been identified. However, coordination between OHA and the City will continue as the project progresses.

Chinatown could be considered a TCP because it reflects Chinese cultural values and traditions in its architectural details, organization of space and activities (National Register Bulletin 38, 1994). As described in Section 3.10.1, Chinatown is a historic district listed on the NRHP.

3.11 PARKLANDS

Parks and recreational facilities in the study area have been identified through a review of available mapping, coordination with City, State, and federal agencies, and field surveys. This section describes the findings of this work.

Hawaii's mild tropical climate encourages a variety of outdoor recreational activities. Consequently, numerous areas have been designated as parks and recreational areas on the island of Oahu. These parks and open space areas are heavily utilized by the public for various activities, making Oahu's parks and recreational facilities valuable and important.

Through literature review, agency coordination and field review, parklands in the project area were identified. In addition to interviewing agencies, several documents were reviewed, including the Index of Oahu Parks and Facilities (City and County of Honolulu, April 1997); Existing State Parks and Other Areas Fiscal Year 1997-98 (State of Hawaii, 1998); aerial photos; and TMK Oahu Street and Condo Map Book, 12th Edition (Hawaii TMK Service, 1998).

This list was evaluated to identify those park and recreation resources located immediately adjacent to elements of the alternatives, including those located adjacent to proposed ramps, park-and-ride lots, and transit centers. These parks and recreational facilities are listed on Table 3.11-1, and their locations are shown on Figures 3.11-1A through 3.11-1C.

TABLE 3.11-1
PARKLAND RESOURCES IMMEDIATELY ADJACENT TO PROJECT ELEMENTS

Map Key[1]	Park	Street	Hectares (Acres)	Classification [2]	Jurisdiction
1	Pearlridge Community Park	Moanalua Road	3.69 (9.12)	Community Park	City and County
2	Pearl Country Club	Kaonohi Street	N/A	Golf Course	Private
3	Aloha Stadium	Kamehameha Hwy and Salt Lake Boulevard	39.43 (97.44)	Sports Arena	State of Hawaii
4	Aala Park	North King Street	2.71 (6.69)	Urban Park	City and County
5	Fort Street Mall	Fort Street	0.35 (.87)	Mall	City and County
6	Chinatown Gateway Park	Bethel Street	0.16 (.40)	Urban Park	City and County
7	Union Street Mall	Between Hotel and Bishop Streets	0.15 (0.36)	Mall	City and County
8	Iolani Palace State Monument	Hotel Street	4.29 (10.60)	Urban Park	State of Hawaii
9	Unnamed park adjacent to federal building	Ala Moana Boulevard and Halekauwila Street	N/A	Urban Park	United States
10	Thomas Square	South Beretania Street, Ward Avenue and King Street	2.60 (6.42)	Urban Park	City and County
11	Mother Waldron Neighborhood Park	Pohukaina Street	0.71 (1.76)	Neighborhood Park	City and County
12	Ala Moana Regional Park, including Aina Moana Recreation Area (Magic Island)	Ala Moana Boulevard	48.22 (119.18)	Regional Park	City and County
13	Frank C. Judd Mini Park	Kapiolani Boulevard	0.15 (0.37)	Mini Park	City and County
14	Ala Wai Promenade	Kalakaua Avenue	1.79[3] (4.43)	Urban Park	City and County
15	Ala Wai Community Park and Clubhouse	Kapiolani Boulevard	5.66 (13.98)	Community Park	City and County
16	Ala Wai Neighborhood Park	University Avenue	6.35 (15.70)	Neighborhood Park	City and County
17	Duke Paoa Kahanamoku Beach Park	Paoa Place	0.17 (0.43)	Beach Park	City and County
18	King Kalakaua Park (formerly Waikiki Gateway)	Kalakaua Avenue	0.23 (0.57)	Urban Park	City and County
19	Beachwalk Triangle	Beachwalk and Kalakaua Ave.	0.06 (0.15)	Urban Park	City and County
20	Princess Kaiulani Triangle	Kaiulani and Kuhio Avenues	0.05 (0.12)	Urban Park	City and County
21	Kuhio Avenue Mini Park	Kuhio Avenue	0.05[4] (0.12)	Mini Park	City and County
22	Kuhio Beach Park	Kalakaua Avenue	1.38 (3.40)	Beach Park	City and County
23	Kapiolani Regional Park[5] (includes Honolulu Zoo)	Kapahulu and Kalakaua Avenues	62.62 (154.73)	Regional Park	City and County
24	Kapiolani Beach Park	Kalakaua Avenue	4.89 (12.09)	Beach Park	City and County

AR00047495

TABLE 3.11-1
PARKLAND RESOURCES IMMEDIATELY ADJACENT TO PROJECT ELEMENTS

Map Key[1]	Park	Street	Hectares (Acres)	Classification [2]	Jurisdiction
25	Waikiki Beach[6]	Kalakaua Avenue	unknown	Various	Various (City, State, and Private)

Sources: Parsons Brinckerhoff Inc., Initial Field Survey 1989, Update January 1992; City and County of Honolulu Department of Parks and Recreation, Index of Oahu Parks and Facilities, 1997; DLNR, State Parks Division, Existing State Parks and Other Areas, 1998, Agency Interviews, December 1999.

Notes:

[1]Map Key refers to numbers on Figures 3.11-1A through 3.11-1C.

[2]Classifications:

District Park - park approximately 20 acres in size servicing approximately 25,000 people, with playfields, recreation complex and passive areas.

Community Park - park approximately 10 acres in size servicing approximately 5,000 people with playfields, passive areas and a recreation building.

Neighborhood Park - park approximately 6 acres in size, servicing approximately 5,000 people, with playfields, courts, and a comfort station.

Mall - long, narrow, pedestrian walkway in commercial areas, with benches, water fountains, arbors, landscaping.

Mini Parks - small landscaped areas, servicing high-density areas with benches, picnic tables, and children's play areas.

Regional Park - Large area that may serve the entire island or region of the island with a variety of recreation park types and facilities, natural and cultural sites.

Urban Parks - Passive landscaped areas, usually located in residential or business areas.

Beach/Shoreline Park- Area along shoreline, with facilities to support water activities, picnicking, and other passive activities.

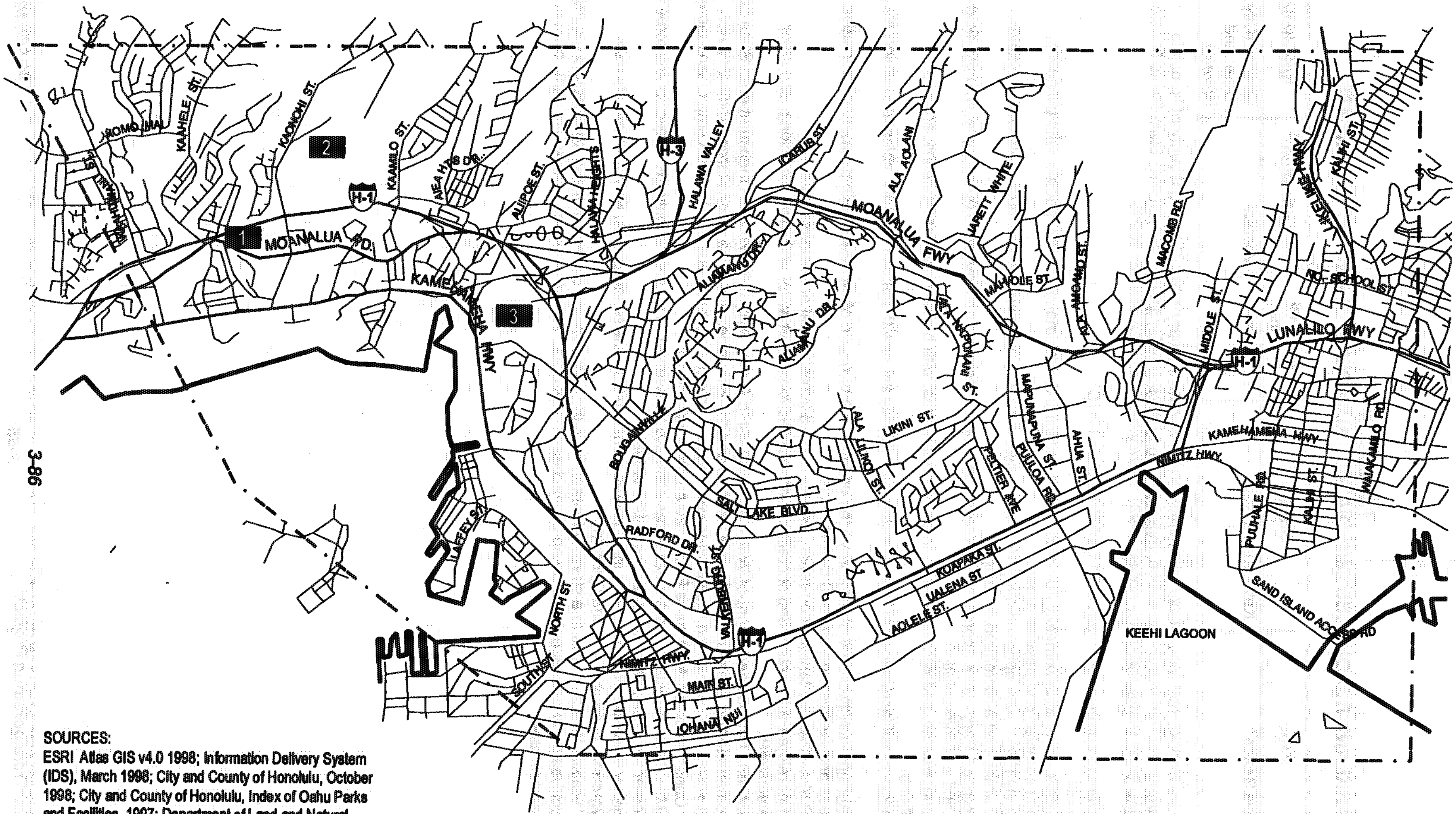
Classifications not included: Right-of-Ways, Traffic Related Areas, Military Parks and Unencumbered State Land

[3]Ala Wai Promenade has two portions, the Waikiki side and the Ewa side. The Ewa side is larger and measures roughly 4.43 acres. The size of the Waikiki side could not be determined, but it is a smaller, thin strip of land along the Ala Wai Canal, between Ala Moana Boulevard and McCully Street.

[4]The Kuhio Mini Park consists of three small areas along Kuhio Avenue. The area of only the largest of the three is known; the other two mini parks are landscaped bus stops.

[5]The acreage for Kapiolani Regional Park includes the Honolulu Zoo, the tennis courts, Paki Community Park, Waikiki Playground, and the community gardens.

[6]The name "Waikiki Beach" refers to a stretch of beach from the State-owned Duke Kahanamoku Beach to the edge of Sans Souci Beach, and does not refer to an official beach park area. Note that beach ownership in this area is both public and private.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; City and County of Honolulu, Index of Oahu Parks and Facilities, 1997; Department of Land and Natural Resources, State Parks Division, Existing Parks and Other Areas, 1998; Bryan's Sectional Map, Oahu 1999; Tax Map Key, Oahu Street and Condominium Map Book, 1998 12th Edition.

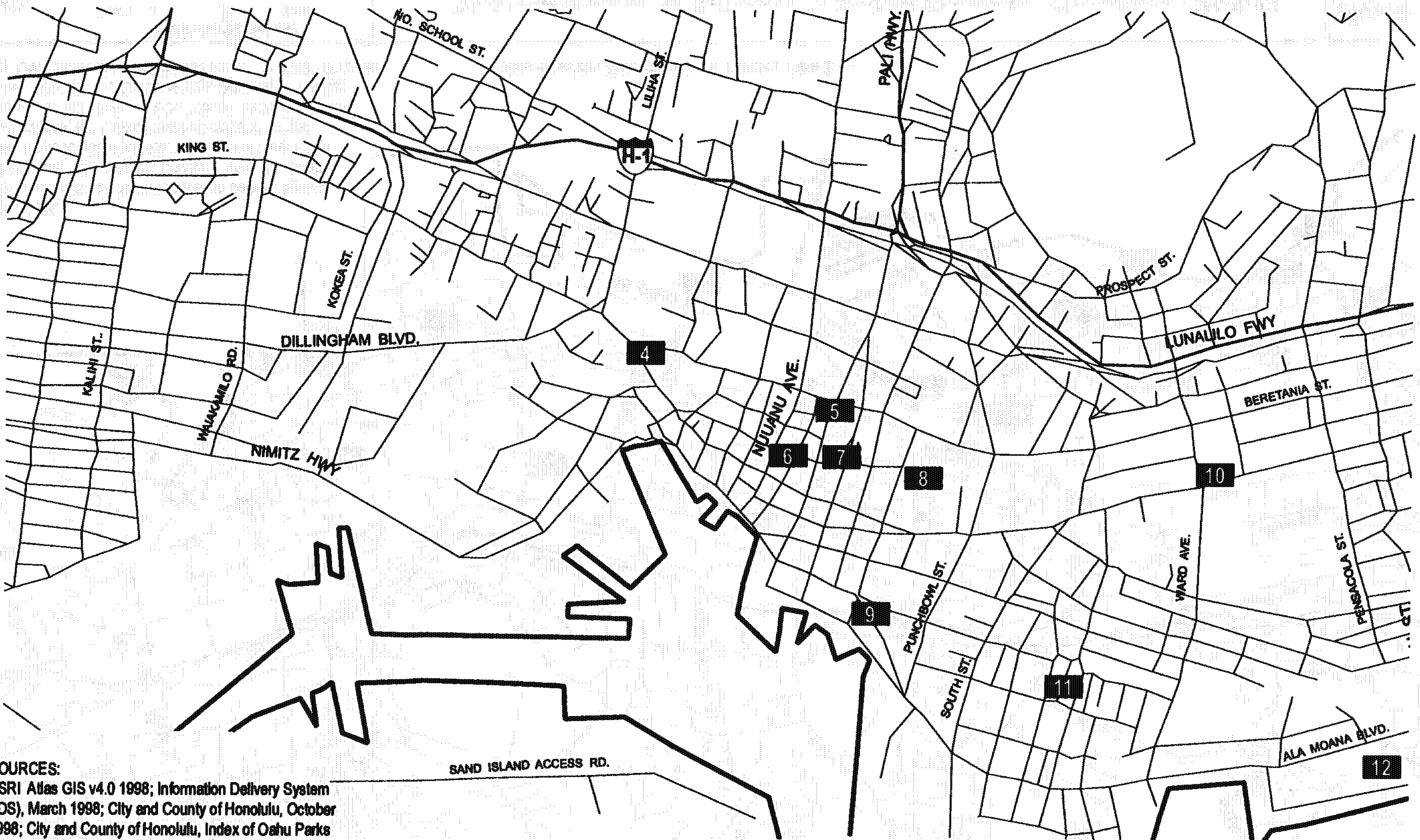
* Parklands' location/description can be found on Table 3.11-1

N

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Parkland Resources Adjacent To Project Elements: Aiea - Fort Shafter

Figure 3.11-1A



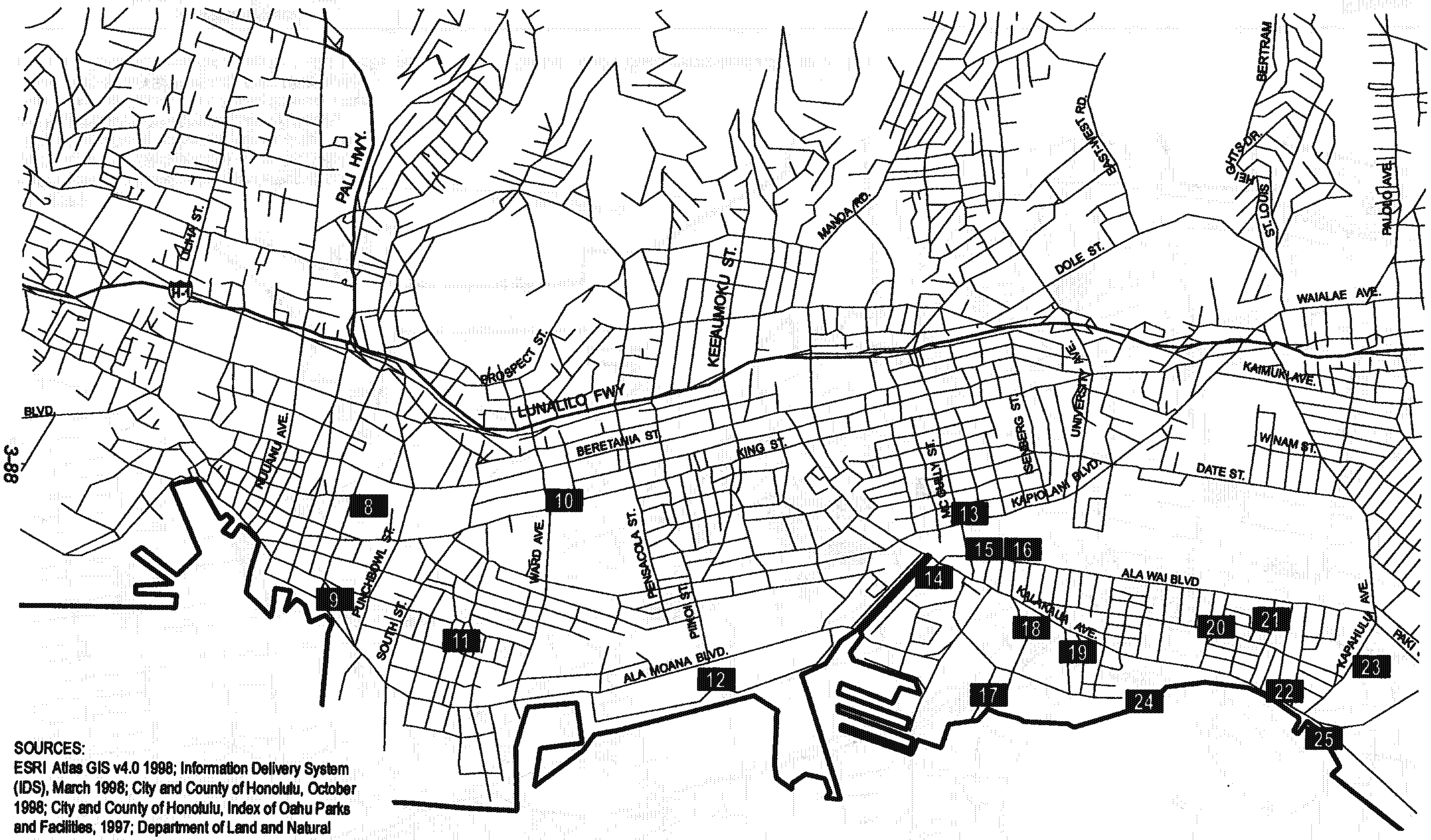
SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; City and County of Honolulu, Index of Oahu Parks and Facilities, 1997; Department of Land and Natural Resources, State Parks Division, Existing Parks and Other Areas, 1998; Bryan's Sectional Map, Oahu 1999; Tax Map Key, Oahu Street and Condominium Map Book, 1998 12th Edition.

* Parklands' location/description can be found on Table 3.11-1

Scale: 0 .50 1 mi
Scale: 0 1 2 km

Parkland Resources Adjacent To Project Elements: Fort Shafter - Downtown

Figure 3.11-1B



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; City and County of Honolulu, Index of Oahu Parks and Facilities, 1997; Department of Land and Natural Resources, State Parks Division, Existing Parks and Other Areas, 1998; Bryan's Sectional Map, Oahu 1999; Tax Map Key, Oahu Street and Condominium Map Book, 1998 12th Edition.

* Parklands' location/description can be found on Table 3.11-1

N

Scale: 0 .50 1 mi

Scale: 0 1 2 km

Parkland Resources Adjacent To Project Elements: Downtown - Waikiki

Figure 3.11-1C

Chapter 4.0
Transportation Impacts

CHAPTER 4 TRANSPORTATION IMPACTS

4.0 CHAPTER OVERVIEW AND ORGANIZATION

Overview

This Chapter describes and compares the impacts and performance of the No-Build, TSM and BRT Alternatives on the transportation system within the primary transportation corridor, and the performance of the linkages between the primary transportation corridor and the other parts of the island. The focus is on system performance in 2025, the planning horizon year for this project.

Transportation performance is assessed in four major areas. The first pertains to the public transit system. Performance measures are introduced upon which to assess the comparative benefits of the alternatives. This analysis shows that:

- With respect to transit capacity and frequency of transit service, the No-Build Alternative would provide about a 10 percent increase in transit service compared to service levels in 1997. The TSM Alternative would provide approximately a 27 percent increase over 1997 levels. The BRT Alternative would provide approximately a 72 percent increase over 1997 levels.
- The BRT Alternative would attract more ridership than either the TSM or No-Build Alternatives. The BRT Alternative would generate a 61 percent increase in transit boardings over 1991 levels (1991 was the last time boarding studies were made).
- The BRT Alternative would increase the mode share of transit more than the other alternatives by improving in-town mobility, strengthening the connections throughout Oahu, providing a reliable service that would be buffered from traffic delays, and reducing transit travel times throughout Oahu. As a result transit would become a more competitive mode.
- The benefits of a high capacity BRT system are substantially greater than the bus network that would be provided under the TSM Alternative, especially for travel within the PUC.
- The seated capacity (a surrogate for level of comfort for transit patrons) of the BRT Alternative would be slightly greater than the demand. This allows some room for future growth. The seated capacity of the TSM Alternative would be about equal to the demand. With the No-Build Alternative, the ridership demand exceeds the seated capacity by over 30 percent. Almost a quarter of all riders would not find a seat and would be required to stand. In some instances, buses would be full and would pass by riders waiting at stops.

The second assessment pertains to impact on the roadway network. Performance measures are presented by which to gauge the functioning of the roadway system in 2025. The major conclusions are:

- The BRT Alternative would improve the person carrying ability within the Urban Core by an average of 10 percent over the No-Build Alternative. To get an equivalent increase in general-purpose throughput, two roadway lanes in each direction would need to be provided in the Urban Core, which is impossible to do without major displacements. The TSM Alternative also would improve person-carrying ability, although to a much lesser degree than the BRT Alternative.
- The BRT Alternative could accommodate even further increases in travel demand beyond 2025 without major road reconstruction.
- The mobility that would be provided by the TSM and BRT Alternatives would be greater than that provided by the No-Build Alternative because of increases in transit and HOV use. The BRT Alternative would be superior to the TSM Alternative in terms of regional mobility.
- By 2025, key intersections in the Urban Core would be near or at capacity under all alternatives. However, only the BRT Alternative would provide a non-congested travel mode through these

intersections, achieving faster transit travel times within the Urban Core. The BRT Alternative would provide the best level of transit service.

- While greatly improving transit service and person carrying capacity, the TSM and BRT Alternatives would result in somewhat reduced LOS for automobile traffic within the Urban Core.
- Under all alternatives, major regional roadways would still have traffic bottlenecks in 2025, as they do today. These bottlenecks would generally be the worst with the No-Build Alternative.

The third assessment area is impacts to on-street parking and loading zones. The major conclusions are:

- An efficient transit system would encourage people to use transit rather than drive private vehicles. As a result, parking demand in the PUC with the BRT Alternative should decline along the transit spine.
- Where on-street parking is removed to permit transit lanes in the TSM and BRT Alternatives, new neighborhood parking facilities would be considered to replace the on-street parking, but only if they served a community purpose.
- Loading zone impacts would occur with both the TSM and BRT Alternatives. Revised loading areas would be developed and coordinated through a community-based planning process.

The fourth assessment area is impacts to bicyclists and pedestrians. The No-Build Alternative would not affect bicycle or pedestrian facilities. The TSM Alternative would not affect pedestrian facilities, but its extensive network of semi-exclusive lanes in the downtown area could adversely affect bicycle travel. Where possible, existing bike lanes would be replaced by joint use bicycle/transit lanes.

The BRT Alternative has been planned to enhance bicycle travel by incorporating the following elements:

- Where the In-Town BRT system could affect lanes currently used by bicycles, either a separate bike lane would be provided, or an alternate route has been identified. These are the preferred solutions to eliminate the conflict between transit vehicles and bicyclists.
- Where a bike lane cannot be accommodated, or an acceptable alternative route would be difficult to identify, cyclists would be allowed to share the transitway in curb-running sections. Many cities, including New York City, London, Toronto, Madison Wisconsin, Seattle and Portland Oregon, allow bicycles to use at least portions of their curb-running transitways.

These measures would generally improve bicycle travel in the PUC.

The BRT Alternative would positively affect the pedestrian environment through station and sidewalk amenities.

Organization

Section 4.1 discusses the performance of the public transit system in 2025 under the different alternatives. Section 4.2 discusses the functioning of the roadway system. Section 4.3 discusses the impacts of the alternatives to on-street parking and loading zones. Section 4.4 describes the impacts of the alternatives to bicyclists and pedestrians.

4.1 TRANSIT IMPACTS

4.1.1 Transit Service Supplied

This section describes the transit service levels that would result from each alternative and highlights the relative differences in the levels of service provided between the alternatives. Table 4.1-1 offers several indicators of how much transit service would be supplied to the transit rider under each alternative. Revenue miles are the number of miles a transit vehicle is open to the paying public to ride. Revenue hours are the number of hours people can ride transit, excluding times when the vehicles are operating but not open to the public (i.e., when a bus leaves its route to return to the garage). All the future alternatives would increase the fleet size, service revenue miles, and revenue hours over 1997.

TABLE 4.1-1
TRANSIT SERVICE SUPPLIED
(FORECAST YEAR 2025)

	1997 System	No-Build	TSM	BRT
Annual Revenue Miles (million)	16.30	17.97	20.74	27.97
Annual Revenue Hours (million)	1.17	1.31	1.40	1.80
Fleet Size	520	541	601	768

Source: Parsons Brinckerhoff, Inc. and Federal Transit Administration, 1997 National Transit Database.

Each build alternative would provide more revenue miles and revenue hours than the No-Build Alternative, indicating higher capacity and more frequent service. The increase of the No-Build Alternative of 2025 over 1997 would be about a 10 percent increase in annual revenue miles. The TSM Alternative would have approximately a 27 percent increase over 1997. The BRT Alternative would have approximately a 72 percent increase over 1997. The higher amount of revenue hours and revenue miles with the BRT Alternative is a reflection of the objective to provide added person carrying capacity in the corridor without building new roadways.

4.1.2 Ridership Impacts of the Alternatives

This section presents the impacts of the alternatives on the use of transit. This is important since an increase in transit ridership demonstrates the improved access and operating efficiency of the system. It begins with a comparison in terms of islandwide ridership, then proceeds to look at ridership in key travel markets.

1) Islandwide Impact

The impact that each alternative will have on transit ridership is a key indicator of its transportation benefits. To the extent that an alternative attracts more riders than another, it is providing better mobility by reducing travel time or cost. Increases in transit ridership also can be viewed as a proxy for many other transit benefits – reduced highway congestion, energy consumption, and emissions.

The information presented in this section, as well as all of the evaluation information based on travel forecasts presented in later sections, has been derived from the travel demand forecasting procedures maintained by the OMPO, the regional planning organization for the island. These procedures simulate the choices made by residents, business, and visitors regarding the nature, number, mode, time-of-day, and geographic orientation of trips that they make on a typical weekday. The procedures have been developed with data obtained in extensive surveys of Oahu households, transit riders, and air passengers. Future year forecasts reflect the population and employment forecasts that have been prepared by the Department of Business, Economic Development and Tourism (DBEDT) and the zonal allocations that have been prepared by the Department of Planning & Permitting.

As shown in Table 4.1-2, the BRT Alternative is forecasted to attract more ridership than either the TSM or No-Build Alternatives. Similarly, the BRT Alternative would result in an increased percentage of transit trips (mode share) compared to the other alternatives.

TABLE 4.1-2
RIDERSHIP FORECASTS ISLANDWIDE
(FORECAST YEAR 2025)

	No-Build	TSM	BRT
Total Transit Trips (Daily Linked Trips)	286,700	296,500	333,000
New Transit Trips compared with No-Build	Not Applicable	9,800	46,300
New Transit Trips compared with TSM	Not Applicable	Not Applicable	36,500
Transit Mode Share:			
All Trip Purposes	6.6%	6.9%	7.9%
Work Trips	14.7%	15.7%	18.4%

Source: Parsons Brinckerhoff, Inc.

2) Impact on Ridership Within the Primary Transportation Corridor

The preceding analysis provides an islandwide forecast for Oahu. A more complete understanding of the differences among the alternatives can be discerned by looking at ridership within the primary transportation corridor, which is the focus of this MIS/DEIS. The BRT Alternative would attract additional transit riders by both improving in-town mobility and strengthening the connections throughout the corridor. The increases in ridership and mode split shown in Table 4.1-3 reflect the service benefits – particularly reduced travel time – that such a system would provide within the primary transportation corridor.

TABLE 4.1-3
TRANSIT RIDERSHIP WITHIN THE PRIMARY TRANSPORTATION CORRIDOR
(DAILY LINKED TRIPS IN 2025)

	No-Build	TSM	BRT
Total Transit Ridership within the Primary Transportation Corridor	251,900	255,900	288,200
Transit Mode Share:			
All Trip Purposes	8.5%	8.7%	10.0%
Work Trips	19.2%	19.5%	22.6%

Source: Parsons Brinckerhoff, Inc.

While the TSM Alternative would provide some service benefits, the added benefits of a high capacity BRT system are shown to attract substantially more riders within the primary transportation corridor.

With regard to the BRT Alternative, its 333,000 average daily transit trips, islandwide, are forecast to account for 488,300 transit boardings on an average weekday in 2025. This compares to 1991 average daily transit trips of 206,650 and daily boardings of 239,680. The increase in daily ridership would represent a 61 percent increase. As shown in Table 4.1-4 approximately 22 percent of the daily transit trips islandwide would involve use of the In-Town BRT.

TABLE 4.1-4
TRANSIT RIDERSHIP BY SUB-MODE
(FORECAST YEAR 2025)

Transit Sub-Mode	BRT Daily Transit Boardings
Boardings on Regional BRT and Local Buses	416,400
Boardings on In-Town BRT	71,900

Source: Parsons Brinckerhoff, Inc.

3) **Other Measures of Service**

The ridership forecasting results can be used to compute several other indicators of the level of service provided by each alternative. These measures are presented in Tables 4.1-5 and 4.1-6 and discussed below.

Transfer Rates

One indicator of the level of service is the number of transfers a typical rider must make to complete a trip. Riders prefer not to transfer, unless transferring results in a shorter total travel time. In Table 4.1-5, the amount of transferring is expressed in terms of the number of boardings per linked transit trip. The BRT Alternative would involve the greatest amount of transferring because in a hub-and-spoke network many riders would access the system by feeder bus. In the No-Build Alternative and TSM Alternative (which has a less aggressive hub-and-spoke network than the BRT Alternative), more riders would have a one-mode ride from origin to destination. The additional transferring in the BRT Alternative is to a high degree offset by the more frequent, more comfortable, and more reliable service provided, and in many cases by a shorter total travel time as well with these alternatives.

TABLE 4.1-5
OTHER MEASURES OF SERVICE
(FORECAST YEAR 2025)

Measure	No-Build	TSM	BRT
Boardings per Linked Trip (Transfer Rates)	1.24	1.27	1.47
Passenger per Seat at Peak Load Point (Comfort)	1.31	1.01	0.86

Source: Parsons Brinckerhoff, Inc.

Comfort

Another way to look at level of service is comfort, which can be measured in terms of the probability of getting a seat on the transit vehicle during the peak hour. As shown in Table 4.1-5, the seated capacity of the TSM Alternative would be about equal to the demand. On an average weekday, there would be at least one seat for every rider even at the heaviest used part of the system. The seated capacity of the BRT Alternative would be slightly greater than the demand. With the No-Build Alternative, however, the ridership demand exceeds the seated capacity by over 30 percent. Almost a quarter of all riders would not find a seat and would be required to stand. In some instances, buses would be full and would pass by riders waiting at stops.

Reliability of Service

Another component of transit level of service is the reliability of the service, or the likelihood the service will remain on schedule. In most cases, the reliability of service is correlated to the amount of the service that utilizes exclusive facilities. Transit service in local mixed traffic is subject to delays caused by traffic congestion, as discussed in Section 4.2. Transit service on an exclusive right-of-way is less subject to delays caused by other vehicles or outside events. The BRT Alternative can thus be expected to be less affected by traffic delays and offer more reliable service, which will play a role in attracting transit ridership.

Transit Travel Time in the Primary Transportation Corridor

The BRT Alternative is the only alternative to provide a P.M. zipper lane and exclusive bus ramps along the H-1 Freeway. It also, because of the exclusive transit lanes in-town, is projected to result in better transit LOS at the analyzed intersections within the Urban Core. This means that, because of the congestion on the roadways and the provision of exclusive lanes, the BRT Alternative would provide faster transit travel times and more reliable service within the Primary Transportation Corridor than either the TSM or No-Build Alternatives.

TABLE 4.1-6
PROJECTED 2025 TRANSIT TRAVEL TIME WITHIN THE URBAN CORE
(IN VEHICLE TIME)

	No-Build Transit Travel Time (minutes)	TSM Transit Travel Time (minutes)	BRT Transit Travel Time (minutes)
Downtown - Kapolei	53.7	45.5	36.8
Downtown-Waikiki	18.7	15.8	13.7
Downtown-U.H.-Manoa	27.8	23.7	14.2
Downtown-Kalihi	7.9	6.8	5.1

Source: Parsons Brinckerhoff, Inc.

Travel time differences by 2025 are shown in Table 4.1-6, Transit Travel Time Within the Primary Transportation Corridor, for selected origins and destinations. Table 4.1-6 shows that the P.M. zipper lane and exclusive transit lanes in-town provided in the BRT Alternative will allow the BRT to operate significantly faster than buses in the No-Build Alternative, where no new priority is given to transit vehicles. The travel times shown are for in-vehicle time, in other words exclusive of time spent traveling to-and-from bus stops and the time spent waiting for the bus to arrive.

4.1.3 Ridership on the In-Town BRT

This section provides more detailed information on the projected ridership for the In-Town BRT segments of the BRT Alternative, including the number of boardings and alightings projected for each station and the link volumes between stations.

1) Boardings and Alightings

Table 4.1-7 shows how the 71,900 daily riders on the In-Town BRT segments of the BRT Alternative would be distributed by station. The heaviest utilized stations would be the Middle Street Transit Center at the Ewa end of the lines and the Union Mall Station in Downtown Honolulu before the two lines branch. Of the 71,900 daily boardings, 32,100 would occur along the joint lines between Middle Street and Downtown Honolulu, 23,700 would occur on the Kakaako/Waikiki Branch and 16,100 would occur on the University Branch.

Transit riders arrive at their boarding station by walking, by feeder bus, and by driving to a park-and-ride facility. Table 4.1-8 shows how many people are expected to arrive at each station on the In-Town BRT segments of the BRT Alternative by each mode. Almost 64 percent of all In-Town BRT riders are expected to arrive by walking, and another 31 percent arrive by feeder bus. Transfers from feeder buses are expected at 18 of the stations, with almost 67 percent of the transfers occurring at Middle Street Transit Center.

Kapahulu, University/King, Kalihi, and Isenberg are the next most frequent bus transfer stations. Less than 5 percent of all riders are expected to arrive by auto.

TABLE 4.1-7
BRT ALTERNATIVE
IN-TOWN BRT STATION BOARDINGS AND ALIGHTINGS
(TOTAL DAILY IN YEAR 2025)

Eastbound			Westbound		
Station	**On**	**Off**	**Station**	**On**	**Off**
Middle Street to Downtown Honolulu			**University Branch**		
Middle Street Transit Center	17,020		UH Manoa	1,300	
Kalihi	2,410	690	University/King	1,840	90
Honolulu Community College	1,800	1,190	Isenberg	2,190	120
Iwilei Transit Center	1,120	1,200	Convention Center	1,040	520
Chinatown	790	630	Keeaumoku/Ala Moana Center	900	630
Union Mall		5,220	Pensacola	1,060	590
University Branch			Thomas Square	800	320
Union Mall	1,520		Alapai Transit Center	1,430	540
Iolani Palace	310	900	Iolani Palace	900	310
Alapai Transit Center	540	1,430	Union Mall		1,520
Thomas Square	320	800	**Kakaako/Waikiki Branch**		
Pensacola	590	1,060	Kapahulu	2,350	
Keeaumoku/Ala Moana Center	630	900	Kuhio/Liliuokalani	1,900	10
Convention Center	520	1,040	Kuhio/Seaside	2,120	800
Isenberg	120	2,190	Saratoga	1,330	500
University/King	90	1,840	Fort DeRussy	880	310
UH Manoa		1,300	Hobron	1,080	360
Kakaako/Waikiki Branch			Ala Moana Park	1,110	630
Union Mall	2,030		Kamakee	1,660	980
Aloha Tower/Federal Building	1,080	1,500	Cooke Street	1,640	1,490
Cooke Street	1,490	1,640	Aloha Tower/Federal Bldg.	1,500	1,080
Kamakee	980	1,660	Union Mall		2,030
Ala Moana Park	630	1,110	**Downtown Honolulu to Middle Street**		
Hobron	360	1,080	Union Mall	5,220	
Fort DeRussy	310	880	Chinatown	630	790
Saratoga	500	1,330	Iwilei Transit Center	1,200	1,120
Kalakaua/Seaside	800	2,120	Honolulu Community College	1,190	1,800
Kalakaua/Uluniu	10	1,900	Kalihi	690	2,410
Kapahulu		2,350	Middle Street Transit Center		17,020
Total	**35,960**	**35,960**	**Total**	**35,960**	**35,960**

Source: Parsons Brinckerhoff, Inc.

TABLE 4.1-8
BRT ALTERNATIVE
IN-TOWN BRT MODE OF ARRIVAL
(FORECAST YEAR 2025)

Station	Walk	Bus	Drive
Middle Street Transit Center	200	15,180	1,630
Kalihi	2,150	950	0
Honolulu Community College	2,690	0	300
Iwilei Transit Center	2,010	10	300
Chinatown	1,420	0	0
Union Mall	8,040	720	0
Iolani Palace	1,200	10	0
Alapai Transit Center	1,740	230	0
Thomas Square	1,040	80	0
Pensacola	1,610	50	0
Keeaumoku/Ala Moana Center	1,480	50	0
Convention Center	1,560	0	0
Isenberg	1,370	940	0
University/King	870	1,070	0
UH Manoa	830	460	0
Aloha Tower/Federal Bldg.	2,160	430	0
Cooke Street	2,690	440	0
Kamakee	2,560	80	0
Ala Moana Park	1,710	20	0
Hobron	1,440	0	0
Fort DeRussy	1,190	0	0
Saratoga	470	150	1,210
Kalakaua/Seaside	800	0	0
Kuhio/Seaside	2,120	0	0
Kalakaua/Uluniu	10	0	0
Kuhio/Liliuokalani	1,900	0	0
Kapahulu	560	1,790	0
Total	**45,820**	**22,660**	**3,440**

Source: Parsons Brinckerhoff, Inc.

2) Link Volumes

Table 4.1-9 displays the forecast In-Town BRT link volumes between stations for the BRT Alternative. As shown, the Ewa end of the In-Town BRT facility will be more heavily utilized than the Koko Head ends. On the Ewa end, the In-Town BRT would carry a fairly uniform load from Middle Street to Downtown Honolulu, reaching a maximum of approximately 19,400 one-way daily riders on the Honolulu Community College to Iwilei Transit Center and Chinatown to Union Mall segments. Heading Koko Head from Downtown, the link volumes decrease as you reach the ends of the two branches.

TABLE 4.1-9
BRT ALTERNATIVE
IN-TOWN BRT LINK VOLUMES
(TOTAL DAILY IN YEAR 2025)

Eastbound		Westbound	
Segment	**Volume**	**Segment**	**Volume**
Middle Street to Downtown Honolulu		**University Branch**	
Middle Street Transit Center to Kalihi	17,000	UH Manoa to University/King	1,300
Kalihi to Honolulu Community College	18,700	University/King to Isenberg	3,000
Honolulu Community College to Iwilei Transit Center	19,400	Isenberg to Convention Center	5,100
Iwilei Transit Center to Chinatown	19,300	Convention Center to Keeaumoku/Ala Moana Center	5,600
Chinatown to Union Mall	19,400	Keeaumoku/Ala Moana Center to Pensacola	5,900
University Branch		Pensacola to Thomas Square	6,400
Union Mall to Iolani Palace	8,300	Thomas Square to Alapai Transit Center	6,900
Iolani Palace to Alapai Transit Center	7,800	Alapai Transit Center to Iolani Palace	7,800
Alapai Transit Center to Thomas Square	6,900	Iolani Palace to Union Mall	8,300
Thomas Square to Pensacola	6,400	**Kakaako/Waikiki Branch**	
Pensacola to Keeaumoku/Ala Moana Center	5,900	Kapahulu to Kuhio/Liliuokalani	2,300
Keeaumoku/Ala Moana Center to Convention Center	5,600	Kuhio/Liliuokalani to Kuhio/Seaside	4,200
Convention Center to Isenberg	5,100	Kuhio/Seaside to Saratoga	5,600
Isenberg to University/King	3,000	Saratoga to Fort DeRussy	6,400
University/King to UH Manoa	1,300	Fort DeRussy to Hobron	7,000
Kakaako/Waikiki Branch		Hobron to Ala Moana Park	7,700
Union Mall to Aloha Tower/Fed. Bldg.	9,400	Ala Moana Park to Kamakee	8,200
Aloha Tower/Federal Building to Cooke Street	9,000	Kamakee to Cooke Street	8,800
Cooke Street to Kamakee	8,800	Cooke Street to Aloha Tower/Federal Building	9,000
Kamakee to Ala Moana Park	8,200	Aloha Tower/Federal Building to Union Mall	9,400
Ala Moana Park to Hobron	7,700	**Downtown Honolulu to Middle Street**	
Hobron to Fort DeRussy	7,000	Union Mall to Chinatown	19,400
Fort DeRussy to Saratoga	6,400	Chinatown to Iwilei Transit Center	19,300
Saratoga to Kalakaua/Seaside	5,600	Iwilei Transit Center to Honolulu Community College	19,400
Kalakaua/Seaside to Kalakaua/Uluniu	4,200	Honolulu Community College to Kalihi	18,700
Kalakaua/Uluniu to Kapahulu	2,300	Kalihi to Middle Street Transit Center	17,000

Source: Parsons Brinckerhoff, Inc.

4.2 HIGHWAY IMPACTS

The Islandwide Mobility Concept Plan (1999), one of the principal frameworks of the Primary Corridor Transportation Project, acknowledges the difficulty and relatively temporary benefit of widening roadways. Physical and aesthetic constraints make roadway widening within the primary transportation corridor very difficult and expensive, particularly within the Urban Core of Honolulu from Middle Street to Waialae-Kahala. Given the difficulty of adding lanes, future transportation improvements within the Urban Core are principally focused on transporting more people within the same roadway space as provided today.

The primary transportation corridor has two segments, the H-1 freeway segment, and the In-Town segment. Regional improvements within the TSM and BRT Alternatives build on the successful H-1 zipper lane project, lengthening and expanding hours of operation along with transit centers and express ramps for direct connection to the zipper lane.

Besides the expanded A.M. peak operation, with the BRT Alternative during the P.M. peak period, the H-1 zipper lane operation is proposed in the Ewa-bound direction which, in conjunction with the P.M. peak period use of the existing Koko Head-bound shoulder lane would provide added capacity where it is needed most.

Improvements within the In-Town urban core with the TSM and BRT Alternatives focus on converting general-purpose traffic lanes to semi-exclusive and exclusive transit lanes. Doing so improves person carrying capacity, thereby providing an alternative to the automobile for mobility within the Urban Core.

4.2.1 Person Throughput

The TSM and BRT Alternatives would provide more person carrying ability within the Urban Core by reallocating roadway lanes from general-purpose use to transit or ride-share use. The BRT Alternative would provide significant gains in person carrying ability within the Urban Core due to its higher level of transit service than the other alternatives.

Table 4.2-1 compares the A.M. peak hour person throughput for selected screenlines within the Urban Core for each of the alternatives. The throughput in Table 4.2-1 is based on the observation that demand exceeds capacity on most of the highway facilities during the peak periods. When travel demands cannot be accommodated during a specific time period due to congestion, people will reschedule their trips for some other time, will seek an alternative mode of transportation, or will avoid making the trip altogether. The travel demand model used in this MIS/DEIS assumes demand spreading over a wide peak period so rescheduling is already accounted for. The projected 2025 vehicle travel demand above the capacity at the screenlines were, therefore, converted to transit trips if there was available transit capacity in that Alternative.

Table 4.2-1 shows that the BRT Alternative would improve the person carrying ability within the Urban Core by an average of 10 percent over the No-Build Alternative. This means that to get an equivalent increase in general-purpose throughput, total Urban Core roadway lanes would have to be increased by almost two lanes in each direction, which is impossible to do without major displacements.

The TSM Alternative would have much less effect on person-carrying ability than the BRT Alternative.

This analysis was conducted assuming an In-Town BRT articulated vehicle with a capacity for up to 120 persons per vehicle. By using even higher capacity vehicles (bi-articulated vehicles) or by further increasing the frequency of the BRT service, person carrying capacity could be increased even more, without the need for additional roadway construction within the transportation corridor.

TABLE 4.2-1
PROJECTED 2025 A.M. PEAK HOUR-PERSON CARRYING CAPACITY AT SELECTED SCREENLINE LOCATIONS (PERSONS/HOUR)

	Alternative		
Screenline Location	**No-Build**	**TSM**	**BRT**
Ewa-bound at Ward Avenue	23,433	23,589	24,354
Ewa-bound at Punchbowl Street	18,915	20,036	22,151
Koko Head-bound at Liliha Street	25,421	24,755	29,785
Koko Head-bound at Bishop Street	25,746	24,448	26,123

Source: Parsons Brinckerhoff, Inc.

4.2.2 Regional Roadway Mobility

Limited access freeways and high-capacity arterial roadways provide much of the regional roadway mobility. Along H-1, Ewa of Middle Street, transit priority would be provided by the existing A.M. and proposed P.M. zipper lane. With the BRT Alternative the Ewa-bound zipper lane would be implemented in conjunction with the use of the existing Koko Head-bound shoulder lane during the P.M. peak period. The No-Build and TSM Alternatives would utilize only the A.M. zipper system that exist today, while the BRT Alternative would provide higher capacity levels for transit through the use of express ramps into and out of the zipper lane. The P.M. zipper lane would provide the same type of benefit for Ewa-bound peak period traffic that the A.M. zipper lane provides for Koko Head-bound peak period traffic today. The zipper lane is currently designated as an express lane, requiring at least three or more persons in each vehicle using it, so extending the zipper lane will benefit not only transit riders, but 3+ vehicle occupants as well. Even today, based on current data, the express lane carries at least 2,000 more people per hour in autos than the highest utilized general purpose lane. In the future, about the same number of 3+ vehicle occupants will benefit over a four hour period in the A.M. and with the BRT Alternative in the P.M. peak period as well.

The zipper lane system is an integral part of the regional BRT component of the BRT Alternative. It allows regional BRT vehicles to bypass much of the congestion that is present in the general purpose lanes on H-1 Freeway today and projected to be much worse in the future.

1) System Performance Indices

Table 4.2-2, Projected Peak Period VMT/VHD, shows that in 2025 the BRT Alternative (which has the highest level of transit service provided), would have the lowest peak period Vehicle Miles of Travel (VMT) compared to the TSM and No-Build Alternatives. This reflects increased use of travel modes other than single-occupant-vehicles (SOVs) and less impact to non-primary roadway routes. This is confirmed by the lower number of vehicle trips (because there are more transit trips) projected to occur with the BRT Alternative than in the TSM or No-Build Alternatives.

Higher VMT reflects more vehicle trips made as well as indicating more circuitous travel for an alternative. This circuitous travel results from congestion on the main roadways causing vehicles to "hunt" for less congested routes. This, in turn, affects neighborhoods as streets meant to accommodate local traffic become through traffic routes.

Another indicator of regional roadway performance is Vehicle Hours of Delay (VHD) which is the difference between free-flow and congestion. The lower this delay, the better. In 2025 the BRT and TSM Alternatives are projected to have substantially lower daily VHD than the No-Build Alternative. While the BRT Alternative would have a greater amount of person throughput than the TSM or No-Build Alternatives, it would have more

TABLE 4.2-2
PROJECTED YEAR 2025 PEAK PERIOD VMT/VHD

Alternative	Time Period	VMT	VHD	Vehicle Trips Assigned
No-Build	A.M.	4,574,657	122,519	556,572
	P.M.	5,037,454	129,451	671,402
	Total Peak	9,612,111	251,970	1,227,974
TSM	A.M.	4,548,195	112,708	553,802
	P.M.	5,019,677	124,036	669,079
	Total Peak	9,567,872	236,744	1,222,881
BRT	A.M.	4,480,203	114,930	548,069
	P.M.	4,985,205	128,639	664,116
	Total Peak	9,465,408	243,568	1,212,185

Source: Parsons Brinckerhoff, Inc.
Notes: VMT = vehicle miles traveled
VHD = vehicle hours of delay

VHD than the TSM Alternative as general traffic lanes would be reconfigured to provide exclusive transit lanes, and therefore reduced capacity for autos.

2) Vehicle Screenline Analysis

Another way of evaluating roadway mobility is to examine the traffic volume versus roadway capacity ratio (V/C) passing through a screenline, an imaginary line that cuts across roadways within a transportation corridor. For this study, the screenlines cut across roadways oriented in the Ewa-Koko Head direction. Figure 1.2-3 illustrates the location of these screenlines.

The V/C is usually expressed as a decimal number that indicates the amount of roadway capacity used by the traffic demand. A V/C of 1.0 indicates demand equals capacity, while a V/C greater than 1.0 indicates that demand exceeds capacity, and that at least some vehicle queuing would occur. Tables 4.2-3 and 4.2-4 summarize the V/C ratios at selected screenlines within the Primary Corridor study area.

A useful index used to categorize V/C is Level of Service (LOS). LOS is a qualitative index based on the V/C quantitative analysis that involves traffic volumes, number of roadway lanes and their configurations, and traffic signal timing and phasing. LOS ranges from A, which indicates free-flow conditions to F which indicates congested conditions.

The screenline analysis indicates that in all alternatives by 2025, major regional roadways will still have traffic bottlenecks, as they do today.

In the regional freeway part of the primary corridor, these bottlenecks would be worst for the No-Build Alternative. It is projected to capture the lowest transit share, and, therefore, have the greatest number of cars on the road. The BRT Alternative would benefit from a BRT system that utilizes an enhanced contra-flow zipper lane to expedite transit and ride-share vehicles on the freeway. The BRT Alternative, with its higher level of transit service and resulting higher share of trips on transit, would have better V/C ratios in the regional freeway part than the other alternatives.

Within the Urban Core part of the primary corridor, the No-Build and TSM Alternatives would have comparable V/C ratios. The BRT Alternative would have the same or slightly higher V/C ratios due to reduced capacity for autos when general-purpose lanes are reallocated to transit use.

TABLE 4.2-3
PRIMARY CORRIDOR
LEVEL OF SERVICE AT SCREENLINES, 2025 A.M. PEAK HOUR INBOUND

Screenline Name	No-Build				TSM				BRT			
	Vehicle Volume	Capacity	V/C Ratio	LOS	Vehicle Volume	Capacity	V/C Ratio	LOS	Vehicle Volume	Capacity	V/C Ratio	LOS
Farrington	6416	12750	0.50	A	6287	12750	0.49	A	6035	12750	0.47	A
Kahe Point	4783	3200	1.49	F	4782	3200	1.49	F	4483	3200	1.40	F
Ewa	7310	9950	0.73	C	6885	11700	0.59	A	6459	11700	0.55	A
Waikele	10307	9750	1.06	F	10134	11500	0.88	D	9403	11500	0.82	D
Kalauao	18061	17650	1.02	F	17847	17650	1.01	F	16606	17650	0.94	E
Moanalua	19580	22100	0.89	F*	19565	22100	0.89	F*	18381	22100	0.83	F*
Kapalama	22347	17700	1.26	F	21985	17250	1.27	F	21408	16800	1.27	F
Nuuanu	22308	19600	1.14	F	22076	18900	1.17	F	21086	17900	1.18	F
Ward	19888	20700	0.96	E	19807	19750	1.00	F	19620	18400	1.07	F
Manoa-Palolo	22714	21150	1.07	F	22711	21150	1.07	F	22509	21150	1.06	F
Kapakahi	5957	5200	1.15	F	5900	5200	1.13	F	5813	5200	1.12	F
Helemano	2776	2550	1.09	F	2780	2550	1.09	F	2669	2550	1.05	F
Kipapa	7784	9250	0.84	D	7726	9250	0.84	D	7361	9250	0.80	D
Lumiaina	10912	12250	0.89	D	10855	12250	0.89	D	10412	12250	0.85	D

Source: Parsons Brinckerhoff, Inc.
Note: * LOS F caused by downstream congestion

TABLE 4.2-4
PRIMARY CORRIDOR
LEVEL OF SERVICE AT SCREENLINES, 2025 P.M. PEAK HOUR OUTBOUND

Screenline Name	No-Build				TSM				BRT			
	Vehicle Volume	Capacity	V/C Ratio	LOS	Vehicle Volume	Capacity	V/C Ratio	LOS	Volume	Capacity	V/C Ratio	LOS
Farrington	6577	12750	0.52	A	6476	12750	0.51	A	6299	12750	0.49	A
Kahe Point.	4583	3200	1.43	F	4562	3200	1.43	F	4378	3200	1.37	F
Ewa	6749	9950	0.68	B	7239	11700	0.62	B	6972	11700	0.60	B
Waikele	9890	9750	1.01	F	9764	11500	0.85	D	9353	11500	0.81	D
Kalauao	16276	14150	1.15	F	16092	15900	1.01	F	15229	15900	0.96	E
Moanalua	18181	18200	1.00	F	17865	19900	0.90	E	16992	19900	0.85	D
Kapalama	21319	15950	1.34	F	21289	15500	1.37	F	20804	15050	1.38	F
Nuuanu	22104	19100	1.16	F	22110	18750	1.18	F	21253	18200	1.17	F
Ward	23345	23200	1.01	F	23402	22250	1.05	F	22934	20900	1.10	F
Manoa-Palolo	23325	21050	1.11	F	23208	21050	1.10	F	23189	21050	1.10	F
Kapakahi	5217	3900	1.34	F	5166	3900	1.32	F	5088	3900	1.30	F
Helemano	2796	2550	1.10	F	2826	2550	1.11	F	2725	2550	1.07	F
Kipapa	7713	10600	0.73	C	7685	10600	0.73	C	7393	10600	0.70	C
Lumiaina	10343	12250	0.84	D	10342	12250	0.84	D	9972	12250	0.81	D

Source: Parsons Brinckerhoff, Inc.
Note: * LOS F caused by downstream congestion

Regardless of the vehicular V/C ratios, the proposed reallocation of general-purpose lanes for transit or ride-sharing use with the BRT Alternative is the only reasonable way to achieve greater person carrying capacity in the future.

Evaluation of such systemwide indices as vehicle miles traveled (VMT), vehicle hours of delay (VHD), auto person hours of travel, screenline volume/capacity ratios (V/C) and level of service (LOS) all indicate positive benefits of the TSM and BRT Alternatives over the No-Build Alternative due to projected increases in transit and HOV use. Further, they also show that the BRT Alternative is superior to the TSM Alternative in terms of regional mobility due to higher transit use and less vehicle miles traveled overall.

3) Freeway Operations with Zipper Lane Deployed

Analyses were conducted to determine the feasibility of the zipper lane component of the Regional BRT system. One of the issues considered was an evaluation of freeway operations on H-1 Freeway just east of the Kaonohi Street grade separation. This area, known as the Kalauao Screenline, is representative of the freeway operations influenced by existing and proposed deployment of the zipper lane. It also provides a consistent segment of roadway on which vehicular operations can be evaluated and passenger throughput can be measured and compared between the alternatives.

At this location, under existing Year 2000 traffic conditions during the A.M. peak hour, the H-1 Freeway carries 14,170 vehicles per hour (vph) in the Koko Head-bound direction. Within the A.M. peak period, a maximum Ewa-bound volume of 5,010 vph occurs. These volumes were derived using traffic counts conducted by the State of Hawaii Department of Transportation (HDOT) at count station H-6-J on H-1 Freeway at the Halawa Stream Bridge. Halawa Interchange ramp counts, also conducted by HDOT, were used to derive the count at the Kalauao Screenline. At the Kalauao screenline, there are seven lanes in the Koko Head-bound direction and three lanes in the Ewa-bound direction with the zipper lane deployed. The contra-flow zipper lane removes two Ewa-bound lanes while adding a Koko Head-bound lane. The paved shoulder is used as a travel lane during the A.M. peak period, so, including the zipper lane, there are seven lanes in the Koko Head-bound direction. Even though they carry more people per lane, the zipper (3+ occupancy) and HOV (2+ occupancy) lanes carry fewer vehicles per lane than the unrestricted general-purpose lanes. Therefore, the general-purpose lanes control the overall vehicle capacity of the H-1 Freeway. Based on the general purpose volume and capacity, both Koko Head-bound and the Ewa-bound traffic operate at an acceptable LOS during the existing A.M. peak period, as shown in Table 4.2-5.

TABLE 4.2-5
EXISTING AND PROJECTED YEAR 2025 H-1 FREEWAY OPERATIONS AT KALAUAO SCREENLINE

	A.M. Peak Hour			P.M. Peak Hour		
	Lanes	**Volume (vph)**	**LOS**	**Lanes**	**Volume (vph)**	**LOS**
Existing Year 2000						
Koko Head-Bound	7	14,170	E	4	6,060	C
Ewa-Bound	3	4,720	D	6	9,640	E
Projected Year 2025-BRT Alternative						
Koko Head-Bound	7	14,900	E	4	7,270	D
Ewa-Bound	3	5,670	D	6	11,000	E

Source: Parsons Brinckerhoff, Inc. based on HDOT traffic counts.
Note: vph = vehicles per hour, LOS = level of service

If an Ewa-bound zipper lane were implemented today, during the P.M. peak period traffic conditions, six lanes would be provided for traffic in the Ewa-bound direction. The zipper lane would displace two Koko Head-bound lanes, but operating the shoulder lane during the P.M. peak period would provide four lanes in the Koko Head-bound direction. During the P.M. peak period the maximum hourly volume in the Ewa direction is 9,640 vph. The maximum Koko Head-bound hourly volume during this time is 6,060 vph. As shown in Table 4.2-5, at these volumes, H-1 would operate at an acceptable LOS during the peak periods.

The same lane configurations are proposed for the Year 2025 BRT Alternative. The projected maximum A.M. peak period hourly volume in the Koko Head-bound direction is 14,900 vph, while the maximum hourly volume in the Ewa-bound direction is 5,670 vph. Table 4.2-5 summarizes the results that indicate that H-1 would operate at an acceptable LOS during the future A.M. peak period.

The projected maximum P.M. peak period hourly volume in the Ewa-bound direction is 11,000 vph, while the maximum hourly volume in the Koko Head-bound direction is 7,270 vph. Analysis results summarized in Table 4.2-5 show that both directions of H-1 Freeway would operate at an acceptable LOS during the P.M. peak period.

4) Person Throughput on H-1 Freeway

More frequent service combined with proposed zipper lane enhancements such as the express ramps would allow greater use of the zipper lane by BRT vehicles. As a result, even though the zipper lane is assumed to be in place for the No-Build, TSM, and BRT Alternatives during the A.M. peak period, the BRT Alternative is projected to carry more people through the Kalauao Screenline in the Koko Head-bound direction.

During the P.M. peak period, the added zipper lane operation in the Ewa-bound direction coupled with more frequent service and the express ramp enhancements for the BRT Alternative would result in significant increases in person throughput. Direct benefits would accrue not only to buses, but all vehicles with three or more occupants (3+). Additionally, the provision of the P.M. zipper lane, would draw 3+ traffic out of the HOV and general-purpose lanes, providing indirect benefits to other motorists as well.

Table 4.2-6 compares the person throughput in the peak direction between the No-Build, TSM, and BRT Alternatives. As shown, the BRT Alternative provides more person throughput capability on H-1 Freeway, especially during the P.M. peak period due to the proposed implementation of the zipper lane. Transit passenger carrying capacity is also increased because of more frequent service and the ability for BRT vehicles to exit and enter the zipper lane at key locations along the corridor.

TABLE 4.2-6
PROJECTED YEAR 2025 COMPARISON OF H-1 FREEWAY PERSON THROUGHPUT AT THE KALAUAO SCREENLINE

Lane	A.M. Peak Hour			P.M. Peak Hour		
	No-Build	TSM	BRT	No-Build	TSM	BRT
Zipper	6,755	7,710	9,675	0	0	6,725
HOV	4,405	4,300	3,800	5,060	5,295	3,800
General Purpose	12,710	12,650	12,650	10,140	10,120	10,120
Total	23,870	24,660	26,125	15,180	15,415	20,645

Source: Parsons Brinckerhoff, Inc.
Note: Numbers are persons per hour.

4.2.3 Traffic Operations at Intersections

1) Intersection Analysis Results

Within the Urban Core of Honolulu, traffic flow is governed by intersection operations. Intersection analyses were conducted to assess the relative impacts of the Alternatives.

As shown in Table 4.2-7, Peak Hour Intersection Operations, by 2025 many intersections in the Urban Core (for all of the alternatives) are projected to be at or near capacity, even with signing, striping and signal optimization. In most cases, intersections even under the No-Build Alternative would be at or near capacity.

TABLE 4.2-7
PROJECTED YEAR 2025 A.M. AND P.M. PEAK HOUR INTERSECTION LOS

INTERSECTION	Peak Time Period	No-Build		TSM		BRT	
		Auto LOS	Transit LOS	Auto LOS	Transit LOS	Auto LOS	Transit LOS
Sand Island Access	A.M.	F	F	F	F	F	***
Road and Nimitz Hwy	P.M.	F	F	F	F	F	***
Waiakamilo Road	A.M.	F	F	F	F	F	***
Nimitz Hwy	P.M.	F	F	F	F	F	***
Kalihi Street and	A.M.	F	F	F	F	F	A
Dillingham Boulevard	P.M.	F	F	F	F	F	C
Bishop Street and	A.M.	F	F	F	C	F	B*
S. King Street	P.M.	F	F	F	C	F	B*
Punchbowl Street and	A.M.	F	F	F	B	F	B
S. King Street	P.M.	F	F	F	B	F	B
Ward Avenue and	A.M.	F	C	F	C	F	C
Kapiolani Boulevard	P.M.	F	D	F	C	F	C
Piikoi Street and	A.M.	C	B	F	C	C	A
Kapiolani Boulevard	P.M.	F	C	F	C	F	A
Kalakaua Avenue and	A.M.	F	D	F	C	F	D
Kapiolani Boulevard	P.M.	F	F	F	C	F	D
University Avenue and	A.M.	E	F	F	F	F	D
S. King Street	P.M.	F	E	F	E	F	D
University Avenue and	A.M.	C	C	C	C	D	B
Dole Street	P.M.	E	C	E	C	E	C
Punchbowl Street and	A.M.	C	C	C	C	B	***
Ala Moana Boulevard	P.M.	F	D	D	B	D	***
South Street and	A.M.	D	D	E	D	C	***
Ala Moana Boulevard	P.M.	F	E	E	D	D	***
Ward Avenue and	A.M.	F	C	F	C	F	***
Ala Moana Boulevard	P.M.	F	C	F	B	F	***
Piikoi Street and	A.M.	F	F	F	B	F	B
Ala Moana Blvd.	P.M.	F	B	F	A	F	A
Atkinson Drive and	A.M.	E	D	F	C	F	B
Ala Moana Boulevard	P.M.	F	F	F	B	F	B
Hobron Lane and	A.M.	F	F	F	F	F	B
Ala Moana Boulevard	P.M.	F	F	F	F	F	A
Kalia Road and	A.M.	F	F	F	F	F	C
Ala Moana Boulevard	P.M.	F	F	F	F	F	B
Sand Island Access	A.M.	F	F	F	F	F	***
Road and Nimitz Hwy	P.M.	F	F	F	F	F	***
Waiakamilo Road	A.M.	F	F	F	F	F	***
Nimitz Hwy	P.M.	F	F	F	F	F	***
Kalihi Street and	A.M.	F	F	F	F	F	A
Dillingham Boulevard	P.M.	F	F	F	F	F	C
Bishop Street and	A.M.	F	F	F	C	F	B*
S. King Street	P.M.	F	F	F	C	F	B*
Punchbowl Street and	A.M.	F	F	F	B	F	B
S. King Street	P.M.	F	F	F	B	F	B
Ward Avenue and	A.M.	F	C	F	C	F	C
Kapiolani Boulevard	P.M.	F	D	F	C	F	C
Piikoi Street and	A.M.	C	B	F	C	C	A
Kapiolani Boulevard	P.M.	F	C	F	C	F	A

Notes: * = BRT on Hotel St. ** = Bus routes on Kuhio Avenue *** No Transit

TABLE 4.2-7 (CONTINUED)
PROJECTED YEAR 2025 A.M. AND P.M. PEAK HOUR INTERSECTION LOS

INTERSECTION	Peak Time Period	No-Build		TSM		BRT	
		Auto LOS	Transit LOS	Auto LOS	Transit LOS	Auto LOS	Transit LOS
Kalakaua Avenue and	A.M.	F	D	F	C	F	D
Kapiolani Boulevard	P.M.	F	F	F	C	F	D
University Avenue and	A.M.	E	F	F	F	F	D
S. King Street	P.M.	F	E	F	E	F	D
University Avenue and	A.M.	C	C	C	C	D	B
Dole Street	P.M.	E	C	E	C	E	C
Punchbowl Street and	A.M.	C	C	C	C	B	***
Ala Moana Boulevard	P.M.	F	D	D	B	D	***
South Street and	A.M.	D	D	E	D	C	***
Ala Moana Boulevard	P.M.	F	E	E	D	D	***
Ward Avenue and	A.M.	F	C	F	C	F	***
Ala Moana Boulevard	P.M.	F	C	F	B	F	***
Piikoi Street and	A.M.	F	F	F	B	F	B
Ala Moana Blvd.	P.M.	F	B	F	A	F	A
Atkinson Drive and	A.M.	E	D	F	C	F	B
Ala Moana Boulevard	P.M.	F	F	F	B	F	B
Hobron Lane and	A.M.	F	F	F	F	F	B
Ala Moana Boulevard	P.M.	F	F	F	F	F	A
Kalia Road and	A.M.	F	F	F	F	F	C
Ala Moana Boulevard	P.M.	F	F	F	F	F	B

Source: Parsons Brinckerhoff, Inc.
Notes: * = BRT on Hotel St. ** = Bus routes on Kuhio Avenue *** No Transit

To improve operations at the worst intersections in all alternatives would require major intersection reconstruction, involving expensive grade separations and widening or would require major reworking of the urban roadway network. Public input throughout project planning indicated that extensive grade-separations/widenings would not be acceptable, so grade-separations/ widenings were avoided as a mitigation measure in all of the alternatives.

Providing additional person carrying capacity at intersections (through transit and rideshare enhancements) is being proposed as a preferable and more rational way of improving urban mobility as compared to major reconstruction.

Improving person carrying capacity in a congested urban area relies on the ability of the transit system to operate efficiently. LOS can be used as an indicator of traffic as well as transit efficiency, and Table 4.2-7 summarizes this transit LOS as well as auto LOS as projected in 2025. Table 4.2-7 shows that the BRT Alternative would be unique in providing a travel mode that could avoid the auto congestion at key intersections that is forecasted for all alternatives. Due to their use of exclusive transit lanes, BRT vehicles could pass freely through congested intersections even though intersection LOS for the general-purpose lanes might be poor. The result would be less delay for transit riders and better transit schedule reliability.

The BRT Alternative provides the best transit level of service as measured in terms of lack of impedance.

In contrast, in the No-Build Alternative, both auto and transit components of the transportation system are projected to operate in congested conditions. Transit would have no advantage over autos. The TSM Alternative would have somewhat better transit LOS than the No-Build Alternative because of its semi-exclusive transit lanes.

Public opposition to major roadway widenings or grade-separations within the Urban Core strongly influenced the definition of the TSM and BRT Alternatives. To accommodate future travel demand, these alternatives focused mostly on increased person carrying capacity at intersections. The analysis indicates that the BRT Alternative would accomplish this goal better than the TSM and No-Build Alternatives. An unavoidable consequence of focusing on increased person carrying capacity is reduced LOS for auto traffic at some intersections.

The BRT Alternative's exclusive lanes also allow significantly faster transit speeds than the semi-exclusive lanes of the TSM Alternative. By 2025 general-purpose auto speeds on the urban arterial streets are projected to be between the average transit speeds projected for the TSM and BRT Alternatives.

These various analyses show that implementing transit-priority measures in the BRT Alternative would allow transit to be an effective competitor to auto travel under projected future traffic conditions.

4.2.4 Summary of Travel Benefits within the Urban Core

By 2025 key intersections in the Urban Core would be near or at capacity under all alternatives. However, only the BRT Alternative, with its exclusive transit lanes, would provide an alternative, non-congested travel mode through these intersections, achieving faster transit travel times within the Urban Core. As a result, the exclusive transit lanes could carry substantially more people per hour through the intersections than the general-purpose traffic lanes. The TSM Alternative, while providing some transit priority with its semi-exclusive lanes, would still have slower speeds caused by vehicles turning at intersections, affecting transit speeds and reliability. While greatly improving transit service and, therefore, person carrying capacity, the TSM and BRT Alternatives would result in somewhat reduced LOS for auto traffic within the Urban Core. Selected roadway improvements have been included to mitigate some of these impacts to autos, but given public opposition to major roadway widenings and grade separations, these have been kept to a minimum.

The BRT Alternative offers the ability to accommodate even further increases in travel demand, without major road reconstruction. This could be achieved by using higher capacity BRT vehicles or further increasing the frequency of transit service.

4.2.5 Sensitivity Analysis

When planning efforts for the MIS/DEIS had begun, initial transportation analyses were based on the 2025 population and employment forecasts for Oahu from a January 1999 draft report by DBEDT.

DBEDT recently revised their 2025 population and employment forecasts. Therefore, we conducted a sensitivity analysis to determine the effect of the revised forecasts on the projected travel demands and impacts presented in this chapter. As shown in Table 4.2-8 the magnitude of the change in the population now being forecast for 2025 is a reduction of about five percent. Employment is now projected to be about four percent higher than in the forecasts discussed in this MIS/DEIS.

Despite the revised DBEDT forecast, as can be seen in the table, the net effect on vehicle trips and transit trips would be at most a two percent change. It was therefore deemed unnecessary to re-do the analyses because the change in the forecast was deemed not significant enough to alter the analyses and conclusions in this document substantially.

TABLE 4.2-8
COMPARISON OF OAHU YEAR 2025 FORECASTS

	Oahu Population	Non-Construction Employment	Total Transit Ridership	In-Town BRT Boardings	Resident Vehicle Trips	
					A.M. Peak Period	P.M. Peak Period
In This MIS/DEIS (1/99 Forecast)	1,083,600	586,100	333,000	71,900	477,600	602,430
Updated forecast (2/00 Forecast)	1,029,800	608,700	334,400	70,400	486,300	604,660
Change from 1/99 Forecast	(53,800)	22,600	1,400	(1,500)	8,700	2,230

Source: DBEDT, Research and Economic Analysis Division, January 1999 and February 2000.

4.3 PARKING IMPACTS

Parking impacts fall into three categories. The first category of impact would be that related to parking at transit centers and park-and-rides. The second would be on-street parking impacts, due to the designation of exclusive or semi-exclusive lanes for transit vehicles. The third category of impact pertains to off-street parking.

4.3.1 Transit Centers and Park-and-Ride Facilities

To intercept auto users closer to their trip origin and get them on transit, park-and-ride facilities are proposed in all of the alternatives. Many of the park-and-rides will occur at transit centers and give parkers transit connections to multiple destinations. From a regional perspective these park-and-rides will reduce VMT as well as parking and traffic impacts in the urban core. While there may be some localized impacts associated with these park-and-rides, sites have been selected to minimize the potential traffic impacts and increase opportunities to enhance neighborhoods. Table 4.3-1 shows the number of parking spaces proposed at each transit center and park-and-ride facility in the TSM and BRT Alternatives. The number of spaces shown are

TABLE 4.3-1
PROPOSED NEW PARKING STALLS AT PARK-AND-RIDE FACILITIES FOR TSM AND BRT ALTERNATIVES

Proposed Transit Centers and Park-and-Ride Facilities	Number of New Parking Stalls	
	TSM	BRT
Aloha Stadium Park-and-Ride (upgrade part of existing parking)	500	500
Iwilei Transit Center	300	300
Kalihi Park-and-Ride	--	300
Kaneohe Transit Center	150	150
Kapolei Transit Center	500	500
Waipahu Transit Center	700	800
Middle Street Transit Center	750	1000
Pearl City/Aiea Transit Center	--	500
Waianae Transit Center	100	100
TOTAL	**3,000**	**4,150**

Source: Parsons Brinckerhoff, Inc.

based on projected usage from the travel demand models combined with a preliminary assessment of site constraints and surrounding neighborhood compatibility. Project-specific community planning and environmental assessments would be performed for each of these sites prior to their implementation.

4.3.2 On-Street Parking

Curbside parking spaces were counted as being affected if their expected use in the year 2025 would be affected in any way, either all day long or limiting their use to off-peak hours.

Parking spaces are categorized by availability during peak and off-peak hours. "Unrestricted parking" spaces are defined as those currently available during both peak and off-peak hours. There are no parking spaces that are available only during peak hours and not at off-peak hours. Therefore, unrestricted parking spaces represent those parking spaces that would be impacted during peak period transit operation.

"Restricted parking" spaces refer to all other types, namely spaces that currently have some time restriction on parking. Most such spaces are available only during off-peak hours. These spaces would therefore not be affected by peak-period transit operations, because their use is not allowed during the peak traffic hours. The definition of restricted parking also includes spaces that are available only partially during off-peak hours, such as those on Ala Moana Boulevard that are for use only on weekends, holidays, and overnight on weekdays.

The number of affected parking spaces was determined from City and County striping plans and/or independent field checks. Where curb parking spaces were not marked by parking meters and/or parking space stripings, the linear curbside distance available for parking (exclusive of driveways and other uses such as bus stops, loading zones, no parking zones, etc.) was measured and divided by 6.67 meters (22 feet), the length of a typical parking space according to the City and County's Traffic Standards Manual (DTS, July 1976).

Impacts during the peak hours (unrestricted spaces) would occur under both build alternatives. The BRT Alternative would have the greatest impact, taking as much as 386 unrestricted spaces. The TSM Alternative would have the next largest impact on unrestricted parking (326 spaces). The TSM Alternative would have parking impacts, due to the need for improvements such as road-widening and semi-exclusive lanes for the local bus priority system. The No-Build Alternative is the only alternative that would not have any parking impacts.

Only the BRT Alternative would affect restricted parking spaces that are currently not available at peak hours. All of these impacts (591 spaces) would be confined to the In-Town BRT alignment. The No-Build and TSM Alternatives would not affect any restricted parking spaces.

1) No-Build Alternative

The No-Build Alternative would not have any impacts on existing parking spaces, because it does not propose any changes to current roadway uses.

2) TSM Alternative

The TSM Alternative would affect roughly 296 unrestricted parking spaces that are currently available during both peak and off-peak hours. This alternative would not affect any restricted parking spaces that are currently limited to off-peak use only.

Potential parking reductions would occur on King Street and Beretania Street. Transit vehicles would operate in semi-exclusive lanes on these streets, requiring that curbside lanes be restricted to use by transit vehicles or vehicles making right turns. The impact would occur along King Street between Middle Street and Waialae Avenue (269 spaces) and Beretania Street between Aala Park and South King Street (27 spaces), most of which are spaces available all day. On King Street, the segment from Middle Street to Richards Street would lose 102 spaces, Richards Street to Ward Avenue 24 spaces, Ward Avenue to McCully Street 71 spaces, and McCully Street to Waialae Avenue 72 spaces. These spaces (both marked and unmarked) would require the elimination of parking spaces during peak hours, while they would still be available during off-peak hours.

3) BRT Alternative

A transitway required for the Pearl City/Aiea Transit Center if located at Pearlridge Center would affect about 30 curb parking spaces on Kaonohi Street, all of which are unrestricted parking spaces available during peak and off-peak hours. In addition, the In-Town BRT would affect a total of 356 unrestricted spaces and 591 restricted parking spaces. Of these the Middle Street to Downtown branch would affect parking on Kaaahi Street (27 unrestricted spaces) and an additional 20 unrestricted spaces on Richards Street between Hotel and King Streets.

Along the University Branch, Kapiolani Boulevard would lose the most curb parking, totaling roughly 302 unmarked restricted parking spaces available now only at off-peak times. About 48 unmarked spaces on the makai side of Kapiolani Boulevard between McCully Street and University Avenue would be affected. The remaining roughly 254 affected spaces on Kapiolani Boulevard occur along the stretch between Ward Avenue and McCully Street. Other spaces affected by the University Branch would be along South King Street (43 unrestricted and 45 restricted), Ward Avenue (17 unrestricted and 32 restricted), and University Avenue (56 unrestricted and 22 restricted).

Along the Kakaako/Waikiki Branch a total of 193 unrestricted spaces and 190 restricted spaces would be affected. On Halekauwila, and Pohukaina Streets, 69 unrestricted and 66 restricted spaces would be affected. These spaces are all marked. The makai side of Ala Moana Boulevard would lose 124 restricted spaces (unmarked), though these impacts would be limited to weekend, holiday, and nighttime uses, when they are currently available. On Auahi Street, 71 unrestricted (unmarked) spaces would be impacted. Other unrestricted spaces would be affected on Richards Street (31 marked spaces), Queen Street (5 marked spaces), Saratoga Road (5 marked spaces), and Kapahulu Avenue (12 marked spaces).

4.3.3 Off-Street Parking

The University Branch of the In-Town BRT could affect roughly 8 off-street parking spaces associated with Club Rock Za near the mauka-Ewa corner of Kapiolani Boulevard and Kalakaua Avenue. The widened right-of-way which would generate the loss of these affected spaces is not needed at the outset of the project. The taking of these spaces would be deferred until the affected property is redeveloped. The discussion on displacements in Section 5.2 also deals with related parking impacts.

4.3.4 Parking Mitigation

It is expected that an efficient transit system would encourage people to use transit rather than driving private vehicles. In fact, on the order of 4,000 people per day under the TSM Alternative and over 20,000 people per day under the BRT Alternative are expected to be diverted out of their cars to use transit. Some of these former auto drivers would be able to give up their cars or park their cars at outlying park-and-ride facilities, thereby lessening the need for parking in the PUC. The need for parking would decline regardless of whether the people who gave up their cars are residents and/or employees in the PUC. Thus, parking demand in the PUC is expected to decline in general under all build alternatives, but especially along the transit spine in the BRT Alternative. Moreover, the community planning process will be an integral part of the design phase to help mitigate any potential parking impacts to specific neighborhoods.

In areas where a large concentration of parking spaces would be affected, replacement parking in new off-street parking facilities would be considered, but only if they meet other livable community objectives and are the result of community-based planning.

4.4 LOADING ZONE IMPACTS

Conceptual engineering designs have taken into consideration the need to avoid impacts on as many loading zones as possible, especially in the Waikiki area. Potentially affected areas and the proposed mitigations are discussed in this Section.

As shown in Table 4.4-1, the linear distance designated as loading zones was measured along the proposed alignments. The number of zones that these distances represent is also included in the table. One continuous street segment that allows loading activity was counted as one loading zone; if the activity was allowed continuously along several blocks, such as in Waikiki, each block was counted as a separate zone.

TABLE 4.4-1
SUMMARY OF ESTIMATED LOADING ZONE IMPACTS

Alternative	Total Distance Meters (Feet)	Peak And Off-Peak (Number Of Zones)		Off-Peak Only Loading (Number Of Zones)	
		Commercial Vehicles With Permit	Passenger Or Other Vehicles	Commercial Vehicles With Permit	Passenger Or Other Vehicles
No-Build	0	0	0	0	0
TSM	2,361 (7,747)	37	2	3	1
BRT	1,777 (5,830)	26	2	2	0

Source: Carter Burgess and Parsons Brinckerhoff, Inc.

The table also distinguishes the loading zones allowed during both peak and off-peak hours, as opposed to those zones restricted to use only during off-peak hours.

Most loading zones are also restricted to use by commercial vehicles, which are primarily tour buses and freight vehicles with permits. Other vehicles that may stand briefly in such loading zones include taxicabs, armored cars, and special transit service vehicles.

4.4.1 No-Build Alternative

The No-Build Alternative would not have any impacts on existing loading zones, because that alternative does not propose any changes to existing roadway uses.

4.4.2 TSM Alternative

Under the TSM Alternative, a local street bus priority system would operate on Kuhio Avenue in Waikiki, North and South King Street, and South Beretania Street. In total, an estimated 2,361 meters (7,747 feet) of loading zones would be affected. About 1,969 meters (6,460 feet) would be in Waikiki. Under the TSM Alternative, buses would operate on Kuhio Avenue in semi-exclusive lanes, affecting both mauka and makai curbside loading zones. The total impact of this alternative would be the equivalent of 43 loading zone spaces, of which 37 are peak and off-peak loading zones for commercial vehicles with permits. As a mitigation, it might be necessary on Kuhio Avenue to limit the hours of operation of the semi-exclusive lanes to peak-hours only, and to only one direction at a time.

4.4.3 BRT Alternative

The total loading zone impacts for the BRT Alternative would be approximately 1,777 meters (5,830 feet). The Regional BRT would not cause any loading zone impacts. The impacts that would occur are those associated with the In-Town BRT system, mostly in Downtown and Waikiki, as well as on Kaaahi Street in Iwilei.

In Waikiki, about 1609 meters (5,280 feet) of loading zone would be affected, mostly on Kalakaua and Kuhio Avenues. The In-Town BRT would operate in a semi-exclusive mode in the makai curbside lane of Kalakaua Avenue. As a result, commercial passenger and baggage loading would be restricted to side streets and loading bay areas only. Officially prohibiting loading in this segment is not anticipated to create any adverse impacts, because landscaping that restricts loading opportunities on Kalakaua Avenue currently exists between Lewers Street to just past the Royal Hawaiian Shopping Center.

On Kuhio Avenue, BRT vehicles would operate in an exclusive lane mode, mostly in the second lane from the mauka curb. Commercial and freight loading on the mauka side would be restricted to side streets and three segments where tour buses currently stop in front of major hotels: 1) Outrigger Waikiki Surf, 2) Waikiki Market Place/Outrigger West, and 3) Prince Kuhio. In these segments, the BRT system would be configured to operate in the median to allow for loading in those areas fronting the three hotels. The loading zones on the makai side of Kuhio Avenue would not be affected.

4.4.4 Loading Zone Impacts Mitigation

As with parking impacts, community-based planning would be an integral part of the design phase to address mitigation measures for loading zone impacts.

4.5 BICYCLING IMPACTS

This section describes the project's potential impacts to existing and currently proposed bicycle systems in the study area, as described in the Honolulu Bicycle Master Plan (April 1999).

The No-Build Alternative would not affect bicycle transportation because it would not affect existing streets in a manner to interfere with the safety and convenience of cyclists. Implementation of the Bicycle Master Plan would continue under all alternatives. All buses would have bike racks to accommodate intermodal transit. New bike parking racks will continue to be installed around the city.

Because the TSM Alternative includes an extensive network of semi-exclusive lanes in the PUC, bicycle usage could be affected where existing bike lanes are converted to joint-use bicycle/transit lanes. A policy would be established under the TSM Alternative allowing bicycles to use the semi-exclusive bicycle lanes.

One of the primary purposes of the MIS/DEIS is to enhance in-town mobility by restoring a balanced transportation system that includes measures that encourage transit, bicycle and pedestrian modes. Therefore, the BRT Alternative has been designed to provide concurrent systems enhancing transit, bicycle and pedestrian travel within the very limited space of the existing roadway rights-of-way. Cyclists have been accommodated along the entire length of the In-Town BRT system.

The general approach to enhancing bicycle travel under the BRT Alternative includes the following elements:

- BRT vehicles would be equipped with bike racks to facilitate intermodal transit. Bike parking facilities would be installed at transit centers, transit stops, and park-and-ride facilities.
- A separate bike lane would be provided, or an alternate route would be identified, where the transitway would interfere with the present pattern of bicycle travel. These are the preferred solutions to eliminate

the conflict between transit vehicles and bicyclists. In many areas, a 4.3 meters (14 feet) facility for the joint use of bicycles and vehicles could be provided, rather than separate bike lanes, if preferred by cyclists.

- Where a bike lane cannot be accommodated or an acceptable alternative route would be difficult to identify, cyclists would be allowed to share the transitway in curb-running sections. Many cities, including New York City, London, Toronto, Madison Wisconsin, Seattle and Portland Oregon, allow bicycles to use at least portions of their curb-running transitways.

In most cases, these measures would improve bicycle transportation over the existing conditions.

Should the BRT Alternative be selected, coordination with cyclists would be conducted to further define the details of the bicycle mitigation program.

The In-Town BRT could assist with implementation of planned bikeway facilities through coordination of right-of-way and/or use of travel lanes. Planned bikeway facilities that could be jointly developed include proposed facilities on Dillingham Boulevard, South King Street, Ala Moana Boulevard, Kalia Road, and Saratoga Road. Methods of incorporating these proposed bicycle facilities in the design would be addressed in subsequent planning phases.

4.5.1 Impacts to Existing Bikeways and Cycling

Although most of the In-Town BRT alignment is not designated as a "bikeway", roadways along the alignment are used by cyclists to varying degrees because of the paucity of bikeway facilities. Figures 3.1-4A through 3.1-4C show existing bikeways in the study area that support cycling as a viable transportation mode and recreational activity. Bikeways recommended in the Honolulu Bicycle Master Plan are also shown.

A bikeway can be a bike route, lane or path. A bike route is a road that is designated for the shared use of bicycles and motor vehicles. Bike routes typically have wide shoulder lanes or relatively little traffic. A bike lane is a portion of a roadway designated by striping, signage or pavement markings for the preferential or exclusive use of bicycles. A bike path is a completely separated right-of-way designated for the exclusive or semi-exclusive use of bicycles. In urban areas, bike paths are normally paved, and located in parks or scenic areas.

Most of Honolulu's existing bikeways are not linked systematically, although the Pearl Harbor Bike Path is continuous between Waipahu and Aloha Stadium, and eventually is proposed for extension to Kapolei. Bikeways on Kalanianaole Highway also form a continuous link between Kahala and Hawaii Kai.

When bikeways are not continuous, cyclists must use roadways that are not designated as bikeways. More confident cyclists often use the street. Less confident cyclists tend to ride on sidewalks or landscaped areas off of the roadway, although riding on sidewalks in business districts, such as Downtown, is illegal.

Ala Moana Boulevard between Queen Street and Piikoi Street, and Kalia Road/Saratoga Road, would be the only sections along the In-Town BRT alignment with semi-exclusive or exclusive BRT lanes in narrow curbside lanes (less than 4.3 meters (14 feet) wide). Since it would not be safe to allow bicyclists to use the Koko Head-bound curbside transitway, it is proposed that cyclists use the existing paved, shared-use, pedestrian/bike paths in Ala Moana Beach Park for the one-half km (0.3 mile) segment between Queen Street and Atkinson Drive. Alternative routes to Kalia Road/Saratoga Road are also available.

Other segments that contain semi-exclusive/exclusive BRT curbside lanes include Hotel Street (lanes wide enough for shared bicycle use), South King Street between Alapai Street and Ward Avenue (existing bike lane to be retained), University Avenue by Puck's Alley (existing bike lane to be retained), Ala Moana

Boulevard between Piikoi Street and Atkinson Drive (lanes wide enough for shared bicycle use), Kalakaua Avenue (existing bike lane to be retained) and Kapahulu Avenue (existing bike lane to be retained).

Street-by-street descriptions of how the transitways would affect bicycle transportation in the study area are provided below.

Dillingham Boulevard is not currently designated a bikeway although it links the Keehi Interchange end of the Nimitz Highway bike path with Kalihi and Iwilei. Much of Dillingham Boulevard presently has little or no shoulder space, and the curb lanes are not wide enough for bicycles and motor vehicles to travel side-by-side safely.

The In-Town BRT transitway is proposed to be center-running on Dillingham Boulevard, reducing the number of through lanes by two. The impacts on each section of Dillingham Boulevard would be as follows:

- Existing paths/sidewalks would remain between the Nimitz Highway bike path and the first crosswalk on Dillingham Boulevard.
- Between Middle Street and Puuhale Road, the curb lanes would remain the same width (between 3.9 and 4.3 meters (13 and 14 feet)), which is adequate for cyclists and motor vehicles to travel side-by-side.
- Bicycle transportation would improve in the section between Puuhale Road and Kaaahi Street despite the fact that the In-Town BRT would reduce the number of through lanes to one each way because these curbside lanes would be 4.3 meters (14 feet) wide, which allows motor vehicles and bicycles to travel side-by-side safely (see Section 4.5.3). This is an improvement over the existing narrower lane width.

The BRT transitway would traverse Kaaahi Street and Iwilei Road, to link Dillingham Boulevard and North King Street. Bicycle transportation would not be affected by the use of these roads because Kaaahi Street has no outlet, and is not used for cycling. Only a very small portion of Iwilei Road would be used for the transitway.

The transitway on North King Street would occupy the two mauka side lanes, which would not affect cycling because cyclists could use the makai curb lane when traveling in the Koko Head-bound direction.

The transitway would share the bus lanes on Hotel Street, an existing bus mall that restricts general-purpose vehicles from North King Street to Alakea Street Koko Head-bound and to Richards Street Ewa-bound. To maintain access to properties along Richards Street, the makai-bound BRT lane would be a shared-use lane. Therefore, the existing level of bicycle access on Hotel Street and on Richards Street would remain the same.

On South King Street (the Ewa end of the University Branch), the In-Town BRT vehicle would use general-purpose lanes. Therefore, bicycle transportation along the makai side of South King Street would not be affected along this section. Although a curbside-running Koko Head-bound transitway is proposed from Alapai Street to Ward Avenue, bicycle transportation along this segment would improve because a bike lane would also be provided along this section (see Section 4.5.3).

The Ewa-bound transitway on South King Street between Richards Street and Ward Avenue would be in a contra-flow lane next to the mauka curb. This would prevent the use of this lane by Koko Head-bound cyclists who currently use this lane to avoid the makai-side lanes that turn onto Kapiolani Boulevard. Instead, cyclists could use an existing shared-use bike path within the Capitol District which passes next to the State Capitol, Iolani Palace, the State Library, Honolulu Hale and the Municipal Building.

The transitway would be center-running on Ward Avenue and on Kapiolani Boulevard between Ward Avenue and Atkinson Drive. Kapiolani Boulevard is limited as a cycling facility but since four travel lanes would remain after the transitway is established, the present level of bike access would be retained.

At Atkinsion Drive and Kalakaua Avenue, the transitway would shift to curbside-running to University Avenue. Since general-purpose vehicles would be allowed use of these transitways, the existing level of bicycle transportation along this section of Kapiolani Boulevard would remain the same.

On University Avenue, the transitway would shift to center-running to UH-Manoa. The existing makai-bound and mauka-bound bike lanes would be relocated to the curb, and existing street parking would be removed (see Section 4.3). Therefore, the existing level of bicycle transportation along University Avenue would remain the same.

The Kakaako/Waikiki Branch of the In-Town BRT would begin on Richards Street, reducing this roadway to two general-purpose lanes. Although cyclists would be allowed in these through lanes, the lane widths would not be wide enough for both bicycles and motor vehicles side-by-side. The operating speeds along this stretch of Richards Street are fairly low, and automobiles would not need to significantly decrease their speed when following cyclists.

The transitway would transition to Halekauwila Street, and then to South Street. The transitway on Halekauwila Street would be shared with general-purpose vehicles so bicycle transportation on Halekauwila Street would remain the same. Bicycle transportation would also not be affected on South Street because cyclists could ride on the Koko Head side of this one-way mauka-bound street.

The transitway would have a center-running alignment on Pohukaina and Auahi Streets in Kakaako, leaving two through lanes. The remaining lanes on Pohukaina Street would not be wide enough for both bicycles and motor vehicles, but the remaining lanes on Auahi Street would be wide enough for both uses. The reduction of bicycle service on Pohukaina Street would be offset by the use of nearby parallel streets that would be unaffected by the transitway, such as Halekauwila and Auahi Streets.

A transitway on Ala Moana Boulevard would connect Kakaako and Waikiki. From Queen Street to just Koko Head of Atkinson Drive, the Koko Head-bound transitway would be curbside-running and the Ewa-bound transitway would be center-running. From Ewa of Atkinson Drive to Kalia Road, the transitway would be center-running.

Ala Moana Boulevard attracts very little bicycle usage because there is very little shoulder space, and motor vehicles travel at a relatively high speeds. A current alternative to using Ala Moana Boulevard between Queen Street and Atkinson Drive is a shared-use pedestrian/bicycle path within Ala Moana Regional Park running along the park's mauka-boundary near, and parallel to, Ala Moana Boulevard.

In Waikiki, the transitway would follow a curbside alignment on Kalia Road, Saratoga Road, Kalakaua Avenue, Kapahulu Avenue and Kuhio Avenue. None of these streets are designated bikeways. On the first two streets, both Koko Head and Ewa-bound transitways would run side-by-side, leaving three and two through lanes, respectively. There is not enough space for bicycles and motor vehicles to share these lanes safely. However, Ala Moana Boulevard and Kalakaua Avenue would serve as alternate routes because both streets contain wider curbside lanes.

On Kalakaua and Kapahulu Avenues, the single Koko Head-bound transitway would run along the makai and Koko Head curbs, respectively. These lanes would be closed to general-purpose vehicles. Bike lanes would be provided along both streets (see Section 4.5.3).

On Kuhio Avenue, bicycle transportation would not be affected because in the Koko Head-bound direction, the number of lanes would not change, and in the Ewa-bound direction, a 4.3 meter (14 feet) wide curbside lane would be provided (see Section 4.5.3). The wider lane would be an improvement to existing conditions.

4.5.2 Impacts to Future Bikeway Facilities

The Honolulu Bicycle Master Plan (April 1999) calls for the development of an integrated network of bikeways that would link people with their destinations. The State Department of Transportation, the agency that prepared Bike Plan Hawaii, was an active participant in the preparation of the Honolulu Bicycle Master Plan, which updates the State's Bike Plan Hawaii (April 1994) for the Primary Urban Center.

The recommendations of both plans are similar. The Honolulu Bicycle Master Plan recommended the development of a regional bike corridor which would be a grid of east-west and mauka-makai bikeways. Figures 3.1-4A through 3.1-4C show the recommended bikeways in the Honolulu Bicycle Master Plan.

The No-Build Alternative would not affect the proposed bikeways.

The TSM Alternative could affect the proposed bikeways because of the extensive network of semi-exclusive lanes that are proposed in the PUC. Bicycles would be able to share the semi-exclusive lanes with transit vehicles.

With the BRT Alternative, the following proposed bikeway facilities would be jointly planned with the transitway to enhance both transit and bicycle travel:

- Bike lanes on Dillingham Boulevard between Keehi Interchange and Puuhale Road;
- Bike lanes on North and South King Streets between River Street and Kapiolani Boulevard;
- Bike lanes on University Avenue between Varsity Place and Maile Way; and
- Bike lanes on Ala Moana Boulevard between Downtown and Waikiki.

4.5.3 Mitigation Measures

To improve or maintain the level of bicycle transportation in the study area, the following bicycle enhancement projects would be provided under the BRT Alternative:

- Widen the curbside lanes on Dillingham Boulevard from 3 to 3.7 meters (10 to 12 feet) to 4.3 meters (14 feet) between Puuhale Road and Kaaahi Street;
- Bike lane on South King Street between Alapai Street and Ward Avenue;
- Bike lane on Kalakaua Avenue between Saratoga Road and Kapahulu Avenue;
- Bike lane on Kapahulu Avenue between Kalakaua Avenue and Kuhio Avenue; and
- Widen the west (Ewa)-bound curbside lane on Kuhio Avenue between Kapahulu Avenue and Kalaimoku Street.

4.6 PEDESTRIAN IMPACTS

All of the alternatives would preserve existing pedestrian facilities, such as sidewalks and walking paths. The BRT Alternative would be constructed primarily on existing roadways and existing pedestrian street crossings would be preserved. Full pedestrian access would be provided at transit centers and curbside In-Town BRT stops in conformance with the Americans With Disabilities Act (ADA). Existing signalized cross walks would be upgraded to access center-running In-Town BRT stops.

Moreover, the BRT Alternative would provide benefits for pedestrians in a number of ways. Transit would use less space to carry more people than automobiles. Environmentally friendly transit vehicles would produce less noise and air pollution. These factors would contribute to an improved urban walking experience. As transit begins to carry a heavier load of trips under this alternative, the transportation system would become more balanced and walking would play a greater role.

Redevelopment around the transit centers and transit stops would allocate resources for pedestrian improvements. This would provide the opportunity to widen and landscape sidewalks making urban Honolulu a more attractive place. Growth focused around the BRT system could be tailored to transit/pedestrian oriented uses.

4.6.1 Special Event Impacts

None of the alternatives would affect parades and large events, such as Hoolaulea, that are held on Ala Moana Boulevard and/or Kalakaua Avenue, even the BRT with its In-Town BRT system. If required the Kakaako/Waikiki Branch of the In-Town BRT could be rerouted curing parades, just as the bus routes along these streets are rerouted during parades today. The embedded-pate technology would require the substitution of buses for the BRT vehicles along that branch or branch segment during parades and special events.

Chapter 5.0

Environmental Analysis and Consequences

CHAPTER 5 ENVIRONMENTAL ANALYSIS AND CONSEQUENCES

5.0 CHAPTER OVERVIEW AND ORGANIZATION

Overview

With Chapter 4 having addressed the transportation impacts of the No-Build, TSM, and BRT Alternatives, this Chapter discusses the potential impacts of these alternatives on the built and natural environments. The purpose of this presentation is to disclose fully the beneficial and adverse impacts of the alternatives. Laws do not require the selection of the alternative with the least adverse impacts, but the consequences of selecting each alternative must be disclosed.

This Chapter identifies the short-term (construction-phase) and long-term (operational-phase) impacts that would be associated with the project. Measures to mitigate adverse impacts are identified, and these mitigation measures are included in the project definition (i.e., the mitigation measures applicable to the selected alternative would be provided in association with project construction).

The impacts of the No-Build Alternative compared to the existing conditions (Chapter 3) are discussed below. It would not require any business or residential displacements. Impacts to ecosystems and visual, historic, water and park resources would be limited to localized impacts associated with the construction of roadway and other transportation improvements anticipated over the next three years. However, this alternative poorly supports the purposes and needs of the project, as described in Chapter 1. The No-Build Alternative does not provide a transportation system that would effectively handle present or future levels of travel demand. It would not maintain even current levels of mobility, encourage land use development in desired patterns, support implementation of an urban growth strategy that integrates land use and infrastructure planning, or maintain the existing quality of life. The No-Build Alternative would rely on conventional diesel buses, at least for the immediate future, and continue the present focus on automobiles for transportation. Consequently, regional air pollutant emissions would worsen in the order of 15 to 30 percent by 2025, although increased emissions may be offset by reductions due to vehicle emission improvements. Localized air quality (worst-case 1-hour microscale concentrations) would deteriorate at 11 of 17 locations studied. Noise levels along streets would remain similar to present levels, even with an increase in the number of diesel buses and vehicles, because the vehicles would be moving more slowly ("passby" noise increases with speed).

In comparison to the future No-Build baseline conditions, the TSM Alternative, with its emphasis on revamping bus service, would provide moderate support to the project's purposes and needs in terms of enhancing people-carrying capacity within the corridor. However, this alternative would not support desired land use development patterns or the City's urban growth strategy that integrates land use and infrastructure planning. Up to 12 businesses and institutions could be displaced by this alternative because of the expansion of the Kalihi-Palama Bus Maintenance Facility/Middle Street Transit Center and the construction of the Iwilei Transit Center. In each case alternative sites exist where displacements would not be necessary. If displacements are required landowners would be compensated and affected businesses would be provided with relocation assistance. A benefit of the expansion of the maintenance facility is that it would improve the visual appearance of this industrially zoned area by providing landscaping and an attractive design.

The TSM Alternative on the average would not worsen air quality conditions. Noise levels would not increase, again because of the trade-off between more vehicles and slower speeds. Impacts to neighborhoods, historic resources, ecosystems, water resources, and parklands would be similar to those under the No-Build Alternative. These impacts would be associated with the construction of transportation projects expected over the next three years.

The BRT Alternative represents a major improvement over the TSM Alternative in terms of meeting the project purposes and needs. It would substantially increase people-carrying capacity within the corridor and help focus growth along the alignment of the In-Town BRT system. Higher density redevelopment in a transit-supportive manner, particularly at transit centers and transit stops, would be encouraged. This alternative would be more effective than the TSM and No-Build Alternatives in supporting implementation of an urban growth strategy that integrates land use and infrastructure planning. It would help facilitate desired land use development patterns consistent with the vision for the island. It would improve connections between Kapolei and the PUC, and among communities in the PUC.

The BRT Alternative could potentially displace up to 12 businesses. Up to two partial displacements are also possible. These displacements would result from the following project elements: modifications to the Kalihi-Palama Bus Maintenance Facility/Middle Street Transit Center, new transit centers in Pearl City/Aiea and Iwilei, and a road widening on Kapiolani Boulevard. Optional sites are being considered for all three transit centers which would not require displacements. Affected occupants would be provided with relocation assistance and landowners would be compensated if property takings are required.

Coordination is continuing with the State Historic Preservation Division (SHPD) to reach agreement on the historic resources potentially affected by the BRT Alternative. The only potential historic resource that would be adversely affected would be a warehouse in Iwilei that is part of the former Oahu Rail and Land Company complex. This structure would be demolished if one of two sites for a transit center were selected. Should this structure be deemed a historic resource, a Section 4(f) impact would be triggered, and site-specific mitigation measures would be developed in future stages of project development. No historic structures are located on the alternative site for the Iwilei Transit Center.

In the BRT Alternative, transit centers, transit stops and other project elements would be designed to maintain or improve visual conditions through cohesively designed landscaping, street furniture, street trees and lighting. Transit stops in special design districts would be designed to harmonize with their unique environments. However, the grade separation and noise barrier structures included in this alternative would introduce visual intrusions to certain viewsheds.

With regard to air quality and noise emissions, through the use of electric bus technology, the BRT Alternative would reduce emissions in comparison to the diesel buses in the No-Build and TSM Alternative. Because the BRT Alternative would reduce automobile travel, regional air emissions would be less. Also, the electric buses would generally be quieter than conventional diesel buses. However, the Regional BRT system would create a noise impact along sections of H-1 that would require noise mitigation.

The construction-phase impacts of the BRT Alternative would be greater than those of the TSM Alternative because of the larger scale of construction. For example, a transitway would be constructed along the alignment of the In-Town BRT system. Construction impacts would be temporary and detailed mitigation plans would be developed, including a maintenance of traffic plan. An archaeological contingency procedure would be developed should unanticipated resources be encountered during construction.

Impacts to neighborhoods, ecosystems, and water resources would be similar to the No-Build and TSM Alternatives.

Organization

This Chapter is organized around technical disciplines. Within each discipline, the impacts of the No-Build, TSM, and BRT Alternatives are presented and contrasted. The assessment of environmental consequences identifies the effects of each alternative in order to help select the preferred alternative and identify areas for further study.

This Chapter includes discussions of the following environmental, socio-economic, and cultural parameters:

- Land Use/Employment
- Displacements/Relocations of Existing Land Uses
- Neighborhoods
- Visual and Aesthetic Resources
- Air Quality
- Noise/Vibration Levels
- Ecosystems
- Water Resources
- Energy Usage
- Historic and Archaeological Resources
- Parkland Resources

Construction-phase impacts, and secondary and cumulative impacts, are addressed at the end of the Chapter.

5.1 LAND USE AND EMPLOYMENT

This section analyzes the potential impacts of the alternatives in terms of existing land uses, development projects and land use plans and policies. Section 5.1.1 summarizes the land use findings. Section 5.1.2 focuses on the regional impacts, while Section 5.1.3 focuses on corridor-level impacts such as accessibility, land use and development and consistency with plans and policies. Section 5.1.4 discusses transit center and transit stop area impacts. The concluding section summarizes the effects of the alternatives on employment.

5.1.1 Overview

The BRT Alternative transit components are compatible with and supportive of land use plans and policies. The No-Build and TSM Alternatives are less supportive of proposed public policies and plans that link transportation and land use through transit-oriented goals and objectives.

An added factor in the evaluation of influences by alternatives on surrounding land uses may be in the technology options being studied. Among the options being evaluated, the sense of permanence referred to earlier would best be met by the BRT option more so than one that does not require a major investment in a fixed transitway. In other words, a typical conventional bus route that currently exists in Honolulu and is offered by the No-Build and TSM Alternatives can be changed "overnight". This program does not convey a sense of permanence that is valued as an asset to attracting developer interest to invest in a community.

With respect to the differentiation between the transit technologies being studied for the In-Town BRT, the STREAM or embedded plate technology would require a higher investment in wayside improvements, namely the power modules (including some utility relocation) and substations. Additionally the STREAM vehicles need to travel in the transitway where the embedded plates are located (other than for short distances where the battery back-up can be used). This reinforces to a developer that the vehicles are not easily going to be reassigned somewhere else. This is less the case with the hybrid diesel/electric technology. The permanency with the hybrid diesel/electric technology comes from the substantial investment in the transitway pavement construction and lane delineations, stations, streetscape furnishings along the transitway, and traffic signal priority improvements.

The connecting transit services that feed into the backbone transit line also would help focus development into targeted areas. Therefore, the BRT Alternative offers growth-shaping opportunities, if it is accompanied by transit supportive local policies. This includes zoning, parking policies, and mixed-use permissive land use.

5.1.2 Regional Impacts

The region in which the study area falls already has a highly urbanized character. While the BRT Alternative could affect land use development along the In-Town transit spine, the BRT system would be unlikely to change the overall trend of development at the regional level. The BRT Alternative would indicate government's willingness to invest in a transit system thereby providing a sense of permanence in the primary transportation corridor, a policy action which has had a strong influence in generating much needed developer interest in cities elsewhere. This would help focus growth along the In-Town BRT alignment particularly at transit stops and help encourage higher density development in a transit-supportive manner at transit centers throughout the island.

5.1.3 Corridor Level Impacts

1) Land Use and Accessibility

The impact of the alternatives on land use at the corridor level is based on relative increases in accessibility to major destinations and activity generators such as work, schools, and recreation. These factors affect the alternatives in terms of their consistency with the City and County's goal of using the project to help shape the growth of areas surrounding the project, and these areas' urban livability.

As shown in Table 5.1-1, Activity Generators and Major Destinations in the Primary Urban Center, the alternatives would offer varying service levels to important economic generators in the PUC. These generators are major travel destinations and range from Aloha Stadium and Pearl Harbor to the Ala Moana Center, and hotels/attractions in Waikiki. As Table 5.1-1 shows, the BRT Alternative would provide enhanced service to most of these destinations as compared to the No-Build and TSM Alternatives.

2) Land Use and Development

The present consideration of a major transit investment is focusing not only on mobility but also on a broader planning context. The major investment decisions center on how well the transit alternatives can shape growth, improve the quality of life, make the city and its neighborhoods more livable, and "Keep the Country Country" by containing sprawl.

The BRT Alternative would provide greater growth-shaping opportunities as compared to the TSM and No-Build Alternatives.

Investments in fixed facility-type transit such as the In-Town portion of the BRT Alternative have resulted in desired land development responses in other cities, including Portland, San Diego, and Denver. The permanent nature of a major fixed linear transportation system has been shown to catalyze other development plans and investment decisions.

A fixed transit corridor can serve as the backbone of a compact, sustainable city. Such a permanent facility signals to the development community a commitment to permanent access and travel markets. This in turn encourages the development community to invest along the transit spine.

TABLE 5.1-1
MAJOR DESTINATIONS IN THE PRIMARY URBAN CENTER

Site	Location	Size or Service Levels	No-Build	TSM	BRT
1	Pearl City Shopping Center	250,000 sq. ft. GLA	0	0	+
2	Pearlridge Center	1,400,000 sq. ft. GLA	0	0	++
3	Pearl Highlands Center	409,847 sq. ft. GLA	0	0	++
4	Aloha Stadium	About 50,000 seats	0	+	++
5	Stadium Mall	220,287 sq. ft.	0	+	++
6	Costco Center	205,247 sq. ft. GLA	0	0	0
7	Salt Lake	16,332 residents (in 1990)	0	0	0
8	Pearl Harbor Naval Base	15,000 workers	0	0	0
9	Arizona Memorial	1.5 million attendees/year	0	0	0
10	Honolulu International Airport	9 million passengers/year	0	0	0
11	Mapunapuna	163 acres	0	0	+
12	Middle Street Industrial Area	NA	0	+	++
13	Honolulu Community College	4,000 students	0	0	++
14	Kalihi/Palama	40,147 residents (in 1990)	0	0	++
15	Kalihi Kai Industrial District	585 acres	0	0	0
16	Sand Island	About 510 acres	0	0	0
17	Iwilei Industrial District	320 acres	0	++	++
18	Chinatown	About 30 acres	++	++	++
19	Downtown Financial District	60,000 daytime population	++	++	++
20	Government Centers (Federal/State/City)	About 150 acres, 3 million sq. ft.	++	++	++
21	Queen's Medical Center	About 750,000 sq. ft.	+	+	+
22	Kakaako	over 600 acres; 20,000 workers	0	0	++
23	Victoria Ward Centers	over 250,000 sq. ft.	0	0	++
24	Neal Blaisdell Center	22 acres; about 400,000 att./year	0	0	++
25	Kapiolani Community College	7,000 students	0	0	++
26	Kapiolani Business District	About 2 million sq. ft. commercial	0	0	++
27	Ala Moana Center	2 million sq. ft. GLA	++	++	++
28	Ala Moana Park	About 120 acres	++	++	++
29	Waikiki Beach	8.3 million annual visitors	0	0	++
30	Kapahulu/Diamond Head	20,860 residents in 1990	0	0	+
31	Ala Wai Golf Course	200,000 rounds/year	0	0	+
32	Honolulu Zoo	700,000 attendees/year	0	0	++
33	Kapiolani Park	155 acres	0	0	++
34	McCully/Moiliili	28,466 residents in 1990	0	0	++
35	University of Hawaii at Manoa	19,000 students	0	0	+
36	Tokai University Pacific Center	—	0	0	+
37	Hilton Hawaiian Village	22 acs; 2,545 rooms; 1,900+ employees	0	0	++
38	Hale Koa Hotel, Fort DeRussy	72 acs; 817 rooms; 900+ employees	0	0	++
39	Royal Hawaiian Shopping Center	6.5 acs; 279,000 sq. ft. GLA; 1,500+ employees	0	0	++

Sources: City Department of Planning and Permitting; Parsons Brinckerhoff, Inc.

Notes:
- ++ These activities are located within 400 meters (1/4-mile) of transit centers, or BRT transit stops.
- \+ These activities are located within 800 meters (1/2-mile) of transit centers, or BRT transit stops.
- 0 These activities are not served by transit centers, or BRT transit stops. Where an activity has more than one location, at least one location is served but not necessarily all locations, treatments, and other ground level elements.

sq. ft. = square feet
GLA = gross leasable area

The connecting transit services that feed into the backbone transit line also can help focus development into targeted areas. Thus, the BRT Alternative could offer growth-shaping opportunities, if it was accompanied by transit supportive local policies. This includes zoning, parking, and mixed-use permissive land use policies.

This assessment is consistent with the views of a panel of experts convened for this project in July 1999, which was comprised of land use/transportation planners and developers from other parts of the United States and Honolulu. The panel was assembled to address land use and growth-shaping aspects of the transit alternatives.

Among the findings and recommendations of the land use panel was the conclusion that without a major investment in a permanent fixed transit system, the desired growth pattern in the PUC would very likely not happen. The land use panel viewed the PUC as being "ripe" for development and redevelopment when the economy rebounds. The panel agreed that appropriate implementation tools need to be established that favor development in the PUC, and discourage or prohibit development where it is not desired.

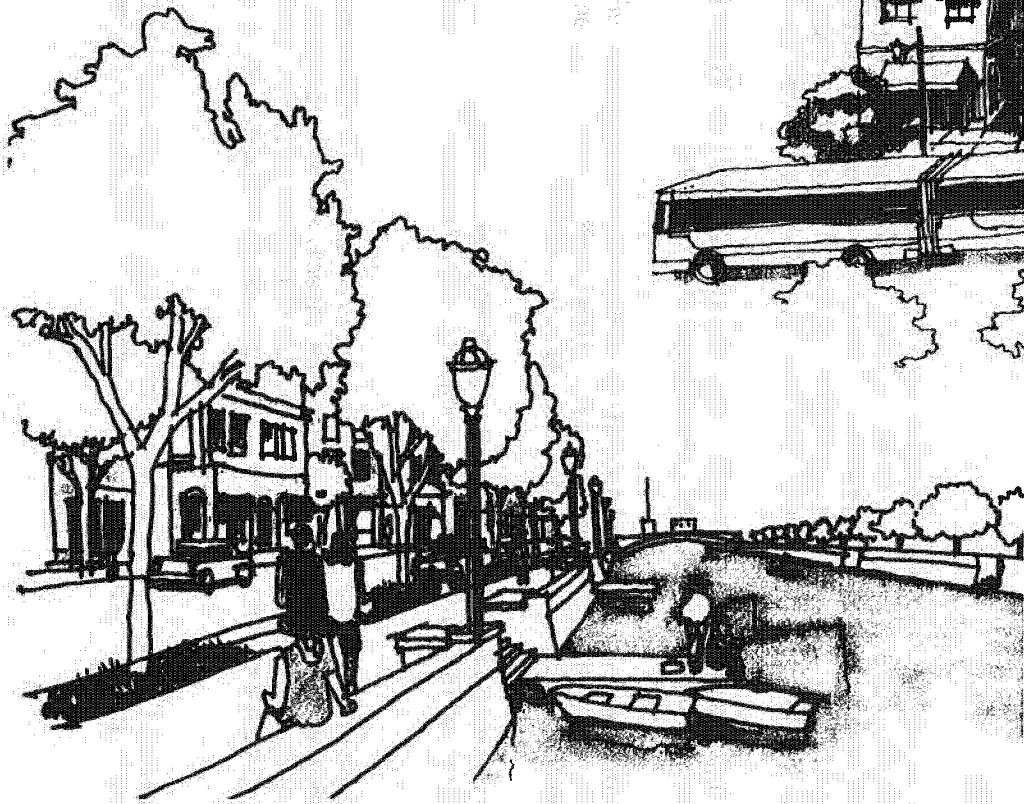
It was concluded by the land use panel that many of the ingredients are in place in Honolulu to implement a transit system that could be influential in accomplishing the City's stated land use goals. This conclusion was conditioned upon a comprehensive transit/land use implementation strategy developed and managed by a strong land development implementation body.

The land use panel pointed out that an important feature in attracting development along a transit corridor is the availability of already assembled tracts of land. According to transit-oriented development experts Michael Bernick and Robert Cervero in Transit Villages in the 21st Century, 1997, "if developers face the prospect of negotiating individual land purchases among multiple land owners, any one of whom can renege and doom a project, little is likely to happen. The risks and uncertainties are just too great."

There are areas along the alignment where redevelopment is more probable because of ownership patterns. These areas lie particularly in Kakaako and Iwilei. Other parts of the corridor have in-fill potential as indicated below:

- The parcels along Dillingham Boulevard at Middle Street just makai of the City's Kalihi-Palama bus maintenance facility (joint use transit center with commercial/retail);
- Parcels along the Kapalama Canal between Dillingham Boulevard and King Street (mid-rise residential as shown in Figure 5.1-1);
- On Kaaahi Street at Iwilei Road makai of Aala Park (mixed use residential/retail in combination with the Iwilei Transit Center);
- Along Ward Avenue at Kapiolani Boulevard (former Symphony Park redevelopment site – commercial or public use);
- Along Kapiolani Boulevard at Keeaumoku Street (mixed-use including the Sheridan Street Superblock as shown in Figure 5.1-1);
- Kapiolani Boulevard at Atkinson/Kalakaua Avenue mauka of the Hawaii Convention Center (high-rise mixed use);
- University Avenue/King Street (University-oriented mixed use with residential over retail);
- In Kakaako, mauka along Pohukaina and Auahi Streets (retail/entertainment); and
- In Waikiki, Lewers Street at Kalakaua Avenue (hotel/commercial).

Mixed Uses
Possibility of residential units atop shops and
services along Kapiolani Boulevard and Sheridan Streets



Promenade:
Possibility of mid-rise housing along Kapalama Canal

Land Use Development Possibilities

Figure 5.1-1

3) Consistency with Land Use Plans

General Plan

Since the automobile was introduced in Hawaii early in the 1900s, development of Oahu has evolved from that of an ahupuaa (land division extending from uplands to sea) system to an auto-oriented land use pattern. With an auto-oriented land use pattern development occurs along roadways, with growing pressure to urbanize peripheral agricultural lands resulting in suburban sprawl. As in much of the United States, people who live in suburbs work in the city, and drive long distances to do so. With the majority of people commuting between suburbs and Downtown, traffic congestion in the urban core has been the result, and this congestion worsens as suburbs grow.

The General Plan for the City and County of Honolulu is the planning document that directs where future growth would generally be located. It addresses growth in the following areas: population, economic activity, housing, and utilities. These four areas are the keys to establishing where future growth can and would be located. As a matter of General Plan policy, future growth is directed to where residential and employment uses would occur in conjunction with transportation access and circulation.

The No-Build Alternative does not support General Plan policies. The TSM Alternative somewhat supports the General Plan policies of population distribution, but does not support the policies of orderly economic growth and transportation. The BRT Alternative supports the General Plan policies and guidelines, and is therefore consistent with the City's organizing principles.

Development Plans

Transportation and circulation are integral functions within a livable city. They should, therefore, be tightly integrated with land use management controls and policies. The corridor spans three different DP areas (Ewa, Central Oahu and the PUC) and is, therefore, influenced by various transportation policies. Recognizing that each of the DP areas is a unique piece of the transportation corridor, it is necessary to review these policies as they have been outlined in their respective development plans.

The Ewa DP was updated and adopted in 1997. Since the Central Oahu and PUC DPs are currently being updated, both existing and proposed policies are analyzed in these areas.

The No-Build and TSM Alternatives do not support the General Plan policy of achieving full development of the PUC. Potential impacts of these alternatives include continued pressure to urbanize outlying agricultural lands, higher transportation costs and limited choices for urban lifestyles.

Implementation of the No-Build or TSM Alternatives would be inconsistent with current and proposed growth policies, particularly in the PUC where it would diminish the effectiveness of proposed DP policies to create a livable city.

Implementation of the BRT Alternative could be expected to result in beneficial impacts, particularly in the PUC. This alternative would provide the people-carrying capacity and service levels necessary to serve the urban lifestyle envisioned in the PUC DP. It also would provide the most beneficial impact in terms of its ability to focus investment along the alignment of the high capacity transit system, in accordance with the proposed PUC DP.

Table 5.1-2 summarizes the consistency of the alternatives with DP policies and guidelines within the primary transportation corridor (Ewa, present and proposed Central Oahu DP, and present and proposed PUC DP).

TABLE 5.1-2
RELATIONSHIP OF ALTERNATIVES TO PRESENT AND PROPOSED DEVELOPMENT PLAN POLICIES AND GUIDELINES

	Alternative		
Development Plan	**No-Build**	**TSM**	**BRT**
Ewa	O	O	XX
Central Oahu (Present)	O	X	XX
Central Oahu (Proposed)	O	O	XX
Primary Urban Center (Present)	O	O	XX
Primary Urban Center (Proposed)	–	O	XX

Sources: Helber Hastert & Fee Planners, Inc.; Plan Pacific, Inc.
Notes: XX Highly Consistent with Policy
X Consistent with Policy
O Weak or Poorly Defined Relationship to Policy

In summary, key goals the TSM Alternative would fail to address include supporting economic development, and providing a variety of attractive and convenient modes of travel for residents. The No-Build Alternative does not provide a transportation system that addresses the growth-shaping provisions of the Development Plans for the PUC and Ewa. The TSM Alternative does not address the General Plan goal of containing sprawl nor does it strongly encourage the use of transit. The panel of experts assembled to review the proposed alternatives and evaluate their growth-shaping/quality of life merits echoed these findings, as discussed earlier in this section.

State Plans, Policies and Programs

At the corridor level, all of the alternatives are consistent with the Hawaii State Plan and the State Land Use Commission (SLUC) land use designations. Table 5.1-3 summarizes the project alternatives' consistency with other State of Hawaii plans, policies and programs.

The BRT Alternative may not be consistent with the Iwilei Project, because one of the two potential transit center sites would be part of the site proposed for development by the Housing and Community Development Corporation of Hawaii (HCDCH). The transit center if located on the HCDCH site would require designing it as part of a joint use project that also includes a residential tower, associated parking spaces, and walkways envisioned by the Iwilei Project. The other site being considered for the Iwilei Transit Center would not be in conflict with HCDCH plans.

The BRT Alternative would be consistent with the HDOT's (Highways Division) improvement plan known as the Ala Moana Boulevard Improvements: Atkinson Drive to Kalakaua Avenue. The project involves landscaping to improve the pedestrian environment. The proposed transit and pedestrian oriented improvements are consistent with one another.

HDOT (Highways Division) also has an ongoing program to restore the concrete bridge deck on the Pearl City viaduct of the H-1 Freeway. The Regional BRT improvements include replacement of the existing permanent median barrier with a movable one. The movable barrier will be lighter weight than the fixed barrier. Implementation of the BRT improvements would be coordinated with the maintenance/rehabilitation program for the Pearl City viaduct to ensure consistency with the State's ongoing program for this facility.

Close coordination between the affected State agencies and the City's DTS will continue so that the alternatives would maximize compatibility with the State's plans and programs for the surrounding area.

TABLE 5.1-3
CONSISTENCY WITH STATE PLANS AND POLICIES

	ALTERNATIVE		
	NO-BUILD	TSM	BRT
Hawaii State Plan	C	C	C
Hawaii State Functional Plans	C	C	C
Transportation Plans			
Transportation Functional Plan	C	C	C
Oahu Regional Transportation Plan and Oahu Transportation Improvement Program	C	C	C
Honolulu International Airport Master Plan	C	C	C
Oahu Commercial Harbors 2020 Master Plan	C	C	C
State Cruise Ship Terminal Needs Assessment	C	C	C
Land Use Plans			
State Land Use Plan	C	C	C
Reuse Plan for Barbers Point Naval Air Station	C	C	C
Housing and Community Development Corporation of Hawaii Master Plan (East Kapolei)	C	C	C
Kakaako Mauka and Makai Area Plans	C	C	C
Honolulu Waterfront Master Plan (superceded in the industrial port areas by the Oahu Commercial Harbors 2020 Master Plan; valid elsewhere)	C	C	C
Aloha Tower Development Corporation Master Plan	C	C	C
Recreational Plans			
Statewide Comprehensive Recreational Plan (SCORP)	C	C	C
Educational Institution Plans			
UH Manoa Long Range Master Plan	C	C	C
Leeward Community College Long Range Plan	C	C	C
UH West Oahu Campus Master Plan	C	C	C
Project-Specific Plans			
Iwilei Project (OR&L Complex)	C	C	I[1]

Source: Parsons Brinckerhoff, Inc.
Key: C: Consistent with Plan/Program
I: Potentially inconsistent with Plan/Program
[1] Based on Conceptual Design Study for the Iwilei Project (Submitted by Kober/Hanssen/Mitchell Architects. Prepared for the State of Hawaii Department of Business, Economic Development & Tourism, Housing and Community Development Corporation of Hawaii [HCDCH], July 1998.)

5.1.4 Transit Center and Transit Stop Area Impacts

The development of the area surrounding transit centers and transit stops is guided and affected by existing and proposed land uses. The policies guiding growth, particularly those General Plan and DP policies discussed in Section 3.1 and Section 5.1.3, support transit-oriented development. Other factors that affect transit center and transit stop area land uses include the availability of land for development as well as the market. It has been seen in other cities that most land use impacts are generally concentrated within 400 meters (quarter-mile) of the transit stop. This distance coincides with the maximum distance that most people would walk to-and-from a transit stop. It also has been found that transit stops located within commercially designated areas support higher density land development and redevelopment than those in low-density residential areas.

The transit stop/transit center area likely impacts on land use have been analyzed based on a 400-meter (quarter-mile) walking distance from the stop/center. For the Ewa DP area, the DP adopted in 1997 was used to determine the effects on land use. For Central Oahu and the PUC DP areas, where the Development Plans are currently being updated, the proposed Development Plans were used to evaluate the likely impacts on land use.

It also should be noted that, in comparison with existing bus stops, the transit stops associated with the BRT Alternative would have different configurations, providing a greater sense of permanence. Curb-running transit stops would have increased amenities including enhanced shelters, seats and landscaping. Median transit stops would have raised platforms in the median of the street. These platforms would be safely accessed by well-marked, signal controlled, pedestrian crosswalks. The platforms themselves would be provided with sheltered waiting areas, seats, lighting and safety railings so transit patrons can wait in safety and comfort. Figure 2.2-4 shows typical median and curb transit stops for the In-Town BRT system.

In evaluating potential land use impacts around each of the proposed transit centers and transit stops, each parcel was categorized as follows:

- Existing Land Uses to Remain: Land uses that are existing now are not expected to change because a transit stop/center is located in the area.
- Land Uses Which Could Be Intensified: Intensification of an existing land use due to the presence of a transit stop/center. This could be development of an underdeveloped parcel or redevelopment of an existing parcel.
- Land Uses Likely to Change: Land uses that are expected to change from their existing land use due to the presence of a transit stop/center or due to policies and/or development plans for the area.

Table 5.1-4 provides a comparison of the general land use impacts anticipated among the No-Build, TSM, and BRT Alternatives.

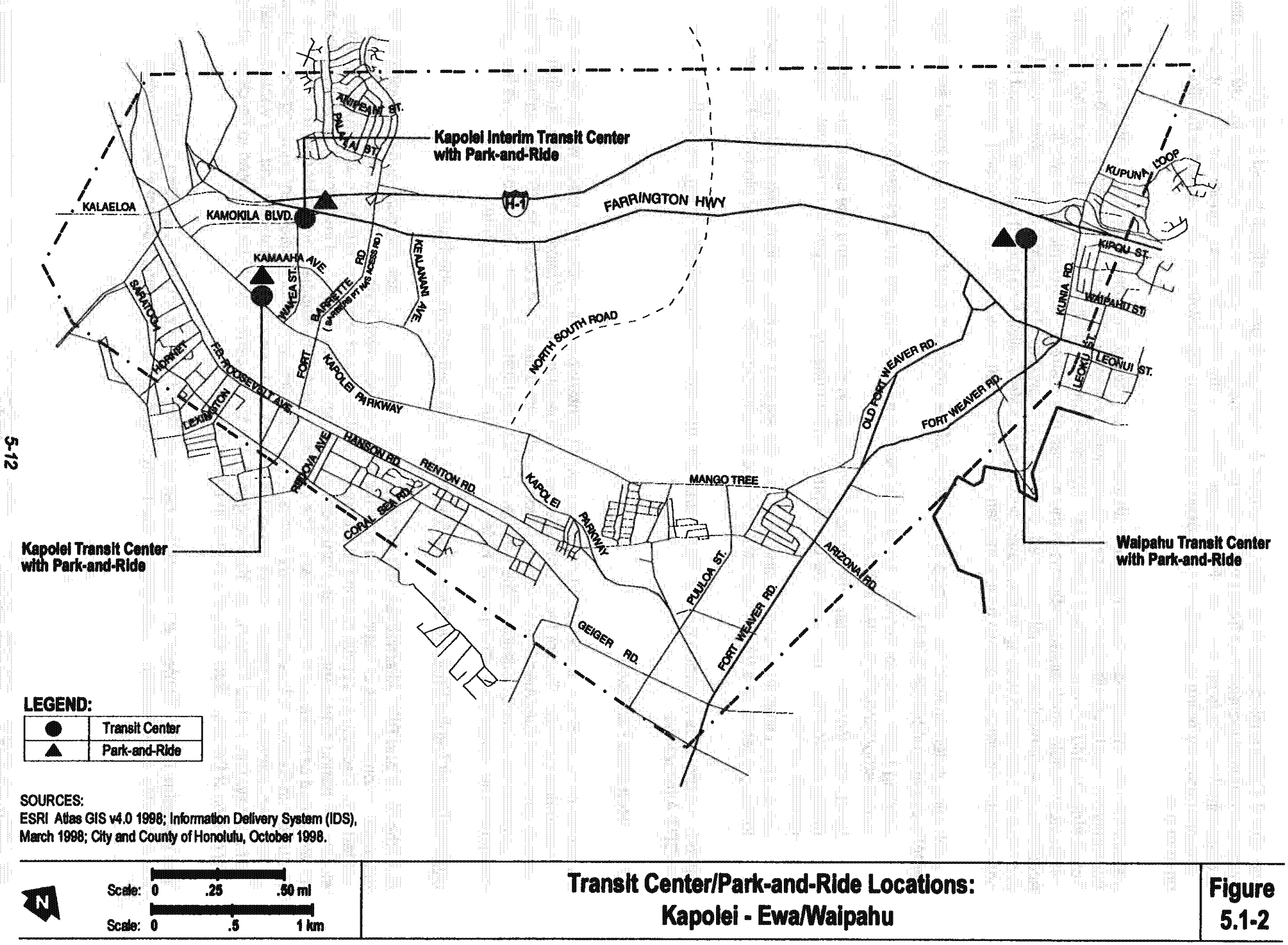
1) Regional Facilities

As shown in Table 5.1-4, there are four regional transit centers/park-and-rides proposed within the primary transportation corridor. Two of these are included in all the alternatives, Waipahu and Aloha Stadium. The Kapolei and Pearl City/Aiea Transit Centers would be included under the TSM and BRT Alternatives. Figure 5.1-2 shows the general location of the Kapolei and Waipahu transit centers. Figure 5.1-3 shows the general location of the Aloha Stadium Park-and-Ride and the Pearl City/Aiea Transit Center.

Kapolei Transit Center/Park-and-Ride and Waipahu Transit Center/Park-and-Ride

With the TSM and BRT Alternatives, the introduction of a new transit center and park-and-ride facility in the developing communities of Kapolei could help facilitate development of parcels in and around this transit-related site. Pedestrian activity relating to the transit centers would stimulate business at surrounding retail stores and eating establishments, and could encourage additional commercial investment as well as demand for expanded services such as child care. The connection between Kapolei and the Honolulu Urban Core, as discussed in Section 1.1, is a necessary element to link the first and second cities, encouraging coordinated growth. An interim or temporary transit center with a park-and-ride lot would be built first in a vacant parcel near the new City Police Station. As Kapolei grows, the transit center would be relocated to be closer to the new center of the city. Both sites are shown in Figure 5.1-2.

The Waipahu Transit Center/Park-and-Ride near Kunia Road would continue to support the plans and policies in this growth area. It would serve commuters from the surrounding residential communities.

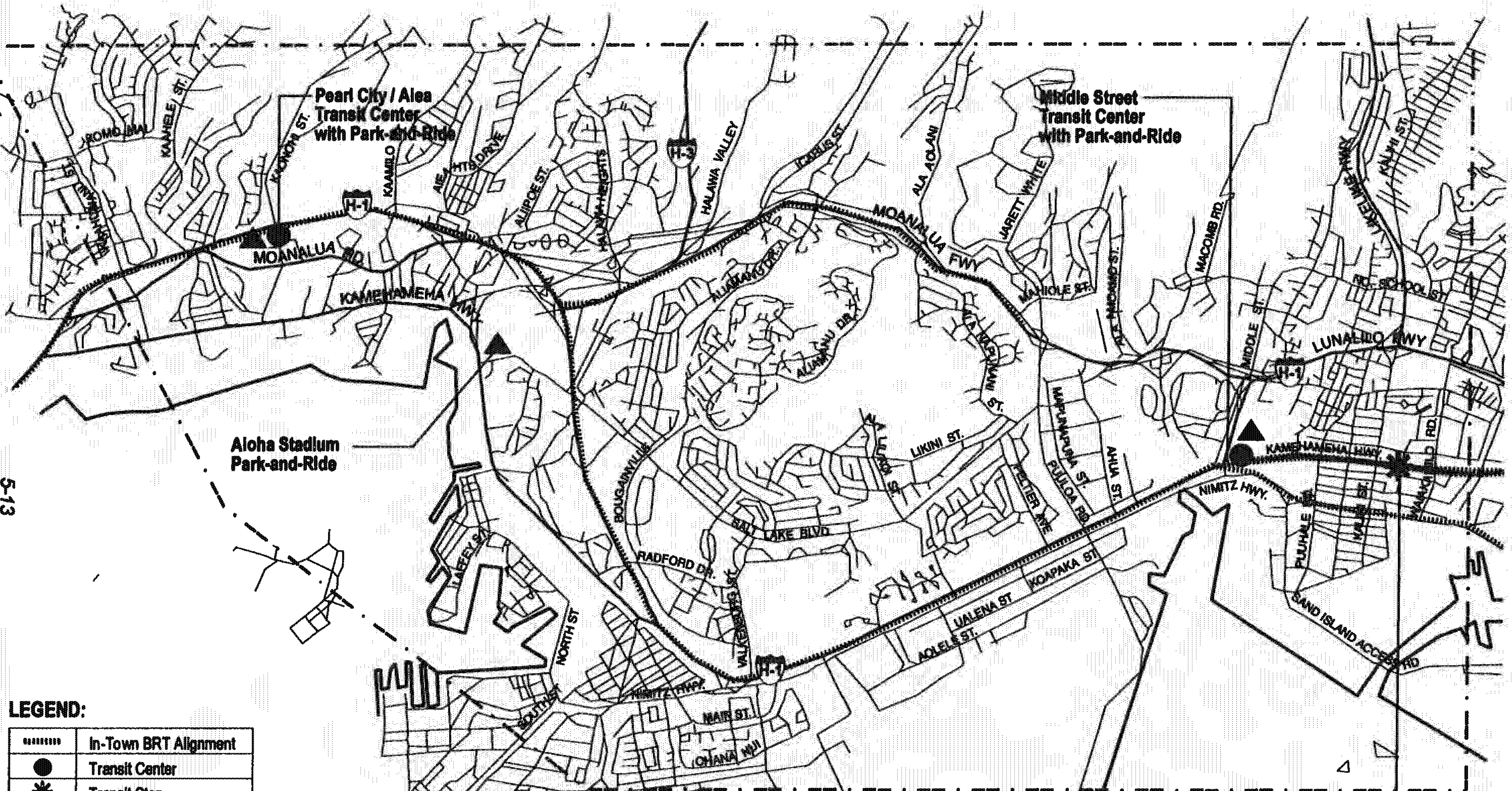


SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Transit Center/Park-and-Ride Locations: Kapolei - Ewa/Waipahu

Figure 5.1-2

AR00047543



LEGEND:

▪▪▪▪▪▪	In-Town BRT Alignment
●	Transit Center
✱	Transit Stop
▲	Park-and-Ride

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Transit Center/Transit Stop/Park-and-Ride Locations: Pearl City - Aiea - Kalihi

Figure 5.1-3

TABLE 5.1-4
POTENTIAL FOR TRANSIT-ORIENTED DEVELOPMENT

Transit Facility	Alternatives		
	No-Build	TSM	BRT
Regional Facilities			
Kapolei Transit Center/Park-and-Ride	-	XX	XX
Waipahu Transit Center/ Park-and-Ride	X	X	X
Pearl City/Aiea Transit Center/Park-and-Ride	-	XX	XX
Aloha Stadium Park-and-Ride	X	X	X
In-Town Facilities			
Middle Street to Downtown			
Middle Street Transit Center/Park-and-Ride	-	X	X
Kalihi Stop/Park-and-Ride	-	-	X
Honolulu Community College Stop	-	-	X
Iwilei Transit Center/Park-and-Ride	-	X	X
Chinatown Stop	-	-	X
Union Mall Stop	-	-	X
University Branch			
Iolani Palace Stop	-	-	X
Alapai Transit Center	X	X	X
Thomas Square/NBC Stop	-	-	X
Pensacola Stop	-	-	XX
Ala Moana/Keeaumoku Stop	-	-	XX
Convention Center Stop	-	-	XX
Isenberg Stop	-	-	X
University/King Stop	-	-	XX
UH Manoa (Sinclair Circle Stop)	-	-	X
Kakaako/Waikiki Branch			
Aloha Tower/Federal Building Stop	-	-	XX
Cooke Street Stop	-	-	XX
Kamakee Stop	-	-	X
Ala Moana Park Stop	-	-	X
Hobron Stop	-	-	X
Ft. DeRussy Stop	-	-	X
Saratoga Stop	-	-	X
Kalakaua/Seaside Stop	-	-	X
Kalakaua/Uluniu Stop	-	-	X
Kapahulu Stop	-	-	X
Kuhio/Liliuokalani Stop	-	-	X
Kuhio/Seaside Stop	-	-	X

Sources: Helber Hastert & Fee Planners, Inc.; Plan Pacific, Inc.; Parsons Brinckerhoff, Inc.
Notes: X — May accelerate rate of transit-oriented development
XX — Support transit-oriented development
\- — No Transit Center or Enhanced Transit Stop at this location

Pearl City/Aiea Transit Center

The Pearl City/Aiea Transit Center would support the existing and planned area development. One location being considered for the Pearl City/Aiea Transit Center is the Kamehameha Drive-In site. The western portion of the Pearlridge Shopping Center is a major development that is certain to remain. If the transit center is located at the Kamehameha Drive-In site, other portions of the Drive-In property would probably redevelop and intensify with possibly a mix of the residential and commercial uses called for in the PUC DP. The resulting uses would still be within the context of the PUC DP. Alternative locations are also being considered for the transit center near the Pearlridge Shopping Center as well as near Aloha Stadium.

Aloha Stadium Park-and-Ride Lot

A park-and-ride lot at Aloha Stadium is included under all the alternatives (see Table 5.1-4). The facility is not expected to induce changes to land uses in the area surrounding the site. Stable residential neighborhoods consisting of single-family dwellings and medium-density apartments are in the vicinity of the Aloha Stadium site. Makai and Ewa of Aloha Stadium, across from Kamehameha Highway, is the marine recreation area for Pearl Harbor Naval Base.

2) In-Town Facilities

Three transit centers, 24 transit stops, and three Park-and-Ride facilities are planned for urban Honolulu from Middle Street to the University of Hawaii at Manoa and Waikiki in the BRT Alternative (see Table 5.1-4). The Alapai Transit Center is included in all alternatives. The Middle Street Transit Center/Park-and-Ride Facility and the Iwilei Transit Center/Park-and-Ride Facility are planned for the TSM Alternative as well as the BRT Alternative. As shown on Table 5.1-4, the BRT Alternative provides an enhanced transit system which includes transit centers and transit stops that would be permanent facilities supporting the desired development patterns. For example, as discussed in Section 1.1, the PUC DP calls for pedestrian-scale development with convenient walking access to transit. The land uses surrounding Dillingham Boulevard, Iwilei, Kakaako, Convention Center, Kapiolani Boulevard, and some Waikiki sites would be, in varying degrees, influenced by the presence of transit-related facilities and would support a pedestrian-scale environment. Although other areas would not change as much as these, they would nevertheless benefit from the support of their more fully developed pedestrian environments. The areas in which land uses would remain unchanged but supported would be in the vicinity of Middle Street, Chinatown, mauka of Neal Blaisdell Center near Thomas Square, and certain areas within Waikiki that have been fully developed under current City land use policies.

The following discusses in more detail some of the areas around the transit centers and transit stops.

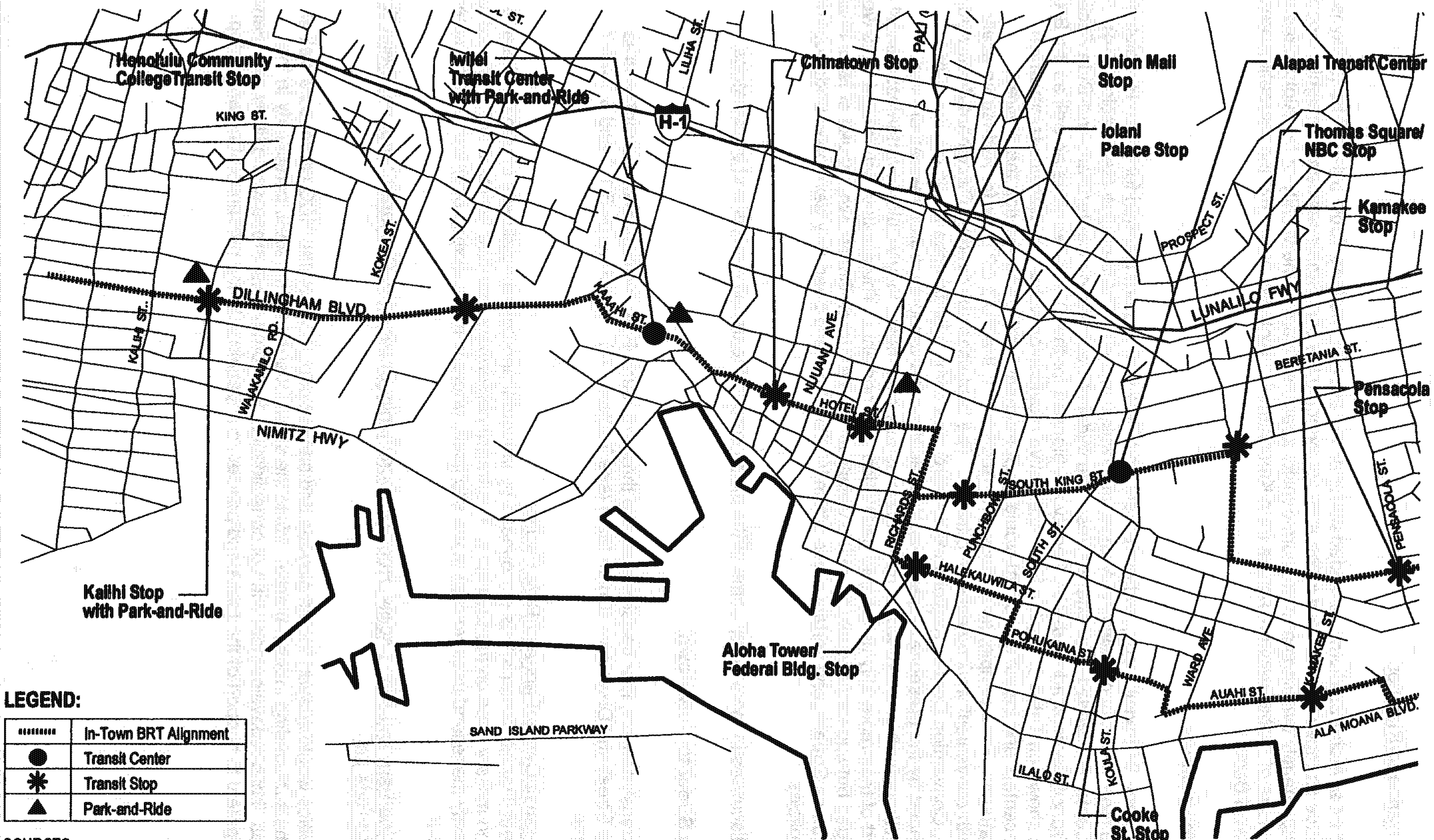
3) Middle Street to Downtown

There are two transit centers, four transit stops, and three Park-and Ride facilities planned for the area between Middle Street and Downtown (Union Mall) (see Table 5.1-4). See Figures 5.1-3 and 5.1-4 for general locations.

Middle Street Transit Center/Park-and-Ride Facility
The Middle Street Transit Center site is surrounded by industrial and commercial uses on the mauka and makai sides, and military uses on the Ewa side. The transit center/park-and-ride facility is not expected to change or intensify these land uses, except at the site itself, where joint-use transit oriented retail/commercial uses would occur.

Kalihi Transit Stop/Park-and-Ride Facility, Honolulu Community College (HCC) Transit Stop, and Iwilei Transit Center/Park-and-Ride Lot

The transit facilities would support the employees and student population on the HCC campus as well as employees in the surrounding industrial area. While the small lot sizes of this area, particularly in the residential areas, limits redevelopment without consolidation, the commercial areas would likely experience some redevelopment in support of the plans and policies, compatible with the presence of a transit stop.



LEGEND:

▪▪▪▪▪▪▪▪	In-Town BRT Alignment
●	Transit Center
✱	Transit Stop
▲	Park-and-Ride

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Transit Center/Transit Stop/Park-and-Ride Locations: Kalihi - University Area 1

Figure 5.1-4

Chinatown Transit Stop and Union Mall Stop

For the most part, no major changes or intensification of land uses are expected due to transit stops in Chinatown and at Union Mall. Transit stops would provide service to employees, residents, and visitors. Intensification of the existing land uses and/or changes to land use is not expected. Because Hotel Street is already a bus-only facility, the alignment of a high-capacity, frequent transit service would not significantly increase visibility of existing land uses along it. Pedestrian access is presently provided with a sidewalk on both sides of Hotel Street.

4) University Branch

One transit center and eight transit stops are planned for the University Branch of the BRT system (see Table 5.1-4). See Figures 5.1-4 and 5.1-5 for general locations.

Iolani Palace Transit Stop and Alapai Transit Center

The Iolani Palace Transit Stop would be located in the Hawaii Capital Special District's Historic Precinct. It will be designed as a low key facility so as not to detract from the historically important buildings, grounds and movements in the Precinct.

Since the Alapai Transit Center, located on the mauka side of the intersection of Cooke and South King Streets already exists under the No-Build Alternative (and is also included in the TSM Alternative), the land uses surrounding the transit center would remain the same. The development of the air rights over the transit center, however, is a longer term opportunity.

Thomas Square/NBC Transit Stop, Pensacola Transit Stop and Ala Moana/Keeaumoku Transit Stop

The Thomas Square/NBC Transit Stop area is well established with the presence of the Honolulu Academy of Arts, Thomas Square, Blaisdell Concert Hall, Hawaiian Electric Company (HECO), Straub Medical Center and the Honolulu Club. With the recent development of One Archer Lane, parcels for redevelopment are limited. Therefore, a transit stop would have minimal influence on land use at this location.

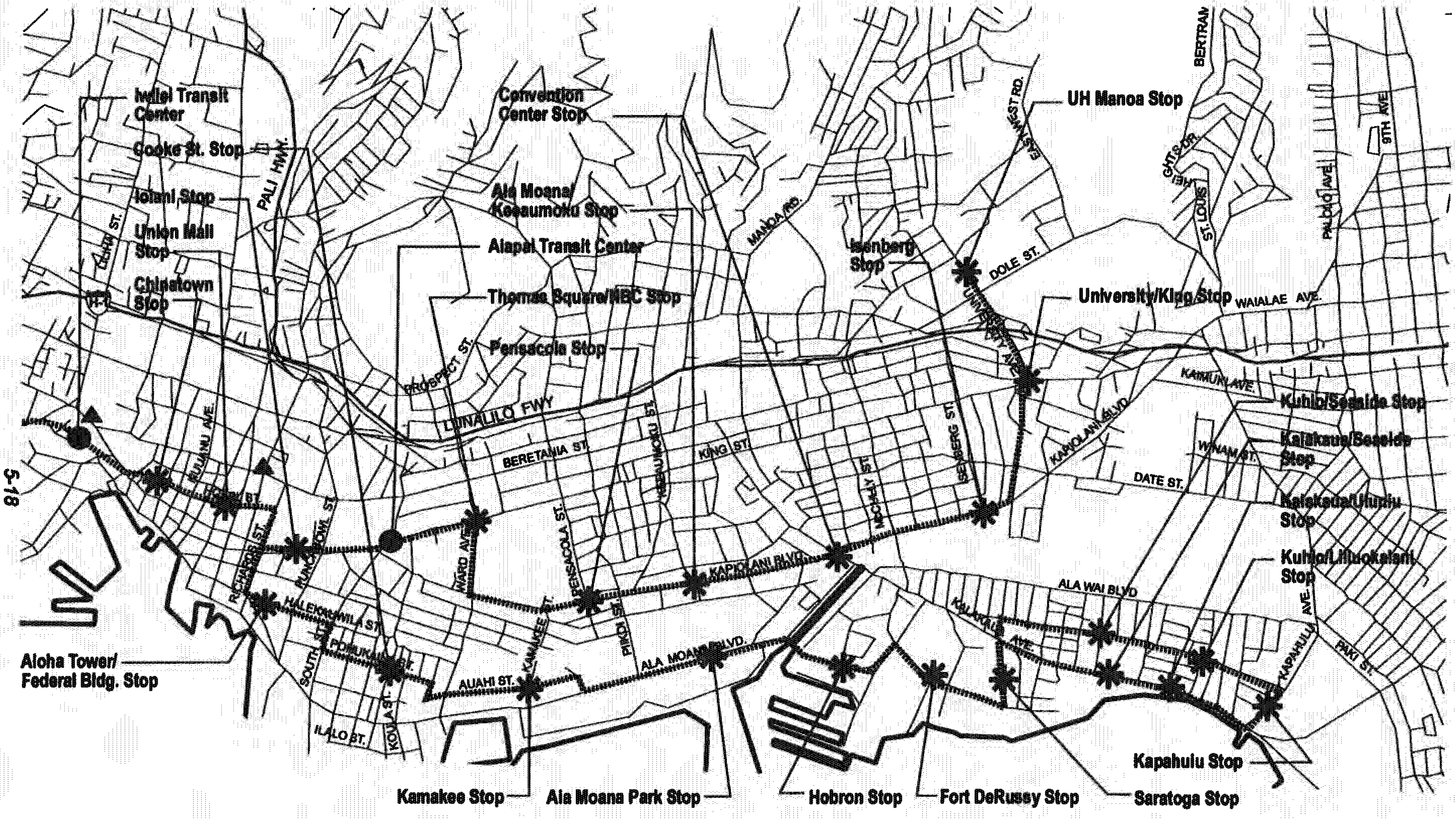
In contrast, both the Ala Moana/Keeaumoku Transit Stop and the Pensacola Transit Stop offer good opportunities for intensification of commercial land uses in support of existing residential and commercial land uses. There are several large vacant parcels which offer excellent opportunities. In-fill development along Kapiolani Boulevard will also likely happen.

Convention Center Transit Stop

With or without a transit stop, the recently constructed Convention Center is expected to encourage redevelopment of the adjacent areas. Land uses that are not expected to change are the small residential parcels mauka of the Atkinson Drive/Kapiolani Boulevard intersection in the McCully/Moiliili neighborhood, as well as the medium-density residential areas on the Ewa side of Kalakaua Avenue. Commercial land uses along Kapiolani Boulevard, Atkinson Drive, and Kalakaua Avenue would intensify because of both the transit stop and the Convention Center.

Isenberg Transit Stop

A transit stop at the comer of Isenberg Street and Kapiolani Boulevard would be part of the BRT Alternative. This area consists primarily of residential land uses. Lands on the mauka side of Kapiolani Boulevard are primarily comprised of small lots with single-family and multifamily residences. Although this area may experience some consolidation of residential parcels, no major redevelopment in the area is expected.



LEGEND:

'''''''''	In-Town BRT Alignment	✳	Transit Stop
●	Transit Center	▲	Park-and-Ride

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Transit Center/Transit Stop/Park-and-Ride Locations: Kalihi - University Area 2

Figure 5.1-5

Residences makai of Kapiolani Boulevard are characterized by existing high-density apartment buildings. This area also would not be expected to experience intensification or change as a result of a transit stop.

University/King Transit Stop and UH Manoa Transit Stop

The transit stop at University/King would support the land use plans and policies for the area. Commercial land uses could intensify in the area of the University/King Transit Stop because of the increase in pedestrian activity. In addition, residential areas in the general vicinity would likely increase in density if adopted PUC DP policies allow and encourage higher density residential parcels in the area through the conversion and consolidation of smaller lots.

The University of Hawaii comprises the majority of land uses surrounding the UH Manoa Transit (Sinclair Circle) Stop, located on the Bachman Hall lawn adjacent to Sinclair Library on University Avenue, between Metcalf and Dole Streets. The areas immediately mauka of Dole Street are distinct open spaces and would be retained to mark the gateway and entrance to the University. Nearby residential areas are primarily single-family homes on small parcels. A transit stop at this location would support the existing land uses in the area with little change expected.

5) Kakaako/Waikiki Branch

There are 12 transit stops planned for the Kakaako/Waikiki Branch of the BRT system (see Table 5.1-4). See Figure 5.1-5 for general locations.

Aloha Tower/Federal Building Transit Stop

The Aloha Tower/Federal Building Transit Stop is adjacent to the Honolulu Harbor waterfront district designated by the State of Hawaii for redevelopment. Uses that are consistent with this redevelopment plan – such as the Aloha Tower Marketplace, Hawaii Maritime Museum and cruise ship terminals would remain. The introduction of a transit stop would make Aloha Tower Marketplace/Hawaii Maritime Museum and surrounding areas more readily accessible and thereby promote a greater level of business activity. It, therefore, could encourage additional retail, hotel, passenger cruise ship facilities and entertainment uses planned for the Honolulu Harbor waterfront to occur sooner than would otherwise occur if no transit stop were constructed. The area adjacent to the transit stop also includes the Federal Building, Waterfront Towers, Waterfront Plaza and the State Judiciary Center. These are all, substantial, relatively recent developments that will likely remain.

Cooke Street Transit Stop

In the vicinity of the Cooke Street Stop, the proximity of a transit stop may encourage more intensive use consistent with the land use policies for the Kakaako Community Development District.

Kamakee Transit Stop and Ala Moana Park Transit Stop

Victoria Ward Centers, a major land owner/developer has plans for intensifying their already successful retail holdings in the vicinity of the Kamakee Transit Stop. The stop will support these plans by providing an alternative means of access to the automobile.

The stop at Ala Moana Beach Park will enhance accessibility to this important Citywide resource.

Hobron Transit Stop, Ft. DeRussy Transit Stop, Saratoga Transit Stop, Kalakaua/Seaside Transit Stop, Kalakaua/Uluniu Transit Stop, Kapahulu Transit Stop, Kuhio/Liliuokalani Transit Stop, Kuhio/Seaside Transit Stop

With few exceptions, the introduction of transit stops in Waikiki would not significantly influence land use changes. The key influence transit stops would probably have would be to promote greater levels of business activity in ground floor spaces along Ala Moana Boulevard, and Kalakaua and Kuhio Avenues.

Mauka/Ewa of the Hobron transit stop, behind the lots fronting Hobron Lane and Ala Moana Boulevard, are adjoining properties bounded by Ala Wai Boulevard and Lipeepee Street that are either vacant or developed in low-rise apartment buildings. These properties are zoned Apartment Precinct, although the PUC DP Land Use Map designates them for Resort Mixed Use, so they could, by this land use policy, be re-zoned to the more intensive Resort Mixed Use Precinct. A transit stop in this vicinity could encourage this zone change, but the decision is a legislative one that would also take into account many other factors, including public opinion.

On the Koko Head side of the Saratoga Transit Stop, the present pattern of resort hotel and commercial uses would probably remain, but possibly in altered form, through redevelopment.

The blocks bounded by Lewers Street, Kalakaua Avenue, Saratoga Road and Kalia Road may be developed through lot consolidation and redevelopment. The Outrigger Hotel Corporation, which owns or manages several hotels in this area, has expressed interest in redeveloping these blocks, particularly with the availability of incentives such as the zoning regulations mentioned in Section 3.1, and local and State tax exemptions for new construction projects. The proposed Saratoga Transit Stop would probably not be sufficient in itself to induce redevelopment, but it would complement the zoning and tax incentives and guide the form of redevelopment toward a more transit-oriented design.

The key influence of transit stops on Kalakaua/Seaside Avenues and on Kalakaua/Uluniu Avenues would be an increase in business activity at the street level. Also, it is likely to reinforce a pedestrian-oriented design, especially along building frontages, as properties are renovated and improved.

Since most of the properties in the vicinity of the Kuhio/Liliuokalani Avenues Transit Stop have been developed to the maximum allowed under zoning regulations, the present level of land use pattern would remain unchanged, with or without the transit stop. However, there are properties with additional development potential, such as mauka of Kuhio Avenue. Some of these properties are vacant since development activity stopped in the early 1990s because of unfavorable market conditions for new, high-rise condominium projects. The proximity of a transit stop could make the development of these lots more attractive, but the timing of future development on these properties would more likely be influenced by a broader change in the real estate market.

A transit stop could make the area of Kuhio/Seaside Avenues more attractive for high-rise residential development; especially since the transit system would help reduce noise levels from diesel buses and otherwise improve the ambience of Kuhio Avenue.

5.1.5 Construction Employment Impacts

Substantial economic impacts would result from the BRT Alternative relative to the No-Build Alternative. These impacts may be measured by increases in State output/economic activity, employment, and job earnings.

Construction expenditures would occur over the period of construction, directly creating new demand for construction materials and jobs. These direct impacts would lead to indirect or secondary economic impacts, as output from other industries increases to supply the construction industry. The direct and indirect impacts of construction expenditures cause firms in all industries to employ more workers, leading to induced impacts as the additional wages and salaries paid to workers lead to higher consumer spending, creating new demand in many other economic sectors.

1) Methods and Assumptions

Terminology

To analyze the economic impacts of the alternatives, the economic consequences of an increase in the demand for construction goods and services was modeled. Economists use input-output (I-O) models to analyze how changes in a specific industry affect other industries and households.

The following terms help to characterize this process.

- **Direct Impacts** — the increase in demand within the State economy for construction materials and services from the project; usually measured as construction expenditures, but can also be expressed as the number of new construction jobs or job earnings.
- **Indirect Impacts** — the sum of all transactions that filter through the State economy because of the direct purchase of material and labor by the project's construction activity.
- **Induced Impacts** — the increase in household consumption within the State economy from workers who receive additional earnings through the direct or indirect impacts of construction.
- **Total Impacts** — the sum of the direct, indirect and induced economic impacts as measured by the overall increase in output, employment, and/or earnings within the State economy; also referred to as the total multiplied impacts, where the multiplier is the ratio of total to direct impacts.
- **Gross Impacts** —the economic effects of total project expenditures prior to assessing the proportion of economic impacts that would have still occurred in the absence of the project being constructed.

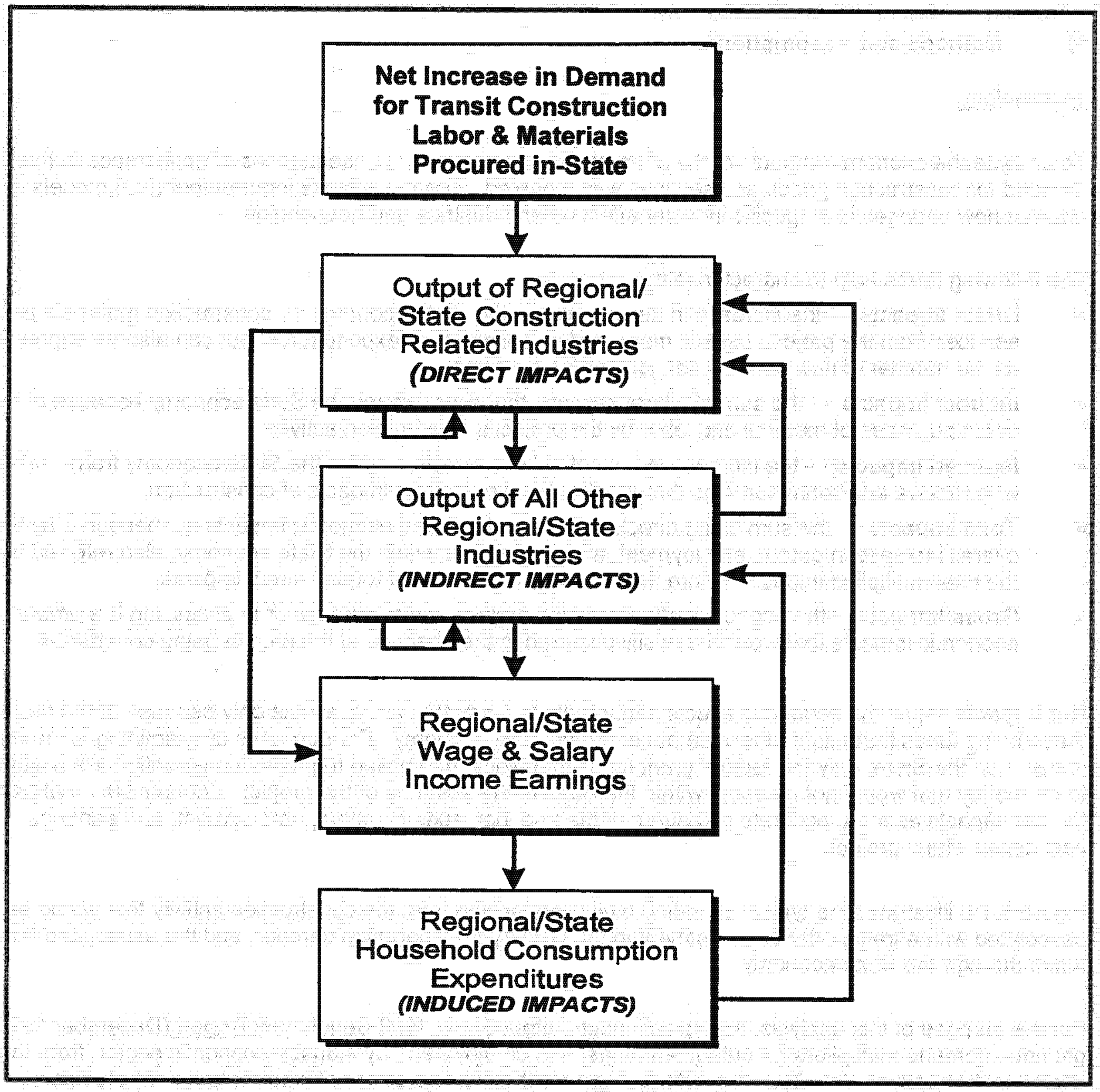
Net Impacts —just the economic effects attributable to funds that are available only because of the project; these being funds that might otherwise not enter the local economy. For purposes of examining economic impacts on the State, only the federal grant funds that would be applied to project construction are assumed to be money that would not be spent within the State in the absence of the project. Economists emphasize the net impacts as more accurate measures of the true increases in output, employment, and earnings associated with a project.

Figure 5.1-6 illustrates the typical spending multipliers arising from the construction activity that would be associated with a transportation investment in the primary transportation corridor, and the associated flow of funds through the State economy.

For the purpose of this analysis, the Hawaii Input-Output Study 1992 Benchmark Report (December 1998) provides demand multipliers for output, earnings, and employment, by industry/economic sector, from the State Input-Output model. The Benchmark Report is the fifth in a series of input-output (I-O) studies of Hawaii's economy prepared over the past 30 years by the Department of Business, Economic Development & Tourism (DBEDT).

These multipliers apply to the State. For this project, Oahu represents the majority of the State's market for construction activities, and given the magnitude of the project, expenditures would have wider-ranging

FIGURE 5.1-6
CONSTRUCTION SPENDING MULTIPLIER REACTIONS



Source: Parsons Brinckerhoff, Inc.

economic impacts. Therefore, given the economic dominance of Oahu to the rest of the State and the geographic isolation of the State from the rest of the U.S. economy, it is appropriate to consider Statewide economic impacts.

Application of State of Hawaii Input-Output Multipliers

Three classes of State of Hawaii I-O final demand multipliers are utilized to estimate the gross and net impacts:

- ***Final Demand Output Multipliers*** translate the initial project capital expenditures (demand) for construction outputs to the total multiplied effect on the demand for output of all firms/industries (in dollars) within the State economy;
- ***Final Demand Earnings Multipliers*** translate the same direct project expenditures into the total multiplied effect on wage and salary earnings within the State economy; and
- ***Final Demand Employment Multipliers*** convert project expenditures into the total multiplied effect on employment within the State economy, expressed in person-year jobs.

An estimate for the construction-related direct employment can be backed into by dividing a fourth class of multiplier, the ***Direct Effect Employment Multipliers,*** into the total employment estimates derived from the final demand employment multipliers when the capital cost estimates do not include detailed labor requirements. Similar ***Direct Effect Earnings Multipliers*** and resultant direct wage and salary earnings estimates can also be derived.

As shown in Table 5.1-5, capital costs are divided into three categories: general construction (including engineering/design services), transit vehicles, and land acquisition. The majority of the capital costs fall under the first category, general construction, which is assumed to be completely procured within the regional economy. The construction services industry I-O multipliers for the State are then applied to this portion of the total capital costs. Buses and other transit vehicles are assumed to be procured from outside the State.

TABLE 5.1-5
CAPITAL COSTS BY CATEGORIES
(1998 \$ × 1,000)

Alternative	Expenditure/Multiplier Categories			
	General Construction	Vehicles	Land	Total
No-Build	\$0	\$316,900	–	\$316,900
TSM	\$141,400	\$365,300	\$12,000	\$518,700
BRT	\$515,800	\$532,500	\$12,000	\$1,060,300

Source: Parsons Brinckerhoff, Inc.

Table 5.1-6 presents final demand multipliers, as well as the direct effect multipliers, for the State as contained the DBEDT Input/Output Study.

TABLE 5.1-6
STATEWIDE ECONOMIC IMPACT MULTIPLIERS

		Final Demand Multipliers			Direct Effect Multipliers	
Expend-iture Category	Hawaii I-O Industry #	Output (dollars)	Earnings (dollars)	Employ-ment (jobs)	Earnings (dollars)	Employ ment (jobs)
Construction	#24, Road Construction	2.24	0.48	11.1	1.97	2.46

Source: Hawaii Input-Output Study 1992 Benchmark Report, Department of Business, Economic Development and Tourism (December 1998).

Gross total economic impacts is calculated by multiplying the expenditure in millions of dollars in the General Construction category in Table 5.1-5 by the appropriate final demand multiplier in Table 5.1-6. Using the BRT Alternative as an example, expenditures of $515.8 M in the general construction category multiplied by the final demand employment multiplier of 11.1 yields a gross total employment impact on all industries within the regional economy of

1. ($515.8 M × 11.1) = 5,725

person-year jobs. However, some of these jobs would have occurred without the investment in the primary transportation corridor. A more realistic measure of net impacts on employment can be assessed by multiplying the gross total employment impact by the percentage of general construction expenditures representing the in-flow of federal money to the State. This gives

2. ($515.8 M × 11.1 × 53.8% (which represents the percentage of federal money vs. local money expected to be contributed to the construction portions of the BRT Alternative)) = 3,080

person-year jobs, which represents the increase in Statewide employment attributable to federal money used to fund the project.

Gross direct construction employment within the State can be derived by dividing the direct effect employment multiplier from Table 5.1-6 into the gross total employment attributable to the construction expenditures from Table 5.1-7, or

3. (5,725 ÷ 2.46) = 2,327

person-year jobs in project engineering and construction. Similarly, gross direct employment earnings for these 2,327 person-year jobs over the construction period would total

4. ($247.6 M ÷ 1.97) = $125.7 M

in 1998 dollars.

TABLE 5.1-7
TOTAL ECONOMIC IMPACTS OF PROJECT

		Total Statewide Impacts			Direct Construction Impacts	
Alternative	(A) Gross Direct Expenditure for Construction ($1998 Million)	(B) Output ($ Million)	(C) Earnings ($ Million)	(D) Employment (Jobs)	(E) Earnings ($ Millions)	(F) Employment (Jobs)
		=(A) x 2.24	=(A) x 0.48	=(A) x 11.1	=(C)÷1.97	=(D)÷2.46
No-Build	0.0	0.0	0.0	0.0	0.0	0.0
TSM	141.4	316.7	67.9	1,569	34.5	638
BRT	515.8	1,155.4	247.6	5,725	125.7	2,327

Source: Parsons Brinckerhoff, Inc., using DBEDT I/O multipliers (see Table 5.1-6)

2) Summary of Economic Impacts

The gross and net total impacts on the State economy are exhibited in Tables 5.1-7 and 5.1-8. Table 5.1-7 presents the gross total economic impacts for the entire State.

TABLE 5.1-8
ECONOMIC IMPACTS OF FEDERAL FUNDS

		Total Statewide Impacts			**Direct Construction Impacts**	
Alternative	(A) Federal Funds Expected for Construction ($1998 Million)	(B) Output ($ Million)	(C) Earnings ($ Million)	(D) Employment (Jobs)	(E) Earnings ($ Millions)	(F) Employment (Jobs)
		=(A) x 2.24	=(A) x 0.48	=(A) x 11.1	=(C)÷1.97	=(D)÷2.46
No-Build	0.0	0.0	0.0	0.0	0.0	0.0
TSM	85.3	191.1	40.9	947	20.8	385
BRT	277.5	621.6	133.2	3,080	67.6	1,252

Source: Parsons Brinckerhoff, Inc., using DBEDT I/O multipliers (see Table 5.1-6)

Using the BRT Alternative as an example, new demand for construction would generate gross direct impacts equal to the capital cost of $515.8 million in 1998 dollars. Adding in the indirect and induced impacts on the output of other industries in the State, the gross multiplied impact on output would total $1.16 billion over the construction period. Of this amount, $247.6 million would be paid to workers as wage and salary earnings for the 5,725 person-year jobs generated.

Table 5.1-8 presents the net total economic impacts within the State attributable to federal money used to fund the project. Demand for construction expenditures would range from no federal construction money for the No-Build Alternative to $277.5 million for the BRT Alternative (1998 dollars), reflecting the money generated by federal grants used for construction portions of the project. Adding in the indirect and induced impacts on the output of other Hawaii industries, the net multiplied impact on output would range from no construction money for the No-Build Alternative to $621.6 million for the BRT Alternative over the construction period. These numbers correspond to no new jobs created for the No-Build Alternative to 3,080 person-years of new jobs created for the BRT Alternative.

While the gross total economic impacts are useful for examining the overall magnitude of the project, the net economic impacts from federal funds represent more generally accepted and appropriate estimates of the true economic impacts that would arise solely from project construction. This is because the local funds to be invested in the project would likely be spent in some other manner within the local economy — with similar multiplied impacts — in the absence of the investment in the primary transportation corridor.

5.2 DISPLACEMENTS AND RELOCATIONS

This section discusses potential displacements of existing land uses associated with the No-Build, TSM, and BRT Alternatives. Displacements would occur in the following cases:

- at certain proposed transit stops, transit centers, and maintenance facilities where the space requirement of the transit feature could not be accommodated within the existing roadway or sidewalk right-of-way; and
- along proposed transit alignments where the existing roadway right-of-way would not be adequate for proposed project elements (e.g. widening of Kapiolani Boulevard at Kalakaua Avenue).

The analysis of displacement impacts is based on conceptual engineering plans as of April 2000, from which a list of potentially affected tax map keys (TMKs) was compiled. In the case of occupied TMKs, existing businesses were specifically identified. The business names reflect tenants occupying those locations in early 1999. Surveys to reflect more recent changes in tenancy have been made through April 2000. The number of employees at potentially affected businesses was estimated by referring to the Hawaii Business Directory (1997 and 1998 versions) and by field checking locations as necessary between March 1999 and April 2000.

Where an alternative would require additional right-of-way, the associated property acquisitions could result in total or partial displacement of existing land uses. For this initial analysis, a "total displacement" was defined as cases where enough of a property would be lost as to make the existing land use on that property no longer viable. A property was defined as a tax map key (TMK) parcel. For example, if a parcel were to lose a large portion of an occupied building, be segmented, and/or lose access to the street system, it was deemed a total displacement. A "partial displacement" determination was applied to cases where some land and/or building portion may be lost, but it was deemed that the continuation of the existing land use would be economically viable, based on information currently available.

In the case of total business displacements, all employees at the site would be displaced. Partial displacements may also displace some employees from the site. Vacant TMKs currently containing no business or institutional activities were not included in the following analysis, as they did not meet the aforementioned criteria for displacements.

The TSM and BRT Alternatives would be constructed within or adjacent to existing roadways as much as possible, in part to minimize costs and also to minimize residential and business displacements. Depending on the maintenance facility and transit center site selected, there would be a maximum of 12 businesses displaced with either alternative. There would be no displacements with the No-Build Alternative. All displacements are expected to be of commercial properties. The choice of BRT propulsion technologies would not influence the number of displacements required by any alternative.

5.2.1 Residential Impacts

No residential impacts are expected under any project alternative as a direct result of transit improvements.

Whether to replace on-street parking in each impacted neighborhood is a policy to be decided by the City Council. Options for mitigation range from no replacement of lost parking spaces to one-to-one replacement. Parking impacts are discussed in Section 4.3.

5.2.2 Business Impacts

Business relocations would be required for the TSM and BRT maintenance facility expansion and transit centers. The No-Build Alternative would not result in any business displacements.

Table 5.2-1 summarizes the businesses and institutions that would be affected by each alternative. Some displacements would be partial, while others would be total displacements requiring relocation. The TSM Alternative would displace between zero to twelve businesses and potentially one partial displacement, depending on the selection of transit center sites. The BRT Alternative would also displace zero to twelve businesses and result in one to two partial displacements.

With some alternatives, there would be right-of-way impacts to properties occupied by businesses and institutions. Those impacts affecting only parking are discussed in Section 4.3. Such impacts are not discussed in this section because they are not expected to affect the viability of any of the businesses on those properties.

TABLE 5.2-1
SUMMARY OF ESTIMATED BUSINESS DISPLACEMENT IMPACTS

Alternative	Total Displacements		Partial Displacements
	Number of Businesses	Displaced Employees[1]	Number of Businesses
No-Build	0	0	0
TSM	0 to 12	About 0 to 63	0 to 1
BRT	0 to 12	About 0 to 63	1 to 2

Source: Parsons Brinckerhoff, Inc.
Note: [1] Estimates from 1998 Hawaii Business Directory, 1997 Hawaii Business Directory, and field checks. Displaced Employees are those employees at only those businesses that would be totally displaced.

1) TSM Alternative

The TSM Alternative would have zero to twelve total displacements requiring relocation, plus potentially one partial displacement. Those displacements are summarized by project element in Table 5.2-2.

TABLE 5.2-2
SUMMARY OF ESTIMATED POTENTIAL BUSINESS IMPACTS BY SITE

Project Element	Alternatives		Total Displacements		Partial Displacements
	TSM	BRT	Number of Businesses	Displaced Employees[1]	Number of Businesses
Pearlridge Transit Center *Option at Kam Drive-In*	X	X	0	0	0 to 1
Middle Street Maintenance Yard and Transit Center *Option at Fort Shafter*	X	X	0	0	0
Middle Street Maintenance Yard and Transit Center *Option adjacent to existing bus maint. Facility*	X	X	8	About 20 to 47	0
Iwilei Transit Center *Option at parking lot*	X	X	0	0	0
Iwilei Transit Center *Option at OR&L site*	X	X	4	About 4 to 16	0
Kapiolani road widening		X	0	0	1

Source: Parsons Brinckerhoff, Inc.
Notes: [1] Estimates from 1998 Hawaii Business Directory, 1997 Hawaii Business Directory, and field checks. Displaced employees are those employees at only those businesses that would be totally displaced.

The TSM Alternative could cause displacements at the Middle Street Transit Center. The proposed site would also serve as an expanded storage yard and maintenance facility for transit vehicles. In addition, some options for Pearlridge and Iwilei Transit Centers would have displacement impacts, if selected. The Pearlridge Transit Center in the vicinity of Kaonohi Street may cause one partial displacement. The Iwilei Transit Center may cause up to four business displacements. Other transit centers in Kapolei and Waipahu would not result in any displacements.

Potential Impacts: Pearlridge Transit Center Options

There would be a transit center and parking facility in the general area of Pearlridge and Kaonohi Street. A specific site has not been selected. The former Kamehameha Drive-In Theater is a possible site. If selected, it would require approximately one-quarter of the old theater site, causing a partial displacement. Although the theater is no longer in operation, the site is used as a flea market on Wednesdays, Saturdays, and Sundays.

Potential Impacts: Middle Street Maintenance Facility and Transit Center Options

The transit center/maintenance facility at Middle Street, if located on the site just makai of the existing Kalihi-Palama bus maintenance facility, would require the relocation of eight businesses near the mauka, Koko Head corner of Dillingham Boulevard and Middle Street. These businesses employ a total of 20 to 47 people. The alternative site across Middle Street at Ft. Shafter would not require displacements but would not function as effectively for the intended uses.

Potential Impacts: Iwilei Transit Center Options

The Iwilei Transit Center would be located at one of two optional sites: one is an existing parking lot between Awa and Iwilei Roads and the other is the OR&L site. If the parking lot site were selected, there would be no displacement impacts. The parking lot site could be developed as a joint-use parcel, including the transit center and commercial, retail, or residential uses.

If the OR&L site were selected, three buildings containing four businesses at that site would be displaced. These businesses employ roughly four to 16 people combined. The OR&L parcel in Iwilei is also proposed for developed by HCDCH, which has announced plans to construct mixed-use retail and residential buildings and off-street parking at the same location as the proposed Iwilei Transit Center. If this site is selected, there would be close coordination between the City and HCDCH to create a mutually consistent development plan for a joint-use project in Iwilei.

2) BRT Alternative

In comparison to the potential displacements discussed in the TSM Alternative, the BRT Alternative would have the same potential displacements, plus one additional partial displacement. These impacts are also reflected in Table 5.2-2. There would be no additional total displacements.

The partial displacements would result from a road widening on Kapiolani Boulevard at its intersection with Kalakaua Avenue by the Hawaii Convention Center. This road widening is not needed at the outset of the project. This right of way acquisition would be deferred until the affected property is redeveloped. As a result, one business on the mauka side of Kapiolani Boulevard is considered a partial business displacement, but has the potential to be a total displacement. If deemed a partial displacement, the business could lose roughly eight parking spaces and roughly a third of its floor space; part of the building façade would also need to be rebuilt. No employees would likely be affected if this location were treated as a partial displacement; if it were to be considered a total displacement, an estimated 20 or more employees could be affected. One other recently vacated business site that was formerly a restaurant would also be affected, but because the location is currently vacant, it is not counted as a displacement. In addition, some landscaping would be lost fronting the convention center on the makai side of Kapiolani Boulevard, and parts of two vacant lots would be acquired.

Right-of-way acquisitions would be required at two locations to allow the Waikiki branch of the In-Town BRT to make turns. There would be no direct impact to businesses, buildings, or access to buildings; therefore, they were not counted as displacements. Some landscaping would be lost from a commercial property on the mauka-Koko Head corner of Richards and Halekauwila Streets. A right-of-way acquisition at the makai Ewa corner of Halekauwila and South Streets would take part of a vacant property.

5.2.3 Relocation Assistance Program

Since federal funds would be used to assist project construction, the project would be subject to provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 CFR Part 24, 42 U.S.C. 4601, et seq.). State law on relocations is provided in Hawaii Revised Statutes (HRS) Chapter 111, Assistance to Displaced Persons. These laws and regulations are designed to provide such services as the following:

- Determination of the needs of displaced persons or businesses;
- Assistance for displaced persons or owners of displaced businesses in obtaining and becoming established in suitable locations;
- Provision of information on federal assistance programs for displaced persons or businesses;
- Assistance in minimizing hardships to displaced persons or businesses associated with relocation; and
- Coordination of relocation activities with other project activities and government actions that may affect the relocation program.

Fair market compensation for land, buildings and uses would be provided to property owners directly affected by right-of-way requirements. For properties that would experience partial displacement but not relocation, mitigation would be provided at project cost, such as reconstruction of building façades and replacement of lost parking stalls. In addition, moving and other expenses would be reimbursed, as described below. The costs of the relocation assistance are included in the project's cost estimates, as described in Chapter 2.

1) Residential

Displaced persons are entitled to replacement housing payments in addition to the cost of the displaced dwelling. Depending on the status of the displaced person, these payments could consist of a purchase supplement, rental assistance, or a down payment. Purchase supplements include the price differential between the cost of the replacement dwelling and the displaced dwelling, an increase in mortgage interest costs, or incidental expenses. For owner-occupants of 90 to 179 days or tenants of 90 days or more, only a down payment may be provided toward the purchase of a replacement dwelling. Displaced persons also are entitled to reimbursement of moving costs and certain related expenses.

No residential displacements are expected as a result of the proposed project.

2) Businesses

Actual and reasonable moving expenses would be reimbursed but proof of expense would be required. Related expenses, such as personal property losses, expenses in finding a replacement site, and reestablishment expenses, may also be reimbursable. Alternatively, certain businesses could elect an optional fixed payment not exceeding $20,000 depending on a two-year average of annual net earnings. Affected businesses would be encouraged to plan moves in advance so that relocation would occur with minimal delays and inconvenience.

5.3 NEIGHBORHOODS, COMMUNITY FACILITIES, AND ENVIRONMENTAL JUSTICE

5.3.1 General Impacts

This section discusses potential impacts to neighborhoods and community character during operation of the proposed alternatives.

The No-Build and TSM Alternatives would not affect community or neighborhood character or facilities since the proposed transit improvements (changes in bus service) would operate over existing streets with minimal new construction. Although the P.M. zipper lane on the H-1 Freeway and expansion of the Kalihi/Palama (Middle Street) bus maintenance facility are elements of the TSM Alternative, neither action would change the existing industrial and mixed business use character of the Airport, Mapunapuna, or Kalihi neighborhoods. Neighborhood character and cohesion in these areas would not be adversely affected.

With the BRT Alternative, establishment of an in-town transit spine, park-and-ride lots, transit centers, and stops would enhance community cohesion at new station locations, especially where redevelopment potential exists, such as the Iwilei and Kakaako areas of the corridor. Transit stops and centers would provide a focal point of activity in areas where, at present, there is little foot traffic and people activity.

1) Fire and Rescue Services/Police/Emergency Medical Services

Increases in traffic volumes and worsening congestion in the primary transportation corridor would continue under the No-Build and TSM Alternatives. Emergency response times would worsen, and access to services and facilities would become increasingly congested and dangerous, especially during peak hours. With the BRT Alternative, response times for emergency vehicles would decrease because they would be able to use the transit priority lanes of the Regional and In-Town BRT systems to bypass roadway congestion when enroute to an emergency.

2) Schools

No adverse effects on school facilities from the No-Build, TSM, and BRT Alternatives are expected. Rather, access to schools in the corridor would be enhanced through enhanced transit service. For example, the BRT Alternative would provide a BRT line from the Middle Street Transit Center to the University of Hawaii Manoa campus. Construction would not interfere with campus facilities, and access to the Manoa campus would be enhanced by the BRT Alternative. Other schools that would benefit under the BRT Alternative are Honolulu Community College, McKinley High School, and Lunalilo and Jefferson Elementary Schools.

3) Parks and Recreation Areas

The No-Build, TSM, and BRT Alternatives would not adversely affect parks and recreation areas. With the BRT Alternative, access would be improved to Thomas Square, Ala Moana Regional, Ala Wai, Kakaako, and Kapiolani Parks. Impacts on parklands are discussed in more detail in Section 5.11.

4) Traffic and Parking

Traffic and parking impacts are discussed in Chapter 4. Overall, traffic volumes and congestion would increase the most with the No-Build Alternative. Transit stops, centers, and park-and-ride lots would generate localized increases in auto traffic during rush hours. The most noticeable effects would occur in areas where there is already substantial vehicle activity and in areas where small increases in existing low or low-to-moderate traffic levels may be perceptible. The construction of the BRT Alternative in street rights-of-way of the Ala Moana/Kakaako neighborhood on Ward Avenue and Ala Moana Boulevard, in Downtown Honolulu on Richards Street, and in Moiliili on Kapiolani Boulevard and University Avenue, would result in loss of some on-street parking spaces. The net effect is that the people carrying ability of these streets would be increased under the BRT Alternative.

5.3.2 Barriers to Social Interaction

None of the alternatives would create visual and psychological barriers within neighborhood boundaries. The In-Town BRT stops would be at-grade where social interaction can take place.

5.3.3 Mitigation Measures

Sensitive design of the new stops and transit centers can help the new facilities blend with and enhance the existing environment. Use of appropriate construction materials and landscaping would help lessen the visual intrusion of a new facility in or adjacent to a neighborhood. Other mitigating design features include installation of new pedestrian paths and bikeways or enhancement of such existing facilities.

5.3.4 System Safety and Security

System safety and security planning would be part of the overall system design for the selected alternative. Primary concern would be for the safety of patrons and personnel and additionally for the safety of other elements. The design would provide a safe environment that would minimize the possibility of injury to patrons or personnel, or damage to transit system equipment.

The system design under the BRT Alternative would aim to be such that no single equipment failure or human error could result in serious injury. An operating plan including a hazard analysis and risk assessment would be developed. This plan would include general approaches to failure management, including modes of operation under abnormal conditions. A separate maintenance plan would also prescribe preventive and corrective maintenance procedures. This plan would address equipment reliability, routine maintenance procedures and schedules, and safety assurance procedures for vehicles used in revenue service.

System security would be provided to protect the public and the transit system from crime and vandalism in all of the alternatives. The security system may include a combination of the following: transit system workers, special transit police, and local police. A comprehensive System Security Plan would be prepared during the final design phase to address passenger security, employee security, revenue security, vandalism, theft, crowd control, power/mechanical failures, fires, accidents, and other incidents.

Safety concerns have been taken into account in the locating and concept design of the median transit stops for the In-town BRT element. Measures including bollards at the ends of the platforms and railings along the backside of the platforms on the transit medians would provide passengers a safe waiting environment. Further, median transit stops would be located at street intersections so that riders would be using crosswalks to get to and from the boarding area.

5.3.5 Environmental Justice (Executive Order 12898)

Presidential Executive Order (EO) 12898, signed on February 11, 1994, is called the Executive Order on Environmental Justice. It requires federal agencies to take appropriate and necessary steps to identify and avoid disproportionately high and adverse effects of federally-assisted projects on minority and low-income populations' health or environment. Minority is defined as (OST Docket No. OST-95-1411):

- Black Americans, which includes persons having origins in any of the black racial groups of Africa;
- Hispanic Americans, which include persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
- Asian Americans, which include persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands; and

- American Indians and Alaskan Natives, which include persons having origins in any of the original people of North America and who maintain cultural identification through tribal affiliation or community recognition.

Low-income means a household income at or below the U.S. Department of Health and Human Services poverty guidelines, which, for 1999 in Hawaii, was an income at or below $19,210 per year for a family of four.

Figure 3.3-1 identifies the major neighborhoods in the study area. As described in Chapter 2, the proposed project would be implemented from Kapolei on the west end, to Manoa and Waikiki on the east end. However, the level of adverse impact and benefit on any particular neighborhood would depend on which elements of the project would be located within that neighborhood. As described in Section 3.3-1 (and shown on Table 3.3-2), minorities, as defined above, comprised almost 70 percent of the entire Oahu population in 1990. Only two neighborhoods in the study area, Waikiki and Airport/Hickam/Pearl Harbor, had non-minority populations of greater than 50 percent. Therefore, it is difficult to assess compliance with EO 12898 using only the minority criterion, or else almost every neighborhood in the study area, regardless of their socio-economic status, would be afforded protection under EO 12898, which is clearly not the intent of the executive order. However, by considering other factors, such as income, poverty and housing status (see Tables 3.3-3 and 3.3-4), the socio-economic differences between neighborhoods becomes apparent. In addition, it was necessary to analyze the socio-economic conditions of areas smaller than neighborhood units because the aggregated data on major neighborhoods (shown on Tables 3.3-1 through 3.3-4) could conceal information relevant to the identification of a smaller area within a neighborhood as a concentration of minority and low-income populations.

Table 5.3-1 displays minority and low-income populations by neighborhood or sub-neighborhood in the study area, and Figures 5.3-1A through 5.3-1C show their locations. Race, household income, rental occupancy rates, and poverty levels were considered in identifying these populations. Another important factor considered was whether the neighborhood or sub-neighborhood has a high percentage of families within its total number of households. Neighborhoods with small average household sizes (i.e., small percentage of families), even though they may have relatively lower median household income and high renter-occupancy rates, were often not considered to be minority and low-income populations. Examples of such areas include residences near a college or university, or urban areas populated by young working adults (i.e., those who are not in their prime earning years) who have chosen an "urban lifestyle." However, some of these types of neighborhoods contained high poverty rates, and were therefore identified as containing minority and low-income populations.

Four sub-neighborhoods in Waipahu, the residential area near Aloha Stadium, Chinatown, Kaheka and Lower McCully were identified as sub-neighborhoods containing minority and low-income populations. The only major neighborhood identified with minority and low-income populations is Kalihi-Palama.

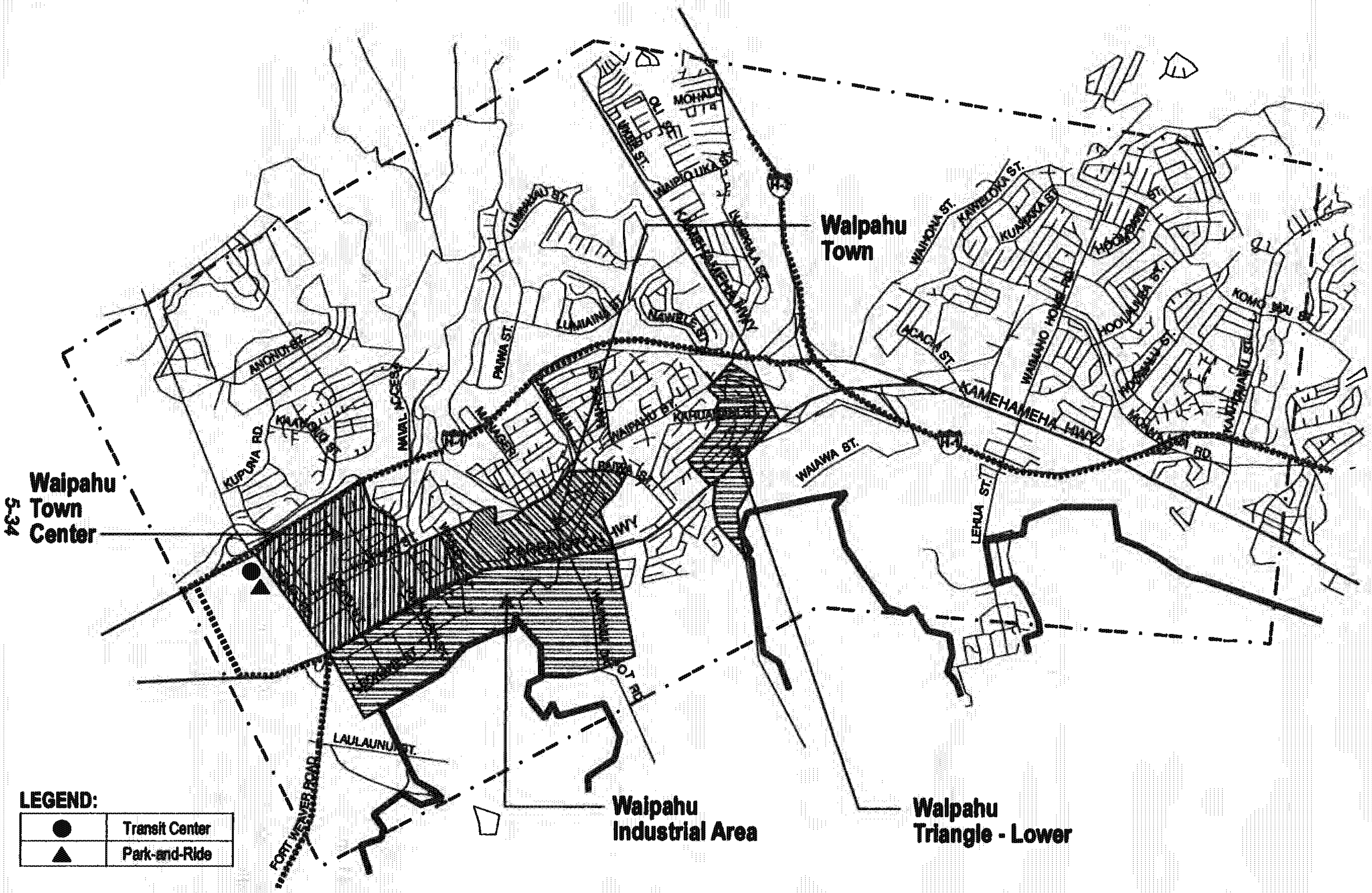
The TSM or BRT Alternatives would not cause disproportionately high and adverse health or environmental effects on these minority and low-income populations because:

- although some of the populations would be located near elements of the proposed project, such as the alignment of the In-Town BRT, the project would benefit these populations by improving their transit service;
- the alignments were selected in such a manner as to minimize adverse impact while maximizing travel benefits for minority and low-income residents (Chapter 2 contains a further discussion of the balancing of transportation benefits with environmental impacts leading to the selection of certain arterial streets for the alignment of the In-Town BRT system);
- many areas along the alignment are not minority or low-income;
- some minority and low-income populations are not located near elements of the proposed project;
- minority and low-income areas are not being isolated by the project;

TABLE 5.3-1
ENVIRONMENTAL JUSTICE
MINORITY AND LOW-INCOME POPULATIONS IN STUDY AREA
(BY NEIGHBORHOOD OR SUB-NEIGHBORHOOD)

Neighborhood or Sub-Neighborhood	Rationale[1]
Waipahu Town Center (sub) Census Tract (CT) 89.01 5,344 persons	80 percent minority population $33,200 median household income 6 percent family poverty rate 57 percent renter occupancy 90 percent of households are families
Waipahu Industrial Area (sub) Parts of CT 87.03 and 87.02 2,813 persons	77 percent minority population $19,811 median household income 35 percent family poverty rate 94 percent renter occupancy 82 percent of households are families
Waipahu Town (sub) Parts of CT 82, 87.02 and 88 3,850 persons	90 percent minority population $33,636 median household income 18 percent family poverty rate 69 percent renter occupancy 89 percent of households are families
Waipahu Triangle – Lower (sub) Parts of CT 82 and 87.01 3,404 persons	96 percent minority population $45,476 median household income 10 percent family poverty rate 38 percent renter occupancy 87 percent of households are families
Stadium (sub) Parts of CT 74, 75.01 and 76 3,114 persons	83 percent minority population $28,669 median household income 22 percent family poverty rate 60 percent renter occupancy 85 percent of households are families
Kalihi-Palama CT 53 (part), 54, 55, 56 57, 58, 59, 60, 61, 62.01 (part) and 62.02 40,144 persons	91 percent minority population $25,647 median household income 16 percent family poverty rate 71 percent renter occupancy 76 percent of households are families
Chinatown (sub) CT 52 2,480 persons	88 percent minority population $13,202 median household income 17 percent family poverty rate 97 percent renter occupancy 45 percent of households are families
Kaheka (sub) CT 36.01 5,151 persons	75 percent minority population $20,544 median household income 9 percent family poverty rate 69 percent rental occupancy 34 percent of households are families
Lower McCully (sub) 5,856 persons Parts of CT 24.01 and 25	78 percent minority population $24,208 median household income 12 percent family poverty rate 77 percent rental occupancy 49 percent of households are families

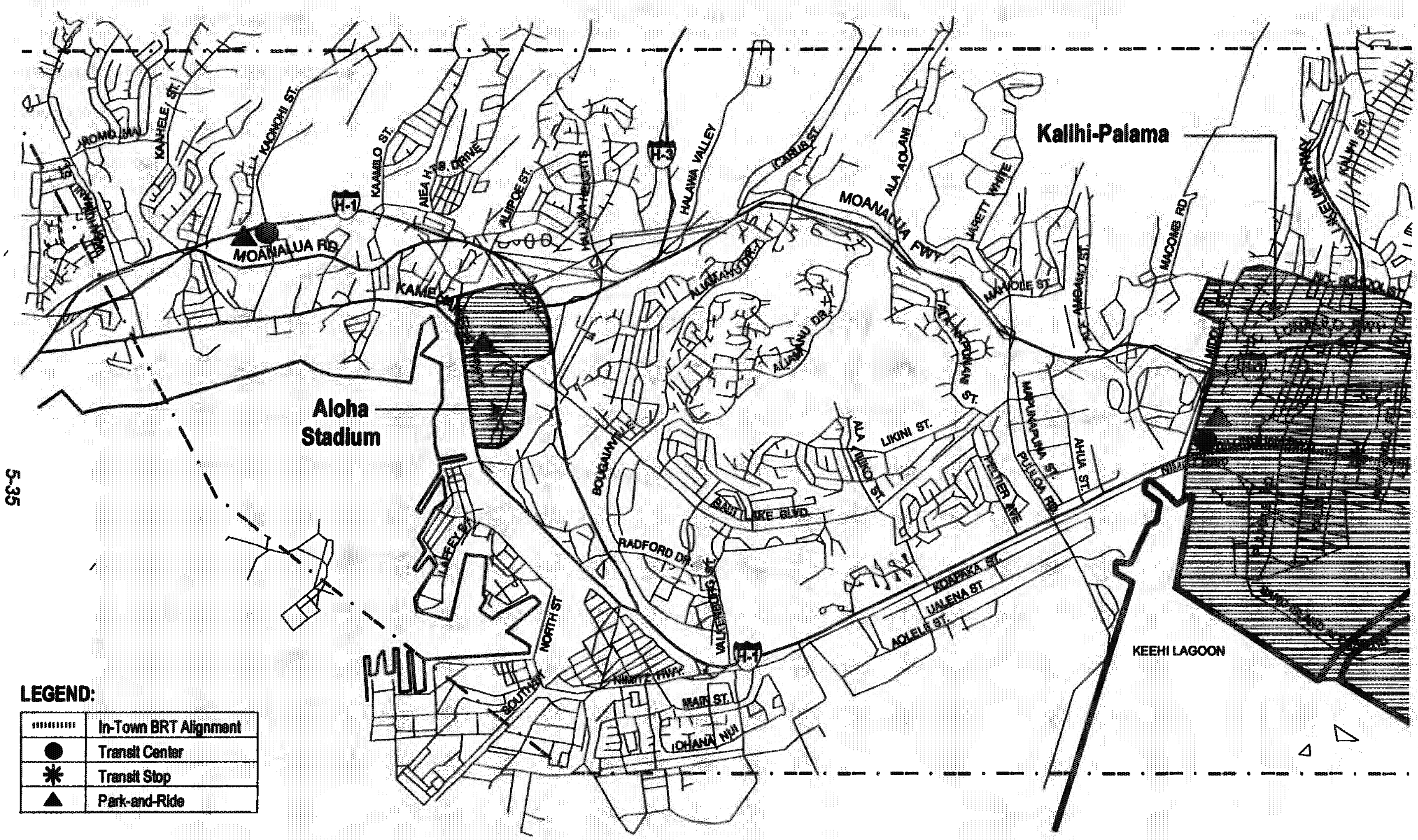
Source: Neighborhood Profiles, City and County of Honolulu Planning Department (now Department of Planning and Permitting), and Parsons Brinckerhoff, Inc.
Note: [1] Data is from the year 1990 U.S. Census.
"Other race" was included in minority population.



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Locations of Minority and Low-Income Populations: Waipahu - Pearl City

Figure 5.3-1A



LEGEND:

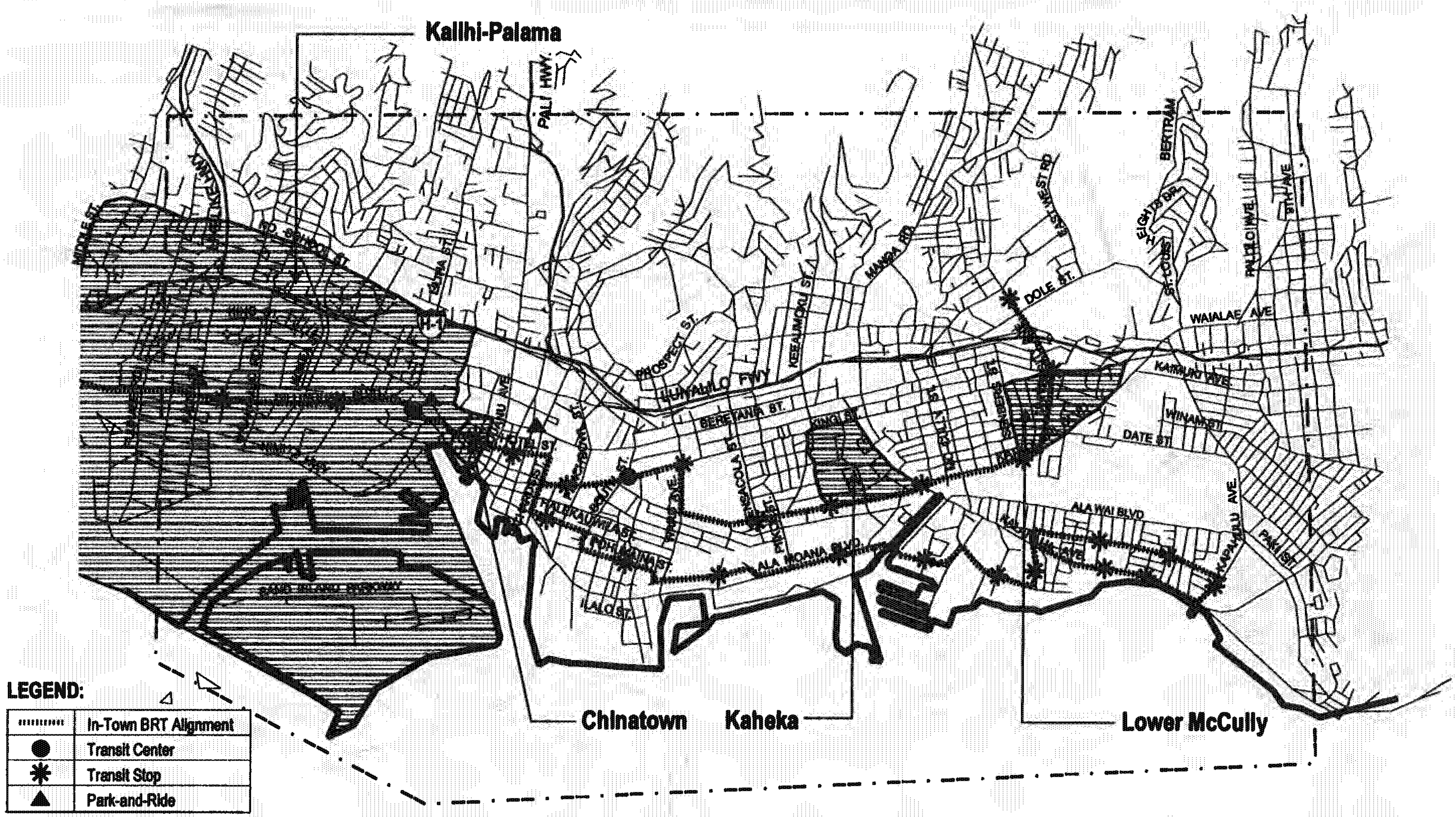
⁞⁞⁞⁞⁞⁞	In-Town BRT Alignment
●	Transit Center
✳	Transit Stop
▲	Park-and-Ride

SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Locations of Minority and Low-Income Populations: Aiea - Fort Shafter

Figure 5.3-1B



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998.

Scale: 0 .25 .50 mi
Scale: 0 .5 1 km

Locations of Minority and Low-Income Populations: Kalihi - University

Figure 5.3-1C

- the proposed project would not create health risks to the minority and low-income populations; and
- project-related impacts to the minority and low income populations would be avoided, minimized or mitigated whenever possible.

In summary, minority and low-income areas would not be disproportionately affected.

Most of the minority and low-income populations identified on Table 5.3-1 are not located near construction activities associated with the proposed project and, therefore, would not experience disproportionate adverse health or environmental effects. The express/HOV facilities, P.M. zipper lane and the Waipahu Transit Center/park-and-ride facility near Kunia Road would be the only project elements near the minority and low-income populations in Waipahu. However, the express/HOV and zipper lanes would be located on Fort Weaver Road and the H-1 Freeway, neither of which bisect Waipahu (Fort Weaver Road is west and south of Waipahu, and H-1 is north (mauka) of Waipahu). The transit center/park-and-ride facility would be located on vacant land owned by the Estate of James Campbell. Similarly, the Stadium residential area would not be affected by the H-1 Freeway P.M. zipper lane and the Aloha Stadium park-and-ride lot, the only project elements near this neighborhood.

Minority and low-income populations identified on Table 5.3-1 that would be directly affected by the project are located in Kalihi-Palama, Chinatown, Kaheka, and Lower McCully (see Figures 5.3-1A through 5.3-1C). The In-town BRT would traverse the Kalihi-Palama and Chinatown neighborhoods, and be adjacent to the Kaheka and Lower McCully sub-neighborhoods. Because these neighborhoods have relatively high rates of transit usage, moving the In-town BRT alignment to avoid these neighborhoods would detract from the ability of the project to enhance service to minority and low-income populations. The BRT Alternative would substantially improve the level of transit service (amenities, access and quality) provided to the minority and low-income populations in the urban core. The BRT Alternative, as well as the TSM Alternative, would also improve transit service for minority and low-income populations outside the urban core, such as those populations in Waipahu, because of the conversion to a hub-and-spoke system and increase in service levels compared to the No-Build Alternative.

The benefit to the identified minority and low-income populations is improved transit service, without the drawback of disproportionate adverse health or environmental impacts. As described in Section 2.2.3, the In-Town BRT system would be constructed by converting general-purpose traffic lanes on city streets, which would eliminate the need for major right-of-way acquisitions.

Participation from residents and business owners serving the minority and low-income populations has been actively solicited throughout project planning (see Appendix A). Workshops, presentations and small group meetings have been held in all communities throughout the island, including the four rounds of workshops within the Oahu Trans 2K process, and individual meetings with community, environmental, business and civic organizations. Input from these public involvement activities has been influential in planning the proposed project.

Potential health risks to minority and low-income populations are related to traffic safety, adverse air quality and noise impacts, and the release of hazardous materials. However, these risks would not disproportionately affect minority or low-income populations, and potential impacts of these types would be minimal or mitigated, as described elsewhere in this document.

Potential traffic safety hazards could involve transit riders being exposed to In-Town BRT and other vehicles while walking to or waiting in the In-town BRT median platforms. However, these median In-Town BRT stops would be located at intersections where crosswalks are provided, and the platforms would include bollards and railings (see Section 5.3.4). Air quality impacts would not pose health risks because carbon monoxide (CO) levels throughout the project area would not exceed the National Ambient Air Quality Standards (AAQS), and would be generally the same as the No-Build Alternative (see Section 5.5). The State AAQS would be exceeded at certain intersections under all the alternatives. However, it should be noted that the State AAQS for CO is set at such a stringent level, that it is exceeded at many locations that have even moderate traffic volumes. Also, the air quality analysis is based on the assumption of worst-case meteorological conditions that may only occur once a year or even less. The proposed project would not cause noise impacts except in Kunia, which is not considered to be an area of minority and low-income population (see Section 5.6). Finally, the proposed project may uncover previously contaminated soils and groundwater. To reduce exposure to residents and construction workers, special handling procedures would be implemented (see Section 5.12).

Adverse impacts to the minority and low-income populations adjacent to the project would include construction impacts, business relocations, and the removal of some landscaping. Whenever possible, measures to avoid, minimize, or mitigate adverse impacts would be implemented as described in relevant sections of this document.

Another potential adverse impact to minority and low-income populations is the proposed location of the BRT Alternative's system maintenance facility. Two sites are being considered, both are in the Kalihi-Palama neighborhood, adjacent to the existing bus maintenance facility on Middle Street (see Section 2.2.3). This site was selected because of its proximity to the existing bus maintenance facility, the parcel zoning is industrial, and there are no residences immediately adjacent to the site (the nearest residences are several hundred meters to the east). Therefore, the placement of this facility in Kalihi-Palama does not represent a disproportionately high and adverse effect on minority and low-income populations.

In conclusion, the proposed project would be located at and near some minority and low-income populations. In accordance with the EO 12898, federal projects must take appropriate and necessary steps to avoid disproportionately high and adverse effects on these populations. For those minority and low-income populations near elements of the project (in particular the BRT Alternative), these populations would benefit from improved transit service without experiencing disproportionate health or environmental impacts. Even the proposed location of the BRT Alternative's system maintenance facility in Kalihi-Palama is not a disproportionately high and adverse impact, because residents would not be directly affected by such a facility.

5.4 VISUAL AND AESTHETIC RESOURCES

The purpose of this section is to identify the project elements that would result in visual impacts and to discuss them in relation to the important visual resources identified in Section 3.4.

Potential visual impacts were determined by assessing the compatibility of the transportation improvements in the context of the existing environment. A key concept in visual quality assessment is the notion of visual compatibility between the alternatives and the existing landscape. "Visual compatibility" is defined as the degree to which the existing visual resources and the proposed transportation improvements can co-exist harmoniously. The degree of visual compatibility is greater when a transportation improvement blends in, i.e., conforms, rather than contrasts with surrounding visual resources.

5.4.1 Impacts

Regardless of the type of propulsion technology selected for use, the In-Town Transit System in the BRT Alternative would use bus-like vehicles without an overhead catenary system or fixed rails, running at-grade on existing roadways. Therefore, the enhanced operation of buses and the new BRT vehicles would not have a negative impact on visual resources along most of the proposed alignments. Priority treatment for buses would involve minimal physical change, resulting in little or no visual impact on the existing landscape, regardless of land use. The embedded plate technology requires substations every ½ mile or so (i.e., 24 buildings about the size of a small one-story house). They could be designed to blend in with the surrounding neighborhoods and placed underground where the water table permits, if necessary.

The BRT Alternative provides opportunities to enhance the urban form – not only in the Urban Core but also wherever transit improvements are proposed. These enhancements to activity centers serve as opportunities for mixed uses and public spaces. As an at-grade system, typically running within existing roadways and streets, it offers an opportunity to enhance the visual quality of the streetscape and enhance the pedestrian experience. There would be a greater sense of visual order and unity because of the physical improvements and landscape treatments along the alignment. There could be special paving at crosswalks, street lighting, banners, street furniture, and plantings along the entire corridor, which would reinforce the character of the area and the sense of place.

In comparison, the TSM Alternative would have minimal visual impact, because transportation elements that are potentially visually intrusive would be limited to one bus ramp, some sound barriers, and fewer transit centers. The No-Build Alternative would have no visual impact.

Table 5.4-1 summarizes the visual resources that would be impacted. Mitigation measures for these impacts are described in Section 5.4.2.

TABLE 5.4-1
SUMMARY OF IMPACTS TO VISUAL RESOURCES

Project Element	Affected Visual Resources	Alternatives	
		TSM	BRT
H-1 Kunia Interchange Sound Barrier	mauka-makai view	X	X
Various In-Town BRT Transit Stops	Kalihi-Palama District, Chinatown, Downtown, State Capitol, Ala Moana Park, Waikiki, UH-Manoa, Kalia Road, Kalakaua Avenue/Waikiki Beach, Kapiolani Boulevard		X

Source: Parsons Brinckerhoff, Inc.

1) No-Build Alternative

The No-Build Alternative would not involve additional construction; therefore, no impacts on visual resources would occur.

2) TSM Alternative

Most proposed improvements are limited to existing roadways such as the H-1 Freeway; therefore, there would be little or no visual change. There may be some visual impacts on residents near the proposed noise barrier at the Kunia Interchange, which would affect mauka-makai views.

Sound barriers to mitigate noise impacts near the H-1 Kunia Interchange could have an impact on the residential areas adjacent to the walls. As discussed in Section 5.6, the recommended walls at Kunia Interchange would be about 2 to 6 meters (6 to 20 feet) in height, located on the Koko Head side of the interchange. There would be some obstruction of mauka-makai views from residences both mauka and makai of H-1. Some of these residences lie below the raised profile of H-1, such that the mauka-makai views from those residences are already slightly obstructed. Other portions of H-1 are below-grade, such that the wall would be a new object in the visual landscape. The wall also could limit views of the H-1 Freeway, as well as possibly reduce exposure to sunlight for some residences.

3) BRT Alternative

Under the BRT Alternative, a mauka-makai view could be affected at the H-1 Kunia Interchange by noise barriers, as described in the TSM Alternative. In addition, transit centers/stops and road widening elements may have some visual impacts. Other structures such as bus ramps would not be visually intrusive to the existing surrounding views.

Transit centers and park-and-ride lots would include passenger shelters, street furniture, ornamental light standards, landscaping and in some cases passenger and community oriented retail and public facilities. These elements would be designed to be appropriate in each setting and could, in some cases, enhance the aesthetics of the area. Most transit centers are not located in visually sensitive areas.

The Kapolei and Waipahu Transit Centers would occur in areas that are not yet fully urbanized. These transit centers with park-and ride lots would feature passenger shelters, street furniture, ornamental lights, landscaping and canopy trees. These elements could help to enhance the visual order of these areas, without disrupting existing mauka views.

Some transit stops are located in visually sensitive areas. Special Districts have visual resources valued by visitors and residents; therefore, design of the transit system would need to be handled carefully through these areas. Kapiolani Boulevard would have some median and curbside transit stops. These canopied waiting areas will vary depending on the surrounding neighborhood but in general will look like the typical stops pictured in Figure 2.2-4. The In-Town BRT stops in the Chinatown Special District, and in the Hawaii Capitol Special District would not have canopies or other elements which would impact views of any important landmarks. The transit stop planned in front of the Duke Kahanamoku Statue on Kalakaua Avenue, also would not have a canopy.

Other sensitive areas where transit stops are planned include the following:

- Downtown
- Waikiki Special District
- Hawaii Convention Center
- UH Manoa
- Ala Moana Park
- Kalia Road in Fort DeRussy
- along Kalakaua Avenue

The maintenance yard would not have a negative visual impact on the immediate environment, because the proposed facility would be visually compatible with the existing industrial environment. This sector is industrially zoned and highly transitional in nature.

A new bus/HOV ramp would be built to access the Middle Street Transit Center. Because there is an existing interchange, the additional ramp would blend into the existing environment without causing a visual impact. Four other ramps also would be constructed at Kapolei, Kunia Road, Kaonohi Street, and Radford Drive, and one of the existing Waiawa Interchange ramps would be widened by one lane. These structures would become part of the existing infrastructure and be visually compatible with their respective environments. Views of and from the ramps would not be substantially affected because the ramps would not be visible at street level, and they would not impede important views such as those of the Koolau and Waianae Mountains or the distant urban and makai views.

The In-Town BRT transitway would require street widening and/or tree trimming at points along the alignment. Any visual impacts on landscaping would be mitigated through provision of new street plantings or appropriate tree trimming to accommodate the BRT vehicles. Other roadway widening in some areas would not have much impact, because widening is expected to be visually compatible with surrounding land uses.

5.4.2 Mitigation

All project elements potentially causing visual impacts would be designed and landscaped to have the least possible visual effect. Project elements such as transit centers, transit stops, and noise barriers would be designed to blend in with their surroundings.

The physical appearance of transit centers and stops located in Special Districts would be determined during final design. Kapiolani Boulevard and UH Manoa also are considered potentially sensitive areas for transit stops. Stops would be designed to blend in with their unique existing environments, based on public input and conformance with appropriate design standards. Effective planning with area businesses, residents, and agencies would result in design features unique to each area. For example, the transit stop at Kalakaua Avenue and Uluniu Avenue, fronting the Duke Kahanamoku Statue, would not involve a canopy structure. Rather, it would be a discreetly designed stop so as not to obstruct the view of the statue and the ocean from the street.

5.5 AIR QUALITY

This section describes the potential air quality impacts of the No-Build, TSM, and BRT Alternatives. Sections 5.5.1 and 5.5.2 provide descriptions of both the regional (i.e., Honolulu-wide) and microscale, or "hotspot," air quality impacts of the alternatives, respectively. The analytical methods used to predict the impacts described in these sections are accepted by U.S. Environmental Protection Agency (EPA) and the State of Hawaii Department of Health (HDOH). Section 5.5.3 discusses project conformity with the Statewide Implementation Plan.

The results of the regional analysis indicate that the No-Build Alternative would be expected to worsen regional air quality in the order of 15 to 30 percent due to more vehicles using the roadway system and increasing congestion. However, this impact would be partially offset by reductions in vehicle emissions per vehicle over time. The build alternatives (TSM and BRT Alternatives) would improve regional air quality over the No-Build Alternative by about 8 percent. However, there would be little difference between these alternatives.

At the microscale level, selected intersections representative of the primary transportation corridor were analyzed based on current and future No-Build, TSM and BRT Alternatives. Under current traffic and worst case meteorological conditions, carbon monoxide (CO) concentrations near 13 of the 17 intersections were estimated to exceed the State Ambient Air Quality Standards. Under the No-Build, TSM, and BRT Alternatives, eleven of the intersections are predicted to experience higher CO concentrations. In comparing these future scenarios, CO concentrations would be better at some intersections and worse at others. On average, the TSM and BRT Alternatives would not worsen air quality conditions compared to the No-Build Alternative, and there is little difference between the build alternatives.

The last section, 5.5.4, discusses how the use of low or zero emission buses under the BRT Alternative would represent an improvement in terms of microscale air quality over the conventional diesel buses under the No-Build and TSM Alternatives.

5.5.1 Regional (Mesoscale) Analysis

It is estimated that the daily total vehicle miles traveled (VMT) would increase from approximately 11,500,000 in 1995 to approximately 13,000,000 by the year 2025 under the No-Build Alternative. This represents a VMT increase of about 12 percent. Since the roadway network capacity in the project study area is not expected to increase substantially under the No-Build Alternative (or under the TSM and BRT Alternatives), it is very likely that average travel speeds would decrease due to the added VMT and traffic congestion. Therefore, daily vehicle hours traveled (VHT) delay is estimated to increase from approximately 132,000 hours in 1995 to approximately 147,000 hours by the year 2025 under the No-Build Alternative, which is about an 11 percent increase. As shown in Table 5.5-1, the composite emission factors decrease substantially with increasing vehicle travel speed. The increase in emissions that would be expected from the increase in VMT and VHT would be partially offset by a reduction in emissions per vehicle over time.

TABLE 5.5-1
COMPOSITE EMISSION FACTORS FOR
PRIMARY CORRIDOR TRANSPORTATION PROJECT

Vehicle Travel Speed (mph)	Composite Emission Factor (grams per vehicle mile)					
	1995			2020		
	Hydro-carbons	Carbon Monoxide	Nitrogen Oxides	Hydro-carbons	Carbon Monoxide	Nitrogen Oxides
10	6.6	55.9	3.0	4.5	44.2	2.2
15	4.8	40.0	2.8	3.5	34.6	2.0
20	3.8	31.8	2.7	2.9	29.2	1.9
25	3.2	26.3	2.6	2.4	22.5	1.9

Source: U.S. EPA MOBILE5A Emission Factor Model.

Total VMT estimates for the TSM and BRT Altematives are lower than the estimated total VMT for the No-Build Altemative. VHT delay estimates for the project build altematives are about 7 to 9 percent lower than the No-Build Altemative VHT delay. As a result, mesoscale emissions for the build altematives are expected to be about 8 percent less than for the No-Build Altemative. Based on the information available, there is little difference amongst the two build altematives with respect to mesoscale air quality impacts.

5.5.2 Microscale Analysis

Microscale, or "hot spot", air quality impact analyses were performed for five scenarios at 17 intersections, which represent various locations in the project area expected to experience peak carbon monoxide (CO) concentrations. The five scenarios studied are year 1999 with present conditions, and year 2025 conditions under the No-Build, TSM, and BRT Altematives. The microscale impact analyses involved assessing worst-case CO concentrations near the 17 selected intersections within the project area for both 1-hour and 8-hour averaging periods. These averaging periods correspond to the averaging times included in the State and the national AAQS.

As indicated in Table 5.5-2, the highest estimated worst-case 1-hour concentration for the existing scenario was 21.7 mg/m^3 and was predicted to occur during the moming peak-traffic hour near the intersection of South King Street and Punchbowl Street. One-hour values for other locations and times under the existing condition ranged from 3.6 mg/m^3 during the aftemoon at the intersection of Hotel Street and Bishop Street to 19.6 mg/m^3 during the moming near the intersection of Nimitz Highway and Sand Island Access Road. While the estimated worst-case concentrations for all locations and periods under the 1999 scenario are in compliance with the national 1-hour AAQS of 40 mg/m^3, the predicted values exceed the more stringent State 1-hour AAQS of 10 mg/ m^3, except at the intersections of Hotel Street and Bishop Street, Kalakaua Avenue and Kaiulani Avenue, Kuhio Avenue and Kapahulu Avenue, and Kuhio Avenue and Seaside Avenue.

Under the No-Build Altemative, worst-case 1-hour concentrations were predicted to increase at eleven of the 17 locations studied. Under this altemative, the highest worst-case 1-hour value (29.7 mg/m^3) was predicted to occur near the intersection of Ala Moana Boulevard and Kalia Road during the moming. Concentrations at other locations and times ranged between 3.4 mg/m^3 and 26.1 mg/m^3. Thirteen of the 17 locations studied were predicted to potentially exceed the State AAQS. However, none were predicted to exceed the national AAQS.

Under the TSM Altemative, worst-case 1-hour concentrations were predicted to remain relatively unchanged, when compared to the No-Build Altemative. Similar to the No-Build Altemative, the highest worst-case 1-hour concentration was predicted to occur near the intersection of Ala Moana Boulevard and Kalia Road during the moming, at 30.1 mg/m^3. This was the highest 1-hour value amongst all of the altematives and locations studied. Thirteen of the 17 locations studied were predicted to potentially exceed the State AAQS. However, none were predicted to exceed the national AAQS.

TABLE 5.5-2
ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS NEAR SELECTED INTERSECTIONS WITHIN THE PROJECT AREA
(milligrams per cubic meter)

Roadway Intersection	Present (1999)		Year 2025 Alternative					
			No-Build		TSM		BRT	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
N. King Street / Kalihi Street	15.4	14.6	16.7	17.4	16.2	15.6	17.2	17.9
Dillingham Boulevard / Kalihi Street	11.3	11.7	13.0	12.1	13.5	11.5	13.3	9.2
S. King Street / Bishop Street	17.6	13.8	26.1	19.3	28.9	20.4	23.9	17.7
Hotel Street / Bishop Street	6.1	3.6	8.3	4.7	7.1	5.0	14.2	9.0
S. King Street / Punchbowl Street	21.7	15.0	23.2	16.2	23.5	16.3	19.3	16.8
Kapiolani Boulevard / Kalakaua Avenue	18.8	13.3	20.4	16.4	19.6	16.4	25.1	20.7
S. King Street / Beretania Street / University Avenue	18.8	17.1	18.4	15.5	17.4	15.0	19.1	18.5
Dole Street / University Avenue	19.1	14.4	12.6	12.1	12.9	12.1	13.0	11.6
Nimitz Hwy. / Sand Island Access Road	19.6	16.8	20.0	16.8	19.9	16.8	15.4	13.6
Nimitz Highway / Waiakamilo Rd.	15.2	15.0	17.0	13.1	17.0	13.3	12.9	10.6
Ala Moana Boulevard / South Street	12.3	10.2	11.3	10.4	13.0	10.1	11.3	9.2
Ala Moana Boulevard / Atkinson Drive	17.1	15.4	21.7	17.8	23.4	18.5	20.7	18.8
Ala Moana Boulevard / Kalia Road	13.5	13.0	29.7	23.4	30.1	23.2	29.7	23.7
Kalakaua Avenue / Kaiulani Avenue	5.1	5.0	6.6	7.1	7.1	7.5	5.4	5.6
Kalakaua Avenue / Kapahulu Avenue	10.4	9.1	3.6	3.4	3.4	3.4	3.4	3.4
Kuhio Avenue / Kapahulu Avenue	9.0	6.2	8.5	7.2	8.3	7.7	8.5	6.6
Kuhio Avenue / Seaside Avenue	7.7	7.0	9.6	10.5	10.6	10.9	11.6	11.2

Source: B.D. Neal & Associates.

Notes: Hawaii AAQS: 10 mg/m^3 (9.5 ppm).
National AAQS: 40 mg/m^3 (35 ppm).
Underline indicates worst-case condition exceeds Hawaii AAQS.

Under the BRT Alternative, worst-case 1-hour concentrations at most of the locations studied were predicted to be about the same as those under either the No-Build or the TSM Alternative. Although CO 1-hour concentrations at five of the 17 representative locations were predicted to be slightly greater under the BRT Alternative than under either the No-Build or TSM Alternative, these differences are small and within the accuracy limits of the model. They reflect some additional queuing that occurs under the BRT Alternative. The differences would not be noticeable. The highest worst-case 1-hour concentration was predicted to occur near the intersection of Ala Moana Boulevard and Kalia Road during the morning, at 29.7 mg/m^3, which is almost the same predicted concentration under the TSM Alternative. Fourteen of the 17 locations studied were predicted to potentially exceed the State AAQS, one more than under the No-Build and TSM Alternatives. This additional location is the Hotel Street and Bishop Street intersection. None of the locations were predicted to exceed the national AAQS.

The estimated worst-case 8-hour concentrations at the 17 study locations under the four scenarios are shown in Table 5.5-3. Under the present scenario, worst-case 8-hour concentrations were found to range from 2.6 to 10.8 mg/m^3, with the highest value occurring at the intersection of South King Street and Punchbowl Street. Thirteen of the 17 locations were predicted to potentially exceed the State AAQS. One of the 17 locations (South King Street at Punchbowl) was predicted to potentially exceed the national AAQS, but other locations were in compliance with the national AAQS by a small margin.

Under the No-Build Alternative, concentrations were predicted to increase compared to the existing scenario at 12 of the 17 locations studied. The predicted worst-case concentrations ranged from 1.8 to 14.8 mg/m^3. The estimated concentrations at 13 of the 17 locations would exceed the State AAQS, and estimated concentrations at six locations would exceed the national AAQS.

Under the TSM Alternative, the predicted worst-case 8-hour concentrations remained about the same as the No-Build Alternative. Estimated concentration would exceed the State AAQS at 13 of the 17 study locations and the national AAQS at five locations.

Under the BRT Alternative, the predicted worst-case 8-hour concentrations remained about the same as either the No-Build or the TSM Alternative. Like the CO 1-hour results, CO 8-hour concentrations at the same five representative locations were predicted to be slightly larger than under the BRT Alternative than under either the No-Build or TSM Alternative, but these differences are within the accuracy of the model and would not be noticeable. They reflect some additional queuing that would result with the BRT Alternative. The highest worst-case concentration was 14.8 mg/m^3, which occurred at the intersection of Ala Moana Boulevard and Kalia Road. Estimated concentration would exceed the State AAQS at 14 of the 17 study locations and the national AAQS at four locations.

Under worst-case meteorology conditions, CO concentrations are predicted to exceed both the State and national standards at various locations under existing conditions and all of the future alternatives. Concentrations under the TSM and BRT Alternatives would be worse than under the No-Build Alternative at some locations and better at others. On average, the TSM and BRT Alternatives would not worsen air quality concentrations compared to the No-Build Alternative.

5.5.3 Conformity with Statewide Implementation Plan

The Primary Corridor Transportation Project is included in the current Statewide Transportation Improvement Program (STIP) for Fiscal Years 2000-2002, and the regional effects of this project are incorporated into and satisfy the requirements of the conforming Statewide Implementation Plan (SIP).

TABLE 5.5-3
ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS NEAR SELECTED INTERSECTIONS WITHIN THE PROJECT AREA
(milligrams per cubic meter)

Roadway Intersection	Present (1999)	Year 2025 Alternative		
		No-Build	TSM	BRT
N. King Street / Kalihi Street	7.7	8.7	8.1	9.0
Dillingham Boulevard / Kalihi Street	5.8	6.5	6.8	6.6
S. King Street / Bishop Street	8.8	13.0*	14.4*	12.0*
Hotel Street / Bishop Street	3.0	4.2	3.6	7.1
S. King Street / Punchbowl Street	10.8*	11.6*	11.8*	9.6
Kapiolani Boulevard / Kalakaua Avenue	9.4	10.2*	9.8	12.6*
S. King Street / Beretania Street / University Avenue	9.4	9.2	8.7	9.6
Dole Street / University Avenue	9.6	6.3	6.4	6.5
Nimitz Highway / Sand Island Access Road	9.8	10.0*	10.0*	7.7
Nimitz Highway / Waiakamilo Road	7.6	8.5	8.5	6.4
Ala Moana Blvd. / South St.	6.2	5.6	6.5	5.6
Ala Moana Boulevard / Atkinson Drive	8.6	10.8*	11.7*	10.4*
Ala Moana Boulevard / Kalia Road	6.8	14.8*	15.0*	14.8*
Kalakaua Avenue / Kaiulani Avenue	2.6	3.6	3.8	2.8
Kalakaua Avenue / Kapahulu Avenue	5.2	1.8	1.7	1.7
Kuhio Avenue / Kapahulu Avenue	4.5	4.2	4.2	4.2
Kuhio Avenue / Seaside Avenue	3.8	5.2	5.4	5.8

Source: B.D. Neal & Associates.
Notes: Hawaii AAQS: 5 mg/m^3 (4.5 ppm).
National AAQS: 10 mg/m^3 (9 ppm).
Underline indicates worst-case condition exceeds Hawaii AAQS.
Asterisk indicates worst-case condition exceeds National AAQS.

5.5.4 Quality of Life

Air quality often affects the quality of urban life. In urban areas, emissions from motor vehicles, industrial facilities, and construction sites are the primary sources of air pollution. Motor vehicles in particular are the primary causes of poor air quality in many cities because they emit such pollutants as carbon monoxide, nitrogen oxides, and hydrocarbons.

Conventional diesel buses emit higher levels of particulate matter (black smoke) than other gasoline-powered motor vehicles. While the total amount of particulate matter generated by buses is a small percentage of the total generated on a regional scale, it does contribute to the nuisance of smoke and soot along the curbside. Despite recent reductions in particulate levels from diesel buses, and the fact that emissions are exhausted at roof level rather than at street level, these particulate emissions can still be very annoying to people. In addition, the California Air Resources Board has identified diesel soot as a potential carcinogen. Diesel exhaust most easily enters the body by breathing, but may also cling to skin or hair and thereafter may be ingested as a consequence of hand-to-mouth activity. Therefore, since pedestrians utilizing the same streetscape as the transit system would be exposed to particulate matter emitted by passing buses, there is some level of health risk from the pedestrian perspective.

Technologies proposed for the BRT Alternative include electric vehicles powered by a wayside traction power delivery system (embedded plate technology) or hybrid electric vehicles where the energy for the traction power is carried on-board the vehicle. The embedded plate technology vehicles would emit zero emissions. The hybrid electric vehicles would be low-emission vehicles because their diesel engines would always be operating at efficient levels. (The black smoke coming from the exhaust of a diesel bus typically occurs when the bus is accelerating and under slow-speed high-load conditions - non-optimal operating conditions). The No-Build and TSM Alternatives would use conventional diesel-powered buses, at least for the immediate future.

Since the BRT Alternative would utilize either zero or low-emission vehicles, it would substantially reduce the level of particulate emissions (black smoke and soot) at certain intersections and street level locations in comparison to the No-Build and TSM Alternatives, which would continue to utilize conventional diesel buses. Unfortunately, there is no acceptable method or model to estimate the microscale impacts of particulate matter. There are accepted methods to estimate particulate matter on a regional scale. However, it is likely that the regional difference between the BRT Alternative, and the No-Build and TSM Alternatives would be very small or non-existent because the reduction in particulate matter due to the replacement of some of the transit diesel buses with zero or low-emission vehicles would represent a very small percentage of the total particulate emissions in the region. However, the replacement of diesel buses with zero or low-emission vehicles would certainly reduce smoke and soot at the street level along the transit alignment, which would improve the pedestrian experience. Therefore, the BRT Alternative would contribute more to improving the quality of urban life than the No-Build and TSM Alternatives.

5.6 NOISE AND VIBRATION

This section discusses the noise and vibration impacts of the proposed alternatives and discusses possible mitigation measures. Section 5.6.1 describes the methodology of the noise impact evaluation, performed in conformance with the requirements of Federal and State agencies. Sections 5.6.2 and 5.6.3 discuss the impacts and recommended mitigation measures. Section 5.6.4 is a discussion of noise levels in relation to the quality of urban life, with particular reference to the difference between conventional diesel buses and electric or hybrid buses with diesel/electric propulsion.

In general, the future noise levels would be lower with the BRT Alternative than with the TSM and No-Build Alternatives. This is due to the use of the quieter electric or hybrid diesel/electric vehicles in the In-Town portion of the BRT Alternative, versus the diesel buses operating in the TSM and No-Build Alternatives. No vibration impacts are expected.

However, there would be a moderate transit noise impact under the BRT Alternative with the hybrid diesel/electric vehicles. There are no projected noise impacts with the wayside-powered electric vehicles. The highway noise impact of the Regional BRT would be near the Kunia Interchange on the H-1 Freeway where standard diesel buses would operate.

Sound walls could be used for sites requiring mitigation, only where reasonable and feasible. The locations and recommended heights of these walls are described in Section 5.6.3

5.6.1 Methodology for Impact Evaluation

This section describes the methodology used for impact evaluation, in accordance with Federal and State requirements.

1) Transit Noise

The proposed Bus Rapid Transit (BRT) transit vehicle would be a single-articulated, low-floor electrically powered or hybrid diesel/electric bus. No overhead catenary or steel rail would be required. Electric powered vehicles would be supplied power from a wayside system referred to as embedded plate. Hybrid diesel/electric buses would be electrically propelled vehicles in which the electricity is produced by an on-board generator (alternator) powered by a diesel engine; electric propulsion would be provided by on-board batteries.

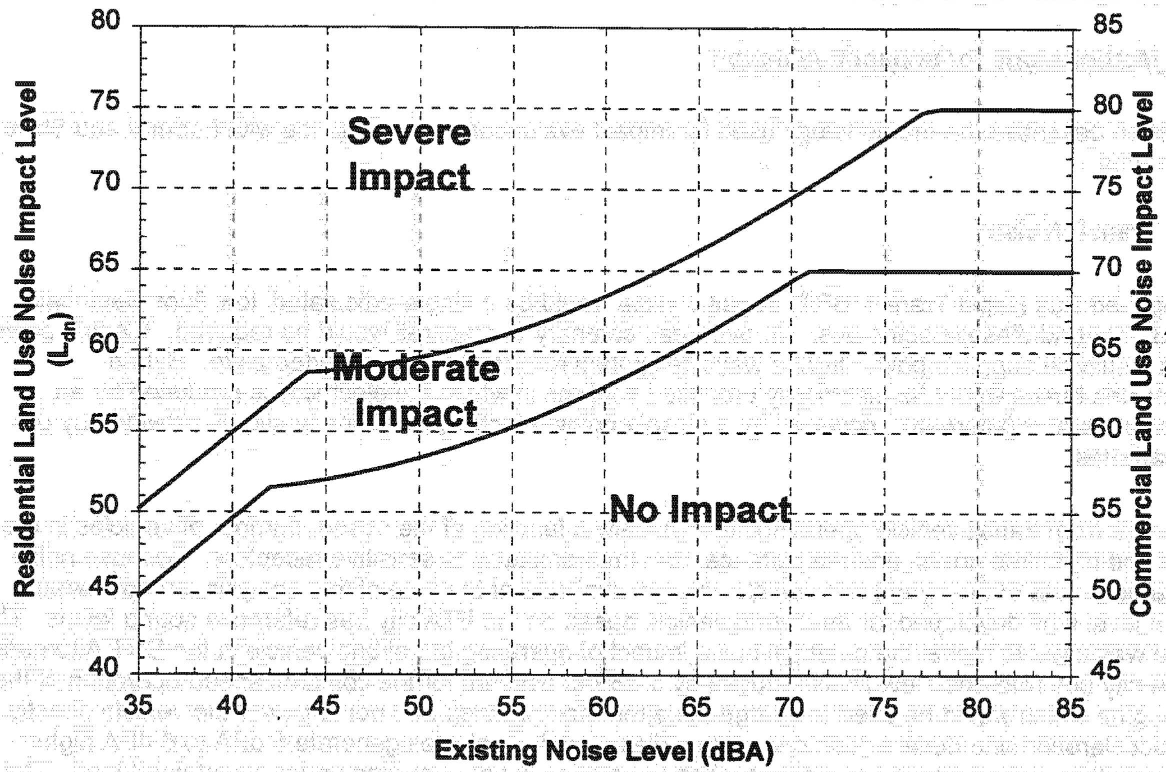
Noise levels from transit vehicle operations are typically a function of the speed, number of vehicles in the daytime and nighttime hours, and the distance from the transitway to sensitive receptors. Because noise measurement data of the hybrid bus vehicle was not available at the time of this analysis, an estimated emission level was developed for the hybrid vehicle based on the FTA city bus reference sound levels. This estimate was used to model the potential noise impact of operating the hybrid vehicle in the BRT Alternatives. The FTA city bus reference level was reduced by 3 dBA to account for the constant speed operation of the diesel engine which would be used to charge the alternator/batteries and not to power the vehicle directly. During acceleration and deceleration operations, diesel engine vehicles generate 5 dBA to 6 dBA higher noise levels than during passby operations when the engine is not operating under a sustained load. The other vehicle proposed is a wayside powered electric bus that would be similar to a rubber-tired Automated Guideway Transit (AGT) vehicle. The FTA noise reference level of an AGT was used to represent the operating noise levels of this type of vehicle.

The transit noise analysis for this project is performed in six steps:

- Inspect project area and categorize existing land use;
- Measure the existing area noise levels;
- Calculate the project-related noise levels;
- Combine the project related noise levels with the existing noise levels;
- Compare the change in noise levels to the FTA criteria; and
- Identify impacts and investigate mitigation measures.

The BRT transit noise levels were compared to the impact thresholds of the FTA criteria. The FTA criteria for residential land use and other uses with nighttime sleep activities are presented in Figure 5.6-1, which identifies the ranges of no impact, moderate impact, and severe impact for varying levels of existing and project-created noise. The criteria are based on either a 24-hour Ldn noise level for residences and buildings where people normally sleep, or a one-hour Leq noise level for land uses and buildings with primarily daytime activities. FTA requires that mitigation be evaluated for all areas where moderate impacts are projected, although consideration of factors such as cost-effectiveness can be incorporated into the decision about whether to specify mitigation for a particular area. FTA considers severe impact to be a "significant adverse effect" under NEPA. Noise mitigation will normally be specified for severe impact areas, unless there is no practical method of achieving a reduction in noise level.

FIGURE 5.6-1
FTA NOISE IMPACT CRITERIA



2) Transit Vibration

As a rubber tired vehicle, ground vibration levels from the electric or hybrid diesel/electric bus would be minimal, and would not exceed the FTA criteria of 72 VdB for residential buildings and other structures where people normally sleep (Category 2) (see Table 5.6-1). There is no land use along the alignment that has vibration-sensitive equipment and would be subject to lower vibration impact criteria.

TABLE 5.6-1
FTA GROUND-BORNE VIBRATION IMPACT CRITERIA

Land Use Category	Ground-borne Vibration Impact levels (VdB re 1 micro inch/sec)	
	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65VdB[3]	65VdB[3]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB

Source: Transit Noise and Vibration Impact Assessment, FTA, April, 1995.
Notes: [1] "Frequent Events" is defined as more than 70 vibration events per day.
[2] "Infrequent Events" is defined as fewer than 70 vibration events per day.
[3] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

3) Highway Noise

Potential noise impacts of the proposed highway elements include H-1 from Managers Drive to the Makakilo Interchange where new HOV lanes are proposed. (The proposed change in the zipper lane from A.M. only to A.M./P.M. is not included in the noise analysis because there would be no new lanes).

Since this highway element would be integrated with an existing highway, the determination of noise impact is based on existing FHWA noise prediction procedures and impact criteria (Highway Traffic Noise Analysis and Abatement, 1995). FHWA requires assessment at affected existing activities, developed lands, and undeveloped lands for which development is planned, designed, or programmed. At these locations, traffic noise is computed for the design year peak noise traffic hour - that is, when the roadway is at its maximum lane volume capacity operating at Level of Service C (allowable speed limit).

Under FHWA guidelines, a noise impact can occur in two ways: one related to land-use type and the other to existing noise levels. A noise impact occurs when predicted traffic noise levels approach or exceed the applicable Noise Abatement Criteria (NAC) in Table 5.6-2 or when predicted traffic noise levels substantially exceed existing noise levels.

The Hawaii State Department of Transportation (HDOT) Noise Analysis and Abatement Policy (1996) implements FHWA regulations on noise abatement (23 CFR 772) for the State of Hawaii. The regulations and policy require that a noise analysis be performed whenever potentially affected receptors exist, either as developed lands or lands that are planned, designed, or programmed for future use.

The FHWA NAC are for different exterior and interior land use activities. The NAC do not constitute legally enforceable noise standards, but represent a yardstick for evaluating the effect of project noise on the surrounding community. The State of Hawaii has adopted the NAC as its standard.

Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels. "Approach" means at least 1 dBA less than the NAC of Leq(h) 67 dBA, and "substantially exceed the existing noise levels" means an increase of at least 15 dBA. The HDOT is primarily concerned with Category B land uses. If the NAC are approached or exceeded in such areas, or if there is a substantial increase above the existing noise level, noise abatement measures must be considered.

TABLE 5.6-2
FHWA NOISE ABATEMENT CRITERIA (NAC)

Activity Category	Leq(h) for Noisiest Traffic Hour – dBA	Description of Activity
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B.
D	—	Undeveloped lands
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Highway Traffic Noise Analysis and Abatement, FHWA, 1995.
Notes: Leq(h) is the one-hour energy equivalent sound level.
Interior noise level standards apply to indoor activities for those parcels where no exterior noise sensitive land use or activities have been identified; and situations where the exterior activities are either remote from the highway or shielded, so that while the exterior activities remain undisturbed, noise nevertheless affects interior activities.

HDOT's Noise Analysis and Abatement Policy (1996) is used to determine whether noise abatement measures can be implemented, depending on if these measures are reasonable and feasible, based on the following criteria:

- Provide a minimum noise reduction of 5 dBA;
- Cost of noise abatement does not exceed $35,000 per residence benefited;
- Number of residences protected will include all dwelling units-owner occupied houses, rental units, mobile homes, etc. All units benefited by a 5 dBA or more noise reduction will be counted regardless of whether or not they were identified as impacted;
- Views of impacted residents are a major consideration in the reasonableness of noise abatement measures;
- Residential areas where future traffic noise levels are greater than 70 dBA or 20 dBA higher than existing noise levels will be given greater consideration; and
- Residential areas along highways at a new location and residential areas constructed before an existing highway will be given greater consideration.

Noise abatement would be considered only at existing residential or planned development sites where building permit approvals have been obtained. The abatement would apply only to outdoor ground level areas.

The traffic noise modeling was performed using the Traffic Noise Modeling (TNM) Highway Traffic Noise Model, Version 1.0b (FHWA, 1998). Input variables to noise modeling and analysis include traffic volumes, speeds, and vehicle fleet mix (auto, medium truck, and heavy truck percentages). To predict the highest future traffic noise, the peak traffic capacity per lane (prior to speed degradation) for modeling mainline highway noise levels was used.

5.6.2 Noise Impacts

In the following discussion the first subsection analyzes the noise impacts that would arise from the transit elements of the proposed project for both the hybrid diesel/electric bus and the wayside-powered electric bus. The second subsection analyzes the noise impact that would arise from the highway element of the proposed project, specifically the H-1 HOV lanes. Only those monitoring sites that lie on the proposed alignment are included in the discussion below.

1) In-Town Transit Elements

Table 5.6-3 summarizes existing and projected transit noise levels for both the electric and hybrid diesel/electric vehicles at 25 noise monitoring locations along the In-Town BRT alignment (see Figures 3.6-3A through 3.6-3C). Noise impacts discussed below are defined by FTA as either no impact, moderate, or severe.

No-Build Alternative

The only source of future noise levels would be traffic movements on the local arterials in the project area. Changes in 2025 traffic are expected to result in no change to a one dBA increase in the existing 24-hour (Ldn) and peak hour (Leq) noise levels at each of the 25 noise measurement sites.

TSM Alternative

The proposed improvements under this alternative would only affect the peak hours of traffic activities. The overall change in traffic noise level would be similar to the future No-Build noise levels. Therefore, no impact is expected under the TSM Alternative.

BRT Alternative

Severe noise impacts are not projected for any sites along the BRT Alternative alignments. There would be moderate noise impacts at only one location, Bishop Garden Apartments (Site 1) with the hybrid diesel/electric vehicle. There would be no impacts projected with a wayside-powered electric vehicle such as STREAM.

2) Highway Elements

The traffic noise impact analysis has been prepared to assess the addition of HOV lanes to H-1 between Managers Drive and Kunia Road.

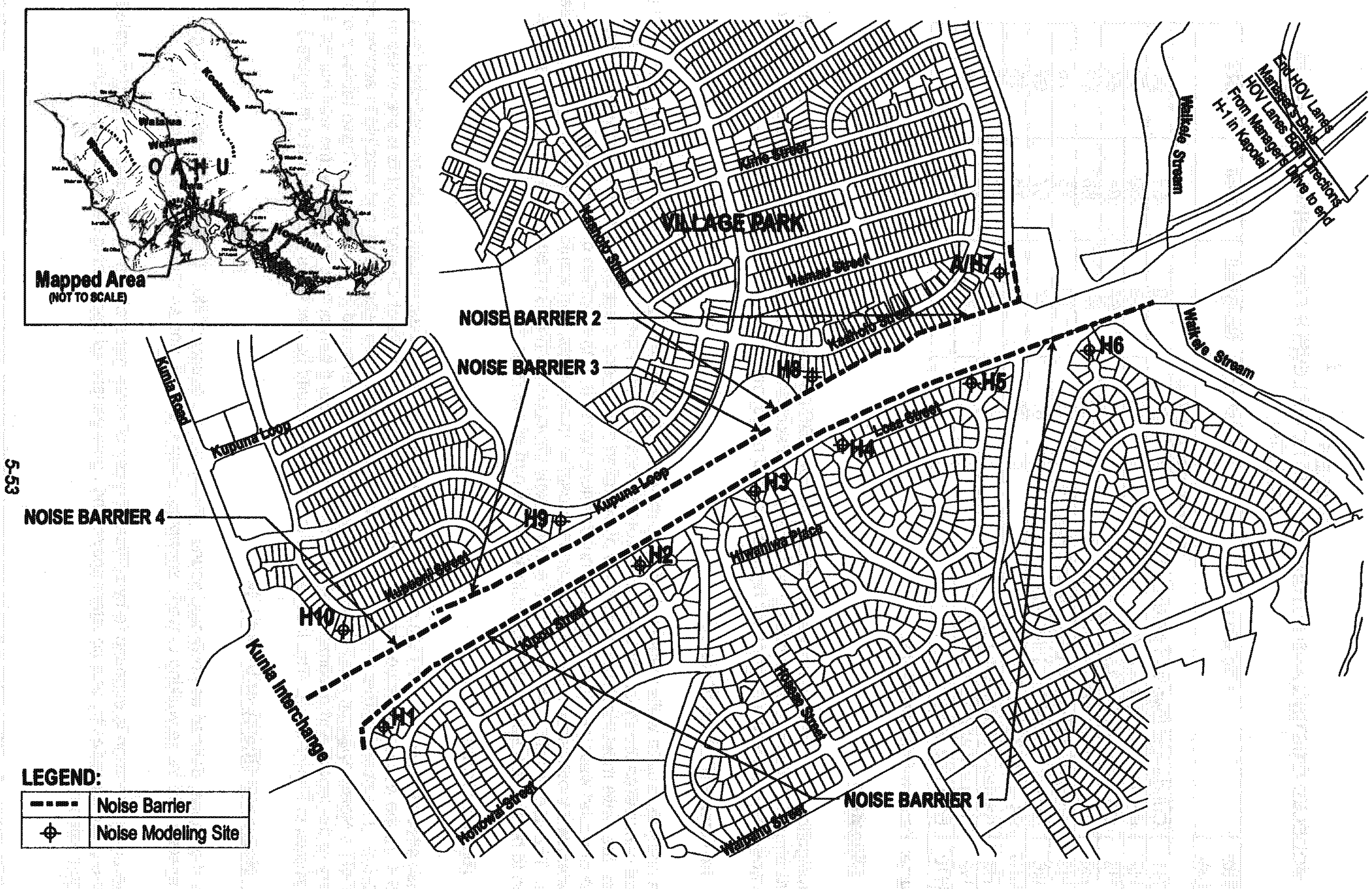
To model properly the HOV lanes on H-1 that would be part of the TSM and BRT Alternatives, ten modeling sites were selected between just west of Managers Drive from the Waikele River Bridge to the Kunia Interchange (see Figure 5.6-2). These sites represent existing single family and multi-family residences on both sides of H-1. Due to limitations on access, all existing conditions on these H-1 sites except H7 were modeled rather than measuring actual noise levels. Site H7 is the same location as noise measurement Site A (see Section 3.6) where existing noise measurements were taken. At this site it was possible to count the traffic during the noise measurement survey. These traffic counts were used to calibrate and adjust the TNM model to account for the topography and local site conditions along the H-1 Freeway.

TABLE 5.6-3
BRT ALTERNATIVE
ESTIMATED FUTURE NOISE LEVELS AT REPRESENTATIVE IN-TOWN SENSITIVE LAND USES

				BRT	
Site No.	Location	FTA Land Use Category (1,2,3)	Existing Noise Level[1] (dBA)	Project Generat-ed Noise	FTA Level of Noise Impact
1	Bishop Garden Apartments	2	66	65[2]/59[3]	Moderate/ No Impact
2	Harbor Square Condos	2	70	61/55	no impact
3	Royal Court Condominiums, 920 Ward	2	73	58/52	no impact
H4	2386 Kapiolani Blvd	2	74	55/49	no impact
5	845 University Avenue	2	69	55/49	no impact
6	Apartment Building, 1720 Ala Moana	2	77	56/50	no impact
7	Saratoga Avenue at PO Office	2	66	54/48	no impact
8	Apartments on Kuhio Avenue between Launiu & Kaiolu	2	76	59/53	no impact
9	Outrigger Waikiki Islander Hotel	2	70	54/48	no impact
10	Waikiki Banyan Hotel	2	72	56/50	no impact
11	Queen Kapiolani Hotel on Kapahulu at Cartwright Road	2	70	55/49	no impact
12	Apartment Building, 1350 Ala Moana	2	73	60/54	no impact
E	Kalihi Kai Elementary School	3	69	56/50	no impact
F	Honolulu Community College	3	72	57/51	no impact
G	Aala Park on King Street	3	68	59/53	no impact
H	Chinatown Gateway Park at Hotel and Bethel	3	73	62/56	no impact
I	Hotel Street at Bishop Street	2	73	64/58	no impact
J	Iolani Palace, on Richards	3	68	59/53	no impact
K	Iolani Palace, on Kapiolani	3	75	53/47	no impact
L	Straub Hospital	2	76	61/55	no impact
M	McKinley HS on Kapiolani	3	79	55/49	no impact
N	Ala Wai Community Park	3	67	53/47	no impact
O	Buddhist Center (University of Hawaii)	3	70	55/49	no impact
P	Gartley Hall on Campus Road (University of Hawaii)	3	63	59/53	no impact
Q	Fort DeRussy, mauka side of Kalia Road	3	66	56/50	no impact

Source: Parsons Brinckerhoff, Inc.
Notes: [1]FTA Category 2 existing noise levels are 24-hour Ldn levels. Category 3 existing noise levels are short-term one-hour Leq levels.
[2]Project generated noise levels for a hybrid diesel/electric bus.
[3]Project generated noise levels for a wayside-powered electric bus, such as STREAM.

It is predicted that the FHWA NAC of 67 dBA would be approached or exceeded at 9 of the 10 modeling sites on H-1 under the No-Build, TSM, and BRT Alternatives. Although predicted future traffic noise levels (Leq) would be the same or no more than 1 dBA higher than the existing peak noise traffic levels (Table 5.6-4) mitigation would be required if Federal funds are used to construct the HOV lanes in this area. Noise abatement measures for these sites are discussed in Section 5.6.3.



Traffic Noise Modeling Sites And Noise Barrier Wall Locations

Figure 5.6-2

TABLE 5.6-4
MODELED EXISTING AND FUTURE TRAFFIC NOISE LEVELS FOR HIGHWAY ELEMENTS
Leq (dBA)

Site No.	Location	Existing	No-Build	TSM	BRT
H-1 Receptor Sites					
H1	Cul-de-sac Ewa end of Kipou St.	68	68	68	68
H2	Kipou St. at Kenola Pl.	69	69	69	69
H3	End of Hinuhinu Way Cul-de-sac	64	64	64	64
H4	Ewa end of Loaa St. makai of H-1	68	68	68	69
H5	Koko Head end of Loaa St. at Lakau Pl.	75	75	75	75
H6	End of Pilimai Pl. Cul-de-sac	67	67	67	67
A/H7	94 – 1413 Hiapo St.	75	75	75	75
H8	Kaaholo at Manena Pl.	78	78	78	78
H9	Kupuohi at Kupuna Loop	78	78	78	78
H10	Ewa end of Kupuohi	74	74	74	74

Source: Parsons Brinckerhoff, Inc.

5.6.3 Mitigation

Some mitigation of noise impacts due to both the In-Town BRT transit element and the highway element in the TSM and BRT Alternatives would be necessary. The section addresses mitigation measures for transit-related noise impacts and mitigation for highway-related noise impacts.

1) In-Town BRT Transit Noise

For this analysis, sound walls were evaluated as mitigation for the In-Town BRT transit noise impacts. Sound walls are considered the most effective noise control measure for at-grade transit systems. In order to be effective, the walls must block the direct view of the noise source and must be solid with minimal openings. The use of sound walls along at-grade segments where transit is in the median of a street would not be feasible since it would affect normal traffic and pedestrian movements, and would restrict emergency vehicle access. The use of noise mitigation for the moderately impacted Bishop Garden Apartments (Site 1) is not deemed to be feasible and would not be included as part of this project.

2) Highway Noise

For those sites along H-1 in the TSM and BRT Alternatives where a noise impact has been predicted (see Table 5.6-4), the estimated noise level reduction for sound barrier walls of different heights is presented in Table 5.6-5. The sound barrier walls that have been determined to be reasonable and feasible in accordance with HDOT's Noise Analysis and Abatement Policy (1996) are presented in Table 5.6-6. These tables are a summary of the length and maximum height of the required sound barrier wall segments; the wall numbers are as shown in Figure 5.6-2. The locations of the required sound barrier walls are presented in Figure 5.6-2.

5.6.4 Noise and Quality of Urban Life

The level of noise, defined as unwanted sound, greatly affects quality of life. This includes people using the transit system and those walking to work, shopping, eating, at play, and so forth along the alignment.

The average pedestrian is exposed to two different types of noise generated from vehicles: noise generated when the vehicle passes by at a constant speed and noise generated upon vehicle acceleration from a standing position.

TABLE 5.6-5
HIGHWAY NOISE BARRIER ANALYSIS - Leq (dBA)

Site No.	Modeled Existing	Modeled Future Unmitigated	6-foot Walls	8-foot Walls	10-foot Walls	12-foot Walls	14-foot Walls	16-foot Walls	18-foot Walls	20-foot Walls
H1	68	68	67	66	65	64	**63**	62	61	60
H2	69	69	**63**	63	62	62	61	60	60	59
H3	64	64	**57**	57	56	56	55	55	55	55
H4	68	69	**62**	61	59	58	58	58	58	58
H5	75	75	73	71	69	67	66	**65**	64	63
H6	67	67	**62**	60	59	58	57	57	56	55
A/H7	75	75	72	71	69	68	66	**65**	63	62
H8	78	78	75	73	71	69	68	67	66	**65**
H9	78	78	76	75	73	72	70	69	67	**66**
H10	74	74	70	69	68	68	**67**	67	67	67

Source: Parsons Brinckerhoff, Inc.
Notes: **XX** – Required noise barrier height.

TABLE 5.6-6
REQUIRED NOISE BARRIER WALLS FOR H-1 FREEWAY

Wall #	Location	Wall Height (feet)	Wall Length (feet)	Number of First Row Residences Protected	Sites Protected
1	Koko Head-bound on ramp at Kunia Interchange to mauka Waikele Stream	6 to 16	6,200	64	H1,H2,H3, H4,H5,H6
2	Ewa-bound right-of-way line	20	2,500	40	H7,H8
3	Ewa-bound edge Mainline to Ewa-bound off-ramp at Kunia Road	20	1,550	30	H9
4	Ewa-bound edge of Mainline	14	1,325	15	H10

Source: Parsons Brinckerhoff, Inc.
Note: See Figure 5.6-2 for locations of required noise barrier walls.

The passby noise of a diesel bus operating at 48 kilometers per hour (30 mph) at a distance of 15 meters (50 feet) is 81 dBA, in comparison to a rubber tired electric vehicle which has a passby level of 75 dBA. This is a difference of 6 dBA, which is a noticeable change in noise level that humans can hear. The hybrid diesel/electric vehicles would have a passby noise level midway between the diesel and electric powered vehicles.

There are also differences between acceleration noises for conventional diesel buses in the No-Build and TSM Alternatives and the electric or hybrid diesel/electric buses in the BRT Alternative. Accelerating diesel buses are typically 3 to 6 dBA noisier than non-accelerating buses, which subjectively ranges from perceptible to clearly noticeable. For comparison, the hybrid diesel/electric buses would have acceleration noise levels that are comparable to the passby noise levels of diesel buses. Since the diesel engine in a hybrid diesel/electric bus operates at a constant, optimum rpm, its noise level would be substantially less than noise levels generated by a diesel engine when accelerating from a standing position. The all-electric vehicle would be 3 dBA to 6 dBA quieter than the hybrid diesel/electric bus during acceleration.

Thus, at the street level, a person's environment along the transit spine would be less noisy with the BRT Alternative than with the TSM and No-Build Alternatives. This difference is due to the use of the quieter electric or hybrid diesel/electric vehicles in the BRT Alternative, versus the diesel buses operating in the TSM and No-Build Alternatives.

5.7 ECOSYSTEMS

No long-term adverse impacts are expected for the ecosystems within the influence of the No-Build, TSM, or BRT Alternatives.

With respect to onshore ecosystems, natural habitat is very limited along the roadways and at the sites that would be affected by any of the alternatives. Although the BRT Alternative would directly affect individuals of species inhabiting the construction areas that are relatively immobile or have small home ranges, removal of this habitat would have little overall effect on wildlife populations. The sites do not represent unique or special habitat within the project area. The TSM and BRT Alternatives would have no effect on the characteristics or size of populations of the resident wildlife or plant species in the area. The BRT Alternative would include new landscaping in areas affected by construction.

No state or federally listed, proposed, or candidate threatened or endangered plant or animal species described in Section 3.7 are likely to be affected within areas proposed for construction. However, a survey of the project area would be conducted for white tern (*Gygis alba*) and their roosts, if the BRT Alternative is selected as the preferred alternative. The State of Hawaii lists the Oahu population of the white tern as endangered. The major site currently used by white terns on Oahu is Kapiolani Park, with some limited activity elsewhere in urban Honolulu (Bruner, May 1992).

Some trees and shrubs would be removed or trimmed to allow the transit stops to be built or the roadway to be widened for the BRT Alternative. The impacts would depend on the stop design and the transit vehicle requirements. The majority of the trees potentially affected are the monkeypods along Kapiolani Boulevard. A set of palm trees and other landscaping at the corner of Richards and Halekauwila Streets would also have to be removed as part of the street widening to allow for an appropriate turning radius for the BRT. The trees that might be affected, either by severe trimming or removal, are shown on Figures 5.7-1A and B.

When the preferred alternative is selected, site visits would be conducted to determine the actual amount of vegetation to be removed. Where feasible, trees would be preserved and utilized in project landscaping. A tree preservation program would be developed in conjunction with a certified arborist.

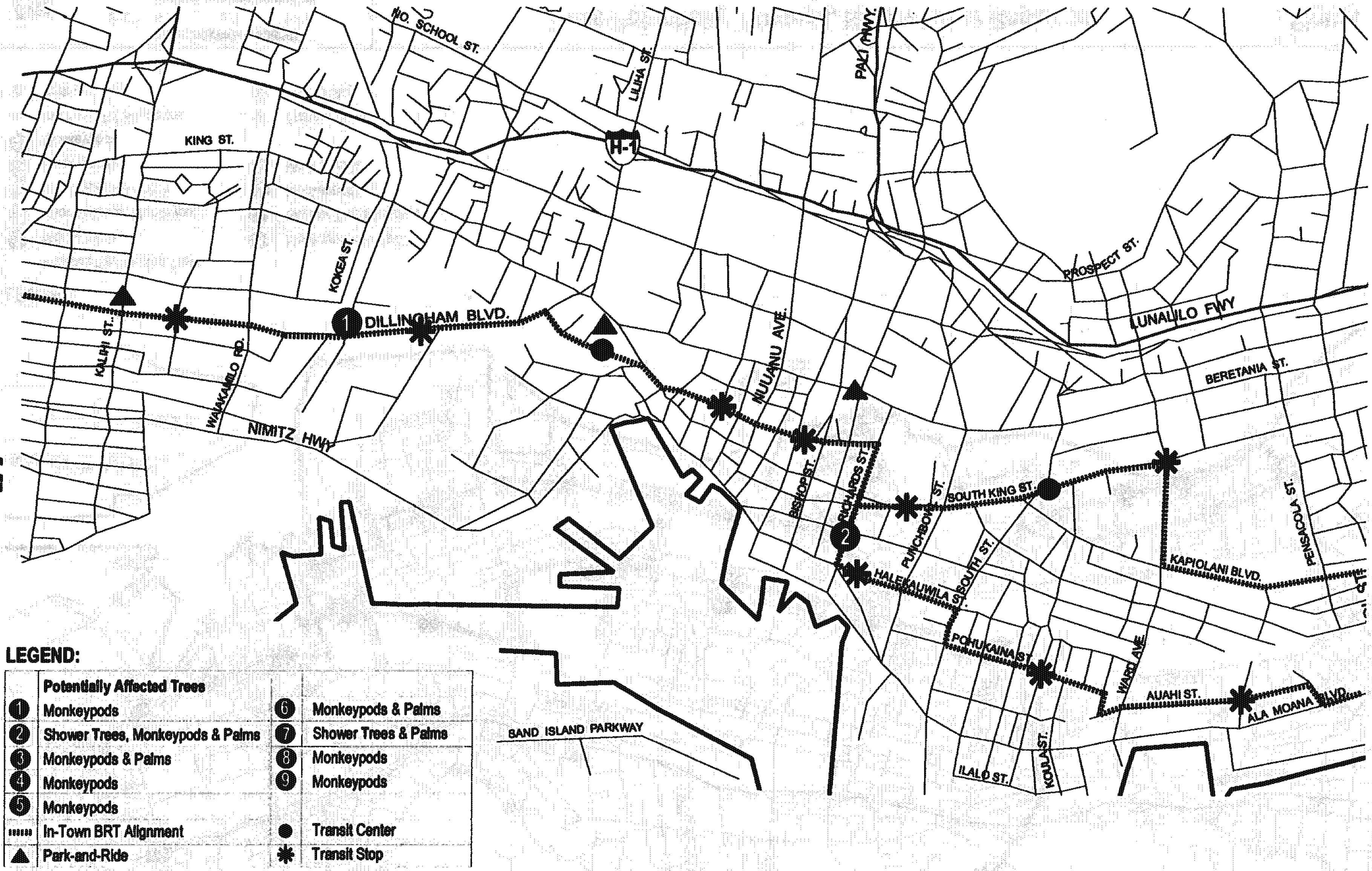
Although some of the alternatives are in the vicinity of 'Exceptional Trees' as defined by the County Council (see Section 3.7.1), none of the alternatives would affect these trees. Table 5.7-1 lists those trees which are located near proposed transit stations.

TABLE 5.7-1
EXCEPTIONAL TREES NEAR THE STATIONS

Location	Common Name	Scientific Name
Near curb at Kalakaua/Uluniu Station	Indian Banyan Tree	*Ficus benghalensis*
Near Ala Moana Station – Mauka and across from Magic Island – at corner of entrance wall	3 Indian Banyan Trees	*Ficus benghalensis*
At entrance to the Zoo	2 Indian Banyan Trees	*Ficus benghalensis*
University of Hawaii at Manoa, near Sinclair Circle	Cannonball Tree	*Couroupita guianensis*

Source: Revised Ordinance of Honolulu, Section 41-13.7, 1990, Foster Botanical Garden, 1999.

Mitigation would consist of revegetation and landscaping along the alignment where possible. Although planting plans would not be prepared until later stages of final design, desirable locations for special landscaping treatment include areas where (1) existing landscaping has been lost; (2) substantial



LEGEND:

	Potentially Affected Trees		
1	Monkeypods	6	Monkeypods & Palms
2	Shower Trees, Monkeypods & Palms	7	Shower Trees & Palms
3	Monkeypods & Palms	8	Monkeypods
4	Monkeypods	9	Monkeypods
5	Monkeypods		
▪▪▪▪	In-Town BRT Alignment	●	Transit Center
▲	Park-and-Ride	✱	Transit Stop

N

Scale: 0 .50 1 mi

Scale: 0 1 2 km

Trees Potentially Trimmed, Relocated or Replaced: Dillingham Boulevard To Richards Street

Figure 5.7-1A

LEGEND:

	Potentially Affected Trees		
1	Monkeypods	6	Monkeypods & Palms
2	Shower Trees, Monkeypods	7	Shower Trees & Palms
3	Monkeypods & Palms	8	Monkeypods
4	Monkeypods	9	Monkeypods
5	Monkeypods		
▪▪▪▪▪▪	In-Town BRT Alignment	●	Transit Center
▲	Park-and-Ride	✱	Transit Stop

N

Scale: 0 .50 1 mi

Scale: 0 1 2 km

Trees Potentially Trimmed, Relocated or Replaced: Richards Street to Waikiki

Figure 5.7-1B

opportunities exist for enhancement of existing streetscapes; (3) joint use is possible; (4) stops, transit centers, park-and-ride lots are proposed; (5) mitigation of specific impacts can be accomplished, such as adjacent to parks or historic sites; and (6) specific relevant goals have been established, such as within special districts.

The amount of undeveloped land required for both the TSM and BRT Alternatives is minimal. Bus ramps, park-and-ride facilities, and transit centers would be built adjacent to current roadways for all of the alternatives. These sites are all near current transportation facilities and no agricultural operations would be affected by any of the proposed alternatives.

Under the Federal Farmland Protection Act (FFPA), federal projects must formally assess their impact on agriculture by completing Form AD-1006, "Farmland Conversion Impact Rating." Once the preferred alternative is selected, the Natural Resources Conservation Service (NRCS) in accordance with 7 CFR 658.4(a) would verify if the isolated soil remnants to be affected are important to agriculture. Coordination with NRCS is on-going.

No adverse impacts on aquatic ecosystems would result from the proposed action. If more people were to ride transit, as forecast for the BRT Alternative, less highway runoff pollutants would enter freshwater and marine ecosystems.

In summary, ecosystem impacts of the proposed project would be minimal. The BRT Alternative may require tree trimming where the transit stops are located or the road needs to be widened to accommodate the transit vehicles. A tree preservation program would be developed to minimize these impacts.

5.8 WATER

No major impacts on water resources are expected for any of the proposed alternatives.

5.8.1 Surface Water

Any additional impervious surface from roadway pavement under all alternatives would increase runoff and associated contaminants discharged to storm-water systems and surface waters. However, with the BRT Alternative, much of the proposed new or widened pavement would be located along existing streets. The incremental increase in impervious surface and associated contaminants resulting from implementation of the Regional and In-Town BRT systems would be minor in comparison to the total existing drainage area and pollutant loading to storm-water systems and surface waterways from Honolulu's Urban Core. Nonetheless, specific control measures would be resolved during final design, and a best management plan would be developed.

No long-term effect on surface water quality of area streams, lagoons, or harbors would be expected. Increasing transit patronage (with the BRT Alternative) would reduce the non-point source pollution created by automobiles.

Moreover, the project should not increase demand for water resources. All landscaping would be selected to match environmental conditions and avoid unnecessary water use.

5.8.2 Groundwater

Because the Southern Oahu Basal Aquifer (SOBA) is a designated sole-source aquifer, EPA will require a water quality assessment (under Section 1424(e) of the Safe Drinking Water Act) to determine the project's impact on the quality of the groundwater in the SOBA. Coordination with EPA is on-going to complete the water quality assessment.

No long-term impacts on groundwater-flow characteristics are anticipated. Increases in roadway runoff from new impervious surfaces would not occur in the SOBA's aquifer recharge areas. Moreover, because of the large pressure difference between water in the caprock and in the SOBA, and the great thickness of the caprock in the project area, pollutants generally do not enter the SOBA from surface activities occurring on the caprock.

5.8.3 Floodplains

No adverse impacts are expected in the 100- or 500-year base floodplains. The proposed TSM and BRT alignments would traverse some floodplains, but the transit system would utilize existing roadways and would not require any changes that may affect the potential for flooding.

5.8.4 Wetlands

It is anticipated that no wetlands would be affected by any of the project alternatives, because the project area is highly urbanized and transitways would be aligned with existing roadways. The transitway would traverse streams using existing bridges, without necessitating alterations to the bridges or streams.

Because this project would not dredge or fill any waters of the U.S., including wetlands, it is anticipated that no Section 404 permit would be required from the U.S. Army Corps of Engineers (ACOE). The U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines (40 CFR 230) are the substantive environmental criteria used to protect the waters of the U.S. through the control of discharges of dredged or fill material under Section 404 of the Clean Water Act.

When the Preferred Alternative is selected, relevant sites along the alignment would be more extensively surveyed for potential wetlands and corresponding coordination with the ACOE will occur.

5.8.5 Navigable Waters

It is anticipated that no navigable waters would be affected by the proposed alternatives, because the project area is highly urbanized and transitways would be aligned with existing roadways. The transitway would traverse streams using existing bridges, and may necessitate alterations to the bridges or streams. Appropriate best management practices will be implemented to ensure adherence to standards set forth under Section 404 of the Clean Water Act. It is anticipated that no Section 404 permit would be required from the ACOE. However, if the alteration of any bridges or streams in the Preferred Alternative were to involve the discharge of dredged or fill material, a Department of the Army permit would be required. Coordination with the ACOE will occur as necessary.

5.8.6 Coastal Zone Management (CZM) Areas

Because the proposed project is a federally-funded activity, it must receive a consistency determination from the State CZM program to assure that the project meets the guidelines in the State policy. Coordination to receive the required consistency determination will occur concurrent with the public and agency review of this document.

5.8.7 Water Recreation

The proposed project is not expected to affect any water recreation activities within or adjacent to the project area. No impact on water quality that could affect recreational uses would occur from any of the alternatives, and no restriction of access to water recreation activities would occur.

5.9 ENERGY

This section provides estimates on the amount of energy that would be consumed under each of the alternatives in the design year 2025. The analysis considers both direct (operational) and indirect energy requirements. Direct energy consumption includes the fuel required for passenger vehicles (automobiles, vans, light trucks) and transit buses. It also includes the electrical power needed to power the In-town BRT vehicles if an all-electric system is selected. Indirect energy consumption includes what is required to construct any capital improvements, and to manufacture and maintain passenger vehicles and transit buses.

The BRT Alternative would result in the least amount of direct energy consumption because it would lead to a substantial decrease in the vehicle miles traveled (VMT) of passenger vehicles, and a substantial increase in VMT of transit buses (and In-town BRT vehicles). Although the per unit energy requirements of a transit bus (or In-town BRT vehicle) is greater than an individual passenger vehicle, the high passenger capacity of these vehicles makes them more energy efficient on a per person basis. The BRT Alternative is estimated to consume up to 39 thousand fewer barrels of oil than the No-Build Alternative, and up to 31 thousand fewer barrels than the TSM Alternative in the design year 2025. If an all-electric In-town BRT technology were used, these savings would be slightly less. The TSM Alternative would also produce direct energy savings in comparison to the No-Build Alternative, but not to the extent as the BRT Alternative.

The BRT Alternative would require the most indirect energy because it requires the most construction. The TSM Alternative would also consume indirect energy because it also includes some construction activities. However, both the BRT and TSM Alternatives would produce maintenance energy savings because they would lead to less use of passenger vehicles. However, the TSM Alternative is not anticipated to save much over the No-Build Alternative because it would lead to an increase in maintenance energy for transit buses. The BRT Alternative would produce a savings of approximately two thousand barrels of oil for maintenance over both the No-Build and TSM Alternatives.

5.9.1 Analysis Methodology

1) Direct Energy (Operational)

The method used to estimate direct energy consumption under each of the alternatives is outlined in the Technical Guidance on Section 5309 New Starts Criteria (FTA, 1999). Direct energy consumption involves the fuel needed by all of the vehicles (automobile, truck, bus, or transitway vehicle) on the island. In assessing the direct energy impact, the following factors were used:

- Annual vehicle miles traveled (VMT) for automobiles, trucks, buses, and In-town BRT vehicles.
- Fuel consumption rates by vehicle type.

Daily traffic volumes and total VMT projected in year 2025 corridor were used in the direct energy analysis under each alternative. The 2025 daily traffic volumes for the island were developed as part of the traffic modeling process. The daily VMT was annualized using a factor of 325 days/year. Table 5.9-1 shows the fuel consumption rates, as measured in British thermal units (BTUs), that were used in the analysis. One BTU is the quantity of energy necessary to raise one pound of water one degree Fahrenheit. These rates were developed by Oak Ridge Laboratory and published in the 1996 Transportation Energy Book: Edition 16.

TABLE 5.9-1
ENERGY CONSUMPTION RATES

Vehicle Type	Energy Consumption/Vehicle Mile
Passenger Vehicles (auto, van, light truck)	6,233 BTU/Vehicle Mile
Transit Bus (all vehicle types)	41,655 BTU/Vehicle Mile

Source: U.S. Department of Energy, Office of Transportation Technologies, 1996.

A slight adjustment was made in calculating the direct energy consumption of the BRT Alternative because it includes the In-Town BRT, a system that could potentially be exclusively electric. If so, the In-town BRT vehicle would use a touchable surface contact system (embedded plate) (see Section 2.2.3). Unfortunately, there is no existing data on the electrical demand of an all-electric In-town BRT vehicle. However, there is data on the electrical demand of light rail transit (LRT) systems. Since the In-town BRT vehicle would require less electricity than a typical LRT vehicle, slight adjustments were made to this information, which resulted in an estimate of 11,300 kilowatts per day for the entire system. Hybrid In-town BRT vehicles could be used as an alternative to an all-electric vehicle (see Section 2.2.3). The fuel consumption of the hybrid vehicle would be similar to transit buses as provided on Table 5.9-1.

2) Indirect Energy

Indirect energy involves the one-time, non-recoverable energy consumption associated with construction activities. In addition to fuel consumption of vehicles involved in the actual construction of different elements of the alternatives, construction energy consumption also includes the energy needed in the production of construction materials. An Input-Output method was used to estimate construction energy consumption for each of the alternatives. Under this method, the construction cost for each alternative is converted into energy consumption based on 1998 base data on the construction of similar transportation systems in the U.S.

Indirect energy also involves the manufacturing and maintenance of vehicles. This includes both passenger vehicles and transit buses.

5.9.2 Energy Impacts

1) Direct Energy (Operational)

Estimates of the annual direct energy consumption, in BTUs, in the year 2025 under the No-Build, TSM and BRT Alternatives are provided in Table 5.9-2. This table also shows the BTU-equivalent barrels of crude oil. A discussion of the direct energy consumption impacts of each alternative is provided below.

No-Build Alternative

Under the No-Build Alternative, the year 2025 Oahu VMT for passenger vehicles (automobiles, vans and light trucks) is projected to be approximately 5,650 million miles and approximately 18 million miles for transit buses. Based on fuel consumption rates provided on Table 5.9-1, these vehicles would consume approximately 35,960 billion BTUs, or approximately 6.2 million barrels of oil, in the year 2025.

TSM Alternative

Under the TSM Alternative, the year 2025 Oahu VMT for passenger vehicles is projected to be approximately 5,620 million miles and approximately 20.7 million miles for buses. Overall, the islandwide VMT under the TSM Alternative is projected to be slightly lower than the VMT under the No-Build Alternative because many travelers would shift from passenger vehicles to buses due to improved transit service. Therefore, the VMT for buses would be approximately 2.7 million miles higher under the TSM Alternative, but the VMT for passenger vehicles would be approximately 30 million miles lower under the TSM Alternative. Based on these VMT projections, passenger vehicles and transit buses would consume approximately 35,910 billion BTUs, or 6.2 million barrels of oil, in the year 2025. This is about 50 billion BTUs, or 8.6 thousand barrels of oil, less than what would be consumed under the No-Build Alternative.

TABLE 5.9-2
ESTIMATES OF ANNUAL DIRECT ENERGY CONSUMPTION IN YEAR 2025

	Alternative		
	No-Build	**TSM**	**BRT**
PROJECTED VEHICLES MILES TRAVELED (In Millions)			
Daily Passenger Vehicle	15.9	15.8	15.6
Annual Passenger Vehicle	5,649	5,622	5,545
Daily Transit Bus	.055	.064	.087.
Annual Transit Bus	18	20.7	28
ESTIMATED BTUs (in Billions)			
Passenger Vehicle	35,208	35,042	34,563
Transit Bus	748.5	863.9	1,165.1
SUMMARY			
Total BTUs (in Billions)	35,956	35,906	35,729
Total Barrels of Oil (in Thousands)'	6,199	6,191	6,160
Change in Barrels of Oil from No-Build Alternative (in Thousands)	N/A	-8.6	-39.2

Source: Parsons Brinckerhoff, Inc.
Note: 1 Barrel of Oil = 5.8 million BTUs (from U.S. Department of Energy, Office of Transportation Technologies, Transportation Energy Data Book: Edition 18 –1998).

BRT Alternative

Under the BRT Alternative, the year 2025 Oahu VMT for passenger vehicles is projected to be 5.550 million miles, and approximately 28 million miles for transit buses. In comparison to the No-Build and TSM alternatives, the VMT for buses would be approximately 10 million and 7.3 million miles higher under the BRT Alternative, respectively. However, the VMT for passenger vehicles would be approximately 100 million and 70 million miles lower under the BRT Alternative, respectively. Based on projected VMT under the BRT Alternative, approximately 35,730 billion BTUs, or about 6.2 million barrels of oil would be consumed in the year 2025. This estimate assumes that hybrid In-town BRT vehicles would be used.

If an all-electric In-town BRT system is used, the fuel consumption indicated on Table 5.9-2 would be lower under the BRT Alternative. Furthermore, an all-electric system would require approximately 11,300 kilowatts per day, which can be provided within the reserve capacity of existing electric power plants according to Hawaiian Electric Company. Nevertheless, an all-electric system overall would consume a slightly greater amount of energy, estimated at 38.5 million BTUs per day on average, which is the equivalent to 6.6 barrels of oil. It should be noted that this modest additional energy demand of an all-electric In-town BRT system would be offset by other advantages of such a system, such as the vehicle's zero air pollutant emissions and its lower noise levels.

In summary, transportation energy consumption under the BRT Alternative would be the lowest among the three alternatives being considered, even if an all-electric In-town BRT system is used. The BRT Alternative would consume up to 39 thousand fewer barrels of oil than the No-Build Alternative, and up to 31 thousand fewer barrels than the TSM Alternative in the design year 2025.

2) Indirect Energy (Construction)

Estimates of the indirect energy consumption under each alternative is provided in Table 5.9-3. This table also shows the BTU-equivalent barrels of crude oil. The energy consumption estimates under construction represents a one-time expenditure of energy. A discussion of the indirect energy consumption impacts of each alternative is provided below.

No-Build Alternative

The indirect energy consumption of the No-Build Alternative would only be associated with the manufacturing and maintenance of passenger vehicles and transit buses. The manufacturing of such vehicles would consume approximately 1.4 million barrels of oil, and maintenance would require approximately 1.4 million barrels of oil in the design year 2025.

TABLE 5.9-3
ESTIMATES OF INDIRECT ENERGY CONSUMPTION

	Alternative		
	No-Build	**TSM**	**BRT**
CONSTRUCTION[1] (in Billions BTU)			
Passenger Vehicle- Manufacturing	7,964	7,927	7,819
Transit Bus Manufacturing	62.4	71.9	97.1
Roadway	0	127.2	1,157
Parking	0	1,047	1,143
Structures	0	286	2,393
Maintenance Facility	0	166	351
Total Construction	8,026	9,62	12,959
Total Construction in Barrels of Oil (in Thousands)	1,384	1,659	2,234
Change in Barrels of Oil from No-Build Alternative (in Thousands)	N/A	276	850
MAINTENANCE[2] (in Billions BTU)			
Passenger Vehicle	7,908	7,871	7,763
Transit Bus	236	273	368
Total Maintenance	8,144	8,143	8,131
Total Maintenance in Barrels of Oil (in Thousands)	1,404	1,404	1,402
Change in Barrels of Oil from No-Build Alternative (in Thousands)	N/A	-0.1	-2.3
Total Indirect Energy Consumption (in Billions of BTUs)	16,171	17,768	21,090
Total Indirect Energy Consumption (in thousands of Barrels Of Oil)	2,788	3,063	3,636

Source: Parsons Brinckerhoff, Inc.
Notes:
1 Construction Energy Conversions (Caltrans, 1983):
Vehicle construction energy:
- Passenger vehicles – 1,410 BTUs/VMT
- Transit bus - 3,470 BTUs/VMT

Roadway – 27,500 BTUs/1977$
Parking – 61,615 BTU/1973$
Structures – 50,100 BTUs/1973$
Maintenance facility – 50,100 BTUs/1973$

2 Maintenance conversions (Caltrans, 1983).
- Passenger vehicles – 1,400 BTUs/VMT
- Transit bus - 13,142 BTUs/VMT

TSM Alternative

Under the TSM Alternative, construction activities would substantially increase the construction sub-total of the indirect energy consumption over the No-Build Alternative. It is estimated that such activities, in addition to the manufacturing of passenger vehicles and transit buses, would require 1.7 million barrels of oil, about

276 thousand barrels more than what would be required under the No-Build Alternative. However, the energy required in the maintenance of passenger vehicles and transit buses would be just slightly lower than what would be required under the No-Build Alternative because this alternative would result in fewer or less use of passenger vehicles. This maintenance energy savings is offset, however, by an increase in the amount of transit buses, which would increase energy consumption under this category.

<u>BRT Alternative</u>

Construction of the BRT Alternative would result in the greatest indirect consumption of energy in comparison to the other alternatives. Overall, it would require 850 and 574 thousand barrels of oil more than the No-Build and TSM Alternatives, respectively. However, since the BRT Alternative would result in fewer or less use of passenger vehicles than the other alternatives, energy consumption for maintenance under this alternative would be over two thousand barrels of oil less.

5.10 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This section discusses the potential impacts of the No-Build, TSM, and BRT Alternatives on the historic and archaeological resources in the study area. Consultation with the State Historic Preservation Division (SHPD) will continue as project planning proceeds. Project features will be discussed with the SHPD and the public with the intent of developing a project concept that will have "no adverse effect" on all historic properties in the study area. Therefore, mitigation measures are discussed in this section to help in accomplishing this goal.

Preliminary assessments of the "effect" on historic and archaeological resources of the alternatives are provided in this section. If the TSM or BRT Alternative is selected, detailed impact analysis and investigation of feasible mitigation measures will continue, in coordination with the SHPD, as design details become available. A Memorandum of Agreement (MOA) will be prepared as part of the preliminary engineering/FEIS studies, for sites where an "adverse effect" is determined.

5.10.1 Regulatory Context

Because of potential federal participation, this project is required to be in compliance with Section 106 of the National Historic Preservation Act. In accordance with Section 106, the "effect" of the project on historic or archaeological resources must be determined by the federal agency proposing or regulating the project. There are three possible "effect" findings:

- No historic properties affected;
- No adverse effect; and
- Adverse effect.

"No historic properties affected" means that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them of any kind (that is, neither harmful nor beneficial). An "effect" means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register of Historic Places (NRHP).

"No adverse effect" means that there could be an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion in the NRHP. In other words, it would not diminish or adversely affect the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

An "adverse effect" means an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. If an "adverse effect" were determined, an MOA between the federal agency and the State Historic Preservation Officer (SHPO) would need to be prepared. Other parties are allowed to be signatories to the MOA.

5.10.2 Impact Assessment on Archaeological Resources

In terms of archaeological resources, SHPD staff has indicated that because most of the project area is urban, with ground conditions consisting of fill and top soil that has already been highly disturbed by construction, it is unlikely that archaeological remains or sites exist in much of the project area. However, archaeological surveys could be conducted during subsequent design of the selected alternative as part of the FEIS in areas that are known to contain subsurface archaeological deposits. At a minimum, archaeological monitoring would be conducted during construction in areas with a relatively high probability of uncovering archaeological remains or sites and if subsurface disturbance by project construction is expected.

SHPD staff has indicated the possibility of an "adverse effect" on unknown archaeological sites. If an "adverse effect" were determined, an MOA would be prepared and would specify possible survey and/or monitoring procedures. The decision as to whether the project would have an "adverse effect" on unknown archaeological sites would be made when more detailed information is generated on the preferred alternative.

No-Build Alternative

Under the No-Build Alternative, impact to known archaeological sites is not expected because, with the exception of the park-and-ride lot at the downtown Block J site, transit-related construction is not proposed. However, if evidence of archaeological remains or sites is uncovered during construction of the park-and-ride lot, work would halt and the SHPD would be contacted immediately to coordinate special handling or investigative procedures.

TSM Alternative

The TSM Alternative would include expansion of the Middle Street bus maintenance facility, in proximity to an area where burials were discovered. Because of this, construction activities on this site would potentially affect known sites.

BRT Alternative

Construction of the BRT Alternative could uncover archaeological resources during construction of a Middle Street maintenance facility and the widening of Kalia Road in the Fort DeRussy area for the In-Town BRT system, because of previous archeological finds in these areas.

As earlier stated, If evidence of archaeological remains or sites are uncovered during construction of the BRT, TSM or No-Build Alternative, work would halt and the SHPD would be contacted immediately to coordinate special handling or investigative procedures.

5.10.3 Impact Assessment on Historic-Period Resources

There are no historic-period resources within the Area of Potential Effect (APE) of the No-Build and TSM Alternatives.

Table 5.10-1 lists the historic districts and historic-period resources (buildings, structures and objects constructed after western contact) within the APE of the BRT Alternative. As indicated on Table 5.10-1, the BRT Alternative would likely have a "no adverse effect" on most of the resources listed because these properties would not be affected by right-of-way acquisition. In other words, the elements of the BRT Alternative (e.g., transit stops) would be in proximity to the resources, but would not physically affect them.

TABLE 5.10-1
PRELIMINARY ASSESSMENT OF EFFECT ON HISTORIC PERIOD RESOURCES

Location	Resource	Preliminary Assessment
Dillingham Blvd./HCC Transit Stop	Honolulu Orthopedic Supply*	No Adverse Effect
Iwilei Transit Center	OR&L Office and Doc. Storage Bldg.	No Adverse Effect
	Four houses behind Tong Fat	No Adverse Effect
Hotel St./Kekaulike Mall Transit Stop	Chinatown Historic District	Adverse Effect
	–Lung Doo Benevolent Society*	No Adverse Effect
	–Yew Char Building*	No Adverse Effect
	–Hotel Street Sidewalk Features	Adverse Effect
Hotel St./Union Mall Transit Stop	Portland Building	No Adverse Effect
Iolani Palace Transit Stop	Hawaii Capitol Historic District	Adverse Effect
	–Federal P.O./Customs Building	Adverse Effect
	–Hawaii State Library	Adverse Effect
Thomas Square/NBC Transit Stop	Roman Catholic Cemetery*	No Adverse Effect
Kapiolani Blvd./Keeaumoku St. Transit Stop	Bakery Kapiolani*	No Adverse Effect
Kapiolani Blvd./Isenberg St. Transit Stop	Kapiolani Apartments*	No Adverse Effect
University Av./King St. Transit Stop	Varsity Theater*	No Adverse Effect
Sinclair Circle Transit Stop	University of Hawaii Historic District	Adverse Effect
	–Sinclair Library*	No Adverse Effect
	–Bachman Hall	No Adverse Effect
Ala Moana Transit Center	Ala Moana Beach Park & Features	No Adverse Effect
Kalakaua Av./Seaside Av. Transit Stop	Gumps (Louis Vuitton)	No Adverse Effect
Kalakaua Av./Uluniu Av. Transit Stop	Kapaemahu Healing Stones*	No Adverse Effect
Kuhio Av./Seaside Av. Transit Stop	Angels/Seaside Bar & Grill*	No Adverse Effect

Source: Mason Architects.
Notes: * Historic status of resource has not been determined.
HCC: Honolulu Community College.
NBC: Neal Blaisdell Center.

There could be an exception to this preliminary assessment of "no adverse effect" for transit stops located in a historic district. However, the design of the stops in the historic districts would be developed to harmonize with the surrounding area as much as possible. Canopies would not be provided, street furniture would be selected to blend in with the surrounding area, and open areas near the transit stops would be modified to be pedestrian waiting areas, minimizing sidewalk congestion. A "no adverse effect" determination may be appropriate once the design details of the transit stops in the historic districts are more fully developed, in conformance with their setting.

A discussion of why preliminary assessments of "adverse effects" were rendered on the historic districts and certain historic-period resources is provided below.

<u>Hotel Street / Kekaulike Mall Transit Stop</u>. This transit stop is located in Chinatown, a historic district with a very high level of street activity. Chinatown also is a commercial district with a large number of businesses that utilize the street-level frontage of buildings for entrances. Many shop owners utilize the sidewalk area for additional product displays, creating an outdoor street market atmosphere that contributes to the historic character of this district. The addition of a transit stop and a possible electrical substation at the Hotel Street and Kekaulike Mall intersection could affect a number of small street-level shops. In addition, Chinatown has a distinct architectural style, which would need to be reflected in the transit stop. Hotel Street's sidewalk

features, which include granite paving blocks and lava rock curbs, have been specifically determined eligible for the NRHP because of their contribution to the Chinatown Historic District. Since these curbs would be temporarily removed during construction of the transit stop, a preliminary "adverse effect" assessment was made.

However, the transit stop would be designed to blend in with its context as much as possible. Kekaulike Mall would be modified to serve as a pedestrian waiting area, minimizing pedestrian congestion on the sidewalk. No canopy would be provided. The assessment may switch to "no adverse effect" once further design details for this stop are available.

The transit stop would not affect any buildings in Chinatown. Therefore, a preliminary assessment of "no adverse effect" was made regarding two buildings near the proposed transit stop.

Iolani Palace Transit Stop. The Koko Head-bound transit stop is planned in front of the U.S. Post Office (Old Federal Building) in the area of a landscaped parking lot. The stop would not include a canopy structure but would include benches and a kiosk. The stop would be set-back from the sidewalk so as not to cause pedestrian congestion. A power substation may be located in the U.S. Post Office complex makai of the parking lot, and would be an intrusive new structure that would affect this building. Therefore, a preliminary assessment of "adverse effect" was made because of the potential that the new structure would be out of character and change the feeling and setting of the historic district, including the U.S. Post Office. However, careful design and placement of benches and kiosks to complement the surroundings, placing the substation underground or within the building, and avoiding impeding pedestrian movement would help minimize impacts on this complex. This assessment would be consistent with the potential effect on the Galleria redevelopment project at the Post Office site.

The Ewa-bound transit stop is planned in front of the State Library. There is ample space between the building and the South King Street sidewalk, and the transit stop would have no canopy so that there would be no adverse effect to this important historic structure.

University of Hawaii Transit Stop. This transit stop, which is part of the BRT Alternative, would be located at the existing Sinclair Circle, which is located off of University Avenue, and is currently used for drop-offs / pick-ups and as a bus stop. Since the transit stop would include structures, there is the potential that these structures would be inconsistent with the character of the University of Hawaii (U.H.) Historic District. Therefore, a preliminary assessment of "adverse effect" was made. However, this assessment could be easily changed to "no adverse effect" if compatible designs were developed. The transit stop would not affect any buildings at the university. Therefore, a preliminary assessment of "no adverse effect" was made regarding the two nearest buildings, Bachman Hall and Sinclair Library.

5.10.4 Impact Assessment on Traditional Cultural Properties

The only traditional cultural properties (TCP) identified in the study areas are in Chinatown. Potential impacts to Chinatown were discussed above under the Hotel Street/Kekaulike Mall Transit Stop.

5.10.5 Mitigation Measures

1) Construction

If a burial or archaeological artifact is uncovered during construction, work would stop and the SHPD would be notified immediately. Construction would resume upon approval of the appropriate authorities. If a MOA were prepared, survey and/or monitoring procedures would be specified.

2) Historic Districts and Historic-Period Resources

Provisions to maintain the character and integrity of historic districts and historic-period resources would be discussed and coordinated with the SHPD. If "adverse effects" are determined, design guidelines may be specified in a MOA and implemented. The design of a BRT transit stop can vary substantially. Despite whether an "adverse effect" is determined or not, transit stops within historic districts, such as Chinatown, Hawaii Capitol and University districts, would be designed to be compatible with the style of the affected district. For example, the design of the transit stops in Chinatown, the Capitol District and the University of Hawaii would be sensitive to the architecture of the adjacent historic buildings. In Chinatown, the extent of transit stop structures would be minimized to increase the amount of sidewalk space used for shopping. New benches and kiosks at transit stops would be placed so as to not impede pedestrian access. Since the buildings along Hotel Street already have canopies, no new overhead coverings will be required.

5.10.6 Coordination

Consultation with the SHPD and the public will continue as additional project details are developed and studies continue. For example, the results of the inventory survey research would be used to assess whether certain properties are eligible for the NRHP. In accordance with Section 106, FTA will make a final determination on the "effect" the project would have on historic properties. If an "adverse effect" is rendered on any property and the SHPO concurs, a MOA would be prepared, which would specify the mitigation measures and coordination processes to be followed for each property adversely affected.

5.11 PARKLANDS AND SECTION 4(f) EVALUATION

This section discusses potential impacts to parks and recreational resources in the project area. None of the alternatives would change the character, function or use of any park or recreational resource in the study area, despite that the two build alternatives would use the Aloha Stadium overflow parking lot as a park-and-ride lot. This use of park property would trigger the provisions of Section 4(f) of the U.S. Department of Transportation Act. The TSM and BRT Alternatives would enhance transit access to parks and recreational resources in the project area by improving the level of transit service to parks along the alignments of these alternatives.

Vehicular access to Ala Moana Regional Park would be adversely affected under the BRT Alternative because of the conversion of two general-purpose lanes to transit lanes on both Ala Moana and Kapiolani Boulevards.

Since the two build alternatives would use land at the Aloha Stadium overflow parking lot, compliance with Section 4(f) of the U.S. Department of Transportation Act is required. Section 4(f) prohibits the use of park and recreational resources unless there is no feasible and prudent alternative. Section 5.11.2 includes the Section 4(f) Evaluation for using the Aloha Stadium overflow parking lot.

5.11.1 Impacts to Parks and Recreation Areas

With the exception of the Aloha Stadium overflow parking lot, none of the alternatives would require land from or cause proximity impacts to any existing park or recreational resource. In general, the BRT Alternative, and to a lesser extent the TSM Alternative, would enhance the value of the park and recreational resources in the study area by improving their accessibility for transit users. However, because the In-Town BRT element of the BRT Alternative would reprioritize general-purpose lanes on major arterials in Honolulu, automobile access to Ala Moana Regional Park would be reduced. On-street parking along Ala Moana Boulevard near the park, which is allowed on most weekends and holidays, would be eliminated. The TSM Alternative would convert certain general-purpose lanes to semi-exclusive bus lanes, which would also require the removal of on-street parking. There would not be any impacts under the No-Build Alternative because roadway capacity for automobiles and parking would not change.

5.11.2 Section 4(f) Evaluation

Section 4(f) of the Department of Transportation Act, 49 U.S.C. 303 and 23 U.S.C. 138 (referred to hereafter as "Section 4(f)"), permits the use of land for a transportation project from a significant publicly-owned public park, recreation area, wildlife and waterfowl refuge, or a historic site only when it has been determined that there is no feasible and prudent alternative to such use; and the project includes all possible planning to minimize harm to the property resulting from such use. The purpose of Section 4(f) is to limit the circumstances under which such land can be "used" for transportation projects. The word "use" in this case means:

- land is permanently incorporated into a transportation facility;
- there is a temporary occupancy of land that is adverse in terms of preservation of the resource; or
- the project's proximity to the site substantially impairs those functions that qualify the site as a Section 4(f) resource even though no land is permanently or temporarily acquired. This is called "constructive use."

The avoidance of Section 4(f) resources was an important consideration in developing and screening the alternatives. None of the alternatives would use or take a historic site. Although elements of the BRT Alternative would traverse historic districts, no buildings important to the integrity of these districts would be used.

Of the many existing and planned public parks and recreational resources in the project area identified in Section 3.11, only one would be affected by the alternatives such that a Section 4(f) Evaluation is required. Both build alternatives would use the Aloha Stadium overflow parking lot at the Salt Lake Boulevard/Kamehameha Highway intersection for a park-and-ride facility for transit patrons.

1) Description of Section 4(f) Resource

Aloha Stadium, owned and maintained by the State of Hawaii, is comprised of 39.43 hectares (97.44 acres). The overflow parking lot is approximately 2.8 hectares (7 acres) in size, and unlike the stadium's other parking areas, the overflow parking lot does not include marked stalls. A portion of the overflow parking lot is presently used as a Commercial Driver License Facility.

The portion of the land encompassing Aloha Stadium was originally owned by the United States Department of Interior and was transferred to the City and County of Honolulu in 1967. The Quitclaim Deed of that transfer, dated June 30, 1967, contains certain use conditions and covenants that require the land to be used and maintained for public recreational purposes. The Quitclaim Deed also states that "the property shall not be sold, leased, assigned, or otherwise disposed of except to another local governmental agency that the Secretary of Interior is satisfied can assure the continued use and maintenance of the property for the aforesaid purposes" (Honolulu Rapid Transit Program Final Environmental Impact Statement, Parsons Brinckerhoff, Inc., July 1992). The Quitclaim Deed further states that if any condition or covenant is breached, regardless of cause, the property would revert to the United States upon demand in writing by the Secretary of Interior.

In October 1970, with the approval by the Department of Interior, the property was transferred to the State of Hawaii with similar provisions as the Quitclaim Deed. Aloha Stadium was then developed on the property along with other parcels of land the City had obtained from private sources and transferred to the State of Hawaii.

Aloha Stadium is primarily used for athletic competitions, such as the Aloha Bowl, Oahu Bowl, Pro Bowl, and University of Hawaii football games. Other recreational uses include the Great Aloha Run, music concerts, and family-oriented fairs. The stadium parking lot is also used for a flea market each week on Wednesday, Saturday, and Sunday. The stadium property consists of a stadium, which seats approximately 50,000 people, an adjoining parking area and an overflow parking area across Salt Lake Boulevard from the stadium. The Commercial Driver License Facility was previously described.

2) Impact on the Resource by the Proposed Action

Only about half of the overflow lot's parking area would be needed for the park-and-ride facility. The total area has space for about 1,000 parked cars. Up to 500 spaces would be needed to service existing and potential transit patrons in the Pearl City to Foster Village region. Therefore, the build alternatives would improve about half the site to accommodate park-and-ride demand. Such improvements would include striping parking stalls, and enlarging the paved parking area.

The use of the Aloha Stadium overflow parking lot as a park-and-ride lot would not affect the activities that take place at the stadium. There would be sufficient parking for both transit and stadium patrons because most transit users would use the park-and-ride lot during the daytime workweek while stadium users normally use the lot on weekends and evening hours when stadium activities that draw large crowds occur. For example, University of Hawaii (U.H.) football games are normally played on Saturday evenings, the Aloha and Oahu Bowls are played on Christmas Day, the Pro Bowl is played on a Sunday, and concerts are normally held in the evenings. The only stadium activities that would overlap with the park-and-ride use are the Wednesday swap meets and high school football games that are played in late afternoons. However, neither of these activities would generate enough patronage so that the overflow parking lot would be needed. Therefore, almost all of the time, both stadium events and park-and-ride uses could be accommodated at the overflow lot with no or little overlap.

About half of the site is presently used as a Commercial Driver License Facility by the Department of Customer Services (DCS). Coordination with DCS is continuing. Since each use would occupy about half of the site, it may be possible for the park-and-ride and Driver's License Facility to share the overflow parking lot parcel.

The City and County of Honolulu encourages transit ridership to stadium events by providing express service from certain residential areas for certain high attendance events, such as U.H. football games. According to DTS, the demand for such service correlates to attendance because the amount of parking at the stadium, including the overflow lot, is not enough for near sold out events. Both the TSM and BRT Alternatives would improve transit service to the stadium.

3) Avoidance Alternatives

There are no feasible and prudent avoidance alternatives. The large population of the Pearl City to Foster Village region necessitates the need for a park-and-ride lot, which is the reason why the lot is proposed under both build alternatives. The large size of the stadium site, its proximity to residential communities, and its under-utilization during the workweek, makes the overflow parking lot the only site in the service area for a park-and-ride lot and transfer site for transit users. There are no other such sites in the immediate area other than other parking sections of Aloha Stadium.

4) Measures to Minimize Harm

Consultation occurred between representatives of the City, the State of Hawaii, the Aloha Stadium Authority, and the U.S. Department of the Interior regarding the use of and impacts on Aloha Stadium during the planning phase of the former Honolulu Rapid Transit Project in 1992. As a result, all parties agreed that the proposed transit system and station at Aloha Stadium would not violate the use restrictions applicable to this property. Given that this use is similar to that proposed in 1992, it is concluded that restrictions on the use of the property and its proposed use would be similar.

5.12 IMPACTS OF CONSTRUCTION ACTIVITIES

5.12.1 Overview

This section presents an assessment of the temporary impacts of construction and mitigation related to those impacts. A more detailed discussion of construction techniques for the various project elements is in the Construction Technical Memorandum (March 2000). Many of the proposed transit facilities would be placed within the same right-of-ways as the existing surface roadway system, which must remain operational throughout construction. The project is being planned, designed and scheduled to meet this challenge with minimal disruption. However, some effects on the environment, nearby facilities, and established patterns of activity are inevitable. These effects would be temporary, and their severity would depend largely on the type of construction employed, how it would be carried out, and what controls are exercised.

The No-Build Alternative has the fewest impacts and the TSM Alternative slightly more. The TSM Alternative mainly involves operational changes to the bus system and these changes in themselves are not considered in this document. The BRT Alternative incorporates the TSM Alternative but includes additional new construction and therefore has a greater impact.

5.12.2 Transportation and Circulation

Most of the impacts to land-based transportation are associated with the BRT Alternative. The No-Build and TSM Alternatives would have little impact on traffic during implementation.

The Construction Management Program would include development of a "Maintenance of Traffic Plan". This plan, which will be reviewed and approved by the Department of Transportation Services (DTS), would include systemwide as well as subarea consideration of the most important traffic and transportation issues and mitigation measures. Specifically, the plan would include:

- Overall maintenance of traffic and transportation goals, project commitments, and identification of key project elements which have been specifically designed to meet maintenance of traffic objectives;
- The systemwide maintenance of traffic program to maintain mobility and accessibility and address project-wide issues such as parking, commuter transportation systems and traffic system management;
- Project subarea maintenance of traffic measures focused on the specific detours, disruptions, problems, and issues expected in each subarea during each stage of construction;
- Coordination program for continued development of the Maintenance of Traffic Plan, including provisions for interaction with public agencies, local communities and the private sector; and
- Procedures for finalizing, monitoring, and implementing the Maintenance of Traffic Plan during construction, as a part of the Construction Management Program.

The Plan would include such policies as:

- Construction activities which would close traffic lanes would be restricted to off-peak hours whenever feasible;
- Construction activities would be phased so as to minimize traffic impacts to any one area;
- During final design, detailed Work Zone Traffic Control Plans, which would include detour plans, would be formulated in cooperation with all affected jurisdictions;
- Existing bus service would be maintained, as well as vehicle and pedestrian movements;
- Unless unforeseen circumstances dictate, no designated major or secondary highway would be closed to vehicular or pedestrian traffic. No local street or alley would be completely closed, preventing vehicular or pedestrian access to residences, businesses or other establishments; and

- An extensive public information program would be implemented which would provide motorists, residents and businesses with information on the location and duration of construction activities, and anticipated traffic conditions.

Truck traffic will be using existing routes except for near construction areas. Signage and traffic cones would be provided to re-route truck traffic around construction zones where necessary.

Bus routes and stops would generally be maintained, although buses may be re-routed over temporary detours and bus stops may be temporarily relocated. Moreover, public transportation facilities and services would be expanded during project construction as part of the Maintenance of Traffic Plan.

Bicycle routes would be included in the rerouting of surface transportation systems. Signage would be provided re-routing established bicycle facilities around construction zones.

Local access to residences and businesses would be maintained during all phases of the construction work. Pedestrian movements would be maintained, but may be temporarily relocated to provide safe passage through work areas. Alternative pedestrian routes, including attractive, well-lighted, safe walkways, would be provided around or through construction areas.

Measures to minimize the impact of loss of parking during construction would be implemented, including temporary parking facilities, staging of construction to minimize parking loss, and remote parking for project construction workers.

In most cases, the nature of the construction for the In-Town BRT system would not require street closures because much of the work would occur in the median of the roadway, allowing vehicles to pass the construction zone using the remaining lanes. Although there would be localized lane reductions in the median in the construction area, curb parking would be temporarily and/or permanently eliminated in many places, so that traffic flow along the curb lanes would be maintained under most situations. (Parking losses and mitigation measures are discussed more fully in Section 4.2.4). Where the In-Town BRT would run along the curb (e.g., Waikiki), lanes in the median and along the opposite curb would remain open. Some presently allowable turning movements could be restricted when construction is occurring within an intersection.

The BRT Alternative (and to a very minor extent, the TSM Alternative) would create truck traffic associated with the transport of construction materials and wastes. Times and routes of construction vehicles would be planned as part of the development of the Maintenance of Traffic Plan. Planning would occur with the intent of minimizing the effect of construction traffic.

5.12.3 Displacements, Relocation and Restricted Access for Existing Uses

Section 5.2 discusses permanent displacements and relocations that could be necessary for the project. The discussion in this section is limited to only those areas that would be needed temporarily during construction.

The BRT Alternative would require temporary areas for construction staging of the In-Town transitways. While staging areas have not been determined, all or a portion of the sites for the future Middle Street and Iwilei Transit Centers could serve as staging areas until development of the transit centers.

5.12.4 Neighborhoods

Impacts to neighborhoods during construction would occur primarily through impacts to local traffic and circulation patterns, air and noise emissions, temporary space requirements for construction activities, and visual conditions as discussed in other sections of this chapter. Neighborhood impacts would pertain primarily to maintenance of access to businesses. Plans to maintain access would be developed in coordination with all abutting land owners and occupants.

5.12.5 Air Quality

Contractors would be required to comply with all applicable air quality laws to limit adverse effects on air quality from demolition, clearing, material processing and construction activities, as well as from construction vehicles.

Construction would cause emissions of fugitive dust, airborne particulate matter of relatively large size. Fugitive dust would be generated by particulate matter being kicked up by such activities as excavation, demolition, clearing, stockpiling, hauling, vehicle movement, and dirt tracked onto paved surfaces at access points. Fugitive dust also would be generated from the material processing and storage that would occur at the stockpile areas associated with recycling usable portions of excavated material.

In order to minimize the amount of construction-generated fugitive dust, the following measures would be followed:

- minimize land disturbance;
- apply water or other environmentally acceptable material to control dust generation;
- cover trucks when hauling dirt or other dust-generating materials;
- stabilize the surface of dirt piles if not removed immediately or other material storage areas;
- use windbreaks;
- limit vehicular paths and stabilize temporary roads;
- pave all unpaved construction roads and parking areas to road grade for a length no less than 15 meters (50 feet) where such roads and parking areas exit the construction site;
- use dust suppressants on traveled paths that are not paved;
- apply dust control and suppression techniques to the material processing activities at the stockpile sites;
- remove unused material and dirt piles when they are no longer needed; and
- revegetate areas where existing landscaping was removed for construction.

As discussed in Section 3.5, carbon monoxide (CO) is the principal pollutant of concern in localized areas. Since emissions of CO from motor vehicles increase with decreasing vehicle speed, disruption of traffic during construction could result in short-term elevated concentrations of CO. To minimize CO emissions, efforts would be made during construction to limit disruptions to traffic through prior planning of alternative routing, traffic control, and public notices, especially during peak travel periods.

5.12.6 Noise and Vibration

Construction noise would adversely affect nearby residences, schools, office buildings, and other noise-sensitive activities.

Table 5.12-1 presents typical maximum noise levels (Lmax) of heavy mobile construction equipment and compressors measured at a distance of 15 meters (50 feet). Since construction activities would take place within 15 meters (50 feet) of noise sensitive receptors, the values in Table 5.12-1 would be representative of the noise levels to be expected during various stages of construction.

TABLE 5.12-1
CONSTRUCTION EQUIPMENT NOISE EMISSION LEVELS

Equipment	Typical Noise Level (dBA) 50 feet from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Truck	88

Source: *Transit Noise and Vibration Impact Assessment*, Federal Transit Administration (FTA), 1995.

To minimize the level of impact, a specification for noise and vibration limits from construction activities would be developed and enforced. The specification would be submitted to Hawaii Dept. of Health (HDOH) for their review. An industrial hygienist would monitor compliance with the specification during construction through on-site noise and vibration monitoring during various stages of construction.

The HDOH also has Community Noise Control requirements, which apply to construction noise. The project cannot exceed the noise levels stipulated by these requirements unless a variance (Construction Noise Permit) is granted by HDOH. Such variances are only granted if they are in the public interest and the construction noise would not substantially endanger human health and safety.

The Construction Management Program would explicitly address the minimization of noise levels generated during construction, and would include the following mitigation measures:

- Design Considerations: during the early stages of Construction Management Plan development, the deployment of noisy equipment would be considered. For example, no stationary equipment would be located near schools or hospitals;
- Sequence of Operations: noisy operations would be scheduled to occur at the same time (as opposed to being spread through the day), and, as feasible, noisy operations would be scheduled to occur when schools are not in session or other noise sensitive activities are occurring;
- Noise barriers would be employed where feasible;

- Source Control: many types of noise emissions can be controlled at the source and in such cases, noise reduction would be employed. For example, noise reducing muffler systems lower exhaust noise by at least 10 dBA; and
- Time and Activity Constraints: as much as possible, noisier activities would be limited to daytime hours.

Vibration levels at adjacent structures would be monitored and the structures protected from vibration impacts, as necessary.

5.12.7 Water Quality

During construction, impacts to surface and groundwater resources potentially could occur. Impacts to surface water would be associated with point and non-point source stormwater discharges and dewatering discharges. These discharges could include particulate (sediment) and chemical contaminants. Potential sediment sources include unstabilized, exposed soil at excavations; drainage from material stockpiles; discharges from haul trucks; and dewatering activities.

Sediment and Erosion Control

Erosion and sediment discharges would be minimized through the application of Best Management Practices (BMPs), techniques designed to minimize erosion, and capture sediment prior to discharge. Examples of BMPs include:

- chemical crusting agents or other stockpile coverings;
- planting of vegetation and/or mulching on highly erodible or critically eroding areas;
- temporary landscaping;
- silt fences;
- sediment control traps,
- straw bale filters,
- proper design and construction of access roads;
- use of inlet system sediment control traps;
- installation of debris basins;
- use of stilling basins to reduce the levels of sediments and other pollutants entering surface and coastal waters;
- construction of dikes or diversions to avoid runoff across erodible areas; and
- monitoring of sediment discharge.

Together, the BMPs would effectively minimize the potential for water quality impacts or off-site impacts from eroded material. Important BMPs would include maintenance of the sediment and erosion control systems, and an ongoing monitoring program to determine the effectiveness of the BMPs and adjust the sediment and erosion control program as required.

Details of the BMPs would be developed during final design stages and detailed erosion and sedimentation control plans would be included in the final construction plans for the project. Through the agency reviews conducted as part of the permit process, the installation of proper sedimentation control techniques would be assured.

Studies at specific locations to identify potential chemical contaminants in dewatering and stormwater discharges and stockpile drainage would be performed during later design phases, and appropriate treatment measures would be employed based on the character of the discharge and the water quality standards of the receiving water body.

Potential spills associated with construction activities pose a potential threat to water resources. Development of a Spill Containment Control and Countermeasure Plan, including maintenance of clean-up equipment on-site, along with detailed spill prevention measures, would mitigate the impact of inadvertent releases.

Dewatering Discharges

For most construction operations, groundwater encountered during excavations would need to be removed during construction (dewatering), and groundwater disposal and ground subsidence would have to be considered. Such dewatering would be temporary, limited to the time required for excavation and construction.

The water removed from excavations must be returned to the groundwater system, added to the stormwater drainage system or discharged to adjacent surface waters. The groundwater would contain suspended sediment and possibly chemical contaminants, and could adversely affect the water quality of receiving surface water bodies by increasing their turbidity and sedimentation rates.

Any dewatering discharge would require a dewatering permit that could only be obtained after designing an appropriate treatment process to ensure that the discharge meets water quality standards. For example, sediment would be removed prior to discharge through a sedimentation or filtering system. A monitoring program would assure compliance with water quality standards.

The groundwater could be contaminated (e.g., petroleum product) at several locations where excavations are required. The contamination potential would be studied in subsequent stages of project planning. Contaminants would be removed in accordance with standards established by the State of Hawaii Department of Health. For example, removal of petroleum products might require the use of oil water separators, strippers or other remediation techniques. Additional studies would be required during the final design phase to determine the precise methods to be employed.

Depression of the natural groundwater table caused by dewatering can induce consolidation of subsoil and subsequent ground settlement (subsidence). Subsidence can cause cracking and other damage to buildings and facilities. To mitigate the potential impacts of subsidence, a structural survey of buildings, roadways and other facilities adjacent to dewatering sites would be performed prior to construction. During construction, a monitoring program would be conducted that would include such techniques as inclinometers to measure relative lateral movement of soil at different elevations, settlement points, and observation wells to study groundwater drawdown. Monitoring data would be reviewed immediately to ensure minimal disturbance to existing facilities. Recharging the groundwater outside the excavation and other measures could be utilized to help minimize the effects of dewatering.

The project area is underlain by the Southern Oahu Basal Aquifer (SOBA). Mitigation measures would be implemented during construction to ensure that no sedimentation or chemical quality effects on the aquifer would occur. The area to be disturbed is not within the aquifer recharge area.

Construction Equipment Use and Maintenance

Since many of the proposed facilities would be built using cast-in-place concrete construction, large amounts of concrete would be transported to the construction site. Each time concrete is transported, residue remaining in the concrete truck must be washed out before it hardens. This wastewater contains fine particles and could cause sedimentation and turbidity if discharged to surface waters.

Concrete trucks would be washed out in accordance with procedures to ensure that water quality standards are not violated. Project specifications would prohibit the washing out of concrete trucks at the project site, or a filtration or settling system would be constructed to prevent fine material from being discharged into surface waters.

The use and maintenance of construction equipment can pose a threat to surface and ground waters. Potential spills associated with vehicle maintenance, such as changing oil and refueling equipment, can introduce new contaminants into the environment at the construction staging area. The servicing and maintenance of construction equipment would be restricted to the base yards of the mobile equipment. At these vehicle maintenance areas, strict enforcement of BMPs would be required. Clean up equipment would be maintained on site and clean up response plans would contain detailed spill response measures.

5.12.8 Ecosystems

Wildlife habitat is very limited along the transitways and at other sites proposed for road, ramp and transit center construction. Construction would directly affect individuals of species inhabiting the construction area that are relatively immobile or have small home ranges. The removal of this habitat would have little overall effect on wildlife populations. The sites do not represent unique or special habitats within the project area. The proposed build alternatives would have no major effect on the characteristics or size of populations of the resident wildlife species in the area.

The BRT Alternative may require placement of piers within some streams. Construction of the piers would be in association with pre-existing bridges. Wherever possible, additional foundations or piers in the streams would be avoided. Construction impacts to water quality that may affect aquatic wildlife would be avoided through mitigation measures agreed to by the ACOE, the HDOH and the DLNR during final design.

5.12.9 Solid and Hazardous Wastes

1) Solid Waste

The volumes of solid waste that would be generated with all of the alternatives are not anticipated to be beyond the ability of existing landfills to handle. Coordination would be conducted with the City Department of Planning and Permitting for a grubbing, grading, and stockpiling permit.

2) Contaminated Materials

While chemicals would not contaminate much of the solid waste that would be generated by construction, portions of the solid waste would likely be contaminated. Contaminants that could exist in solid wastes generated by construction include petroleum hydrocarbons, pesticides, herbicides, organic solvents, metals, PCBs, corrosives, organic lead, contaminants contained in landfill leachate, and other parameters. For these contaminated fractions of the solid waste stream, the level of impact would depend upon:

- the type of contamination;
- location of the area generating the contaminated wastes;
- proximity to surface waters;
- groundwater flow direction and depth relative to site;
- whether a contaminant release has occurred on the property;
- status of the release;
- the nature and extent of such release;
- the proximity of the release to the alignment; and
- the nature of project construction activities near a potentially contaminated area.

Section 3.9 discusses the relationship of the BRT Alternative to sites listed on government registries of potentially contaminated sites. The appearance of a site on one of these environmental registries means that there is a potential of site contamination, and consequently further investigation is required.

However, identification of a site as a potential source of contamination does not necessarily mean that contamination has been positively identified or that an adverse impact would necessarily occur. During this phase of the study, the available information is not detailed enough to make a precise determination of impact. Contamination can only be positively identified by sampling and laboratory analysis.

Once a Preferred Alternative has been identified, additional evaluation would occur to better define potential impacts from the disturbance of potentially contaminated sites. The level of detail required for the additional evaluations would be dependent upon the selected alternative and the proposed project activities. The additional evaluations could include environmental site assessments, additional record review, soil sampling and analysis, and surface water and groundwater sampling and analysis. For example, Phase I investigations of hazardous material sites would be completed where appropriate during the design phase. Specific recommendations, which could include Phase II sampling, would be prepared.

The presence of asbestos-containing material and lead-based paint must be assessed for buildings, which would be razed as part of project construction (e.g., Middle Street Transit Center). As part of assembling the right-of-way for the project, buildings which would be acquired would be evaluated for hazardous materials and possible additional demolition costs.

Subsequent analysis may indicate that some sites require mitigation or remediation. The selection of mitigation measures would consider avoidance of exposure, minimizing impacts through redesign or alignment shift, and remediation. In addition, issues relating to worker health and safety would have to be considered during construction because the health and safety of on-site personnel could be affected if they are exposed to contaminants. When contaminants are identified, the level of Personal Protective Equipment (PPE) that may be required and/or the need for special handling procedures would be assessed. However, it is likely that many types of contaminants that would be encountered would not require special protective equipment, but would require special handling to reduce potential exposure. A Contaminant Management Plan (CMP) detailing contaminant handling procedures and remedial response action would be prepared.

Next steps would depend on whether the contaminated site was already owned by a government agency or whether site acquisition from a private owner is contemplated. If the site is to be acquired, necessary remediation activities would become a factor in the real estate negotiations. Often, the present owner is required to remediate the site before transfer to government ownership.

Any site remediation would be performed in accordance with applicable State and federal laws. Required monitoring and remediation plans would be designed in coordination with the HDOH and other agencies, and the plans would be implemented prior to construction. Both soil and groundwater contamination would be addressed. In addition, the contractor would develop an Emergency Response Plan in coordination with the HDOH and other agencies to establish procedures should hazardous materials be encountered during construction. The handling, treatment, and disposal of any contaminated materials encountered would occur in full compliance with all appropriate requirements.

After selection of the Locally Preferred Alternative (LPA), the alignment would be reexamined in more detail to determine whether sites that could cause offsite contamination are located near proposed facilities.

5.12.10 Utility Service

The BRT Alternative would affect few major utilities but many minor ones, particularly if the embedded-plate traction power system is selected. Substantial planning would occur so that interruptions in utility service to customers are minimized. Coordination with utility providers during planning, final design, and construction would identify problems and provide opportunities to resolve them prior to construction. Replacement and/or relocation of utilities would be closely coordinated with roadwork and station construction to minimize disruption to adjacent properties and traffic. Disruptions to utility service, if necessary, would be restricted to short-term localized events. Careful scheduling of these disruptions and prior notification of adjacent properties that would be affected by temporary service cut-off would mitigate some of the utility relocation impacts.

Many of the utilities that are to be buried underground or moved to another underground location could be relocated simultaneously with existing utilities to minimize the need for multiple excavations. As much as possible, relocated utilities would be buried together or coordinated with infrastructure improvements already planned by the City and County of Honolulu or other agencies.

Siren locations for the Civil Defense Warning System may need to be adjusted. Coordination with Oahu Civil Defense would occur once the Preferred Alternative is selected and preliminary engineering plans are developed. Relocated sirens would remain in the same vicinity and be placed and designed to maintain comprehensive emergency warning coverage. Locations would be coordinated with Oahu Civil Defense during detailed design.

Coordination of utility relocations would be scheduled, programmed, and monitored as a part of the Construction Management Plan and Public Participation Program.

5.12.11 Economic

During construction of the BRT Alternative, local businesses could be negatively affected by increased congestion in front of their properties or by reduced access. Location-specific measures, including access, safety, noise and aesthetic requirements of adjacent businesses, would be identified during final design and incorporated into construction contracts. A public information program for commuters, tourists, local residents and the business community would be sustained. A community and government agency mitigation involvement program would be initiated to allow for the exchange of information and ideas.

5.12.12 Aesthetic and Visual

The construction work for the BRT Alternative would occur in highly visible and traveled areas. Therefore, orderly and clean work sites would be required and enforced throughout construction. Landscaping would be left in place and protected for as long as possible and replaced as soon after construction as possible.

5.12.13 Historic Resources and Archaeology

Depending on which alternative is selected as the Locally Preferred Alternative (LPA), there could be an "adverse effect" on historic resources. A complete discussion of the impacts of each alternative on historic resources is provided in Section 5.10. Should there be an "adverse effect," a Memorandum of Agreement (MOA) under Section 106 of the National Historic Preservation Act would be executed. The MOA would stipulate detailed construction-phase mitigation procedures applicable to the specific resource adversely affected. The terms of the MOA would be strictly followed.

With respect to archaeological resources, most of the project would occur in areas that are already heavily urbanized and industrialized. In addition, most of the project requires little excavation. An archaeological contingency procedure would be developed in the unlikely event that unanticipated resources are encountered during construction. The SHPO would be notified immediately if any bones, artifacts or other signs of historic occupation are observed (refer to Section 5.10).

5.13 OTHER ENVIRONMENTAL CONSIDERATIONS

5.13.1 Cumulative Impacts

A cumulative impact is an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" (40 CFR 1508.7).

The cumulative impacts of an investment in transportation infrastructure in the primary transportation corridor would stem from urban development and re-development. Since a key purpose of this project is to focus future development in the Urban Core and Kapolei, the cumulative impacts of the project are viewed as positive. Investment in other infrastructure systems will be necessary to support the increase in development density. Without the project, urban living would be less attractive, and low density and sprawl development would continue. Continuation of current low density development patterns is inconsistent with the vision for Oahu that was articulated by the public during the Oahu Trans 2K community involvement activities, and is inconsistent with the project purpose of concentrating development. Further discussion of possible cumulative impacts resulting from the project is provided below.

1) Land Use

The No-Build Alternative would result in deterioration in current levels of mobility. In the absence of sufficient people-carrying capacity, it would be more difficult to achieve the desired concentrated growth pattern. The No-Build Alternative would encourage suburban growth patterns and the conversion of open space to low density subdivisions.

With the TSM Alternative, people-carrying capacity would be increased, but not to a degree sufficient to encourage the types of transit-oriented developments that would arise with the BRT Alternative.

Since the BRT Alternative would substantially enhance mobility by increasing people-carrying capacity, they would help focus growth along the alignment of the In-Town BRT system in the Urban Core. Higher density redevelopment in a transit-supportive manner, particularly at transit centers and transit stops, would be encouraged. This alternative would be more effective than the TSM and No-Build Alternatives in supporting implementation of an urban growth strategy that integrates land use and infrastructure planning. It would help facilitate desired land use development patterns consistent with the vision for the island.

2) Farmland

Agricultural activities occur in Ewa and central Oahu. State and City policies encourage urban development, particularly in Ewa. Consistent with State and City policies, urban development would convert some open space to urban land uses.

3) Displacements and Relocations

Subsequent urban development and redevelopment could displace existing land uses. These displacements would be specified and analyzed during the environmental review of the subsequent development projects.

4) Socioeconomic

After the transportation investment is made, subsequent developments would enhance short and long-term employment. Economic efficiency would increase through the improvement of transportation service and mobility.

5) Transportation

Planned transportation projects, including the alternatives addressed in this document, would enhance transportation service and mobility.

6) Air Quality and Noise

The project area has good ambient air quality conditions (see Section 3.5), and planned projects or developments would not substantially change air quality.

As urban development proceeds, ambient noise levels from various human activities may be expected to rise.

7) Water Resources

Impacts on water resources are highly regulated. As urban development proceeds, water quality impacts of each project would be assessed during the environmental review and permitting processes.

8) Biological

Subsequent development would affect ecosystems in the primary transportation corridor, but such ecosystems are already highly modified by human activity. Existing ecosystems would be replaced by the provision of appropriate landscaping incorporated into each development project. The biological impacts of each project would be assessed through its environmental review process

9) Historic and Archaeological

Historic buildings and structures are protected under federal and State law. As subsequent development proceeds, project proponents are required to coordinate with the SHPD before construction affects an historic property. Impacts to archaeological sites are not expected because the primary transportation corridor is largely urban or previously disturbed open space. However, should there be inadvertent encounters with burials, the SHPD must be informed, and appropriate actions taken.

10) Parklands

Parklands are publicly owned. Subsequent developments would not encroach on parks. Impacts on parklands would be assessed during the environmental review process for each subsequent development.

11) Visual and Aesthetic

Visual conditions would change as urban development proceeds. Impacts on visual resources would be assessed during the environmental review process for specific projects.

12) Infrastructure and Utilities

An investment in transportation infrastructure in the primary transportation corridor would increase people-carrying capacity and mobility, and facilitate higher density development. Therefore, as development density increases, more demand would be placed on other infrastructure and utility systems such as water supply, sewage systems, and electric distribution. Investments in these other infrastructure systems would be necessary to accommodate increased development density.

5.13.2 Relationship Between Local Short-Term Uses Versus Long-Term Productivity

Short-term uses of the environment versus long-term productivity refers to the interplay between typically adverse, short-term, construction-phase impacts, and the benefits of the project upon completion. The relative balance between these factors must be disclosed.

An investment in transportation infrastructure in the primary transportation corridor would create short-term, confined adverse impacts during construction. These impacts are discussed in more detail in Section 5.12, but include temporary, localized increases in fugitive dust emissions, noise, and traffic congestion. Utility services could be temporarily affected, and erosion from exposed areas would need to be prevented. Construction-phase impacts would be mitigated, as described in Section 5.12.

An investment in transportation infrastructure would counterbalance the temporary, construction-phase impacts. The investment would promote long-term productivity, and improve the quality of life for Oahu residents and visitors. Specifically, transportation improvements would:

- Improve public transportation service on Oahu, especially within the Urban Core of Honolulu—Kalihi-Palama to the University of Hawaii/Waikiki, and to and from the Kapolei/Ewa region.
- Support and encourage desired land use development patterns, such as higher density development in the Urban Core and in Kapolei.
- Provide improved travel time for transit patrons, thereby providing an attractive alternative to the private automobile.

The long-term productive uses listed above outweigh the temporary nature of the adverse construction-phase impacts of the project, which would be mitigated. The No-Build Alternative would not achieve the long-term productivity enhancements listed above.

5.13.3 Commitments of Resources

A discussion of a project's commitment of resources is required under NEPA. The purpose of the discussion is to disclose irrevocable actions that would result from selecting an alternative. An example (not applicable to this project) would be the extinction of a species.

Given the urban setting of the primary transportation corridor, irreversible commitments of resources would be those associated with the construction process, such as use of energy, construction materials, and labor. Once applied to this project, these resources would not be available for other projects. This commitment of energy, materials and labor is not a drawback since these resources would otherwise be committed to a different construction project.

AR00047615

Chapter 6.0
Financial Analysis

CHAPTER 6 FINANCIAL ANALYSIS

6.0 CHAPTER OVERVIEW AND ORIENTATION

Chapter 6 presents a financial analysis of the alternatives under consideration. It includes a summary of information used to evaluate the financial feasibility of the No-Build, Transportation System Management (TSM), and Bus Rapid Transit (BRT) Alternatives.

The financial analysis has three key objectives:

- identify the major differences between the alternatives with regard to financial resources needed to fund the capital and ongoing operating and maintenance costs associated with the network of projects comprising them;
- identify the relative level of financial resources required from the City, the State of Hawaii, and the federal government to fund the various components of the program; and
- demonstrate the City's financial capacity to build, operate, and maintain a Bus Rapid Transit Program while continuing to operate and expand the existing base transit system.

6.1 FINANCIAL ANALYSIS

The financial analysis has been conducted in recognition of key fiscal constraints at the local, State, and federal levels. First, with both the City and County of Honolulu and the State of Hawaii tightening budgets, it is essential that no new local or State tax increases or new revenue sources be required for any of the alternatives. Second, with strong competition nationally for FTA New Starts funds, the financial plan has been designed to make use of available local and formula funds and to use only modest annual levels of New Starts funding. The expenditure plan has been made flexible such that the individual projects comprising the alternatives can be accelerated or deferred, based on funding availability and priorities set by the OMPO.

The following strategies shaped the development of the financial analysis:

- Network of Projects: The TSM and Alternatives contain a network of discrete yet interrelated transit projects. The characteristics of the network of projects allow multiple sources of funding to be applied to eligible projects;
- Multiple Source Funding: Different sources of federal, State, and local funding are applied to different projects, consistent with policies regarding their use. This allows for multiple funding sources to be combined within an individual project. Sources include existing City funds, City General Obligation (GO) Bonds, and Federal Transit Administration (FTA) formula and discretionary capital grants. Transit related components on State highway facilities are eligible for State and federal highway funds.
- Phasing: The mobility needs and construction schedules are balanced with financing realities, adopting a balance between "build as we can pay" and "pay as we go". Particular care was given to ensure that funding sources would not be exhausted in any given project year and therefore unavailable for other priority uses;
- Protection of the City's Credit Rating: It is the City's intent to retain its current high General Obligation Bond Rating (Aa3 from Moody's and AA- from Standard & Poors) throughout the plan period with respect to any City debt financing that may be required. This is accomplished in the financial analysis by assuming that the amount of GO Bonds outstanding in any one year would not exceed the annual level equivalent to $1.13 billion (1996 $) in direct debt outstanding. This was the maximum amount of direct bonded debt outstanding in 1996 while the City maintained an AA- credit rating; and
- Implementation Flexibility: The financial analysis assumes a specific implementation schedule that can be modified to accommodate changes in mobility policy decisions and financial issues.

In November 1999, the City Council passed Resolution No. 99-338, which said, in part, that "Be it further resolved that the Council strongly supports a preliminary financial approach to include phased use of federal transportation funds, local highway funds and City general obligation bonds to provide the necessary funding;..." The Council's intentions are incorporated in the key elements and assumptions of this financial analysis.

This section summarizes the financial implications of the alternatives and presents the capital and operating financial plans for each. Utilizing the guiding strategies, the financing plans are constructed to be affordable for the entire network of projects, as well as on an annual basis. A description is provided of the assumed revenue sources, commitment of these sources, and schedule of annual outlays planned. This section also describes alternative funding and financing approaches that could be utilized.

To determine the adequacy of sources of funds for the capital and operating requirements of the alternatives, the major existing sources of revenues were examined. Costs were then compared to the revenues projected to be available from these sources over the 10-year period of Fiscal Year 2000-2001 (FY 2001) to Fiscal Year 2009-2010 (FY 2010) within which the projects would be implemented. Costs and revenues were also compared over the 25-year period of FY 2001 to FY 2025. The Fiscal Years are as defined in the City's budget, and extend from July 1 through June 30.

The financial analysis is presented in year-of-expenditure (YOE) dollars. This provides a better understanding of the actual funds that would need to be expended and of the relative effect of inflation on costs and revenues. A baseline rate of inflation of 2.5 percent has been assumed, with a 4.0 percent rate considered as a sensitivity analysis. The 2.5 percent rate is consistent with recent trends in the U.S. national inflation rate and 1 percent higher than Hawaii's inflation rate of 1.5 percent per year for the past 5 years. Year-of-expenditure dollar values are computed by multiplying 1998 dollar values by the compounded escalation factor for the relevant year. For example, in year-of-expenditure dollars, $1.00 in FY 1998 is equivalent to $1.025 in FY 1999, for the assumed baseline rate of inflation of 2.5 percent. To provide a conservative estimate of the City's annual GO bonding capacity, an inflation rate of 1.5 percent per year was assumed in the computation of the maximum amount of direct bonded debt that could be outstanding in any one year.

6.1.1 Key Measures of Financial Performance

The financial assessment uses a cash flow model to evaluate the ability of the various sources of capital and operating revenues to fund the annual capital and operating costs of the alternatives over the FY 2001-2010 implementation period and over the FY 2001 – 2025 period of interest to FTA. The sources and uses cash flow model consists of four basic components: Capital Costs, Operating Costs, Capital Revenues, and Operating Revenues. These components are used to compute the annual Cash Balance and to track the gross and net General Fund Contribution required.

Key measures have been used to assess the financial performance of the alternatives and to contrast the BRT Alternative to the No-Build and TSM Alternatives. These measures are:

- General Obligation Bonding Required by the City;
- Total and Annual City General Fund Contribution Required for Debt Service;
- Total and Average Annual City General Fund Contribution Required for Operating and Maintenance;
- Federal New Starts Transit Capital Funding Required; and
- Federal and State Highway Funding Required.

The results associated with these measures are discussed in Section 6.1.5.

6.1.2 Costs

The capital and operating and maintenance (O&M) costs of the alternatives and their various components were computed in 1998 dollars, by year, over the FY 2001–2025 period. These costs were inflated to reflect year-of-expenditure dollars based on the proposed phasing and implementation schedules for the different alternatives. The financial analysis and tables focus on the first ten years, which is when all of the capital improvements, except vehicle replacements and expansion of the bus maintenance facility in the TSM Alternative will occur. The sections below summarize the capital and O&M costs of the alternatives.

1) Capital Costs

Table 6.1-1 summarizes the capital costs of the No-Build, TSM and BRT Alternatives in YOE dollars, by project type, over the 10-year implementation period of FY 2001-2010. To assure consistency, the implementation schedule used in the cash flow analysis is consistent with the schedule shown in other chapters. Reflecting the guiding strategies described earlier, this schedule could be adjusted in response to fiscal and mobility considerations. There is flexibility in the scheduling of the individual projects comprising the alternatives. This network of projects within the alternatives allows network-financing strategies to be employed.

TABLE 6.1-1
CAPITAL COSTS, BY ALTERNATIVE
TOTAL FOR FISCAL YEARS 2001 – 2010
(YOE $, 000)

	NO-BUILD	TSM	BRT
Bus Acquisitions	$135,939	$159,324	$186,524
TheHandi-Van Vehicle Acquisitions	$16,873	$17,025	$17,025
Bus Maintenance Facility Expansion		(Post-2010)	$30,339
Subtotal, Bus and TheHandi-Van Component	***$152,812***	***$176,349***	***$233,888***
BRT Transit Centers/Park-and-Ride Lots (on Federal/State facilities)		$1,936	$1,895
BRT Transit Centers/Park-and-Ride Lots (on City facilities)		$99,560	$29,270
Bus Priority Treatment –(Fed/State facil.)		$7,182	$7,182
Bus Priority Treatment – (on City facilities)		$11,510	$7,539
Zipper Lane		$34,756	$165,341
Direct Access Ramps			$72,617
Subtotal, Regional BRT Component	***$0***	***$154,944***	***$283,844***
In-Town BRT Transit Centers/Park-and-Ride lots (on State facilities)			$1,431
In-Town BRT Transit Centers/Park-and-Ride lots (on City facilities)			$73,113
In-Town BRT Facility and Vehicles			$289,657
Subtotal, In-Town BRT Component	***$0***	***$0***	$364,201
Total Capital Costs	**$152,812**	**$331,113**	**$881,933**

Source: Sharon Greene & Associates.
Note: Totals may differ due to rounding

Implementation Schedule Of Capital Costs

With the exception of bus acquisition, TheHandi-Van vehicle acquisitions, and In-Town BRT vehicle replacement, the capital costs of the alternatives are concentrated in the first ten years. Funding sources were matched with project elements to maximize the capacity of the combination of financing sources. In some cases, the implementation schedule was adjusted to accommodate the availability of funding from the combined sources. Availability of funding was partially based on the assumed limits of each revenue source, taking into consideration the funding authorization, bond rating, interest rates, and other requirements. This approach of matching project implementation to assumed funding flows supported an overall financing strategy of spreading the financial load across years as well as within years by using multiple revenue sources without exhausting any source that would need to be used for other projects.

2) Operating and Maintenance Costs[1]

The O&M costs comprising the No-Build, TSM, and BRT Alternatives include some or all of the following:

- Bus O&M;
- TheHandi-Van O&M; and
- In-Town BRT O&M.

Tables 6.1-2A and B summarize typical O&M costs of the alternatives for two representative fiscal years in year of expenditure dollars. The fiscal years selected are FY 2005, after initiation of In-Town service (in the BRT Alternative) and FY 2010. To facilitate comparison with current costs for transit operation, these costs are compared to the estimated O&M costs for FY 2000-2001. Annual O&M costs over the FY 2001-2010 implementation period and over the FY 2001-2025 period are reported in the cash flows for each alternative.

As shown in Table 6.1-2A and B, O&M costs consist principally of bus O&M costs, which are relatively similar between alternatives. Bus O&M costs comprise 91 percent of the O&M cost of the No-Build and TSM Alternatives and 80-86 percent of the O&M cost of the BRT Alternative.

An estimated $760,000 (Year 2000 dollars) will be needed for zipper lane O&M costs attributable to this project. Since this project element is part of the interstate system, the financial plan assumes that the costs will be part of the State's overall O&M program. Therefore, details are not included in the cash flow tables.

TABLE 6.1-2A
ESTIMATED OPERATING AND MAINTENANCE COSTS FOR FY 2000-01 AND 2004-05, BY ALTERNATIVE
(YOE $, 000)

	FY 2000-01	FY 2004-05		
		No-Build	TSM	BRT
Bus	$110,533	$125,698	$128,088	$122,323
TheHandi-Van	$11,496	$13,054	$13,054	$13,054
In-Town BRT				$8,624
TOTAL	$122,029	$138,752	$141,142	$144,001

Source: Sharon Greene & Associates.

[1] As noted in Chapter 2, the City will be assuming responsibility for the Oahu component of the State's vanpool program. The costs and revenues associated with the vanpool program have not been included in the financial analysis as cost sharing and funding arrangements were in the process of being defined. The annual net cost to the City for the program was projected to be under $500,000 through FY 2010, with no net cost to the City beyond FY 2010.

TABLE 6.1-2B
ESTIMATED OPERATING AND MAINTENANCE COSTS FOR FY 2000-01 AND 2009-10, BY ALTERNATIVE (YOE $, 000)

	FY 2000-01	FY 2009-10		
		No-Build	TSM	BRT
Bus	$110,533	$148,309	$154,005	$152,555
The Handi-Van	$11,496	$15,301	$15,301	$15,301
In-Town BRT				$13,820
TOTAL	$122,029	$163,610	$169,305	$181,676

Source: Sharon Greene & Associates.

6.1.3 Revenue Sources

The City's financial plans assume seven revenue sources to fund the capital costs associated with the various projects and program elements comprising the alternatives. Three revenue sources are assumed to fund operating and maintenance costs. Summary descriptions of these revenue sources are provided below.

1) Revenue Sources for Capital

Seven sources are proposed to fund the capital costs associated with the alternatives. These are:

- FTA Section 5307 Urbanized Area Formula Grant;
- FTA Section 5309 Fixed Guideway Modernization Grant;
- FTA Section 5309 New Starts Capital Investment Grant;
- Federal Highway Administration Funds including Congestion Mitigation and Air Quality Program (CMAQ), Surface Transportation Program (STP), National Highway System Program (NHS), and Interstate Maintenance Program (IM);
- State Highway Funds (as the local match for Federal Highway funds);
- City Highway Fund Revenues; and
- City General Obligation Bonds.

Tables 6.1-3A through C summarize the eight potential capital funding sources assumed to fund the annual capital costs of the major program elements over the FY 2001-2010 period for each alternative. Costs are reported in year of expenditure dollars.

As shown in Tables 6.1-3A through C, the conceptual capital funding plans for the alternatives assume the project elements are funded by some or all of the following, depending on the alternative: the City Highway Fund, GO bond revenues, and FTA formula and discretionary capital grants. In addition, transit elements on State highway facilities in the TSM and BRT alternatives are assumed to be partially funded with State and federal highway funds. Of the different program elements within which the projects are grouped, seven are eligible for funding under the Federal Highway Administration: BRT transit centers and park-and-rides on federal/State facilities, In-Town BRT transit centers and park-and-rides on federal/State facilities, bus priority treatments on federal/State facilities, zipper lane, and direct access ramps.

FTA Section 5307 Urbanized Area (UZA) Formula Grant

This program provides federal assistance for planning and capital projects. Under the six-year transportation reauthorization act passed in 1998, the Transportation Equity Act for the 21st Century (TEA-21), the City's annual apportionment will be approximately $23 million in 2001, and will increase to $26.7 million in 2003, the

TABLE 6.1-3A
NO-BUILD ALTERNATIVE
CONCEPTUAL CAPITAL FUNDING PLAN
TOTAL FOR FISCAL YEARS 2001 – 2010 (IN YOE $, 000)

Description	Costs	FTA		City	
	FY 2001-2010	Urbanized Area Formula Funds	Fixed Guideway Moderniza-tion Funds	General Obligation Bonds	Highway Fund
Bus Acquisitions	$135,939	$100,433	$8,318	$789	$26,399
Handi-Van Acquisition	$16,873	$13,229	$0	$2,211	$1,433
TOTAL	***$152,812***	***$113,662***	***$8,318***	***$3,000***	***$27,832***
% of Total	***100%***	***74%***	***6%***	***2%***	***18%***

Source: Sharon Greene & Associates.

last year of the TEA-21 authorization period. Over the next six-year authorization period of 2004-2009, this amount is assumed to increase 10 percent, to $29.3 million in 2004 at the start of the new authorization and then held constant. Over the next six-year authorization periods beginning in 2010 and 2016, the annual apportionment is again assumed to increase in the first year of the period and is then held constant.

FTA Section 5307 funds may be used for preventive maintenance. Preventive maintenance costs are defined as all maintenance costs and FTA will participate in eighty percent (80%) of the eligible maintenance costs. If there are Section 5307 funds remaining after other capital and planning needs are met, the remaining funds are assumed to be used for preventive maintenance, up to the maximum statutory limit. As Section 5307 assistance for preventive maintenance reduces the annual General Fund subsidy for transit operating and maintenance (O&M) costs, the financial analysis assumes that $12 million of Section 5307 funds would be used for preventive maintenance in 2001 and 2002, and $6 million would be used in 2003 to 2005.

FTA Section 5309 Capital Investment Grants and Loans

Capital projects to modernize or improve fixed guideway systems are eligible for Fixed Guideway Modernization assistance from FTA's Section 5309 Capital Investment Grants and Loans program. Eligible projects include, but are not limited to, the purchase of rolling stock, signals and communications, operational support equipment, and preventive maintenance.

The City's current annual apportionment of approximately $657,000 is based on bus service operated on exclusive or controlled rights-of-way, e.g. the Hotel Street Transit Mall, and high occupancy vehicle (HOV) lanes. The City's Fixed Guideway Modernization annual apportionments are projected to increase through the TEA-21 authorization period to approximately $788,000 in 2003. With the addition of new In-Town and Regional BRT, the City could qualify for higher levels of funding through the Fixed Guideway Modernization program. To provide a conservative estimate of future funding from this source, however, these additional route-miles of facilities were not included.

FTA Section 5309 New Starts Capital Investment Grants and Loans

FTA Section 5309 New Starts funding is assumed to pay up to 50 percent of the capital cost of the BRT related capital elements in the TSM and BRT Alternatives with local funding sources paying the balance. Depending on the alternative, these elements consist of In-Town BRT, City-funded bus priority treatments not

TABLE 6.1-3B
TSM ALTERNATIVE
CONCEPTUAL CAPITAL FUNDING PLAN
TOTAL FOR FISCAL YEARS 2001 – 2010 (IN YOE $, 000)

	Costs	FTA			City		State	FHWA	
Element	FY 2001-2010	Urbanized Area Formula Funds	Fixed Guideway Moderniza-tion Funds	New Starts Funds	General Obligation Bonds	Highway Fund	Highway Fund	FHWA Funds	Total Revenue
BRT Transit Centers/Park & Ride Lots									
Federal/State Facilities	$1,936	$0	$0	$0	$0	$0	$387	$1,549	$1,936
City Facilities	$99,560	$19,622	$0	$38,368	$41,571	$0	$0	$0	$99,560
Bus Acquisitions	$159,324	$114,631	$8,318	$0	$3,430	$32,945	$0	$0	$159,324
Handi-Van Vehicle Acquisitions	$17,025	$12,475	$0	$0	$816	$3,734	$0	$0	$17,025
Expanded Bus Facility	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment									
Federal/State Facilities	$7,182	$0	$0	$0	$0	$0	$1,436	$5,745	$7,182
City Facilities	$11,510	$1,562	$0	$5,268	$4,681	$0	$0	$0	$11,510
Zipper Lane Extension to Middle Street	$34,576	$0	$0	$0	$9,502	$0	$5,015	$20,059	$34,576
TOTAL	***$331,113***	***$148,289***	***$8,318***	***$43,636***	***$60,000***	***$36,679***	***$6,838***	***$27,353***	***$331,113***
% of Total	100%	45%	3%	13%	18%	11%	2%	8%	100%

Source: Sharon Greene & Associates:

Note: Totals by funding source do not include 1) FTA Urbanized Area formula funds used for preventive maintenance, or 2) City Highway Fund revenues not required as local match for capital and returned to the City General Fund and used for O&M. (See Appendix E)

TABLE 6.1-3C
BRT ALTERNATIVE
CONCEPTUAL CAPITAL FUNDING PLAN
TOTAL FOR FISCAL YEARS 2001 – 2010 (YOE $, 000)

	Costs	FTA			City		State	FHWA	
Element	FY 2001-2010	Urbanized Area Formula Funds	Fixed Guideway Moderniza-tion Funds	New Starts Funds	General Obligation Bonds	Highway Fund	Highway Fund	FHWA Funds	Total Revenue
BRT Transit Centers/Park & Ride Lots									
Federal/State Facilities	$1,895	$0	$0	$0	$0	$0	$379	$1,516	$1,895
City Facilities	$29,270	$16,258	$0	$0	$9,535	$3,478	$0	$0	$29,270
In-Town BRT Transit Centers/P&R Lots									
Federal/State Facilities	$1,431	$0	$0	$0	$1,363	$0	$14	$54	$1,431
City Facilities	$73,113	$14,210	$0	$0	$55,780	$3,123	$0	$0	$73,113
Bus Acquisitions	$186,522	$135,062	$8,318	$0	$9,915	$33,229	$0	$0	$186,524
Handi-Van Vehicle Acquisitions	$17,025	$13,620	$0	$0	$1,009	$2,396	$0	$0	$17,025
Bus Maintenance Facility	$30,339	$13,913	$0	$0	$12,464	$3,962	$0	$0	$30,339
Bus Priority Treatment									
Federal/State Facilities	$7,182	$0	$0	$0	$0	$0	$1,436	$5,745	$7,182
City Facilities	$7,539	$2,498	$0	$0	$4,415	$625	$0	$0	$7,539
Zipper Lane Extension	$165,341	$0	$0		$24,294	$0	$28,209	$112,838	$165,341
Direct Access Ramps	$72,617	$0	$0		$20,914	$0	$10,341	$41,362	$72,617
In-Town BRT	$289,657	$8,275	$0	$182,100	$99,195	$87	$0	$0	$289,657
TOTAL	$881,933	$203,836	$8,318	$182,100	$238,885	$46,899	$40,379	$161,516	$881,933
% of Total	100%	23%	1%	21%	27%	5%	5%	18%	100%

Source: Sharon Greene & Associates

Note: Totals by funding source do not include 1) FTA Urbanized Area formula funds used for preventive maintenance, or 2) City Highway Fund revenues not required as local match for capital and returned to the City General Fund and used for O&M. (See Appendix E) on the State highway system, City-funded In-Town BRT transit centers and park-and-rides, and City-funded regional BRT transit centers and park-and-rides not on the federal/State highway system. The annual levels of New Starts funds assumed in the cash flow analysis would require the City to pay more than its 50% share of BRT related capital costs in certain years. Upon receipt, the Section 5309 New Starts funds would reimburse the City for expenditures made over and above the City's 50 percent share.

Federal Highway Administration (FHWA) And State Highway Funds

The TSM and BRT Alternatives incorporate transit-related highway improvements on portions of the State and federal highway system. These improvements include selected transit centers and park-and-ride lots, bus priority treatments, Zipper lane enhancements, and direct access ramps. These projects are eligible for funding from one or more federal highway sources. All of the projects are eligible for Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funds. The H-1 Zipper Lane and ramps are eligible for receipt of Interstate Highway funds. Most of the projects are on the National Highway System and are therefore eligible for National Highway System (NHS) High Priority Project funds. The financing plan assumes that State-only funds in the State Highway Fund would provide the 20% local match with 80% from federal funds. This plan does not break down funding by specific FHWA program categories, as the actual sources would be more appropriately decided by OMPO and the State. A cooperative effort would be required of the City, State, and federal government to maximize opportunity to secure such funding. Currently, a total of \$116 - \$120 million in FHWA funds are received each year. Funding for this project is projected to use about 17% of the total funds available for highway projects, not counting any formula increases after the TEA-21 authorization period.

For the BRT Alternative, a total of \$202 million in federal/State highway funding has been assumed in the cash flow analysis, with the amount capped at \$25 million annually over the 2001-2010 period. As discussed above for FTA Section 5309 New Starts funds, the annual levels of federal/State highway funding assumed in the cash flow analysis would require the City to utilize City funding, General Obligation bonding, and/or short-term financing in advance of receipt of federal/State highway funds to pay for the transit-related highway capital elements in certain years. Federal/State highway funds received after City expenditure would be used to reimburse the City.

City Highway Fund Revenues

This funding source is used for the 20 percent local match required for capital projects using FTA Section 5307 (except for Preventive Maintenance), FTA Section 5309 Fixed Guideway Modernization, and FTA Section 5309 New Starts funds. Any City Highway Fund revenues that are not required for capital match in a particular year are credited back to the General Fund to offset the City's annual contribution for O&M. Thus, this source is used for capital up to the level of local match required, with the balance available for O&M.

To estimate the available Highway Fund revenues for the Primary Corridor Transportation Project, the assumption made is that the \$60 million (1999 \$) in expenditures from the City Highway Fund currently made for general public works, public safety, sanitation, retirement and health benefits, and highways and streets public safety remains constant over the plan period. It is further assumed that the annual payment from the Fund of \$18.4 million (1999 \$) for debt service on bonds issued prior to FY1999 remains the same through the forecast period, as does the \$25.4 million (1999 \$) transfer to subsidize bus O&M costs.

The level of City Highway Fund Revenues available to fund components of the alternatives is calculated as the total annual City Highway Fund real growth (controlling for inflation) less the \$60 million of other expenditures and the \$44 million of debt service and bus subsidy transfers to the General Fund. The annual growth of the City Highway Fund is based on the average annual historical growth of the fund over the past five years.

General Obligation Bonds

City General Obligation Bonds are proposed to finance capital improvements: Proceeds from the General Obligation Bonds are used primarily for transit improvements including In-Town BRT and other investments such as bus and TheHandi-Van vehicle acquisitions, City-funded transit centers and park-and-ride lots, and City-funded bus priority treatments, if required. With regard to source of payment, the debt service on General Obligation Bonds would be paid from the City General Fund.

General Obligation Bonds are required to meet annual cash flow requirements during the 2001-2010 capital project implementation period. Due to limitations assumed on the annual levels of FTA and FHWA/State highway funds received over this period, the City is required to issue bonds in order to advance funds in place of the New Starts and federal/State highway monies to be received in subsequent years. This is in addition to the bonding required by the City to cover its own share of capital costs. After receipt of federal and State grant monies, the City bond funds advanced to cover the FTA and FHWA/State funding shares are credited back to the City. To accommodate annual cash flow requirements, a total of $320 million in bonds are required for the BRT Alternative. Of this total, $81.1 million is credited back to the City for the BRT Alternative.

There are several policy constraints assumed on the use of GO Bonds. First, the annual level of outstanding bond indebtedness is assumed to be capped. Second, and related to the first constraint, is the assumption that the City will retain its AA-/Aa3 Credit Rating for GO Bonds and its associated low cost of borrowing.

With regard to the first constraint, the assumption is that property values will remain flat and that the City will maintain the current property tax rate. This creates a ceiling on the amount of General Obligation Bonds the City can issue because it limits its debt service payment capacity to the current level of property tax revenues.

The second constraint assumes that the City will retain its General Obligation Bond Rating (Aa3 from Moody's and AA- from Standard & Poor's) throughout the plan period. The City's high AA- credit quality allows it to borrow at a lower cost than if it had a lower credit rating. Therefore, the level of General Obligation Bonds that are outstanding in any given year is assumed not to increase to an extent that will threaten the City's credit rating. It is assumed that the City does not have over $1.13 billion (1996 $) of direct bonded debt[2] outstanding in any one year. This was the maximum amount of direct bonded debt outstanding in 1996 while the City maintained an AA- credit rating.

There are many other factors that are included in a General Obligation credit rating in addition to the amount of outstanding direct bonded debt. Broadly speaking, these are the socioeconomic and assessed property value base that generates tax revenues, the City's financial operations (current account and budget balances),

---

[2] Direct Bonded Debt is the total amount of General Obligation Bonds outstanding that are supported entirely by General Fund Revenues. The City has other general obligation bonds outstanding, but these bonds are primarily supported by tax and fee revenues, such as water and sewer tariffs. Other general obligation bonds that are not included as direct bonded debt are bonds supported by the Water and Sewer Fund, the Housing Fund, and the H-Power Fund. The Highway Fund also pays debt service on the proportion of General Obligation Bonds used for highway purposes. But this is an internal transfer and is not legally considered as an enterprise bond.

legal bond considerations, financial management and other factors. The financial analysis assumes that these conditions will remain similar to the 1996 levels over the year bonding period[3].

The issuance of General Obligation Bonds is constrained in the financial analysis to a total equivalent to the 1996 level of $1.13 billion outstanding in any given year. This amount is adjusted annually to reflect a conservative 1.5 percent rate of inflation and to allow for repayment of principal on outstanding debt.

The financial terms and conditions of the General Obligation Bonds are a 20 year maturity with a 6.25 percent interest rate. The interest rate reflects the Bond Buyer 11 High Grade General Obligation Bond Index. The assumption in the model is that the cost of issuing General Obligation Bonds is 1 percent of the principal bond amount. The cost of issuance is included in the annual debt service amount. There is no debt service reserve fund required for the General Obligation Bonds.

2) Operating and Maintenance Funding Sources

Operating and maintenance funding for the alternatives is derived from three main sources:

- Farebox revenues from bus, TheHandi-Van and In-Town BRT services;
- FTA Section 5307 funds for preventive maintenance; and
- City General Fund operating support.

Of these sources, farebox revenues from the three services cover roughly 28 percent of O&M costs. FTA Section 5307 funds used for preventive maintenance are projected to cover 14 percent of O&M costs. The largest single source of O&M funding is the City General Fund. The O&M contribution provided from this source constitutes 58 percent of O&M costs.

Farebox Revenues

Farebox revenue projections for each of the three services were developed in conjunction with the ridership forecasting process, and reflect projected ridership, fare levels, and fare policies. Based on the analysis results, bus fares are expected to cover roughly 23-28 percent of bus O&M costs (depending on the alternative) over both the FY 2001-2010 and FY 2001-2025 periods. TheHandi-Van fares are projected to cover roughly 10 percent of TheHandi-Van O&M costs. These projected farebox recovery levels are consistent with historical levels of farebox recovery. In-Town BRT fares are projected to cover roughly 36 percent of In-Town BRT O&M costs, or higher than the farebox recovery levels of the other two services.

FTA Section 5307 Urbanized Area (UZA) Formula Funds For Preventive Maintenance

As noted earlier, FTA Section 5307 Urbanized Area formula funds for capital can be used for preventive maintenance costs associated with the transit system. The assumption made in the cash flow model is that $12 million in FTA Section 5307 funds would be reserved for preventive maintenance in both FY 2001 and 2002, and $6 million annually in FY 2003-2005. In other years, these funds would be used for preventive maintenance only if there were surplus funds not required for other transit capital needs. Over the FY 2001-2025 period, a total of between $300 - 365 million in FTA Section 5307 funds is projected to be used for

---

[3] The most important condition is the value of property. Honolulu has experienced a decline in property values since the early 1990s and has also seen an increase in appeals by homeowners to reassess the value of their property. The City has processed the majority of these requests and has stabilized the decline in property tax revenues.

preventive maintenance purposes for the BRT Alternative. Other than those funds set aside through FY 2005, FTA Section 5307 funds are expected to be available for this purpose beginning in FY 2009, after the majority of transit capital expenditures are completed.

As discussed below, use of FTA Section 5307 funds for preventive maintenance serves to reduce the level of O&M contribution required from the City General Fund.

City General Fund

The City General Fund contributes annually to the costs of transit O&M. This contribution is for support of transit operating and maintenance and for payment of debt service costs on GO Bonds issued for transit capital needs. The gross estimate of General Fund support in 1999 is roughly $90 million.

There are various offsetting costs and revenues that constitute the actual level of funding required from the General Fund in any one year. To account for this flow of costs and revenues, the cash flow computes both gross and net contribution from the General Fund. Beginning with the annual gross level of General Fund contribution required to balance annual O&M revenues to O&M costs, two additional costs are added while four other revenues are brought in to reduce the annual contribution required. The two costs added are: a) annual debt service payments for transit-related debt issued prior to 1999; and b) annual debt service payments for debt issued for the Primary Corridor Transportation Project. From this subtotal, four types of revenue are deducted to yield the net annual contribution from the General Fund. These four revenues are: a) the annual transfer of $18.4 million (in constant 1999 $) from the City Highway Fund for debt service; b) the annual Highway Fund growth revenues not required for capital; and d) any annual FTA Section 5307 funds available for preventive maintenance.

6.1.4 Cash Flow Requirements

Tables 6.1-4 and 6.1-5 summarize the capital and O&M funding required by source for the No-Build, TSM and BRT Alternatives. Table 6.1-4 compares the levels of capital funding required by source for each alternative over the ten-year implementation period of FY 2001-2010. Table 6.1-5 contrasts the levels of O&M funding required, by source, for the representative years of FY 2005 and 2010.

The alternatives differ with regard to their relative reliance on individual sources of funding. Some sources such as FTA Section 5307 Formula Grant, 5309 Fixed Guideway Modernization Grant, and City Highway Fund are common to all alternatives and are relatively similar in terms of levels of funding. Other sources such as FTA Section 5309 New Starts, GO Bonds, and BRT fare revenues, are specific to the TSM and BRT Alternatives.

1) Annual Cash Flow Requirements: FY 2001 to 2010

Tables 6.1-3 A through C presented earlier summarized the capital funding that would be required by source over the FY 2001-2010 implementation period for the alternatives as a whole and for the major project elements comprising them. In the absence of a major capital investment, the transit capital program represented by the No-Build Alternative would consist primarily of bus and TheHandi-Van vehicle acquisition and replacement costs. These would be funded chiefly with FTA Section 5307 Urbanized Area formula grant funds and City Highway funds. Beyond the No-Build Alternative level, the capital program additions included in the TSM and BRT Alternatives will require utilization of City funds and/or short and long term bonding in order to provide annual revenues sufficient to meet capital expenditure levels concentrated over the ten-year implementation period. While all three alternatives assume some level of FTA Section 5309 New Starts funding and funding from federal/State highway sources, City funding and financing will also be required as a result of caps on the annual levels of funding assumed to be received under these programs.

TABLE 6.1-4
FUNDING REQUIRED FOR CAPITAL, BY ALTERNATIVE AND BY SOURCE
TOTAL FOR FISCAL YEARS 2001- 2010 (YOE $, 000)

	NO-BUILD	TSM	BRT
CAPITAL SOURCES			
Federal Transit Administration			
Sec.5307 UZA Formula Grant	$113,662	$148,289	$203,836
Sec.5309 Fixed Guideway Modernization	$8,318	$8,318	$8,318
Sec.5309 New Starts		$43,636	$182,100
Federal & State Highway Funds			
FHWA		$27,353	$161,516
State Highway		$6,838	$40,379
Local Funds			
G.O. Bonds *	$3,000	$60,000	$238,885
City Highway Fund	$27,832	$36,679	$46,899
TOTAL CAPITAL FUNDS	**$152,812**	**$331,113**	**$881,933**

Source: Sharon Greene & Associates, Inc.
Note: * GO Bonds: Totals do not include GO Bond funds advanced by the City in anticipation of receipt of federal and State grant funds in the BRT Alternative and then reimbursed with grant funds. Including these bond funds, the total levels of GO bonding for the BRT Alternative is $320 million.

TABLE 6.1-5
FUNDING REQUIRED FOR O&M, BY ALTERNATIVE AND BY SOURCE
FOR SELECTED YEARS: FY 2004-05 AND FY 2009-10 (YOE $, 000)

	NO-BUILD	TSM	BRT
FY 2004-05 OPERATING REVENUES			
Passenger Fares (Bus)	$35,529	$35,778	$33,078
TheHandi-Van Fares	$1,134	$1,134	$1,134
In-Town BRT Fares			$3,080
FTA Sec.5307 UZA Funds (Preventive Mtnce)	$6,000	$6,000	$6,000
General Fund Revenues (for transit support)	$96,089	$98,230	$100,710
TOTAL O&M REVENUES	**$138,752**	**$141,142**	**$144,001**
FY 2009-10 OPERATING REVENUES			
Passenger Fares (Bus)	$42,156	$42,750	$39,423
TheHandi-Van Fares	$1,329	$1,329	$1,329
In-Town BRT Fares			$4,936
FTA Sec.5307 UZA Funds (Preventive Mtnce)	$0	$0	$0
General Fund Revenues (for transit support)	$120,125	$125,227	$135,988
TOTAL O&M REVENUES	**$163,610**	**$169,305**	**$181,676**

Source: Sharon Greene & Associates, Inc.

Conceptual Funding Plans for Capital Cost Components of the Alternatives

In December 1999, the Honolulu City Council passed a resolution (8-0, 1 member absent) that "strongly" supports a preliminary financial approach to include phased use of federal transportation funds, local highway funds and City General Obligation Bonds to provide the necessary funding. The financing analysis assumes that the City would "front load" any FTA and/or FHWA/State transit-related highway funding in the first few years of the projected ten years of the program. Upon selection of a Locally Preferred Alternative and environmental clearance, the Honolulu City Council can begin to commit General Obligation Bonds and City Highway Funds as part of the regular appropriation process.

Funding Concept for In-Town Bus Rapid Transit

As shown in Table 6.1-6, the total capital cost of the In-Town BRT projects is $364.2 million (in YOE $) for the BRT Alternative. This amount includes the In-Town BRT transitway and stops, associated transit centers and park-and-ride, and initial BRT rolling stock. It does not include an estimated $95 million (YOE $) that will be required to replace the BRT rolling stock in FY 2020. The In-Town BRT component is assumed to be funded with 50.0 percent FTA Section 5309 New Starts funds, matched with local capital funds in the form of City GO Bonds, City Highway Funds, and FTA Section 5307 UZA formula grant funds.

TABLE 6.1-6
PROPOSED SOURCES OF FUNDING FOR IN-TOWN BUS RAPID TRANSIT COMPONENT
TOTAL FOR FISCAL YEARS 2001 – 2010 (YOE $, 000)
(BRT ALTERNATIVE)

Source	Total $ (%)	In-Town BRT Elements
FTA Sec. 5309 New Starts	$182,100 50.0%	• Fixed facilities • Rolling stock
FTA Sec. 5307 UZA Formula	$22,485 6.1%	• Fixed facilities • Rolling stock
City GO Bonds	$156,338 42.9%	• All project elements
City Highway Fund	$3,210 0.9%	• All project elements
Other	$68 0.1%	• All project elements
TOTAL	**$364,201 100.0%**	

Source: Sharon Greene & Associates, Inc.

Conceptual Funding Plan for Regional Bus Rapid Transit (BRT)

As shown in Table 6.1-7, the total capital cost of the Regional BRT projects is $283.8 million (in YOE $) for the BRT Alternative. This total does not include bus and TheHandi-Van vehicle acquisitions or the additional bus maintenance facility required in later years in the BRT Alternative. Many of the Regional BRT projects are improvements to provide dedicated or priority treatment on portions of the Interstate system, including the construction of bus-only direct access ramps. Therefore, the conceptual financial plan calls for 75 percent of the cost of the Regional BRT project component to be paid from federal and State highway funds. Approximately 20 percent of the cost would be from City funds in the form of GO Bonds and City Highway Funds, with FTA Section 5307 formula grant funds contributing the remaining 6 percent. No FTA New Starts funds have been assumed for the Regional BRT Program, although elements of the program could qualify for such funding.

Funding Concept for Combined Regional and In-Town BRT Program

Table 6.1-8 summarizes the conceptual funding plan for the combined Regional and In-Town BRT Program over the FY 2001–2010 implementation period. As shown in the table, the total cost of the combined Regional and In-Town BRT Program is $648.0 million (YOE $) for the BRT Alternative.

As shown in the table, the overall BRT Program is proposed to be funded with approximately one-third City General Obligation Bonds, one-third federal and State highway funds, and one-third FTA Section 5309 and 5307 discretionary and formula grants.

TABLE 6.1-7
PROPOSED SOURCES OF FUNDING FOR REGIONAL BUS RAPID TRANSIT COMPONENT
TOTAL FOR FISCAL YEARS 2001 - 2010 (YOE $, 000)
(BRT ALTERNATIVE)

Source	Total $ (%)	Regional BRT Elements
FHWA Funds	$161,461 56.9%	• Priority treatment lanes • Zipper lane • Direct access ramps • Transit centers and park-and-rides on State facilities
State Highway Funds	$40,365 14.2%	• Priority treatment lanes • Zipper lane • Direct access ramps • Transit centers and park-and-rides on State facilities
FTA Sec. 5307 UZA Formula Funds	$18,756 6.6%	• Transit centers and park-and-rides • Bus priority treatments
City GO Bonds	$59,158 20.8%	• All project elements
City Highway Fund	$4,103 1.5%	• All project elements
Total	**$283,843** **100.0%**	

Source: Sharon Greene & Associates.

2) Conceptual Funding Plan for Operating and Maintenance

Table 6.1-9 below compares the TSM and BRT Alternatives to the No-Build with regard to the average annual O&M cost over the FY 2001-2010 period. As shown in the table, the alternatives are similar in terms of average annual O&M costs. The BRT Alternative has slightly higher average annual O&M costs (less than 5 percent higher) than the No-Build and TSM, despite the fact that it has more components contributing to cost.

As the average annual O&M costs in the above table are in year of expenditure dollars, a valid comparison to current O&M costs requires presentation of the data in constant dollars. Table 6.1-10 compares O&M costs for the bus, TheHandi-Van, and In-Town BRT service components of the alternatives to current conditions in 1998 Constant dollars.

The alternatives are similar to each other and to FY 2001 cost levels with regard to Bus and TheHandi-Van services. All alternatives have the same TheHandi-Van O&M costs, which are within 5 percent of current costs. In addition to bus and TheHandi-Van O&M costs, the BRT Alternative includes the cost of providing

TABLE 6.1-8
PROPOSED SOURCES OF FUNDING FOR COMBINED IN-TOWN AND REGIONAL BRT PROGRAM
TOTAL FOR FISCAL YEARS 2001 – 2010 (YOE $, 000)
(BRT ALTERNATIVE)

Source	Total $ (%)	Project Element
FTA Sec. 5309 New Starts	$182,100 28.1%	• In Town BRT fixed facilities • Transit centers • Park-and-rides • Rolling stock
FTA Sec. 5307 UZA Formula	$41,241 6.4%	• Fixed facilities • Transit centers
Federal Highway-Related Funds	$161,516 24.9%	• Priority treatment lanes • Zipper lane • Direct access ramps • Transit centers • Park-and-rides
State Highway Funds	$40,379 6.2%	• Priority treatment lanes • Zipper lane • Direct access ramps • Transit centers • Park-and-rides
City GO Bonds	$215,497 33.3%	All project elements
City Highway Fund	$7,312 1.1%	All project elements
TOTAL	**$648,046** **100.0%**	

Source: Sharon Greene & Associates.

TABLE 6.1-9
AVERAGE ANNUAL OPERATING AND MAINTENANCE COSTS
OVER FISCAL YEARS 2001 – 2010 (YOE $, 000)

Alternative	Average Annual O&M Cost	% Increase Over No-Build
NO-BUILD	$141,690 *	
TSM	$144,521 *	2.0%
BRT	$149,078 **	5.2%

Source: Sharon Greene & Associates.
Notes: * No-Build and TSM include cost of TheBus and TheHandi-Van service.
** BRT Alternative includes cost of In-Town BRT in addition to TheBus and TheHandi-Van service. Pending further refinement of cost and funding arrangements, none of the alternatives include the potential cost to the City for assuming responsibility for the Oahu portion of the State's vanpool program. These costs would be part of the No-Build Alternative, and thus would be common to all alternatives.

TABLE 6.1-10
AVERAGE ANNUAL OPERATING AND MAINTENANCE COSTS
OVER FISCAL YEARS 2001 – 2010 (CONSTANT 1998 $, 000)

Alternative	Bus	TheHandi-Van	In-Town BRT	Total
FY 2001	$102,641	$10,675		$113,316
NO-BUILD	$106,220	$11,023		$117,243
TSM	$108,480	$11,023		$119,503
BRT	$105,813	$11,023	$8,885	$125,721

Source: Sharon Greene & Associates, Inc.

and maintaining In-Town BRT service. Pending further refinement of costs and funding arrangements, none of the alternatives include the potential cost to the City for assuming responsibility for the Oahu portion of the State's vanpool program. These costs would become part of the No-Build, and thus would be common to all alternatives.

Revenues for the O&M costs associated with the alternatives come from the following sources:

- Bus fares: these cover roughly 28 percent of bus O&M costs;
- TheHandi-Van fares: these cover roughly 10 percent of TheHandi-Van O&M costs;
- In-Town BRT fares: these are assumed to cover approximately 36 percent of BRT O&M costs;
- City General Fund operating support: various transfers and credits to and from the General Fund are considered in computing the net General Fund operating support required; and
- FTA Section 5307 Urbanized Area formula grant funds: these funds may also be available in certain years. Based on direction from the City, FTA Sec. 5307 formula grant funds will be used for bus preventive maintenance at annual specified amounts through 2005. Beyond 2005, these funds could be used for preventive maintenance after funding eligible capital needs.

In the absence of any new revenues to fund the higher local operating subsidy required, the City has the financial capacity to fund the increased level of subsidy using existing sources of revenue through appropriations from the City's General and Highway Funds.

6.1.5 Financial Performance Measures

The results of the financial analysis are summarized in Tables 6.1-11 through 6.1-14 and are discussed below. The financial analysis focuses on the performance of the BRT Alternative relative to the No-Build and TSM Alternatives with respect to the following key measures:

Capital Funding Requirements, Fiscal Years 2001 - 2010

- Total and Annual Capital Funding Required;
- Level of City General Obligation Bonding Required;
- City Highway Fund Revenues Required;
- FTA Section 5309 New Starts Funding Required; and
- FHWA Funding Required.

Operating And Maintenance Funding Requirements, Fiscal Years 2001 - 2010

- Total and Annual Operations and Maintenance Funding Required;
- Average Annual Debt Service Payment Required; and
- Average and Annual Net City General Fund Contribution Required.

Capital And Operating Funding Requirements, Fiscal Years 2001 - 2010

- Average Annual Total City Contribution Required from the Highway Fund and General Fund;
- Average Annual Increase in Total City Contribution over No-Build; and
- Average Annual Increase in Total City Contribution over TSM.
- Detailed cash flow analyses were conducted to assess total and annual financial requirements over the 2001-2025 period. The analyses were performed using year of expenditure dollars inclusive of inflation. Cash flow analyses were conducted for the three alternatives.

These cash flow analyses are provided in Appendix E.

1) Capital Funding Requirements

The sections below summarize the key findings related to the five capital funding evaluation measures:

- Total and Annual Capital Funding Required;
- Level of City General Obligation Bonding Required;
- City Highway Fund Revenues Required;
- FTA Section 5309 New Starts Funding Required; and
- FHWA Funding Required.

Total and Annual Capital Funding Required, FY 2001 - 2010

Table 6.1-11 summarizes the total annual capital funding required for the No-Build, TSM, and BRT Alternatives over the ten-year implementation period. The capital costs of the alternatives increase with the number of projects comprising them. To an extent, the alternatives represent a spectrum, ranging from the No-Build Alternative, to the introduction of BRT elements in the TSM Alternative, to the build-up of the BRT program including In-Town and Regional BRT components in the BRT Alternative. The spectrum of costs ranges from $331.1 million for the TSM Alternative to $881.9 million for the BRT Alternative.

Tables 6.1-3A through 6.1-3D provided earlier, summarized the capital funding requirements for the alternatives over the Fiscal Year 2001-2010 implementation period. As shown in the tables, General Obligation bonding, FTA Section 5309 New Starts funding, and Federal/State Highway funding are required to provide adequate funding during this period.

Level Of City General Obligation Bonding Required, Fiscal Years 2001 - 2010

The financing scenarios for all of the alternatives assume that the City would use a portion of its General Obligation bonding capacity. Table 6.1-11 summarizes the annual level of GO bonding required by each alternative. As shown in Table 6.1-12, the level of GO bonding required reflects the relative capital cost of the alternative. The highest cost alternative (BRT Alternative) has the greatest need for bonding ($320 million) compared with $60 million for the TSM Alternative and $3 million for the No-Build Alternative. A portion of the GO bonding required in the BRT Alternative is to provide capital funding in advance of receipt of federal and State grant funds. Table 6.1-12 summarizes the annual bonding required for the BRT Alternative over the FY 2001-2010 period.

City Highway Fund Revenues Required

Table 6.1-11 summarizes the total amount of City Highway Fund revenues required to fund a portion of the capital costs of each of the alternatives. The level of funding ranges from a low of $27.8 million for the No

TABLE 6.1-11
SUMMARY OF KEY FINANCIAL MEASURES BY ALTERNATIVE
OVER FISCAL YEARS 2001 - 2010 (YOE $, 000) *

	No-Build	TSM	BRT
CAPITAL			
Total Capital Cost	$152,800	$331,100	$881,900
GO Bonds Issued	3000	60000	$320,000
City Highway Fund Revenues Required	$27,800	$36,700	$46,900
FTA New Starts Funding Required	$0	$43,600	$182,100
FHWA Funding Required	$0	$27,400	$161,500
OPERATING			
Average Annual Debt Service Payment (Post-1999)	$400	$4,500	$21,000
Average Annual (Net) General Fund Contribution	$56,700	$68,700	$94,700
CAPITAL AND OPERATING			
Average Annual Total City Contribution Required from Highway Fund and General Fund	$59,500	$72,400	$99,400
Average Annual Increase in Total City Contribution Over No-Build		$12,900	$39,900
Average Annual Increase in Total City Contribution Over TSM			$27,000

Source: Sharon Greene & Associates.
Note: * Rounded to nearest $100

Build Alternative to a high of $46.9 million for the BRT Alternative. All City Highway funds not used as match for federal funds are assumed to be credited back to the City General Fund and are used to reduce the City General Fund contribution for transit operations.

TABLE 6.1-12
ANNUAL BONDING REQUIRED
FOR THE BRT ALTERNATIVE
OVER FISCAL YEARS 2001 – 2010 (YOE $, 000)

	BRT
2001	$20,000
2002	$115,000
2003	$130,000
2004	$55,000
2005	$0
2006	$0
2007	$0
2008	$0
2009	$0
2010	$0
TOTAL	**$320,000**

Source: Sharon Greene & Associates.

FTA Section 5309 New Starts Funding Required

Table 6.1-13 summarizes the level of FTA Section 5309 New Starts funding required for the alternatives. On an annual basis, the financial plan assumes availability of New Starts funding for the BRT Alternative.

TABLE 6.1-13
ANNUAL NEW STARTS FUNDING REQUIRED
FOR THE BRT ALTERNATIVE
(YOE $, 000)

Year	New Starts Funding
2002	$10,000
2003	$30,000
2004	$45,000
2005	$44,300
2006	$44,300
2007	$8,500
TOTAL	**$182,100**

Source: Sharon Greene & Associates.

As shown in Table 6.1-13 and earlier in Table 6.1-11, New Starts funding would provide approximately 50 percent of the capital revenues for the BRT related components, with revenues received over the 2002-2007 period. The TSM Alternative would utilize $43.6 million in New Starts funding. The BRT Alternative would utilize $182.1 million in such funding.

Federal Highway Administration Funding Required

The financial plan assumes that FHWA and State highway funding would be available to those projects that are eligible, up to an annual ceiling. The total level of annual Federal and State funding over the FY 2001-2010 period has been assumed not to exceed $25 million. Of this total, 80 percent is assumed to be FHWA funds, with a 20 percent match assumed to be State of Hawaii non-federal highway funds. Actual annual Federal/State highway funding levels and the relative shares from each source would be determined through the federal programming process.

Table 6.1-14 summarizes the schedule assumed for receipt of FHWA highway funds through the State of Hawaii. Less than 50 percent of the funds from eligible categories (IM, NHS, STP and CMAQ) and less than one-fifth of the total FHWA funding would be used over the project period.

2) O&M Funding Requirements

Three comparative measures have been used to evaluate the alternatives;

- Annual Operating and Maintenance Funding Required;
- Average Annual Debt Service Payment Required; and,
- Average Annual Net City General Fund Contribution Required.

Annual Operating and Maintenance Funding Required

As bus and TheHandi-Van operating and maintenance costs constitute over 85 percent of the O&M cost of the BRT Alternative and 100 percent of the O&M cost of the No-Build and TSM Alternatives, the marginal difference between alternatives is small in comparison to the total.

TABLE 6.1-14
COMPARISON OF ANNUAL FEDERAL HIGHWAY FUNDING REQUIRED FOR THE BRT ALTERNATIVE
FISCAL YEARS 2001-2010 (YOE $, 000)

	BRT	$ Available for Other Projects
2001	$1,516	$81,383
2002	$20,000	$64,390
2003	$20,000	$66,327
2004	$20,000	$67,190
2005	$20,000	$68,062
2006	$20,000	$68,943
2007	$20,000	$69,832
2008	$20,000	$70,730
2009	$20,000	$71,639
2010	$0	$92,555
TOTAL	**$161,516**	**$701,051**

Source: Sharon Greene & Associates.
Note: Includes NHS, STP, CMAQ, and IM funding categories only. FY2001-2003 numbers are from the estimated TEA-21 apportionments, as provided by the State Department of Transportation. Estimates for 2004 and beyond are calculated at a conservative 1% increase per year. Bridge Rehabilitation and Replacement, Metro Planning, High Priority Projects, and Minimum Guarantee categories are not included in the total.

Tables 6.1-9 and 6.1-10 presented earlier summarize the comparative differences between the alternatives with respect to average annual O&M costs. The alternatives are relatively comparable with respect to annual O&M funding requirements. In addition to bus and TheHandi-Van O&M costs, Table 6.1-11 summarizes the average annual debt service payment required for the alternatives. In comparison to the $0.40 million average annual debt service payment required for the No-Build Alternative, the average annual debt service payment for the TSM Alternative is $4.5 million, and $22.2 million for the BRT Alternative.

Average Annual Net City General Fund Contribution Required

All of the alternatives require support from the General Fund due to the contribution required for bus and TheHandi-Van services and for debt service. As shown in Table 6.1-11, the average annual City General Fund contribution for O&M is $56.7 million for the No-Build Alternative, $68.7 million for the TSM Alternative, and $94.7 million for the BRT Alternative. The relative difference between the lowest (No-Build) and highest (BRT) Average Annual Net City General Fund Contribution is $38.0 million.

3) Capital and Operating Funding Requirements

Three comparative measures have been used to evaluate the alternatives with respect to total City contribution required for both capital and for O&M:

- Average Annual City Contribution Required from the Highway Fund and the General Fund;
- Average Annual Increase in Total City Contribution over the No-Build Alternative; and,
- Average Annual Increase in Total City Contribution over the TSM Alternative.

Average Annual City Contribution Required

As shown in Table 6-1.11, higher levels of City financial contribution are required for the TSM and BRT Alternatives relative to the No-Build Alternative. Over the FY 2001-2010 period, the average annual level of City contribution required for both capital and O&M is $59.5 million for the No-Build Alternative, and ranges from $72.4 million for the TSM Alternative at the low end to $99.4 million for the BRT Alternative.

Average Annual Increase in Total City Contribution over the No-Build Alternative

Relative to the No-Build Alternative, the average annual incremental level of City contribution required ranges from an additional $12.9 million per year for the TSM Alternative to $39.9 million for the BRT Alternative.

Average Annual Increase in Total City Contribution over the TSM Alternative

Relative to the TSM Alternative, the average annual incremental level of City contribution is $27.0 million per year for the BRT Alternative.

6.1.6 Decision Factors

The financial projections have been prepared on the basis of the information and assumptions set forth in this chapter. The projections may be affected by fluctuating economic conditions and are dependent on the occurrence of future events. Therefore, future financial requirements may vary from the projections and such variations could be material. These financial plans are based on a specific implementation schedule. If available funding, construction costs, planning issues or other factors impact the schedule or the ability of the projects to secure financing, the implementation schedule can be adjusted to accommodate the changing scenario.

The major factors that may influence the financial plans for the alternatives include:

- Availability of federal funds: While the guaranteed transit funding levels in TEA-21 provide greater certainty about the annual flow of federal transit monies, FTA funds are appropriated on a yearly basis. Some level of uncertainty remains regarding the amount and timing of the discretionary and formula funds assumed for the alternatives. The conceptual Capital Financial Plans call for annual receipt of FTA Section 5307 Urbanized Area formula funds and $182.1 million in FTA Section 5309 New Starts funds for the BRT component. Receipt of this funding is assumed through and beyond 2003, the last year of the TEA-21 six-year authorization period.
- Cost-sharing arrangements: The financial plans for the alternatives assume that responsibility for funding and implementation will be shared among City, State, and federal transit and highway agencies. After selection of a Locally Preferred Alternative, the respective roles and responsibilities of the various involved parties will require greater clarification and their respective commitments of funding confirmed.
- Magnitude of operating support for transit: The Operating and Maintenance Financial Plans reflect a 52 percent increase over the TSM in the annual level of local operating support for the BRT Alternative. As a general purpose local government, the City has the authority to raise the additional revenues required to pay for the incremental locally funded operating support from a variety of sources. If actual O&M costs are higher than the projections, or if actual fare revenues are lower, there still remain substantial opportunities for the overall level of support to be moderated. Changes in the fare structure could be made that would minimize impacts on transit dependents yet maintain or increase revenues. Further, increases in the "cap" within which employers may fund employee transit expenses without these being considered "income" for Internal Revenue Service reporting purposes will also enhance transit's ability to earn operating revenue from the farebox. Thus, significant opportunities exist to manage the levels of operating support assumed in this analysis.

- <u>Financing costs</u>: Financing costs associated with the General Obligation Bonds assumed in this analysis are subject to market conditions. The financing cost assumptions are prudent relative to current market conditions. In light of potential fluctuations in the market, these assumptions should be periodically reviewed and updated, as required.

Primary Corridor Transportation Project

Chapter 7.0
Comparison of Alternatives

CHAPTER 7 COMPARISON OF ALTERNATIVES

7.0 CHAPTER OVERVIEW AND ORGANIZATION

Overview

Chapter 1, Purpose and Need, identified existing and future transportation needs of the primary transportation corridor, and the island of Oahu, that require a major investment to correct. It also identified transportation, land use, social and environmental purposes that should be met by a major transportation investment. Chapter 2 described the process by which a range of possible investments was developed, screened and refined to achieve a set of alternatives designed to satisfy these multiple project purposes. Chapters 4 and 5 discussed the beneficial and adverse impacts associated with each alternative, including their transportation and environmental performance. Chapter 6 discussed cost and how each alternative could be financed.

This Chapter compares how and the degree to which the alternatives satisfy the project purposes and needs presented in Chapter 1. It discusses the financial and environmental costs of satisfying these needs. Finally, this Chapter reports the cost-effectiveness and equity (distribution of benefits) of each alternative; these are two criteria that the Federal Transit Administration (FTA) considers in deciding whether to qualify a new transit system for federal funding.

The comparison process includes a comprehensive assessment of the alternatives against cost, mobility, growth-shaping, land use, quality of life, environmental impact, cost-effectiveness, and equity criteria. Table 7.0-1 summarizes the evaluation findings for those criteria where there are significant differences among the alternatives. This is meant only to assist in the selection of a Locally Preferred Alternative (LPA).

All of the alternatives have a substantial implementation cost, even the No-Build Alternative. As the capital cost of the alternative increases, the project purposes become more fully satisfied and the level of transportation and land use benefits increase. The No-Build Alternative would do little to achieve the vision for the future of Oahu, or help to create a more sustainable community, while still necessitating substantial capital cost. By selecting one of the build alternatives (TSM or BRT), Oahu can develop a balanced transportation infrastructure in the primary transportation corridor. This would well position it for current and future travel demands, and set it firmly towards achievement of the goals inherent in the people's vision for the future. These proactive steps can be taken at an affordable cost.

Organization

Section 7.1 compares the three alternatives (No-Build, TSM, and BRT) against the four project purposes and needs. Section 7.2 summarizes their impacts, and Section 7.3 discusses their costs, cost-effectiveness and equity. Section 7.4 recaps the analysis for each alternative across the range of criteria. Section 7.5 lists the permits and approvals potentially required for each alternative.

7.1 COMPARISON OF ALTERNATIVES AGAINST PROJECT PURPOSES AND NEEDS

The purposes and needs to be addressed by a major transportation investment in the primary transportation corridor are listed below (from Chapter 1):

1. Increase the people-carrying capacity of the transportation system in the primary transportation corridor by providing attractive alternatives to the private automobile;
2. Support desired development patterns;

TABLE 7.0-1
SUMMARY OF KEY EVALUATION MEASURES

Measures	No-Build	TSM	BRT
CAPITAL AND O&M COSTS			
Initial Capital Cost (first 10 years) (Millions of 1998 $)	$135.5	$299.5	$767.7
Total Capital Cost (over 25 years) (Millions of 1998 $)	$316.9	$518.7	$1,060.3
Annual Operating and Maintenance Cost at Full System Operation (Millions of 1998 $)	$125.1	$137.4	$176.0
Impact on City Budget (Average Annual Costs for Debt Service and O&M Net of Fare Revenue and Non-City Funding) FY 2001-2010	$59.5 million	$72.4 million	$99.4 million
MOBILITY			
Daily Transit Trips Within the Primary Transportation Corridor (2025) (Daily Linked Trips)	251,900	255,900	288,200
Increase in Transit Trips Over the No-Build Within the Primary Transportation Corridor (2025)	N.A.	4,000	36,300
Daily Transit Mode Share Within the Primary Transportation Corridor (2025) (Work Trips)	19.2%	19.5%	22.6%
Daily Revenue Bus Miles	54,500	62,800	84,800
Comfort Level (Passengers Per Transit Seat)(2025)	1.31	1.01	0.86
Daily Reduction in Vehicle Miles Traveled (Compared to No-Build)	N.A.	44,245	146,705
Daily Reduction in Vehicle Hours of Delay (2025) (Compared to No-Build)	N.A.	15,225	8,400
Projected Transit Travel Time Between Downtown and Kapolei (2025)	53.7 minutes	45.5 minutes	36.8 minutes
Projected Transit Travel Time between Downtown and Waikiki (2025)	18.7 minutes	15.8 minutes	13.7 minutes
Projected Transit Travel Time between Downtown and UH-Manoa (2025)	27.8 minutes	23.7 minutes	14.2 minutes
Projected Transit Travel Time between Downtown and Kalihi (2025)	7.9 minutes	6.8 minutes	5.1 minutes
Typical Levels of Service on In-Town Roads (Transit)	E/F	C/D	A/B
Typical Levels of Service on In-Town Roads (Autos)	E/F	E/F	E/F
New Parking Spaces Provided at Transit Centers/Park-and-Rides	0	3,000	4,150
On-Street Parking Spaces Removed (Unrestricted/Restricted) (U) or (R)	0	296 (U) / 0 (R)	386 (U) / 591 (R)
Number of Loading Zones to be Mitigated	0	43	30
GROWTH-SHAPING AND LAND USE			
Supports Growth-Shaping/Land Use Goals	Not Supportive	Somewhat Supportive	Most Supportive
ECONOMIC IMPACT			
Person-Years of Jobs From Construction Activities (Direct and Indirect)	0	947	3,080

TABLE 7.0-1
SUMMARY OF KEY EVALUATION MEASURES (CONTINUED)

Measures	No-Build	TSM	BRT
QUALITY OF LIFE AND LIVABILITY			
In-Town Transit Technology	Diesel Buses	Diesel Buses	Electric Buses for In-Town BRT
Visual Character	No Impacts	Positive Impacts Possible at Transit Centers	Positive Impacts Possible at Transit Centers and In-Town BRT stops
Noise/Vibration (In-Town)	Increased Noise	Increased Noise	Quieter Along BRT Route
Noise/Vibration (H-1 Freeway)	No Impact	Sound Walls in Waipahu	Sound Walls in Waipahu
ENVIRONMENTAL IMPACTS			
Number of Business Relocations	0	Depends on sites selected for transit centers (0-12)	Depends on sites selected for transit centers (0-12)
Street Trees	No Impact	No Impact	Some tree trimming or replacement at 9 locations (no exceptional trees affected)
Annual Energy Savings Compared to No-Build	N.A.	8,600 Barrels of oil	39,200 Barrels of oil
Historical Resources	No Impact	No Impact	In-Town BRT stops must be sensitive to historic structures, especially in Iwilei, Chinatown, Capitol District and UH-Manoa
Parkland Impacts	No Impact	Joint-use of Aloha Stadium Overflow Parking Lot	Joint-use of Aloha Stadium Overflow Parking Lot
COST-EFFECTIVENESS			
Incremental Cost Per New Rider (compared to No-Build Alternative)	N/A	$9.74	$7.67
EQUITY			
Impacts/benefits for minority or low-income populations	No adverse impacts/ No increased benefits	No adverse impacts/ Some improved transit service	No adverse impacts/ Increased transit service for minority and low income neighborhoods in Waipahu, Salt Lake and Kalihi

Source: Parsons Brinckerhoff, Inc.

3. Improve the transportation linkage between Kapolei and Honolulu's Urban Core; and
4. Improve the transportation linkages between communities in the PUC.

7.1.1 Increase The People-Carrying Capacity Of The Transportation System In The Primary Transportation Corridor by Providing Attractive Alternatives to the Private Automobile

Detailed analyses of mobility are presented in Chapter 4. The following measures of enhanced mobility are used to compare the alternatives:

- Person-carrying capacity of the roadway system;
- Increased transit usage islandwide;
- Reduced traffic congestion; and
- Improvement to other level of service indicators.

1) Person-Carrying Capacity of the Existing Roadway System

The TSM and BRT Alternatives would increase person-carrying capacity by enhancing the level of transit service. Additionally, roadway lanes would become more efficient by reallocating them from general-purpose use to transit or ride-share use. The BRT Alternative would provide substantially more person-carrying capacity within the Urban Core than the TSM Alternative, due to its superior level of transit priority.

The BRT Alternative proposes to increase the person-carrying capacity of the H-1 Freeway with extension of the existing H-1 zipper lane along the Airport Viaduct, the addition of a P.M. zipper lane in the Ewa-bound direction, and construction of express lanes in the H-1 median between Managers Drive and Kapolei. Use of the A.M. and P.M. zipper lane and express lanes would be limited to vehicles with three or more occupants as well as Regional BRT vehicles. For 3+ and BRT vehicles, a free flow of movement would be provided between the PUC and Kapolei, Oahu's first and second cities. The BRT Alternative would therefore benefit carpools of three or more occupants as well as transit users.

Table 7.1-1 compares the A.M. peak hour person throughput for selected screenlines within the Urban Core for each of the alternatives (the method of developing this analysis is presented in Chapter 4). Table 7.1-1 shows that the BRT Alternative would improve person-carrying ability within the Urban Core by an average of 10 percent over the No-Build-Alternative. To get an equivalent increase in person-carrying capacity through road construction alone, the number of roadway lanes in the Urban Core would need to be increased by almost two lanes in each direction (four lanes total). This is not feasible without major displacement of existing land uses and the accompanying adverse social and environmental impacts.

The TSM Alternative would improve person-carrying capacity to a much lesser degree than the BRT Alternative.

Transit systems have the additional advantage of being able to provide still further person-carrying capacity and expansion potential. Each In-Town BRT vehicle has an assumed capacity of 120 persons, corresponding to a vehicle with a single articulation joint. Use of higher capacity vehicles (bi-articulated vehicles) or a further increase in the frequency of BRT service would add more person-carrying capacity, without the need for additional roadway construction. Therefore, the BRT Alternative offers the potential to increase person-carrying capacity beyond that provided by the proposed operating plan for 2025 without additional construction. The Regional and In-Town BRT systems are investments that would efficiently serve growth in travel demand well into the future, beyond the 2025 planning horizon used in this document.

TABLE 7.1-1
PROJECTED 2025 A.M. PEAK HOUR PERSON-CARRYING CAPACITY
AT SELECTED SCREENLINE LOCATIONS
(PERSONS/HOUR)

Screenline Location	Alternative		
	No-Build	TSM	BRT
Ewa-bound at Ward Avenue	23,433	23,589	24,354
Ewa-bound at Punchbowl Street	18,915	20,036	22,151
Koko Head-bound at Liliha Street	25,421	24,755	29,785
Koko Head-bound at Bishop Street	25,746	24,448	26,123

Source: Parsons Brinckerhoff, Inc.

2) Increased Transit Usage Islandwide

Transit ridership is the number of trips taken on transit (not counting transfers). The measure "ridership" addresses key goals of increasing the number of people using transit, decreasing the number using individually driven automobiles, and increasing the number of patrons paying fares. Higher ridership indicates increased attractiveness of a transit system, otherwise transit patrons would choose another mode. Increased transit ridership amplifies the secondary benefits already enumerated for transit, such as reduced energy consumption, enhanced air quality, and support for desired land use development patterns.

Table 7.1-2 compares total daily transit ridership among the alternatives. The BRT Alternative, with the highest level of transit service, is forecast to attract the most transit ridership.

TABLE 7.1-2
RIDERSHIP FORECASTS ISLANDWIDE
(FORECAST YEAR 2025)

	No-Build	TSM	BRT
Total Transit Trips (Daily Linked Trips)	286,700	296,500	333,000
New Transit Trips compared with No-Build	Not Applicable	9,800	46,300
New Transit Trips compared with TSM	Not Applicable	Not Applicable	36,500
Transit Mode Share:			
All Trip Purposes	6.6%	6.9%	7.9%
Work Trips	14.7%	15.7%	18.4%

Source: Parsons Brinckerhoff, Inc.

Transit mode share is the proportion of total trips taken on the transit system, indicating the contribution of the transit system towards satisfying total travel demand. The higher the transit mode share, the fewer the number of automobiles that will be on the roads. The BRT Alternative would result in increased transit mode share compared to the other alternatives. As shown in Table 7.1-3 the advantages of improved transit service with the BRT Alternative are even more pronounced within the primary transportation corridor, as evidenced by the even higher transit mode split within the corridor compared to islandwide.

TABLE 7.1-3
TRANSIT RIDERSHIP WITHIN THE PRIMARY TRANSPORTATION CORRIDOR (DAILY LINKED TRIPS IN 2025)

	No-Build	TSM	BRT
Total Transit Trips	251,900	255,900	288,200
Transit Mode Share:			
All Trip Purposes	8.5%	8.7%	10.0%
Work Trips	19.2%	19.5%	22.6%

Source: Parsons Brinckerhoff, Inc.

3) Reduced Traffic Congestion

Restoration of a balance between automobile, transit, pedestrian and bicycle modes is a prime objective within the primary transportation corridor. Transit improvements would encourage some people to modify their travel behavior by switching from private automobiles to transit, thereby decreasing traffic congestion. Vehicle Miles of Travel (VMT) is a measure of roadway congestion. Higher VMT reflects more vehicle trips made (higher roadway demand and more congestion), and more circuitous travel as drivers "hunt" for less congested routes. The search for less congested routes affects neighborhoods, as streets meant to accommodate local traffic become through traffic routes as drivers seek ways to avoid congestion on major arterial roadways. Table 7.1-4 shows that in 2025, the BRT Alternative (which would provide the highest level of transit service) is projected to have the lowest peak period VMT compared to the other alternatives.

TABLE 7.1-4
PROJECTED YEAR 2025 PEAK PERIOD VMT AND VHD

Alternative	Time Period	VMT	VHD	Vehicle Trips Assigned
No-Build	A.M.	4,574,657	122,519	556,572
	P.M.	5,037,454	129,451	671,402
	Total Peak	9,612,111	251,970	1,227,974
TSM	A.M.	4,548,195	112,708	553,802
	P.M.	5,019,677	124,036	669,079
	Total Peak	9,567,872	236,744	1,222,881
BRT	A.M.	4,480,203	114,930	548,069
	P.M.	4,985,205	128,639	664,116
	Total Peak	9,465,408	243,568	1,212,185

Source: Parsons Brinckerhoff, Inc.
Notes: VMT = vehicle miles traveled
VHD = vehicle hours of delay

Lower peak period VMT for the BRT Alternative reflects increased use of travel modes such as transit as opposed to single-occupant vehicles (SOVs), and less congestion on non-primary roadways. This finding is consistent with the lower number of vehicle trips projected to occur with the BRT Alternative (because there are more transit trips) than with the TSM or No-Build Alternatives.

Another indicator of regional roadway performance is Vehicle Hours of Delay (VHD), which is the difference in total hours of travel between that associated with free-flow traffic conditions, and that associated with projected levels of roadway congestion (see Table 7.1-4). Lower VHD indicates that the roadway network is handling travel demand more efficiently, with less aggravation and frustration for travelers. The BRT and TSM Alternatives are projected to have lower daily VHD than the No-Build Alternative in 2025. While the BRT

Alternative would provide a greater amount of person-carrying capacity than the TSM or No-Build Alternatives, it would create more VHD for motorists than the TSM Alternative since some general traffic lanes would be converted to provide exclusive transit lanes.

4) Improvement to Other Level of Service Indicators

The ridership forecasting results can be used to compute several other indicators of the level of service provided by each alternative. These measures are presented in Table 7.1-5 and discussed below.

One indicator of the level of service is the number of transfers a typical rider must make to complete a trip. Riders prefer not to transfer, unless transferring produces a shorter total travel time. In Table 7.1-5, the amount of transferring is expressed in terms of the number of boardings per linked transit trip. The BRT Alternative would require the greatest amount of transferring because many riders would access the BRT systems by feeder bus. In the No-Build and TSM Alternatives, more riders would have a one-seat ride from origin to destination. The additional transferring in the BRT Alternative would be offset, however, by the more frequent, more comfortable, and more reliable service provided, and in many cases, by a shorter total travel time. The BRT Alternative would provide the most travel time savings for transit patrons.

TABLE 7.1-5
OTHER MEASURES OF SERVICE
(FORECAST YEAR 2025)

Measure	No-Build	TSM	BRT
Average Weekday Boardings	355,100	375,700	488,300
Boardings per Linked Trip (Transfer Rates)	1.24	1.27	1.47
Passenger per Seat at Peak Load Point (Comfort)	1.31	1.01	0.86

Source: Parsons Brinckerhoff, Inc.

Since transit service in mixed traffic is subject to delays caused by traffic congestion, the reliability of transit service is correlated to the extent the system utilizes exclusive travel lanes (which would not be affected by the congestion in general purpose lanes). Since the BRT Alternative would provide substantially more miles of exclusive transitway lanes, it would offer the most reliable service.

One measure of comfort is the probability of getting a seat on a transit vehicle during the peak hour. As shown in Table 7.1-5, the projected ridership in 2025 exceeds the number of available seats by over 30 percent under the No-Build Alternative. Over 30 percent of all riders would be required to stand, sacrificing comfort and decreasing the attractiveness of travel by transit. Worse, buses would be full and pass by riders waiting at stops in some instances.

The number of available seats under the TSM Alternative would be about equal to the demand. On an average weekday, there would typically be a seat for every rider, even at the most heavily used part of the system.

The number of available seats under the BRT Alternative would be slightly greater than the demand, increasing the probability that a rider would find a seat and have a comfortable ride. The availability of surplus seats also reflects the ability of the BRT Alternative to accommodate even further increases in ridership growth without having to increase the number of vehicles.

7.1.2 Support Desired Development Patterns

Chapter 5 provides detailed information on the growth-shaping attributes of the alternatives.

The No-Build and TSM Alternatives would not encourage land use development in desired patterns or support implementation of an urban growth strategy that integrates land use and transportation elements.

The BRT Alternative would substantially increase the people-carrying capacity within the corridor and help focus growth along the alignment of the In-Town BRT system. Because of the permanency of the fixed facilities that would be constructed under this alternative, it would be highly effective in supporting implementation of an urban growth strategy that integrates land use and infrastructure planning. It would help facilitate desired land use development patterns consistent with the vision for the island. Transit centers and transit stops would serve as focal points for transit-oriented development, and would be designed to maintain or improve visual conditions through cohesively designed structures, street furniture, landscaping and lighting. The BRT Alternative would improve the quality of urban living by enhancing transportation service within the Urban Core, and reducing air and noise emissions in comparison to the diesel buses in the No-Build and TSM Alternatives. Because the BRT Alternative would reduce automobile travel, regional air emissions would be less.

7.1.3 Improve the Transportation Linkage Between Kapolei and Honolulu's Urban Core

Improving connections within the primary transportation corridor, including the key linkage between Kapolei and Honolulu's Urban Core, is a principal aim of this project.

The BRT Alternative would provide priority treatments in the H-1 Corridor, which would be used by vehicles with three or more occupants in addition to Regional BRT vehicles. This would enhance the linkage between Kapolei and the Urban Core for all higher occupancy vehicles. The benefits of the P.M. zipper lane, express lanes, and exclusive bus ramps with the BRT Alternative are reflected in the reduced travel time for transit riders shown in Table 7.1-6.

TABLE 7.1-6
PROJECTED 2025 TRANSIT TRAVEL TIME FROM DOWNTOWN TO KAPOLEI
(IN VEHICLE TIME)

	No-Build	TSM	BRT
Travel Time (minutes)	53.7	45.5	36.8

Source: Parsons Brinckerhoff, Inc.

7.1.4 Improve the Transportation Linkages Between Communities in the PUC

Another goal of the project is to improve mobility within the PUC through enhanced transit service. The BRT Alternative would attract additional transit riders both by improving mobility within the PUC, and strengthening the connections between the PUC and the rest of Oahu. This increase in ridership reflects the service benefits – particularly reduced travel time – that such a system would provide in the primary transportation corridor. While the TSM Alternative would achieve some benefits, the benefits of a high capacity BRT system would be substantially greater, especially for travel within the PUC.

As shown by the representative locations in Table 7.1-7, due to the provision of exclusive transitway lanes, the BRT Alternative would provide faster transit travel times (and more reliable service) within the PUC than either the TSM or No-Build Alternatives.

TABLE 7.1-7
PROJECTED 2025 TRANSIT TRAVEL TIME WITHIN THE PRIMARY URBAN CENTER (IN VEHICLE TIME)

	No-Build Travel Time (minutes)	TSM Travel Time (minutes)	BRT Travel Time (minutes)
Downtown - Waikiki	18.7	15.8	13.7
Downtown - UH-Manoa	27.8	23.7	14.2
Downtown - Kalihi	7.9	6.8	5.1

Source: Parsons Brinckerhoff, Inc.

7.2 IMPACTS OF ALTERNATIVES

Having discussed how the alternatives compare in terms of satisfaction of the original project purposes, this section summarizes the environmental consequences associated with them. Selection of a preferred alternative must consider environmental impacts as well as the degree to which an alternative satisfies the project purposes. Chapter 3 describes the existing environmental conditions, and Chapter 5 provides more detailed information on the environmental impacts of the alternatives.

7.2.1 No-Build Alternative

The No-Build Alternative would rely on conventional diesel buses, at least for the immediate future, and continue the present focus on automobiles for transportation. Consequently, regional air pollutant emissions would increase about 20 percent by 2025. Localized air quality (worst-case 1-hour microscale concentrations) would deteriorate at 11 of 17 locations studied. Noise levels along streets would remain similar to present levels, even with an increase in the number of diesel buses and vehicles, because the vehicles would be moving more slowly ("passby" noise increases with speed).

Impacts to ecosystems and visual, historic, water and park resources would generally be limited to localized impacts associated with the construction of roadway and other transportation improvements anticipated over the next three years. The No-Build Alternative would not require any business or residential displacements.

Because there would be no additional federal construction funds associated with the No-Build Alternative, this alternative would produce no additional economic impact during construction.

7.2.2 TSM Alternative

Air pollution emissions due to the increased number of diesel buses and private vehicles associated with the TSM Alternative would increase about 20 percent. The addition of HOV lanes in the median of H-1 from Managers Drive to Kapolei would create a noise impact that would require construction of sound walls in Waipahu. Noise levels in-town would not increase because of the trade-off between more vehicles and slower speeds.

Impacts to neighborhoods, historic resources, ecosystems, water resources, and parklands would be similar to those under the No-Build Alternative. These impacts would be associated with the construction of transportation projects expected over the next three years.

Business displacements could be completely avoided under the TSM Alternative. However, sites are still being considered for the expansion of the Kalihi-Palama Bus Maintenance Facility/Middle Street Transit Center and the Iwilei Transit Center that would entail the displacement of up to 12 businesses and institutions. If displacements are required, landowners would be compensated and affected businesses would be provided with relocation assistance. A benefit of the expansion of the maintenance facility is that it would improve the visual appearance of this industrially zoned area by providing landscaping and an attractive design.
Under the TSM Alternative, approximately 326 on-street parking spaces that are currently available during both peak and off-peak hours would be eliminated on Kaonohi, King, and Beretania Streets. The bulk of the impact would occur in the in-town area along King Street between Middle Street and Waialae Avenue (269 spaces) and Beretania Street between Aala Park and South King Street (27 spaces). On King Street, the segment from Middle Street to Richards Street would lose 102 spaces, Richards Street to Ward Avenue 24 spaces, Ward Avenue to McCully Street 71 spaces, and McCully Street to Waialae Avenue 72 spaces.

Under the TSM Alternative, buses would operate on Kuhio Avenue in Waikiki in semi-exclusive lanes, affecting both mauka and makai curbside loading zones. The total impact is the equivalent of 48 loading zones.

The additional federal construction funds associated with the TSM Alternative would translate into the equivalent of 947 new jobs created directly and indirectly during project construction.

7.2.3 BRT Alternative

Through the use of electric bus technology, the BRT Alternative would reduce air and noise emissions in comparison to the diesel buses in the No-Build and TSM Alternative. Because the BRT Alternative would reduce automobile travel, regional air emissions would be less. Also, the electric buses would generally be quieter than conventional diesel buses. However, as with the TSM Alternative, the Regional BRT system would create a noise impact along a section of H-1 that would require noise mitigation.

Impacts to neighborhoods, ecosystems, and water resources would be similar to that attributable to the No-Build and TSM Alternatives.

The construction-phase impacts of the BRT Alternative would be greater than those of the TSM Alternative because of the larger scale of construction. For example, a transitway would be constructed along the alignment of the In-Town BRT system. Construction impacts would be temporary and detailed mitigation plans would be developed, including a maintenance of traffic plan.

The BRT Alternative could avoid business displacements depending upon which sites are selected for transit centers. Transit center impacts will be separately analyzed in a subsequent phase since there are multiple alternative sites for each location. Under a worst case condition, the BRT Alternative could potentially displace up to 12 businesses. Up to two partial displacements are also possible.

The on-street parking impacts of this alternative would be greater than under the TSM Alternative. Roughly 386 unrestricted parking spaces and 591 on-street parking spaces currently restricted by time of day could be affected depending on the options selected. Fewer loading zones would be affected in comparison to the TSM Alternative.

The additional federal construction funds associated with the BRT Alternative would translate into the equivalent of 3,080 person years of jobs created directly and indirectly during project construction.

7.3 COST-EFFECTIVENESS AND EQUITY OF ALTERNATIVES

Capital and operating/maintenance costs are addressed in Chapters 2 and 6. Cost-effectiveness, the measure used by FTA to compare the cost of a transit investment in relation to its ability to attract new riders to transit, is discussed in this section. This section also addresses equity, which is the distribution of costs, impacts and benefits.

7.3.1 Cost-Effectiveness Analysis

Cost-effectiveness relates the ability of an alternative to attract new riders to its costs. The FTA has established a cost-effectiveness index (CEI) for evaluating the relative merits of fixed guideway or transitway alternatives within a corridor. The FTA also uses the index as input into its rating system which compares projects across the country, and identifies those most worthy of federal funding. The CEI analysis is used by FTA for comparative purposes. It is not an absolute indicator of costs and benefits because of its narrow focus on projected new ridership. The index measures the additional cost of proposed transit investments, using the cost per additional rider projected under the No-Build and TSM Alternatives as the measure against which the BRT Alternative is compared.

The cost-effectiveness analysis translates the capital costs of the alternatives into equivalent uniform annual costs. These uniform annual capital costs reflect assumptions about the economic life of the capital components in each alternative (based on federal guidelines) and the cost of capital (i.e., the discount rate). Uniform annual capital costs are combined with annual O&M expenses and then compared to additional transit patronage to arrive at a CEI for the alternatives.

Because all costs used in the analysis are in constant dollars, the effects of inflation are already taken into account; the discount rate used in the analysis is a "real" discount rate that reflects prevailing interest rates net of the effect of inflation. A real discount rate of 7 percent was used, which is FTA recommended practice.

Assumptions about the effective useful lives of major cost components correspond to the economic lives of the major categories of capital cost. The economic life of heavy construction items, for instance, is assumed to be 50 years, while buses and BRT vehicles are assumed to have a useful economic life of 12 years before needing replacement.

When alternatives are compared in terms of the CEI parameter, the one with the lower cost per new rider represents the more cost-effective alternative. As shown in Tables 7.3-1A and 7.3-1B, the cost per new rider for the TSM Alternative is $9.74, which is greater than the cost per new rider for the BRT Alternative of $7.67. Therefore, the BRT Alternative is more cost-effective than the TSM Alternative in terms of increasing transit ridership over the level of the No-Build Alternative. In comparison to the level of transit ridership that would be achieved with the TSM Alternative, the CEI of further boosting transit ridership to the level forecast to occur with the BRT Alternative would be $7.11.

TABLE 7.3-1A
FACTORS USED TO DEVELOP FTA COST-EFFECTIVENESS INDEX

	ALTERNATIVE		
Factor	**No-Build**	**TSM**	**BRT**
Annualized Capital Cost (1998 dollars)	$ 24,123,000	$ 41,167,000	$ 82,619,000
Total Systemwide Annual Operating and Maintenance Cost (1998 year dollars)	$ 125,068,000	$ 137,424,000	$ 175,954,000
Total Annualized Cost in Forecast Year (1998 year dollars)	$ 149,191,000	$ 178,591,000	$ 258,573,000
Total Annual Ridership (forecast year)	88,303,600	91,322,000	102,564,000

TABLE 7.3-1B
FTA COST-EFFECTIVENESS INDEX

	Comparison		
Factor	**TSM vs. No-Build**	**BRT vs. No-Build**	**BRT vs. TSM**
Incremental Annualized Cost	$ 29,400,000	$109,382,000	$ 79,982,000
Incremental Annual Ridership	3,018,400	14,260,400	11,242,000
Cost-Effectiveness (incremental cost per new rider)	$ 9.74	$ 7.67	$ 7.11

Source: Parsons Brinckerhoff, Inc.

7.3.2 Equity/Environmental Justice

Equity is defined as the fairness of the distribution of costs, benefits, and impacts across various population subgroups. Fairness is determined by the extent to which the costs and impacts are distributed in a way that is consistent with regional goals.

1) Impact on Low Income Areas

Certain areas within the primary transportation corridor contain concentrations of minority and low-income populations (see Section 5.3 which discusses the project's Environmental Justice compliance in more detail). Input from community residents and business owners serving the minority and low-income populations has been actively solicited throughout project planning through the community based planning program (see Appendix A). None of the alternatives would cause a disproportionately high and adverse health or environmental effect on any population group, including minority and low-income populations. Benefits to these groups would be substantial.

2) Environmental/Socioeconomic Equity and Benefit

An analysis of equity and benefit from an environmental and socioeconomic perspective was developed based on the relative balance between environmental and/or socioeconomic impacts and change in transit accessibility. The BRT Alternative would result in improved transit accessibility relative to the No-Build and TSM Alternatives. The BRT Alternative would increase daily transit trips by 16.2 percent over the No-Build Alternative. The BRT Alternative is projected to produce a 12.3 percent increase in daily transit trips over the TSM Alternative.

Alternative. The BRT Alternative is projected to produce a 12.3 percent increase in daily transit trips over the TSM Alternative.

The BRT Alternative would provide greater support for desired land use development patterns in comparison to the No-Build and TSM Alternatives.

3) Local Financing Options Equity and Burden

Chapter 6 discussed the financing plans for the alternatives. No new local revenue sources or tax increases would be required for any alternative. The City would provide its portion of the local funding with existing City funding lines and General Obligation (GO) bonds. FTA formula and discretionary grants also would be used. Transit related components on State highway facilities would be funded with State and federal highway funds.

No geographic or socioeconomic group would pay a disproportionate share of the project's costs.

7.4 SUMMARY BY ALTERNATIVE

Table 7.0-1 summarizes the evaluation measures from the previous sections of this chapter.

1) No-Build Alternative

The level of environmental impact of the No-Build Alternative would be the least of all the alternatives studied, although air emissions would increase. It would also be the least expensive.

However, the No-Build Alternative would poorly support the purposes and needs of the project. It would not provide a transportation system that would effectively handle present or future levels of travel demand. It would not maintain even current levels of mobility. It would not develop attractive travel alternatives to the private automobile, encourage land use development in desired patterns, support implementation of an urban growth strategy that integrates land use and infrastructure planning, nor maintain the existing quality of life. It would only minimally increase the linkage between Kapolei and the PUC, and do nothing to improve mobility within the PUC.

The initial cost (first 10 years) of the No-Build Alternative would be $135.5 million in 1998 dollars. The total cost (over 25 years) would be $316.9 million, which includes the normal replacement of bus vehicles over a 25-year period. Its annualized capital cost (including bus replacement) would be $24.1 million.

2) TSM Alternative

In comparison to the No-Build Alternative, the TSM Alternative, with its emphasis on enhancing and restructuring bus service, would provide some support to the project's purposes and needs in terms of enhancing people-carrying capacity within the corridor. However, this alternative would not go far in developing attractive alternatives to the private automobile, or in enhancing desired land use development patterns or in supporting the implementation of the City's urban growth strategy that integrates land use and infrastructure planning. There would be some improvement in the linkage between Kapolei and the PUC, and in mobility improvement within the PUC.

The level of environmental impact would be greater than under the No-Build Alternative. Depending on the sites selected for transit centers, some businesses could be displaced. This alternative would limit the use of 326 parking spaces, mostly on King and Beretania Streets, and affect a substantial number of loading zones. Air and noise emissions would increase.

The initial cost (first 10 years) of the TSM Alternative would be $299.5 million in 1998 dollars. The total cost (over 25 years) would be $518.7 million, which includes the normal replacement of bus vehicles over a 25-year period. Its annualized capital cost (including bus replacement) would be $41.2 million.

3) BRT Alternative

The BRT Alternative represents a major improvement over the TSM Alternative in terms of meeting the project purposes and needs. It would substantially increase people-carrying capacity within the corridor and help focus growth along the alignment of the In-Town BRT system. Higher density redevelopment in a transit-supportive manner, particularly at transit centers and transit stops, would be encouraged. This Alternative would be more effective than the TSM and No-Build Alternatives in supporting implementation of an urban growth strategy that integrates land use and infrastructure planning. It would help facilitate desired land use development patterns consistent with the vision for the island.

As part of the BRT Alternative, transit centers, transit stops, and other project elements would be designed to maintain or improve visual conditions through cohesively designed structures, street furniture, landscaping and lighting. The quality of urban living would increase.

This Alternative would establish transit as an attractive, viable alternative to the automobile. Transit patrons would reap travel time savings. However, this Alternative would cause more motorist delay than the TSM Alternative, which is expected to accelerate a switch in travel behavior from automobiles to transit. It would establish an attractive, high capacity linkage between Kapolei and the PUC. It would improve mobility within the PUC, including access to Waikiki because of the In-Town BRT system.

In addition, the improvements to H-1 with the BRT Alternative would be used by vehicles with three or more occupants, as well as Regional BRT vehicles.

Potential displacement impacts of the BRT Alternative would be similar to the TSM Alternative, and associated with final site selection for certain transit centers. Parking losses would be greater, although interference with loading zones would be less. Regional and in-town air emissions would decrease, and historical impacts would be relatively minor. Noise levels would be improved in-town and would be the same as the TSM along H-1. Impacts during project construction would be substantially greater than for the TSM Alternative because of the greater scope and duration of construction, particularly building the In-Town BRT system transitway on arterial streets. The construction, however, will result in significantly more employment being generated than with the other alternatives.

The initial cost (first 10 years) of the BRT Alternative would be $767.7 million in 1998 dollars. The total cost (over 25 years) would be $1,060.3 million, which includes the normal replacement of transit vehicles over a 25-year period. Its annualized capital cost (including vehicle replacement) would be $82.6 million. Using FTA criteria, the BRT Alternative would be more cost-effective than the TSM Alternative in attracting new riders.

7.5 REQUIRED PERMITS AND APPROVALS

Table 7.5-1 lists the permits or approvals that may be required by alternative.

TABLE 7.5-1
PERMITS POTENTIALLY REQUIRED

PERMIT	ALTERNATIVE		
	NO-BUILD	TSM	BRT
Federal			
U.S. Coast Guard Bridge Advanced Approval			X
U.S. Environmental Protection Agency Section 1424(e) Approval (Sole Source Aquifer)	X	X	X
U.S. Department of Transportation Notice of Proposed Construction Near Airports			X
U.S. Department of Transportation FHWA Approval of Modifications Within Limits of Interstate Highways			X
U.S. Department of the Navy, Easements on Navy Base Property			X
State			
State Department of Land and Natural Resources Stream Channel Alteration Permit			X
State Department of Land and Natural Resources Historic Sites Review	X	X	X
State Department of Land and Natural Resources Conservation District Use Permit			
Hawaii Community Development Authority – Kakaako			X
State Department of Transportation Permit for Construction to Cross or Enter the State Energy Corridor			
State Department of Transportation Permit to Perform Work Upon a State Highway			X
Hawaii Coastal Zone Management Program – Federal Consistency	X	X	X
State Department of Health Noise Permit	X	X	X
National Pollutant Discharge Elimination System (NPDES) Permit	X	X	X
Development Plan Public Facilities Map Amendment		X	X
Special Design District Permit			X
Zoning Waivers for Public Uses, Public Utilities and Walls			X
Sewer Connection Permits	X	X	X
Water and Water System Requirements for Developments		X	X
Building Permit	X	X	X
Certificate of Occupancy		X	X
Combustible and Flammable Liquids Tank Installation		X	X
Liquefied Petroleum Gases Permit		X	X
Areawide Clearinghouse Review	X	X	X
Development Application in Flood Hazard Districts			X
Construction Dewatering Permit (Temporary)			X
Grubbing, Grading, Excavation, and Stockpiling Permit	X	X	X
Street Usage Permit	X	X	X
Stream Channel Alteration Permit			X
Discharge of Waters Permit	X	X	X

TABLE 7.5-1
PERMITS POTENTIALLY REQUIRED (CONTINUED)

PERMIT	ALTERNATIVE		
	NO-BUILD	TSM	BRT
County			
Development Plan Public Facilities Map Amendment			X
Special Design District Permit			X
Zoning Waivers for Public Uses, Public Utilities and Walls			X
Sewer Connection Permits	X	X	X
Water and Water System Requirements for Developments		X	X
Building Permit		X	X
Certificate of Occupancy		X	X
Combustible and Flammable Liquids Tank Installation		X	X
Liquified Petroleum Gases Permit		X	X
Development Application in Flood Hazard Districts			X
Special Management Area Use Permit			X
Construction Dewatering Permit (Temporary)	X	X	X
Grubbing, Grading, Excavation, and Stockpiling Permit		X	X
Street Usage Permit	X	X	X
Discharge of Waters Permit		X	X

Source: Parsons Brinckerhoff, Inc.

Primary Corridor Transportation Project

Appendix A
Coordination and Consultation

APPENDIX A
COORDINATION AND CONSULTATION

This appendix summarizes public and agency consultation and coordination activities that have been conducted for the Primary Corridor Transportation Project. The process began with four rounds of Oahu Trans 2K public workshops that were held from September 1998 to November 1999. Oahu Trans 2K was a public involvement process used to create and refine the Islandwide Mobility Concept Plan (March 1999). This appendix also summarizes the comments received on the project's Environmental Assessment (EA), Environmental Impact Statement Preparation Notice (EISPN), and Notice of Intent to Prepare an EIS (NOI), as well as other written and oral comments received during the period this Draft EIS was in preparation.

A.1 PUBLIC WORKSHOPS

Public participation activities for the Primary Corridor Transportation Project started with gathering public input to create and refine the Islandwide Mobility Concept Plan (March 1999) (Mobility Plan). From September 1998 through November 1999, rounds of public workshops were held throughout Oahu. These workshops were called Oahu Trans 2K meetings. Each round served a different purpose. The meetings were well advertised, highly participatory, and structured to facilitate public input into the transportation planning process. Total attendance at these four rounds of meetings was over 1,250 individuals (with many attending more than one meeting), and the project mailing list included over 9,000 names.

A project website, <www.oahutrans2k.com>, was established and used to disseminate information. Public input received through the website was tabulated and distributed to agency and project planners. A project hotline was established, which provided information on the public workshops, and solicited public input. Comments received on the hotline were recorded and answered. A brochure was distributed at the public workshops with a tear card for public comments.

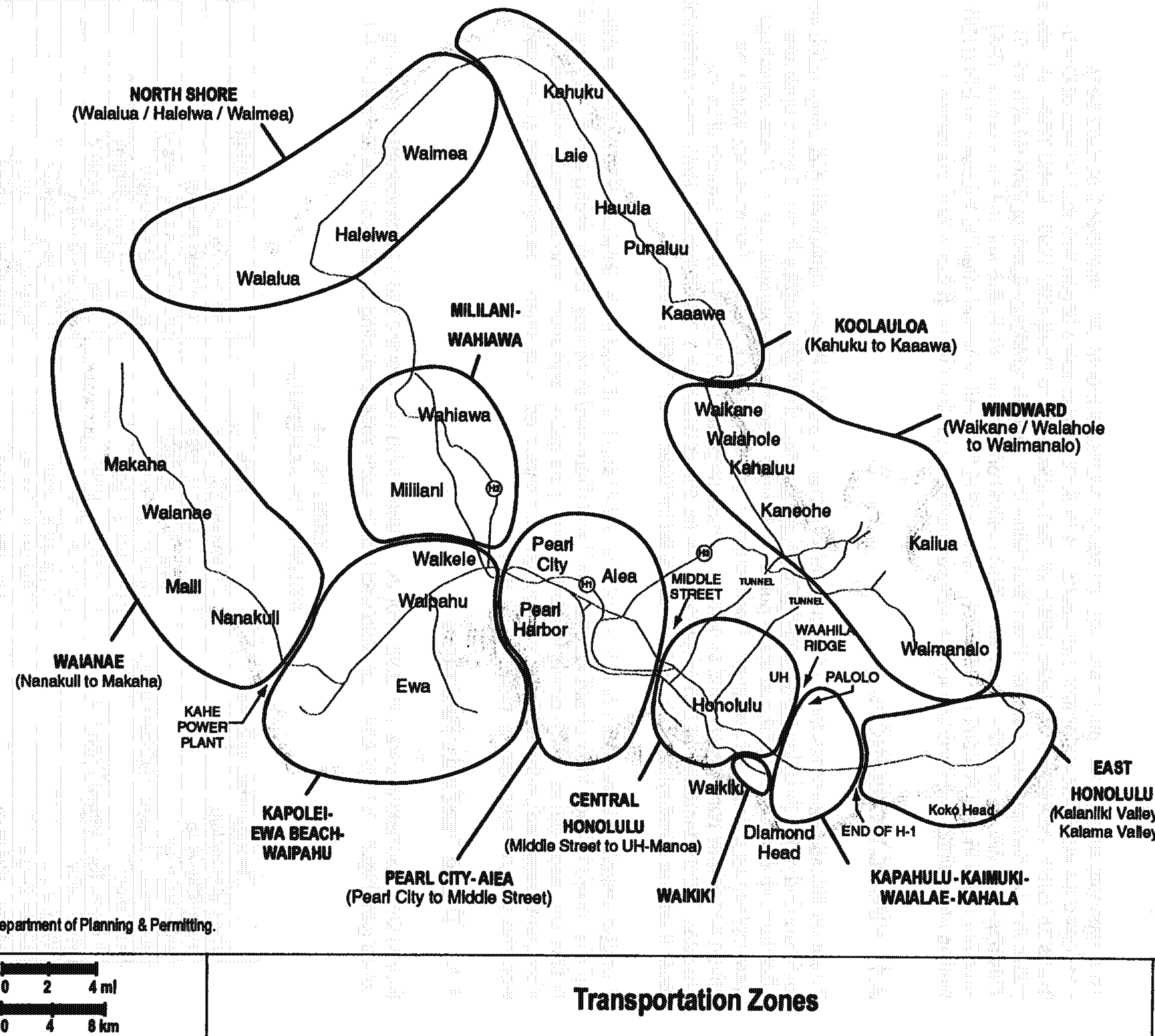
A.1.1 Round One Public Workshops

Round One was held in early fall 1998. For this round, Oahu was divided into 11 transportation planning zones (see Figure A.1-1). One workshop was held in each zone according to the schedule in Table A.1-1.

TABLE A.1-1
ROUND ONE SCHEDULE

Transportation Zone	Date	Location
Central Honolulu	September 28, 1998	Ala Moana Hotel
Pearl City-Alea	September 29, 1998	Aiea High School
East Honolulu	September 30, 1998	Koko Head Elementary
Kapahulu-Kaimuki-Waialae-Kahala	October 1, 1998	Kahala Elementary
Waianae	October 5, 1998	Waianae High School
Kapolei-Ewa Beach-Waipahu	October 6, 1998	Campbell High School
Koolauloa	October 7, 1998	Laie Elementary
Windward	October 8, 1998	Castle High School
North Shore	October 13, 1998	Haleiwa Elementary
Mililani-Wahiawa	October 14, 1998	Mililani High School
Waikiki	November 5, 1998	Jefferson Elementary School

Source: City and County of Honolulu, Department of Transportation Services.



SOURCE:
City & County of Honolulu Department of Planning & Permitting.

Transportation Zones

Figure A.1-1

The purpose of Round One was to obtain input from the community on issues of greatest importance to them. Participants actively participate in the transportation planning process. The input from these workshops was used to:

1. Develop a transportation vision for Oahu;
2. Determine how transportation fits within the Mayor's 21st Century Oahu Vision project;
3. Verify possible transportation improvements and projects for each transportation project zone;
4. Invite participants to share transportation ideas for their community, region and the island; and
5. Provide participants an opportunity to collectively mark down their ideas on a map.

The Round One workshops consisted of an open house, group table design sessions, and group report-back. The open house portion of the program consisted of booths providing information on current SDOT and DTS transportation programs. The SDOT booths included freeway management and ride share programs. The DTS booths included bike plan and traffic calming programs. Other booths showed Federal Transit Administration videos about transit in Portland, Oregon and Curitiba, Brazil, and information about the Primary Corridor Transportation project. The booths remained open throughout the workshop.

The workshop opened with an introductory video specifically produced for the Round One workshops. After that was the interactive portion of the program. Participants joined breakout sessions of about ten people each. A facilitator, whose job was to encourage participation and comments, and help move the process from complaints to proactive suggestions, led each breakout table. The breakout tables were organized by neighborhoods.

Following the interactive session, a spokesperson selected by each breakout group reported back to the larger group.

The comments from the Round One workshops were analyzed, and used to develop a Draft Mobility Plan. In addition, conclusions on the public comments from Round One are provided in Chapters 1 and 7.

A.1.2 Round Two Public Workshops

The Round Two workshops were conducted over a four-week period from November 16, 1998 to December 8, 1998 (see Table A.1-2). The schedule was designed so that at least a month would have passed between a Round One workshop and a Round Two workshop in a particular zone.

TABLE A.1-2
ROUND TWO SCHEDULE

Transportation Zone	Date	Location
Central Honolulu	November 16, 1998	Ala Moana Hotel
Kapahulu-Kaimuki-Waialae-Kahala	November 18, 1998	Kaimuki Intermediate School
East Honolulu	November 19, 1998	Kalani High School
Waianae	November 23, 1998	Waianae High School
Kapolei-Ewa Beach-Waipahu	November 24, 1998	Waipahu Intermediate School
Koolauloa	November 30, 1998	Kahuku High School
Windward	December 1, 1998	Castle High School
North Shore	December 2, 1998	Waialua High School
Mililani-Wahiawa	December 3, 1998	Leilehua High School
Pearl City-Aiea	December 7, 1998	Pearl City High School
Waikiki	December 8, 1998	Jefferson Elementary School

Source: City and County of Honolulu, Department of Transportation Services.

The Round Two workshops reported the results of the Round One workshops, and how the ideas collected fit together to make a Draft Mobility Plan. The Round Two workshops were also used to obtain feedback on certain elements of the Draft Mobility Plan. To accomplish this, the Round Two workshops were designed to:

1. Describe the Round One workshop process;
2. Describe the data analysis effort and how the mobility concepts were generated;
3. Outline changes to suggested transportation improvements and projects based on Round One input;
4. Explain how ideas generated by each zone fit together into a Draft Mobility Plan;
5. Maintain a climate of interaction and positive dialogue;
6. Solicit additional input on transportation improvements and projects; and
7. Organize feedback for ease of review by the technical team.

To accomplish these goals, a custom-designed workbook was created for each zone. These workbooks contained maps and text outlining islandwide mobility concepts, along with exercises and questions designed to stimulate group interaction during participatory table sessions.

The Round Two program was similar in format to Round One, but included new materials. It began with a shorter open house portion and a new five-minute introductory video. The open house included new display boards outlining the 21st Century Oahu Vision Program, the data analysis process, and the Draft Mobility Plan. A laptop computer was available to introduce participants to the project website, <www.oahutrans2k.com>.

The interactive part of the program consisted of breakout sessions organized by neighborhoods, with participants completing the workbook exercises. Facilitators helped explain the concepts and group exercises. As in Round One, participants were encouraged to write down their ideas and mark up the workbooks.

Fifty-nine marked-up workbooks were produced during the Round Two workshops. The comments on these workbooks were used to refine the Draft Mobility Plan and produce a final plan. In addition, conclusions on the public comments from Round Two are provided in Chapters 1 and 7.

A.1.3 Round Three Public Workshops

The Round Three meetings served primarily as a 'report-back' session, targeting the attendees of the Rounds One and Two Oahu Trans 2K meetings, as well as participants in the 21st Century Oahu Vision Program team members who were by then 6-7 months into the Vision Process. Since the Primary Corridor Transportation Project was part of the 21st Century Vision program, the Round Three meetings were conducted in the 19 vision team districts across Oahu, as opposed to the 11 transportation districts that formed the basis of the Rounds One and Two meetings (see Table A.1-3).

Round Three meetings had multiple objectives, including:

1. Present and distribute the Final Islandwide Mobility Concept Plan (March 1999) (Final Mobility Plan), a document based on the ideas from Rounds One and Two;
2. Explain the components of the Final Mobility Plan and how they coordinate;
3. Explain the transit alternatives being proposed for study in the upcoming MIS/EIS process;
4. Invite active participation in the upcoming formal scoping meeting that would kick off the MIS/EIS process; and
5. Obtain feedback on the components of the Final Mobility Plan.

Since the Round Three meetings were combined with meetings of the vision teams, meeting agendas varied to address issues relevant to each vision team. Presentation boards were displayed showing the proposed transit alternatives, the Final Mobility Plan, and the Sand Island Scenic Parkway/Nimitz Parkway plan. Most participants were supportive of and encouraged by the comprehensive nature of the Final Mobility Plan. Conclusions on the public comments from Round Three are provided in Chapters 1 and 7.

TABLE A.1-3
ROUND THREE SCHEDULE

Vision Team	Date	Location
Aina Haina/ Hawaii Kai	March 25,1999	Hahaione Elementary School
Makiki/McCully-Moiliili/Manoa	March 27, 1999	Ala Wai School
Ewa/Kapolei	March 29, 1999	Ewa Beach Elementary School
Mililani	March 30, 1999	Mililani District Park Multi-Purpose Room
Waipahu	April 1, 1999	Waipahu YMCA
Waialae-Kahala	April 5, 1999	Kapiolani Community College
Waimanalo	April 6, 1999	Waimanalo District Park Multi-Purpose Room
Kaneohe/Kahaluu	April 8, 1996	Kaneohe Senior Center
Kalihi-Palama	April 10, 1999	Mayor's Conference Room
Salt Lake/Moanalua	April 12, 1999	Alvah Scott Elementary School
Ala Moana/Kakaako/ Chinatown/Downtown	April 13, 1999	Blaisdell Center Oahu Room
Waikiki/Kapahulu/ Diamond Head	April 15, 1999	Ala Wai Golf Course Clubhouse
Nuuanu/Alewa	April 17, 1999	Mayor's Conference Room
Kailua	April 19, 1999	Kailua District Park Multi-Purpose Room
Waianae	April 20, 1999	Waianae District Park Multi-Purpose Building
North Shore	April 22, 1999	Haleiwa Alii Surf Center
Aiea/Pearl City	April 23, 1999	Waiau District Park
Wahiawa	April 26, 1999	Wahiawa District Park Recreation Center
Koolau Loa	April 27, 1999	Kahuku High School

Source: City and County of Honolulu, Department of Transportation Services.

A.1.4 Round Four Public Workshops

The Round Four meetings were held in the original 11 transportation zones, except East Honolulu was combined with Kapahulu-Kaimuki-Waialae-Kahala, decreasing the number of meetings to ten. Meetings were held over a three-week period from October 25, 1999 to November 9, 1999 (see Table A.1-4). Invitation letters and advertisements encouraged participants to review the Final Mobility Plan prior to attending the meetings.

TABLE A.1-4
ROUND FOUR SCHEDULE

Transportation Zone	Date	Location
Honolulu	October 25, 1999.	Washington Intermediate School
Waikiki	October 26, 1999	Jefferson Elementary School
Pearl City/Aiea/Salt Lake	October 27, 1999	Aiea Elementary School
Kaimuki/Kapahulu/ Waialae/Kahala & East Honolulu	October 28, 1999	Kaimuki Intermediate School
Waianae	November 1, 1999	Waianae District Park
Kapolei/Ewa/Waipahu	November 2, 1999	James Campbell Building
Windward	November 3, 1999	Castle High School
Mililani/Wahiawa	November 4, 1999	Mililani Middle School
North Shore	November 8, 1999	Waialua Elementary School
Koolau Loa	November 9, 1999	Laie Elementary School

Source: City and County of Honolulu, Department of Transportation Services.

The objectives of Round Four included:

1. Present an update of the project and explain the components of the transit program as reported in the Detailed Progress Report to City Council (November 1999);
2. Explain the Sand Island Scenic Parkway element of the project;
3. Review the financial plan of the project;
4. Review the project schedule; and
5. Provide participants the opportunity to question or comment on aspects of the project.

The Detailed Progress Report was well received by the meeting participants. Most of the questions and comments involved details of the In-town BRT. Conclusions on the public comments from Round Four are provided in Chapters 1 and 7.

A.2 FORMAL SCOPING ACTIVITIES ASSOCIATED WITH THE NATIONAL ENVIRONMENTAL POLICY ACT AND THE HAWAII EIS LAW

The public workshops described in the prior section are a major component of the scoping process that has been conducted for this project. This section describes additional scoping activities. Some of the scoping activities described in this section have been conducted to satisfy specific legal requirements of the National Environmental Policy Act and the Hawaii EIS Law.

A.2.1 Meetings with Individual Agencies and Organizations

The project's formal scoping process was initiated in March 1999, following completion and distribution of the Final Islandwide Mobility Concept Plan (March 1999). Meetings were held with more than 100 governmental agencies, elected officials, businesses, and business, community and civic organizations to present the elements of the Final Mobility Plan and gather information and comments. Table A.2-1 lists meetings held to date.

A.2.2 Issuance of Environmental Impact Statement Preparation Notice (EISPN) and Notice Of Intent to Prepare an Environmental Impact Statement (NOI)

In accordance with the National Environmental Policy Act and Chapter 343 (the State EIS law) of the Hawaii Revised Statutes, an Environmental Impact Statement Preparation Notice (EISPN) for the Primary Transportation Corridor Project was published in the April 23, 1999 edition of the State Environmental Notice. Because this project anticipated using federal-aid, the Federal Transit Administration published a Notice of Intent to Prepare an EIS (NOI) in the April 27, 1999 edition of the Federal Register. The EISPN stated that an EIS would be prepared, described the alternatives under consideration at that time, and described the environmental studies to be conducted to evaluate the project alternatives in the Draft EIS. The EISPN was distributed to the federal, State and City and County of Honolulu agencies in Table A.2-2. In addition, the EISPN was sent to utility companies; transportation, business, environmental and neighborhood organizations; and elected officials.

The public review period for the EISPN and NOI closed on May 28, 1999, more than two weeks after the public scoping meeting (discussed in Section A.2.4). However, written comments were accepted by DTS beyond this review period. Table A.2-2 indicates the agencies, organizations and individuals that submitted written comments on the EISPN and NOI. Letters received in response to the EISPN and NOI are reproduced in Appendix C, and Table A.2-3 summarizes these written comments. Responses were mailed to the commentors. Copies of these letters are in Appendix C.

TABLE A.2-1
PROJECT SCOPING AND COORDINATION MEETINGS

Date	Organization or Agency	Date	Organization or Agency
January 13, 1999	Kalihi Business Association	February 1, 1999	Kalihi Community Council
March 17, 1999	OMPO CAC	March 18, 1999	Mobility Coalition Working Group
March 23, 1999	Outreach Breakfast Group w/Prof. Fielding	March 25, 1999	State Department of Transportation (HDOT), Harbors Division
April 5, 1999	City Council Transportation Committee	April 9, 1999	Hawaii Community Development Authority
April 8, 1999	Estate of James Campbell	April 8, 1999	State Department of Land and Natural Resources (DLNR), Historic Preservation Division
April 12, 1999	Federal Highway Administration (FHWA)	April 13, 1999	Presentation by Mayor to small business group at Oahu Country Club
April 14, 1999	State Department of Health (SDOH), Noise Branch	April 14, 1999	Maritime Subcommittee of the Hawaii Chamber of Commerce
April 16, 1999	DURP Students/Faculty	April 20, 1999	Senator Inouye's Office
April 22, 1999	DLNR	April 26, 1999	U.S. Army Corps of Engineers (USACE)
April 27, 1999	SDOT Highways Division and FHWA	April 28, 1999	DLNR
April 28, 1999	Hawaii Transportation Association	April 30, 1999	Cement and Concrete products Industry
May 6, 1999	Downtown Neighborhood Board No. 13	May 7, 1999	SDOT Highways Division
May 10, 1999	State Senator Cal Kawamoto	May 12, 1999	Mobility Coalition
May 17, 1999	OMPO Policy Committee	May 18, 1999	State Senator Norman Sakamoto
May 19, 1999	Mobility Coalition Working Group	May 20, 1999	Campbell Estate
May 27, 1999	State Department of Business, Economic Development and Foreign Trade Zone No. 9	June 4, 1999	US Coast Guard
June 8, 1999	Airport Group International	June 9, 1999	Chevron USA
June 10, 1999	Hawaii Stevedores, Inc.	June 15, 1999	Joint Waikiki Transportation Committee
June 15, 1999	US Department of Army	June 15, 1999	Prof. Karl Kim, University of Hawaii Department of Urban and Regional Planning
June 16, 1999	Malama o Manoa	June 16, 1999	City and County of Honolulu, Transportation Commission
June 16, 1999	Inchscape Shipping Services	June 17, 1999	DLNR Historic Preservation Division
June 17, 1999	Hawaii Pilots Association	June 21, 1999	Sand Island Business Association
June 29, 1999	U.S. Department of Navy	June 30, 1999	McCabe, Hamilton & Renny, Co., Ltd.
July 6, 1999	Atlantis Adventures	July 12, 1999	Sierra Club and local environmental organizations
July 7, 1999	Congressman Neil Abercrombie	July 13, 1999	DLNR
July 19, 1999	Young Brothers, Limited	July 21, 1999	Building and labor organizations
July 26, 1999	Waldren Steamship Company	July 29, 1999	Hawaii Business Roundtable and Oahu Economic Development Board
July 28, 1999	Aloha Cargo Transport	August 2, 1999	Tesoro, Ltd.
August 3, 1999	City and County of Honolulu, Department Design and Construction	August 4, 1999	USACE and the SDOT Harbors Division
August 6, 1999	City and County of Honolulu, Department of Environmental Services	August 12, 1999	Resource Agencies (U.S. Environmental Protection Agency, National Marine Fisheries Service, USACE, SDOH, DLNR)
August 13, 1999	HDOT Highways Division	August 17, 1999	Filipino community group

TABLE A.2-1 (CONTINUED)
PROJECT SCOPING AND COORDINATION MEETINGS

Date	Organization or Agency	Date	Organization or Agency
August 17, 1999	City and County of Honolulu, Board of Water Supply	August 18, 1999	State House of Representatives, Transportation Committee
August 23, 1999	HDOT Harbors Division	August 24, 1999	Hawaii Hotel Association
August 24, 1999	SDOT Highways Division	August 26, 1999	Land Use Research Foundation
August 27, 1999	SDOT Highways Division	August 27, 1999	Hawaii Transportation Association
September 1, 1999	SDOT Highways Division	September 1, 1999	Senator Inouye and Mayor
September 3, 1999	Jacob Kamhis, Pacific Business News	September 9, 1999	Nautilus Subsea Adventures, Inc.
September 30, 1999	Waikiki Improvement Association's Board of Directors	October 13, 1999	Kalihi Business Association
October 27, 1999	Chinatown Task Force	November 3, 1999	Department Design and Construction
November 3, 1999	Sand Island Businesses	November 3, 1999	Department of Planning and Permitting
November 5, 1999	Mortgage Investors	November 8, 1999	GasCo
November 10, 1999	City Council Transportation Committee	November 10, 1999	Congressional Staff: Aaron Leong (Senator Inouye's Office), Alan Yamamoto (Representative Abercrombe's Office), Mike Kitamura (Senator Akaka's Office), Joan Menke (Representative Mink's Office)
November 15, 1999	Governor Cayetano	November 16, 1999	Oceanic Cable
November 16, 1999	Advertiser and Star-Bulletin Board	November 18, 1999	Oahu Transit Services
November 19, 1999	Committee for Accessible Transportation	November 22, 1999	Mayor's Maritime Task Force
November 24, 1999	Mobility Coalition Working Group	November 29, 1999	Iwilei Business Association
December 2, 1999	DLNR	December 2, 1999	Downtown Neighborhood Board No. 13
December 3, 1999	Neil Abercrombie	December 3, 1999	Campbell Estate
December 8, 1999	Aloha Stadium	December 10, 1999	Suzanne Chun Oakland
December 15, 1999	Native Hawaiian Fishermen's Association	December 13, 1999	Hawaiian Dredging
January 4, 2000	Mayor's Maritime Task Force	January 5, 2000	Moanalua Lions
January 6, 2000	Consulting Engineers Council of Hawaii	January 11, 2000	Army Civilian Engineers
January 13, 2000	Senator Inouye's Staff: Jennifer Sabas and Margaret Cumminsky (Legislative Director)	January 21, 2000	Waikiki Ohana Workforce
January 25, 2000	City Council Transportation Committee	February 2, 2000	City Council Transportation Committee
February 16, 2000	Oahu Metropolitan Planning Commission – Citizen's Advisory Committee	February 17, 2000	Meeting with Wally Burnett, Appropriations Committee, Majority Staff, and Aaron Leong, Senator Inouye's staff
February 17, 2000	Waialae Kahala Neighborhood Board Meeting	February 23, 2000	City Council Transportation Committee
March 3, 2000	HCDA	March 6, 2000	Hawaiian Electric Company
March 6, 2000	DLNR	March 7, 2000	Waikiki Ohana Workforce (WOW) Executive Committee
March 9, 2000	Eileen Mortenson, State Director, AARP	March 11, 2000	Vision Teams (19) at Hawaii Convention Center
March 21, 2000	Oahu Fleet Safety Organization	March 21, 2000	Waikiki Neighborhood Board
April 5, 2000	Waikiki Ohana Workforce Focus Group #1 (hotel employees)	April 7, 2000	Kalihi District Park - Meals on Wheels Senior Citizen group

TABLE A.2-1 (CONTINUED)
PROJECT SCOPING AND COORDINATION MEETINGS

Date	Organization or Agency	Date	Organization or Agency
April 10, 2000	Palama Settlement - Senior Citizens group	April 13, 2000	Mayor's Maritime Task Force
April 16, 2000	Mayor, Rep. Hiraki, Sen. Bunda, and Councilmember Duke Bainum	April 17, 2000	PCTP presentation for delegation from Socialist Democratic Party of Germany
April 18, 2000	SDOT - Financial Plan	April 20, 2000	American Society of Civil Engineers
April 20, 2000	General Kenneth R. Wykle, Administrator, Federal Highway Administration	April 24, 2000	Arcadia Retirement Residence
April 26, 2000	Waikiki Ohana Workforce Focus Group #2 (hotel employees)	April 26, 2000	Representative Neil Abercrombe's staff
May 3, 2000	Chamber of Commerce Maritime Committee	May 10, 2000	Kulana Hale (senior citizens residence
May 15, 2000	Wahiawa Rainbow Club	May 15, 2000	Lanakila Senior Citizens
May 24, 2000	One Kalakaua (senior citizens residence)	May 26, 2000	Iwilei Business Community Association
April 27, 2000	SDOT - In-Town BRT	May 30, 2000	National Association of Retired Federal Employees
May 31, 2000	Congressional Delegation staff	June 5, 2000	City Department Brown Bag presentation

Source: Parsons Brinckerhoff, Inc.

TABLE A.2-2
EISPN RECIPIENTS AND COMMENTORS

Agency or Organization	Received Copy of EISPN	Date of Comment Letter
FEDERAL AGENCIES		
Department of Agriculture, Natural Resources Conservation Service	❍	May 6, 1999
Department of Defense		
Army Corps of Engineers	❍	
U.S. Naval Base Pearl Harbor	❍	May 26, 1999
U.S. Army Garrison-Hawaii	❍	
15th CES – Hickam AFB	❍	
Department of the Interior		
U.S. Fish & Wildlife Service	❍	May 24, 1999
U.S. Geological Survey	❍	May 5, 1999
National Park Service	❍	
Department of Transportation		
Federal Highway Administration[1]	❍	June 14, 1999
Federal Transit Administration	❍	
Federal Aviation Administration	❍	May 5, 1999
Coast Guard	❍	
Environmental Protection Agency	❍	
Federal Emergency Management Agency	❍	
STATE OF HAWAII AGENCIES		
Aloha Tower Development Corporation	❍	
Department of Agriculture	❍	
Department of Accounting and General Services	❍	
Department of Business, Economic Development & Tourism	❍	
Energy, Resources & Technology Division	❍	
Land Use Commission	❍	April 29, 1999
Office of Planning	❍	May 24, 1999
Department of Defense	❍	June 24, 1999
Department of Education	❍	May 6, 1999
Main Library and all libraries within the corridor	❍	May 24, 1999
Department of Hawaiian Home Lands	❍	
Department of Health	❍	May 26, 1999
Clean Water Branch	❍	
Clean Air Branch	❍	
Solid and Hazardous Waste Branch	❍	
Noise and Radiation Branch	❍	
Department of Land and Natural Resources	❍	
Commission on Water Resource Management	❍	May 3, 1999
Historic Preservation Division	❍	May 4, 1999 and June 3, 1999
Land Division	❍	May 20, 1999
Parks Division	❍	
Parks Division	❍	

TABLE A.2-2 (CONTINUED)
EISPN RECIPIENTS AND COMMENTORS

Agency or Organization	Received Copy of EISPN	Date of Comment Letter
Department of Transportation		
Airports Division	O	May 18, 1999
Harbors Division	O	May 6, 1999
Highways Division	O	June 9, 1999
Hawaii Community Development Authority	O	
Legislative Reference Bureau	O	
Office of Environmental Quality Control	O	May 13, 1999
Office of Hawaiian Affairs	O	May 28, 1999
University of Hawaii		
Environmental Center	O	
Water Resources Research Center	O	
Facilities Planning and Management Office	O	
Hamilton Library	O	
CITY AND COUNTY OF HONOLULU AGENCIES		
Board of Water Supply	O	May 13, 1999
Department of Design and Construction	O	
Department of Environmental Services	O	April 30, 1999
Department of Parks and Recreation	O	May 24, 1999
Department of Planning and Permitting	O	May 26, 1999
Fire Department	O	May 13, 1999
Honolulu Municipal Reference and Records Center	O	
Police Department	O	May 18, 1999
OTHER INDIVIDUALS AND ORGANIZATIONS		
Hawai'i Bicycling League	O	May 24, 1999
Hawaiian Electric Company	O	
Hawaiian Telephone Company	O	
Leeward Oahu Transportation Management Association	O	May 24, 1999
Life of the Land	O	May 22, 1999
Oahu Metropolitan Planning Organization	O	May 24, 1999
The Outdoor Circle	O	May 18, 1999
The Gas Company	O	
Douglas Meller		May 24, 1999
Patricia Tummons		May 3, 1999
Decision Analysts Hawaii[2]		June 8, 1999

Source: City and County of Honolulu, Department of Transportation Services, June 1999.
Note: Business, environmental and neighborhood organizations, elected officials, and news media who received copies of the EISPN are not indicated on this table if they did not submit comments.
[1] Comment letter from Federal Highway Administration was in response to a May 5, 1999 letter from the Federal Transit Authority, requesting that the FHWA elect to be a cooperating agency on the Primary Corridor Transportation Project (PCTP).
[2] Comment letter from Decision Analysts Hawaii was in response to the Islandwide Mobility Concept Plan (March 1999).

TABLE A.2-3
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
FEDERAL AGENCIES		
Daniel Matsumoto	USDOT, FAA	No comments. Request to be included in scoping process because proposed project is adjacent to airport.
Kenneth Kaneshiro	USDA, Natural Resources Conservation Service	None
William Meyer	USGS, Water Resources Division	None
Robert Smith	USFWS	Endangered bat, waterbird, and plant species within project limits; plant species of concern in Ewa area; recommend avoiding unnecessary destruction of vegetated areas containing species Should address impacts and propose mitigation
C. K. Yokota	Department of the Navy, Pearl Harbor	None
Abraham Wong	FHWA	Preparation of the DEIS/MIS must be coordinated with OMPO Assumptions and data in DEIS must match OMPO's and those in ORTP Cost for alternatives must be determined on a regional basis LPA must be included in ORTP update or amendment Funds must be reasonably available and project must be considered with respect to other transportation priorities Tradeoffs between priority projects must be presented to stakeholders and public Highway options and all other reasonable alternatives should be included in MIS HDOT and OMPO should ensure that the study includes multi-modal alternatives that support their transportation plans for the corridor
STATE AGENCIES		
Esther Ueda	DBEDT, Land Use Commission	Include map of project areas in relation to State land use districts – project areas are designated within State Land Use Urban and Agricultural districts
Edwin Sakoda	DLNR, Commission on Water Resource Management	Stream channel alteration permits (SCAP) needed Avoid adverse Impacts on streams and disclose impacts as much as possible
Thomas Fujikawa	SDOT Harbors Division	Traffic studies associated with Sand Island needed especially at interchanges Several permits required, including those requiring BLNR approval Time required for permitting process may impact Harbors Division tenants Coordinate with HCDA Need more detailed plans for impacts to sewer lines Harbor operations could be disrupted during construction Coordinate with DLNR on Sand Island Access Road maintenance issues Coordinate with Sand Island Business Association – container yard impacts and land impacts may require amendment of several subleases and General Lease from Harbors Division

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
STATE AGENCIES (CONTINUED)		
Thomas Fujikawa (continued)	SDOT Harbors Division	Impacts to Harbor facilities; traffic flow may affect Harbors Division and shipping lanes Coordinate with Harbors Division
Paul LeMahieu	State of Hawaii Department of Education	None
Genevieve Salmonson	OEQC	Format issues – two-sided, acronym list, color figures Include close-up neighborhood maps Endangered species – need detail and mitigation Summarize Trans2K meetings Discuss secondary impacts Mitigation measures in State final EIS must be implemented also
Don Hibbard	DLNR, Historic Preservation	Historic sites and issues – Section 106 and 4(f) treatments necessary Supply information to SHPD, then SHPD will be able to advise better on sites, significance, adverse-effect determinations, and needed mitigation Acknowledges intent to consult with OHA on Traditional/Cultural Properties Use SHPD's or City and County's GIS for historic sites locations Understands need for further work on area of potential effect (APE)
Kazu Hayashida	SDOT Airports Division	Integration with Honolulu International Airport plans/ traffic on airport access roads Suggested coordinating with Airports Division Impacts possible on Honolulu International Airport and existing utilities
Kazu Hayashida	SDOT Highways Division	Identify "stand-alone" components of Alternatives Need two Enhanced Bus/TSM Alternatives – one using city Buses, other using chartered/subsidized buses and ferries for peak periods Clarify proposed "local street bus priority measures" Address potential conflict with signal pre-emption by emergency vehicles Describe and justify project in existing Highway ROW based on benefits, costs, traffic impacts, operational requirements, and safety How will Sand Island Bypass and narrowing Nimitz affect vehicular access and harbor operations in Kewalo Basin and Honolulu Harbor? Need to preserve bicycle routes and safety What are assumptions about effect of travel time and fares on transit use (peak and off-peak)? Use constant transit fares when evaluating alternatives Compare alternatives based on following: peak/off-peak travel times of transit and private vehicles; loss of vehicular capacity; cumulative effects on traffic congestion; cumulative effects on peak vehicular trips and person-trips; transit costs not covered by fares and FTA grants; transit use by low income and elderly; land use and demographic impacts; impacts on Airport and utilities

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
STATE AGENCIES (CONTINUED)		
Kazu Hayashida (continued)	SDOT Highways Division	Consult Highways Division on improvements in highway ROW Include Highway Alternative Please send 10 copies in future
Dean Uchida	DLNR, Land Division	Improvements in flood zone should be designed with LUO Tenants on State lands should be involved in planning Suggested coordination with other agencies – SHPD, Parks, CWRM
Keith Fujio	DOE, State Library	None
Gary Gill	Department of Health	Address noise and fugitive dust during construction
David Blane	DBEDT, Office of Planning	Need comparison of ridership relative to cost projections, considering population and economic growth Identify costs of self-sustaining or subsidized bus/light rail system Consider multi-modal options, *i.e.* Bike and ferry alternatives Sand Island/Nimitz could include bike/ferry system Note wetlands in vicinity of Sand Island (map included) BMP for non-point source pollution should be discussed Consider TDM policies (reduce parking, use tolls, land use policies) Need for park-and-rides and other support facilities for transit in residential areas Redevelopment potential around transit stops
C. Sebastian Aloot	Office of Hawaiian Affairs	Need detailed archaeological/cultural info near coastal areas and appropriate mitigation Conduct Archaeological survey of area Determine eligibility of sites for NHR register Urge consultation with OHA Study gathering and religious rights in corridor Work with cultural expert rather than just archaeologist/anthropologist
Roy Price	DOD, Civil Defense	Impacts to siren warning system (there are one to five existing sirens on alignment, depending on exact infrastructure placement) Siren relocations must be planned into project
CITY AND COUNTY AGENCIES		
Kenneth Sprague	C&C Dept. Environmental Services	None
Attilio Leonardi	Honolulu Fire Department	None
Eugene Uemura	Honolulu Police Department	None
William Balfour	Department of Parks & Recreation	None
Jan Naoe Sullivan	Department of Planning & Permitting	Provide a matrix of alternatives No comments
Clifford Jamile	Board of Water Supply	Submit construction plans for review
Gordon Lum	OMPO	Consistency with ORTP – ORTP assumed exclusive ROW and high-capacity transit system. Does LRT have as much capacity as assumed by ORTP for rapid transit? Is it City policy to center growth in Downtown? All Oahu highway projects within ORTP must be prioritized, including those in this project

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
PUBLIC ORGANIZATIONS		
Gordon Lum (continued)	OMPO	Will project use horizon year of 2020 or coordinate with new ORTP (updated to 2025)?
Darrlyn Bunda	Leeward Oahu Transportation Management Association (LOTMA)	Segments of previously-indicated roadways for priority treatments do not appear to be included – Kamehameha Highway from Wahiawa to Radford Costs/benefits of proposed BRT alignments BRT Alternative unclear, confusing. Is there an LRT for Waikiki? Emphasis seems to be on accessing PUC. Need to serve reverse commute market to get to Leeward area also BRT should have a defined route similar to LRT #1, at least west of Pearlridge, and serve several termini Sand Island should not be studied. Too capital intensive Why are bus ramps not included in LRT Alternatives? Is it possible to mix and match portions of alternatives?
PRIVATE ORGANIZATIONS		
Mary Steiner	The Outdoor Circle	Why is Visioning Program used as justification for transportation study? Did not like format of scoping meeting Process/schedule concerns – when will LPA be announced? What if it is not best alternative based on engineering? If PUC is the origin of most trips, why study Kapolei to University? Why is Kahala not included? What impact on street trees (from project in general, from catenaries)? How will efforts to underground wires be affected?
Robin Brandt	Hawaii Bicycling League	Public participation, notification of the public – need additional opportunities for participation Access to report – publish report on Internet; use larger text and map fonts Process/schedule needs clarification What is the involvement of those outside PUC in scoping? In addition to comparing buses against cars, pedestrians, bikes, and the disabled should be considered; use disincentives & education programs on alternative transportation Make pedestrians first priority and cars last priority Discuss measures to make streets more pedestrian, bike, and disabled friendly Discuss car disincentives New transit system, including transit centers and tunnels. should include services/facilities for pedestrians, bikes, and disabled, and be accessible to all Try double-decker buses Promote bikes as circulators New freeway should not impinge on bikes and pedestrians Do not create alternate freeway routes out of local streets Need to coordinate with advocacy groups Should provide funds for studies on transportation alternatives Traffic modeling assumptions are not sufficient; assumed VMT reduction is not proven

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
PRIVATE ORGANIZATIONS (CONTINUED)		
Robin Brandt (continued)	Hawaii Bicycling League	Air quality impacts depends on VMT Social and economic issues – potential concentration of growth in primary corridor leads to environmental justice issues; who will suffer impacts of project? Natural resource issues – water use, impact on indigenous plants; do not reduce green spaces for high-density residential areas Consistency with bike plans – project boundaries are confusing because they do not match
Henry Curtis	Life of the Land	All reasonable alternatives must be considered under NEPA. Therefore, the DEIS must look at full range of alternatives possible. Add Enhanced Bus & Commuter-Based Dedicated Bicycle Lane Alternatives There should be two Enhanced Bus scenarios; one to increase efficiency for both buses and cars; one to encourage buses by developing a more efficient bus system without decreasing the level of congestion Bike Lane Alternative would use different classifications of bike lanes. Bike lanes should connect residential areas with downtown and university, such as Young Street. Reduction of lanes on Nimitz is also an opportunity. Proposes a specific dedicated bike lane route from University using Dole Street, H-1, Isenberg, Young Street, Thomas Square, Hotel Street, Capitol District, Richards, and Nimitz. Documents/sources quoted/referenced: OMPO Policy Committee; OMPO Technical Advisory Committee; OMPO Citizen Advisory Committee; OMPO Overall Work Program; Oahu Regional Transportation Plan; TEA 21; TIP; Mayor's State of the City Address (1/26/99); Oahu Trans 2K City Blueprints; Oahu Trans 2K; 21st Century Oahu; CEQ's Top 40 Questions Asked About NEPA; Major Investment Study guidelines; HRS 343; HAR 11-200 (Implementation of HRS 343); <u>FHWA/FTA Question and Answers on Public Involvement in Transportation Decisionmaking</u>; other documents such as <u>Islandwide Mobility Concept Plan</u>; among others Rather than increase the joy of driving, by having congestion, people will prefer bus. Enhanced Bus System is reasonable, viable, practical, feasible from technical and economic standpoint; it is environmentally preferable Express Bus headway should be every 15-20 min at peak, 30-45 min at non-peak Suggests two separate, linked Express Bus systems: one to Honolulu and one to Kapolei, with circulator buses Enforce 2-person HOV at $250/violation, making them more efficient, decreasing congestion Increase safety for bicycle traffic; make bicycle planning routine; install bicycle parking in activity centers. Traffic modeling considerations

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
PRIVATE ORGANIZATIONS (CONTINUED)		
Henry Curtis (continued)	Life of the Land	VMT and other assumptions may change due to changes in road networks and travel demand, shift in destinations (Kapolei), increased transit service may increase VMT, population growth Choice of traffic models and measures of success should be explained Account for sensitivity of models, and elasticity of demand What unusual impacts may result from project? Address cumulative and secondary impacts Air quality – primary and secondary impacts, including induced growth from all alternatives Water Resources -- primary and secondary impacts, including induced growth from all alternatives What is Public Policy? – preference for mass transit, increased reliance on autos, or expensive all-encompassing system? Need a thorough community impact assessment Include redevelopment incentive for Kakaako as secondary impact of transit Will transit hubs spur nearby development? Will improvements follow same pace as growth in population and tourism? Who pays for new infrastructure -- residents, new arrivals? Will project strengthen or divide communities? Will rebuilding Natatorium, cruise ship berths & associated parking encourage vehicle use? Will improvements spur growth along corridor? Secondary impacts to PUC EIS due to Sand Island/Nimitz waterfront development Will increase in tourism encourage more vehicle use? How do Enhanced Bus and Dedicated Bike Alternatives compare to other alternatives in terms of air quality, noise, water resources, aesthetics, etc? Will project increase noise in suburbs/agricultural lands Will water quality change due to secondary growth? Are visual impacts afterthoughts or part of planning process? How? What are gridlock effects from all alternatives, and what policies will reduce gridlock? Can trolley be expanded to elevated rail (1992 plan)? Would privatization of bus system reduce congestion? Would using Dillingham or Nimitz for one-way during peak period reduce congestion? Would Employer Trip Reduction (ETR) plans reduce congestion? Process/procedure -- explain timing of project Address how to get people to carpool/use zipper lane Will federal money be available for Sand Island? Why does City's plan include a state highway financed by federal money? Also, City versus State plans raise jurisdictional questions. How can state's Zipper Lane be part of City's Plan? City plans include state programs and enforcement plans.

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
PRIVATE ORGANIZATIONS (CONTINUED)		
Henry Curtis (continued)	Life of the Land	Would Sand Island/Nimitz increase vehicle use? Does PUC plan include express buses outside PUC? Waiawa and Iroquois Point are included in PUC – why not Kahala? Why does MIS study express from suburbs outside PUC? (beyond scope) What are acceptance criteria of FHWA/FTA for NEPA document? Does plan conform with DOT plans? Include ideas from 21st Century Vision, Oahu Trans 2K, and related scoping - how ideas were utilized/screened Explain weighting of different proposals Include baseline plans for rail/trolley Explain effects on residential/business communities of transit Consider economic justice (commercialization of poorer neighborhoods) in siting transmission facilities Is the following a positive statement about rural lifestyles: "Even something relatively simple like having streets without sidewalks can affect community character." <u>Islandwide Mobility Concept Plan</u>. page 4 (What is assumption about sidewalks?) Will there be opportunities for public participation in preparation of MIS? What is source of growth projections? Why move people into Downtown rather than Second City (Kapolei)? Use of overhead lines should be rejected Can electric vehicles be used? Does federal matching funds depend on LPA selected? What is definition of sustainability?
Patricia Tummons		Consider scenic viewplanes Urban sprawl, encroachment into rural areas Emissions from alternatives Traffic modeling necessary
Douglas Meller		Eliminate some bus stops to make routes more efficient Charter private vehicles for peak hour Regulate parking fees Separate Sand Island from project Traffic modeling necessary – travel times, trip generation
Bruce Plasch	Decision Analysts Hawaii, Inc.	Document contains many assumptions about sprawl Define "sprawl" Document indicates contradiction of/one-sided view of sprawl and centralized development. It says Oahu has both widespread sprawl and centralized development. What are benefits and costs of sprawl versus compact development Discussion is moot: many key development decisions have been made by government already Economic decline of commercial areas – which communities? Disputes claim that autos cause economic decline in some areas

TABLE A.2-3 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED IN RESPONSE TO THE EISPN AND NOI AS OF JUNE 14, 1999
(RESPONSES TO THE COMMENTS APPEAR IN APPENDIX C)

Name	Organization	Comment
PRIVATE ORGANIZATIONS (CONTINUED)		
Bruce Plasch (continued)	Decision Analysts Hawaii, Inc.	Development and service costs – sprawl is costly, but higher residential density is not as attractive to buyers; suburban development is not as costly as PUC redevelopment and is easier to locate than PUC in-fill development. Infrastructure planning – document relies on unsubstantiated claim that sprawl is costly and must be subsidized by other neighborhoods. Recommends reading on sprawl and infrastructure financing Contradiction between City policy on urbanizing agricultural lands (in Ewa DP) and protecting prime agricultural lands from sprawl, as stated in document. Economic and environmental costs of agriculture are not any less than that of urban sprawl Factors affecting suburban growth are not limited to transportation policies. Includes development policies and consumer preferences Ewa and Central Oahu would have lower housing prices even without government intervention, due to lack of established communities and services Strategy for the PUC – assumed number of new PUC homes is too high; regardless, PUC should be redeveloped Need to clarify to the public that transportation has land-use development implications, due to mobility issues Implementation of the plan must be realistic Computers and electronic communications may change travel demand and development patterns Extensive network of freeways should include highways Discussion of benefits & costs of automobile travel is biased; does not address benefits of auto travel Is it accurate to use 350 ft/auto as estimated area required for home-based vehicles? Parking area is often shared use. Marginal, sunk, and total costs associated with auto travel should be recognized Use unused equipment and capacity (including carpooling) during peak periods Use road pricing - economic incentives/disincentives to use scarce highway capacity

Source: Parsons Brinckerhoff, Inc.

A.2.3 Agency Information Meeting

An agency information meeting was held on March 11, 1999 at the Ala Wai Club House. The purpose of this meeting was to brief government agencies on the project, and to solicit relevant project information and agency concerns. Agencies invited to this meeting are listed on Table A.2-2. The agencies that attended this meeting are as follows:

- U.S. Department of Transportation, Federal Transit Administration
- U.S. Department of Transportation, Federal Highway Administration
- U.S. Department of Transportation, Federal Aviation Administration
- USACFSC (Hale Koa Hotel)
- U.S. Army Garrison Hawaii
- State Department of Accounting and General Services
- State Department of Business, Economic Development and Tourism, Land Use Commission
- State Department of Defense
- State Department of Health
- State Department of Transportation, Airports Division
- State Department of Transportation, Harbors Division
- State Department of Transportation, Highways Division
- State Department of Transportation, Statewide Transportation Planning Office
- State Office of Environmental Quality Control
- Hawaii Community Development Authority
- City and County of Honolulu, Department of Parks and Recreation
- City and County of Honolulu, Department of Planning and Permitting
- Honolulu Fire Department
- Honolulu Police Department
- Oahu Metropolitan Planning Organization
- Leeward Oahu Transportation Management Association

After a presentation on the current status of project planning, discussion focused on clarification of project elements, the level of federal participation, ridership projections, costs, and consistency with current and ongoing planning activities. Agencies were asked to complete a questionnaire on review procedures, permits, and resources potentially relevant to the project. The comments provided by the agencies that attended the meeting are summarized in Table A.2-4. The summaries on Table A.2-4 are meant to be brief, with no intention of obscuring the content of any comment received. The comments are followed by a written response.

A.2.4 Scoping Meeting

A public scoping meeting was held in the evening on May 11, 1999 at Washington Middle School. The meeting was advertised in MidWeek, through the Round Three public workshops, and by direct mail. The function of the scoping meeting was to invite public comment on the purpose of and need for the project, the alternatives under consideration and the environmental studies to be conducted. The school cafeteria was arranged to accommodate the different activities planned for the evening. Approximately half of the room contained display boards showing maps of the alternatives and photographs of candidate transit technologies. Project planners staffed this area. The other half of the room was used for a formal presentation by the Director of DTS and consultant personnel.

Following the presentation, oral comments were recorded and written comments were accepted. Table A.2-4 provide summaries of these comments. Additional comments were mailed to DTS after the scoping meeting and are also included in Table A.2-4. The summaries on Table A.2-4 are meant to be brief, with no intention of obscuring the content of any comment received. The comments are followed by a written response.

A.2.5 <u>Coordination and Consultation Regarding Sand Island Scenic Parkway and Nimitz Boulevard</u>

Chapter 2 discusses the development of a Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative. At Rounds Three and Four of the Oahu Trans 2K workshops, participants considered the SISP, and the concept was included in the <u>Final Mobility Plan</u>. The project's EISPN and NOI included references to SISP. An extensive public outreach effort was conducted to notify the public and agencies about this project. Meetings were held with individual and organizational stakeholders to discuss the plans, and a tabloid-style Progress Report describing the elements of the project was distributed at numerous public meetings.

Subsequent to the public outreach efforts, agency consultation led to an agreement that SISP needed more alternatives and was best reviewed in the context of the Oahu Regional Transportation Plan (ORTP). Transit, on the other hand, had already been identified in the previous ORTP as a means to meet the need for higher capacity within the PUC. The needed analysis was completed and the DEIS was ready for issuance. Consequently, it was agreed to continue both elements, but on separate tracks.

Steps have since been taken to inform the public of this change in the MIS/DEIS. In July 2000, a letter was sent to agency, public and maritime industry stakeholders who had been involved in coordination meetings on SISP. This letter advised stakeholders that the project would be included in the ORTP update and that it was not being carried forward through the NEPA and Chapter 343 environmental review processes. Approximately 50 letters were sent.

The general public will be notified of this change in plans through a tabloid-style Progress Report that is being developed to provide an overview of the MIS/DEIS to facilitate public understanding. This document will be released concurrently with the public issuance of the MIS/DEIS. The Progress Report will include a section describing how the SISP will be handled. The document will be distributed at the public meetings to be held after issuance of the MIS/DEIS.

TABLE A.2-4
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Name and Organization	Comment	Response
Darrlyn Bunda, Leeward Oahu Transportation Management Association	Favored extending the LRT alignment to Waiawa Interchange.	The BRT Alternative, which has since replaced the LRT Alternative, has an In-Town component that goes as far as the Middle Street Interchange. There is an additional Regional BRT component that would service riders as far as Ewa/Kapolei.
	Waiawa Interchange needs to be reconfigured to serve buses/HOVs and to provide better access to the community, such as Leeward Community College.	Under the BRT Alternative, H-1 around the Waiawa Interchange would be widened and improved with a PM zipper lane. Section 2.2.3 discusses this and other improvements to the existing freeway system in detail.
Todd Boulanger, Na Kama Hele	Requested analysis of how the alternatives integrate bicycling and pedestrian trips.	Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives, although the BRT Alternative would do the most to improve bicycle facilities. However, pedestrians and bikes alone cannot satisfy all of the travel markets that must be accommodated. Chapter 1 discusses the project's purposes and needs, which include making the PUC more pedestrian friendly, and Chapter 4 discusses all modes of transportation. Investments in transit systems promote the pedestrian and bicycles modes as viable modes of travel. DTS will also continue to support programs to foster alternative transportation, such as the hub-and-spoke bus system and traffic calming, and Vanpool.
	Requested consideration of biking as a low cost area circulator.	Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives. Pedestrians and bikes are very much a part of the TSM and BRT Alternatives, but they alone cannot satisfy all of the travel markets that must be accommodated.
	Requested analysis of bikes and pedestrian access impacts along certain corridors, such as the tunnel, King Street and Kapiolani Boulevard.	Bicycle and pedestrian access is described in Sections 4.5 and 4.6.
	Requested analysis of impacts to the safety of pedestrians and cyclists from articulated buses as opposed to shorter or double deck buses.	Bicycle and pedestrian access is described in Sections 4.5 and 4.6.
	Questioned predicted reduction of regional vehicle miles traveled (VMT) from the project.	Extensive traffic modeling was done as part of the planning process. See Chapter 4 for details.
	Requested that disincentives to driving (e.g., road pricing, etc.) be included as alternatives, as well as measures to make walking as the preferred mode within the city.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Name and Organization	Comment	Response
Todd Boulanger, Na Kama Hele	Requested analysis of air and water quality impacts.	Impacts to air quality and water quality are discussed in Sections 5.5 and 5.8, respectively.
	Requested analysis of the socio-economic and environmental impacts on poor families having to depend on automobiles for their transportation.	Environmental justice issues are addressed in Section 5.3.
	Requested that the project conducts a more extensive and diverse public outreach program for scoping, and gave suggestions on how this can be accomplished.	Appendix A summarizes the efforts that have been made to provide opportunities for public participation. Comments from the public are welcome at any point. However, to be part of the official record, comments on the Draft EIS need to be made by the close of the comment period on the Draft EIS.
	Requested analysis of how bus fare increases affect future ridership, road congestion, land use, pollution, parking demand and the success the alternatives.	Financial plans are discussed in Chapter 6, and travel demand is discussed in Chapter 4.
Donald Lubitz	Suggested that right-of-way or corridor be reserved now in anticipation that an expanded transit system would be needed in the future.	Because of existing development patterns in the PUC, the rights-of-way of future transportation systems are primarily the existing transportation rights-of-way. This is why the need is to increase people-carrying capacity within the existing transportation rights-of-way.
	Suggested that the City transit system be used to support education programs for visitors and residents (e.g., provide transportation to education sites).	The PCTP would serve several travel markets, including students and visitors.
W-K Luke	Requested that public places of the project (e.g., transit centers) include amenities for socializing, and cultural elements consistent with area (e.g., Chinatown).	Transit centers and other public spaces included in the project would be designed to be pedestrian-friendly and contribute to a sense of community. Transit centers and stops in special districts such as Chinatown would be designed to blend in and enhance the existing cultural setting.
	Requested spot improvements to improve bus service.	Refinements to the existing bus system are made on an ongoing basis as the need arises.
Wendell Lum	Requested cost and funding information and analysis of impacts to the economy.	A financial analysis is provided in Chapter 6. Impacts on the economy are discussed in Section 5.1.
	Suggested that transportation investment be in the Central and Leeward areas where residential growth is occurring.	Transportation investments will be made throughout the primary transportation corridor. These investments are intended to help facilitate growth in Ewa and the PUC.
Christen Mitchell	As part of the No-Build, suggested a mixed-use land use pattern, and a continuous bikeway through the corridor.	The transportation improvements contained in the No-Build Alternative would do less than the other alternatives to help foster a mixed land use pattern. The transportation improvements in the No-Build would encourage continued suburbanization and loss of open space. The bicycle facilities in the existing State and County Bicycle Master Plans are included in the No-Build Alternative.
	Suggested private-public partnerships for mixed-use development at transit stations.	There are several ways to encourage "joint development" at transit centers and transit stops. Public-private partnerships are certainly being considered.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Name and Organization	Comment	Response
Christen Mitchell	Requested analysis of transportation malls' impact on the surrounding community, pedestrian access, safety and crime, and landscaping.	The social impacts of the project on the neighborhoods is discussed Section 5.3. Pedestrian access issues are addressed in Section 4.6. Landscaping issues are addressed in Section 5.7. In general, transit centers and transit stops are intended to help focus growth along the alignment and help develop a pedestrian and transit-oriented setting.
	Criticized advertising for the scoping meeting.	Appendix A summarizes the efforts that have been made to provide opportunities for public participation, including comments from the business community.
	Critical of overhead wires and motorized ferries on the Ala Wai.	Neither overhead lines nor ferries on the Ala Wai are proposed as elements of the PCTP.
Michelle Matson	Requested that potential impacts to businesses be considered in planning the project.	General economic impacts are discussed in Section 5.1. Chapter 4 discusses impacts on parking areas and loading zones.
	Supports Sand Island Bypass and Nimitz Parkway elements of the project for waterfront development.	The Sand Island component of this project is being addressed in the current update to the Regional Transportation Plan. It is not part of this project at the current time.
Lynne Matusow	Requested deleting the LRT and Ala Moana Waterfront Loop elements from the alternatives.	The LRT Alternative has been replaced by the BRT Alternative. The Ala Moana Waterfront Loop is no longer part of the project.
	Suggested a transit system similar to Curitiba, Brazil.	The In-Town BRT system would be a transit system similar to Curitiba, Brazil, adapted to local conditions. The Curitiba situation is in some ways simpler because more space is available to construct new transportation systems.
	Project should consider that certain streets are used for parades and block parties.	The route of the In-Town BRT system would be modified to accommodate special events. This topic is discussed in more detail in Section 4.6.
	Does not favor the use of overhead wires for the LRT.	Overhead lines are not proposed as a part of the PCTP. The LRT Alternative has been replaced by the BRT Alternative.
	Transit improvements should be extended into Waikiki.	The In-Town BRT would extend throughout Waikiki.
Dick Poirier	Supported congestion pricing and other types of user fees, such as charging for accessing the HOV lanes, as a viable alternative.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.
	Requested the Ewa terminus of LRT Alternative be extended to the Waiawa Interchange area.	The BRT Alternative would accommodate future phased extensions of the system if viable.
	Requested that alternatives for road pricing be studied.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Comment	Response	Comment
Richard Port	Expressed concern about the cost of the alternatives, noting that revenues do not cover operating costs and that the transit system would compete with private operators.	Methods of financing the construction and operation of the alternatives are discussed in Chapter 6.
	Favors expanding the existing bus system, including use of articulated buses.	All of the alternatives would expand the bus system and use articulated vehicles. They vary by the degree and means that they would use to improve transit service.
Richard Quinn	Suggested decentralized transportation systems geared to individual neighborhoods because advances in technology would result in a greater degree of trips within the neighborhood for working and shopping.	While land use changes that would improve the ability of walking to satisfy more trip purposes are desired, walking alone is not expected to address all of the expected increase in travel demand.
Milton Ragsdale	Suggested new alternatives and modifications to certain elements of proposed alternatives - fixed rail along H-1 median from Pearlridge Shopping Center to Kahala Mall, with a subway from Middle Street Transit Center to Ala Moana, and a BRT connecting University/King Transit Center to Manoa Recreation Center or UH quarry area.	These suggestions would be less cost-effective than the alternatives currently under study. Chapter 2 discusses the evolution of the alternatives that receive detailed assessment.
	All BRTs and LRTs should have space or racks for bicycles.	Bicycles will be accommodated on the BRT vehicles.
William Rosa	Requested bus service be more frequent, and that traffic calming be used in downtown areas.	Chapter 2 describes the frequency of bus services for each of the proposed alternatives. The BRT Alternative would provide the greatest frequency of transit service. Traffic calming would continue to be an option wherever an opportunity for implementation is identified.
Linda Starr, Neighborhood Board #2, Kuliouou Kalani Iki	Does not favor special bus ramps- because it would waste resources.	Special bus ramps have been included in the BRT Alternative to decrease travel times for transit patrons.
	Requested studying metering at freeway on ramps.	The Hawaii Department of Transportation has been studying ramp metering.
	Feels that people from Kapolei to Pearlridge would not want to change modes, and that they would want the convenience of riding an express bus into town.	All of the alternatives include selected express routes. Some degree of transfers and modal switches would be necessary for the system to work cost-effectively.
Mary Steiner, The Outdoor Circle	Requested clarification on certain elements of the project, such as details of the transit centers, landscape plans, impact to street trees, and project limits.	Project elements are described in Chapter 2. Landscaping and impacts to trees would be minimized to the extent practicable, and are described in Section 5.7. Further details would be developed in subsequent planning after City Council selects an LPA.
	Criticized lack of public participation.	Appendix A details the extent of efforts made to solicit public participation.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Comment	Response	Comment
Clifton Takamura	Provided suggestions on how to improve existing bus system.	Improvements to the bus system occur on an ongoing basis.
	Suggested using the old OR&L right-of-way as an alignment..	The alignment of the OR&L right-of-way is not appropriate for modern, high-speed transit vehicles. Some of the right-of-way is being proposed for bicycle use.
	Asked whether the proposed transit system will be a moneymaker, and whether it will be used by visitors.	Publicly-funded transit systems are not intended to made a profit. Creation of a profit is not one of the project purposes. Both visitors and residents are expected to use transit under any of the alternatives.
	Favored a system that uses a combination of LRT and buses.	The LRT has been replaced by the BRT Alternative, which would have In-Town and Regional systems that combine traditional buses and more technologically advanced energy-efficient vehicles.
Shannon Wood	Suggested expansion of alternatives to include more freeways, water-based transportation, and expansion of LRT system to Mililani, Hawaii Kai and Waikiki.	Chapter 2 describes the evolution of the alternatives that receive detailed treatment in the MIS/DEIS.
	Requested impacts analysis in the event of a natural disaster, and if the price of fossil fuel rises substantially.	Improved transit would enhance mobility during a natural disaster and if fossil fuel prices rise substantially.
Jim Yamamoto	LRT system should serve Bethel Street.	The LRT has been replaced by the BRT Alternative. There would be a transit stop in the vicinity of Bethel Street.
	Requested analysis of why people drive.	People travel for many reasons, and these factors have been included in the travel demand forecasts prepared for this project.
	Suggested multi-modal efforts to address transportation issues.	The TSM and BRT Alternatives are multi-modal alternatives, as described in Chapter 2.
Brian Yoshida, Moanalua Community Association	Supported the LRT alternative, but would also like to see the project include roadway widening on the H1 Freeway, and extending the Nimitz viaduct to Downtown.	The LRT Alternative has been replaced by the BRT Alternative. The H1 Freeway widening and Nimitz viaduct have been or are being considered under separate projects.
	Requested analysis of disruption of traffic during construction, projected ridership of different alternatives, and projected fares for the LRT.	Construction-phase impacts, including impacts on traffic, are discussed in Section 5.12. Ridership projections are presented in Chapter 4. Fares and project financing plans are presented in Chapter 6.
Pamela Young	Additional right-of-way requirements should be disclosed.	Right-of-way requirements are discussed in Section 5.2.
	Questioned the need for LRT, especially since the Leeward and Central Oahu areas contain a third of Oahu's population.	The LRT Alternative has been replaced by the BRT Alternative. Chapter 1 discusses the need for the project. There is a substantial imbalance now and in the future between travel demand and transportation system capacity for travelers in the Primary Transportation Corridor, which includes Leeward and the southern portion of the Central District.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Comment	Response	Comment
Anonymous	Criticized the lack of opportunity for exchange of comments, questions and answers before the whole audience.	Comment noted.
	Expressed frustration on the lack of progress on needed transportation improvements.	DTS shares the commentors frustration about the lack of progress on this important quality of life issue.
	Supports a "traditional" looking LRT system rather than a "modern" looking LRT system.	The LRT Alternative has been replaced by the BRT Alternative. The final look of the BRT vehicles, if this alternative is selected, has not yet been selected.
Unknown, Agency	Will project be used to assist in urban planning?	Yes. Project is coordinating with current planning efforts to update the PUC DP, sustainability plans of other DP areas and the recently completed Ewa DP. Overall land use objectives are to encourage urban growth in the PUC and Ewa, and discourage suburban sprawl in other areas. Transportation is one tool to help facilitate these land use objectives. Improved transit service will make in-town living more attractive.
	Need land use controls to discourage/prevent gentrification around future transit stations	Will ensure that future development is consistent with community visions and desires.
	Is the third light rail transit LRT Alternative a first phase of the first and second LRT Alternatives?	The LRT Alternative has been replaced by the BRT Alternative.
	Does BRT Alternative include LRT from downtown to Waikiki?	None of the alternatives moving forward include LRT technology.
	Do any of the alternatives include service between the airport and Waikiki?	Ridership estimates will include all travel markets, including demand between the airport and Waikiki. However, addressing the airport/Waikiki travel market is not a major purpose of this project. Airport travelers would need to get to the Middle Street Transit Center to access the system.
	Is modifying the H-1 Zipper Lane to carry P.M. peak traffic possible?	Yes. The BRT Alternative includes a PM zipper lane.
	Is it possible to come up with defensible ridership projections?	Ridership projections are described in Chapter 4.
	Is there a cost per new rider threshold for receiving federal funds as a transit "new start"?	To receive federal funding, a project must be on the federal "new start" list. There are many rating criteria that score projects on the "new start" list, including cost per new rider. The FTA will use many other criteria, such as ridership, to evaluate the project. After determining eligibility, the project would compete with other transit projects across the nation for federal funds.
	Transit center locations in Waipahu should follow the Waipahu Special Area Plan.	There are no site-specific locations for the Waipahu transit centers. However, they will be located strategically to serve BRT treatments on Fort Weaver Road and other roadways.
	Has a site for the LRT maintenance yard for the Waikiki/Downtown line been selected?	The LRT Alternative has been replaced by the BRT Alternative. In-Town BRT vehicles would be maintained at the Middle Street Transit Center.

TABLE A.2-4 (CONTINUED)
SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Comment	Response	Comment
Unknown, Agency	Will lanes be used exclusively for the LRT?	The LRT Alternative has been replaced by the BRT Alternative. The In-Town BRT would use both exclusive and semi-exclusive lanes.
	Disagreed that communities do not want more lanes for automobiles.	Comment noted.
	Will there be any grade-separated sections for the LRT?	The LRT Alternative has been replaced by the BRT Alternative. No grade-separations are proposed.
	People are asking for a more balanced transportation system.	That is what this project is trying to accomplish. Chapter 1 describes the project purposes and needs in more detail.
	Will this project do anything to alleviate the problem of motorists using residential side streets to avoid congestion on the main arterial streets?	By enhancing transit service, more people would be encouraged to use transit instead of private automobiles.
	What are bus ramps?	Ramps that are restricted to buses and certain vehicles, such as vanpools. Their objective is to provide transit priority, thereby rewarding transit patrons with shorter travel times.
	The DPs contain lists of cultural assets and resources, and important viewplanes and visual resources.	The information in the DP's was used in the preparation of the MIS/DEIS.
	What are the costs of the alternatives?	Cost estimates are discussed in Chapter 2.
	What are committed projects?	Projects that are listed in the Oahu Regional Transportation Plan as proposed for completion by the year 2005.
	What is the time horizon for this project?	Planning is based on travel demand forecasts and land use projected for 2025.

Source: Parsons Brinckerhoff, Inc.

Primary Corridor Transportation Project

Appendix B

Bus Rapid Transit Alternative Draft Conceptual Design Drawings

(Separate Volume)

BUS RAPID TRANSIT CONCEPTUAL DESIGN DRAWINGS

The locations and extent of the No-Build, TSM and BRT Alternatives are shown in figures in Chapter 2. In addition, large-format conceptual engineering drawings at a scale of 1:200 are available to the public. These drawings are available at the following libraries:

- University of Hawaii Hamilton Library, Hawaiian Collection
- Legislative Reference Bureau
- DBEDT Library
- Honolulu Municipal Reference and Records Center
- State Main Library
- Kaimuki Regional Library
- Hilo Regional Library
- Maui Regional Library - Kahului
- Lihue Regional Library
- Kaneohe Regional Library
- Pearl City Regional Library
- Hawaii Kai Regional Library
- Aiea Library
- Aina Haina Library
- Ewa Beach Community-School Library
- Kahuku Community-School Library
- Kailua Library
- Kalihi-Palama Library
- Library for the Blind and Physically Handicapped
- Liliha Library
- Manoa Library
- McCully-Moiliili Library
- Mililani Library
- Salt Lake-Moanalua Public Library
- Wahiawa Library
- Waialua Library
- Waianae Library
- Waikiki-Kapahulu Library
- Waimanalo Community-School Library
- Waipahu Library

In addition, copies may be obtained by calling 527-6978.

Primary Corridor Transportation Project

Appendix C
EISPN Comments and Responses

U.S Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports District Office

300 Ala Moana Blvd., Room 7-128
Honolulu, Hawaii 96813
MAIL: Box 50244
Honolulu, Hawaii 96850-0001
Phone: (808) 541-1232
FAX: (808) 541-3462

May 5, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

We have reviewed the Primary Corridor Transportation Project Environmental Assessment (Environmental Impact Statement Preparation Notice) dated April 1999.

Although we have no comments on the EA/EISPN, we request that our office be included in the scoping process because some of the proposed alternatives are adjacent to Honolulu International Airport. These alternatives, with readily accessible links to airport transportation systems, could improve access for passengers, employees, and other users of the airport. We also suggest coordination with the State Airports Division.

If you have any questions, please call David Welhouse at 541-1243.

Sincerely,

Daniel S. Matsumoto

Daniel S. Matsumoto
Civil Engineer

cc: Ben Schlapak, DOTA
Office of Environmental Quality Control

RECEIVED
99 MAY 6 AM 1:55

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02229R

Mr. Daniel S. Matsumoto, Civil Engineer
U. S. Department of Transportation
Federal Aviation Administration
Western-Pacific Region, Airports District Office
Box 50244
Honolulu, Hawaii 96850-0001

Dear Mr. Matsumoto:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 5, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Parsons Brinkerhoff Quade & Douglas, Inc.

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

USDA

Our People...Our Islands...In Harmony

May 6, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

RECEIVED
MAY 10 A8:47

Dear Ms. Soon:

Subject: Primary Cooridor Transportation Project

We have reviewed the above mentioned document and have no comments to offer at this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc:
Office of Environmental Quality Control, 235 South Beretania Street, Suite 702,
Honolulu, Hawaii 96813

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02275R

Mr. Kenneth M. Kaneshiro, State Conservationist
U. S. Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 6, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your letter will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

May 5, 1999

RECEIVED
MAY 6 AII: 56

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project Environmental Impact Statement Preparation Notice

The staff of the U.S. Geological Survey, Water Resources Division, Hawaii District Office, has reviewed the subject Environmental Assessment (EIS Preparation Notice) and we have no comments to offer at this time.

Thank you for allowing us the opportunity to review and comment on this document.

Sincerely,

William Meyer
District Chief

cc: Office of Environmental Quality Control
235 South Beretania St., Suite 702
Honolulu, Hawaii 96813

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02235R

Mr. William Meyer, District Chief
U. S. Department of the Interior
U. S. Geological Survey
Water Resources Division
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

Dear Mr. Meyer:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 5, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your letter will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

RECEIVED

United States Department of the Interior
MAY 26 ... 10

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: LTG

MAY 24 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Re: Notice to Prepare Draft Environmental Impact Statement and Request for a Species List for the Primary Corridor Transportation Project, Oahu, Hawaii (ER 99/397)

Dear Ms. Soon:

The U.S. Fish and Wildlife Service (Service) has reviewed your April 21, 1999, letter notifying us that you intend to prepare a Draft Environmental Impact Statement (DEIS) for the proposed project referenced above. We have also reviewed a letter received from the Federal Transit Administration (FTA), dated May 12, 1999, requesting a list of endangered and threatened species found within the proposed project area. The proposed project is sponsored by the City and County of Honolulu Department of Transportation Services (DTS) and the U. S. Department of Transportation, FTA. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Department of the Interior concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The proposed project involves improving Oahu's primary transportation corridor, which extends from Kapolei in the Ewa District, past Pearl Harbor, Honolulu International Airport, downtown Honolulu, and continues eastward to the University of Hawaii at Manoa. The corridor is approximately 27 miles in length and at most 4 miles in width. The alternatives currently being considered include a No-Build Alternative, Enhanced Bus/Transportation System Management Alternative, a Bus Rapid Transit, and a Light Rail Transit alternative.

The Service has reviewed the information that was provided in your letter and pertinent information in our files, including maps and records prepared by the Hawaii Heritage Program of The Nature Conservancy. The Hawaiian hoary bat (*Lasiurus cinereus semotus*), federally listed as endangered, has been sporadically sighted within the metropolitan area of the proposed project. The following waterbird species, federally listed as endangered, have been observed in wetland areas within the project area:

a. Hawaiian coot (*Fulica americana alai*);
b. Hawaiian duck (*Anas wyvilliana*);
c. Hawaiian common moorhen (*Gallinula chloropus sandvicensis*); and
d. Hawaiian stilt (*Himantopus mexicanus knudseni*).

1 The following federally endangered plant species have been observed within the Ewa area of the Primary Transportation Corridor (refer to Figure 1.1 of the DEIS Preparation Notice):

a. *Abutilon menziesii* (ko`oloa`ula);
b. *Centaurium sebaeoides* (`awiwi); and
c. *Marsilea villosa* (`ihi`ihi).

In addition, the plant *Torulinium odoratum* subsp. *auriculatum* (pu `uka `a), a Species of Concern, has been reported within the Ewa area of the Primary Transportation Corridor. However, it has not been observed there since 1916. The term "Species of Concern" describes species that are of concern to the Service, but require further biological research and field study to resolve their conservation status. These species are not currently federally protected.

2 The DEIS should address any potential project-related impacts to these and other native Hawaiian species and propose mitigation measures that avoid unnecessary impacts and minimize unavoidable impacts. For example, we recommend that these measures include avoidance of unnecessary destruction of vegetated areas containing ko`oloa`ula or any other federally listed plant species.

The Service appreciates the opportunity to provide this technical assistance, and we look forward to reviewing a copy of the DEIS when it is available. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Leila Gibson by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,

Robert P. Smith

Robert P. Smith
Pacific Islands Manager

cc: FWS - Region 1, Portland
OEPC, Washington, D.C.
FTA, San Francisco
USEPA, Honolulu
DOFAW, Hawaii
CZMP, Hawaii

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4629 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02582R

August 16, 2000

Mr. Paul Henson, Field Supervisor
U. S. Department of the Interior
U. S. Fish and Wildlife Service
Pacific Islands Ecoregion, Ecological Services
Box 50088
Honolulu, Hawaii 96850

Dear Mr. Henson:

Subject: Primary Corridor Transportation Project

Thank you for the letter dated May 24, 1999, from Mr. Robert P. Smith regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The endangered species that may be found within the project area are described in Section 3.7 of the MIS/DEIS.
2. Potential impacts on endangered species and proposed mitigation measures are addressed in Sections 5.7 and 5.12.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
517 RUSSELL AVENUE
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO:
5090
Ser N465/10075
May 26, 1999

RECEIVED
99 JUN 2 P 1:30

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

Thank you for affording the Navy an opportunity to comment. As requested, we have reviewed the Environmental Assessment (EIS Preparation Notice) for the subject project and do not have comments pertaining to the environmental review process at this time.

We look forward to participating in the environmental review processes and discussing relevant issues should specific projects impacting our property be proposed. If we can be of further assistance, please do not hesitate to contact me at 471-1171 (Ext. 229).

Sincerely,

C. K. Yokota

C. K. YOKOTA
Director
Regional Environmental Department
By direction of
Commander, Navy Region Hawaii

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD6/99-02735R

August 16, 2000

Mr. C. K. Yokota, Director
Regional Environmental Department
U. S. Department of the Navy
Commander, Naval Base Pearl Harbor
517 Russell Avenue
Pearl Harbor, Hawaii 96860-5020

Dear Mr. Yokota:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 26, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your letter will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Hawaii Division
Box 50206
300 Ala Moana Blvd., Room 3-306
Honolulu, HI 96850
June 14, 1999

IN REPLY REFER TO
HPR-HI
[720.200]

RECEIVED
JUN 16 P12:04
[illegible]

Leslie Rogers, Regional Administrator
Federal Transit Administration
201 Mission Street
Suite 2210
San Francisco, CA 94105

Subject: Primary Corridor Transportation Project: Cooperating Agency Decision and Comments

In response to your letter of May 5, 1999, we elect to be a cooperating agency on the Primary Corridor Transportation Project (PCTP) proposed by the City and County of Honolulu. Alternatives presented by the City are primarily transit options. We understand that if future conditions warrant, our role could be changed to joint lead agency, and that change can readily be accommodated. We agree with your understanding stated in the May 5 letter that the EIS will enable FHWA to discharge its jurisdictional responsibilities and that the EIS will satisfy our NEPA requirements including those related to project alternatives, environmental consequences and mitigation. Please keep this office fully informed about any highway related impacts or improvements for the PCTP. We are committed to being involved and responsive to FTA, our State, City, and MPO partners, and the public throughout the study effort.

1 We would like to take this opportunity to remind you that the DEIS/MIS must be fully coordinated with the Oahu Metropolitan Planning Organization (OMPO.) Assumptions on land-use, demographics, traffic, and other data must be consistent between the PCTP and the OMPO planning process, including the Oahu Regional Transportation Plan (ORTP) update. OMPO is responsible for regional transportation planning on Oahu, and the MIS is really a subarea or corridor planning study that is of regional nature, so it should be carried out in the OMPO forum.

2 The cost for the PCTP alternatives must be determined and considered on a regional basis. The PCTP preferred alternative and all of its transit and highway elements must be fully incorporated into the ORTP by including it in the ORTP update or a plan amendment. Funds for the project must be reasonably available, and as part of the ORTP , the project must be considered with respect to all other transportation priorities in the ORTP to determine its priority and validity in the regional perspective. The project as a whole could consume funding for other priority projects included or being considered for inclusion in the ORTP and the tradeoffs must be presented to the stakeholders and the public for their consideration.

3 Alternatives presented by the City thus far are primarily transit options. While this focus is due to the high capacity transit placeholder in the existing ORTP, the MIS requirements call for all reasonable alternatives to be considered within the MIS, therefore highway options should be considered now rather than after the MIS is completed by the City. The HDOT and OMPO should ensure that the study includes multi-modal alternatives that support their transportation plans for the corridor.

Please feel free to contact Jonathan Young at (808) 541-2700, ext. 325, if you have any questions.

Sincerely yours,

Abraham Wong

Abraham Wong
Division Administrator

cc: Toru Hamayasu (DTS)
Kazu [illegible] (HDOT)
Gordon Lum (OMPO)
Pericles Manthos (HWY)
Julia Tsumoto (STP)

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD00-00406
TPD6/99-02967

Mr. Abraham Wong, Division Administrator
U. S. Department of Transportation
Federal Highway Administration
Hawaii Division
Box 50206
Honolulu, Hawaii 96850

Dear Mr. Wong:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated June 14, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS). Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. Coordination with the Oahu Metropolitan Planning Organization is ongoing. Section 4.2.5 discusses differences in data used for the MIS/DEIS and the Oahu Regional Transportation Plan analyses. A sensitivity analysis concluded that the difference is not significant enough to alter the analysis and conclusions in the MIS/DEIS.

2. The costs of the alternatives are provided in Section 2.3. A full financial analysis of the project is in Chapter 6.

3. Project alternatives are discussed in Chapter 2. Section 2.1 discusses the evolution of alternatives. The Transportation System Management and Bus Rapid Transit Alternatives are multi-modal alternatives. A highway alternative alone is not sufficient to

satisfy project purposes and needs, and is addressed in Section 2.6. A highway alternative is inconsistent with the public's visions for the island's transportation system, as documented through the Oahu Trans 2K process.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

April 29, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for the Primary Corridor Transportation Project

1 We have reviewed the EISPN for the subject project and find that the project areas, as represented on Figures 2.1 through 2.6, are designated within the State Land Use Urban and Agricultural Districts. We suggest that the Draft EIS include a map showing the project areas under the different alternatives in relation to the State land use districts.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject EISPN.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

cc: OEQC

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02130R

Ms. Esther Ueda, Executive Officer
State of Hawaii
Department of Business, Economic Development and Tourism
Land Use Commission
P. O. Box 2359
Honolulu, Hawaii 96804-2359

Dear Ms. Ueda:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated April 29, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following response to your comment is provided.

1. Land use is addressed in Sections 3.1 and 5.1. With the exception of a small area in Ewa, the entire primary transportation corridor is designated as Urban by the State Land Use Commission.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

TIMOTHY E. JOHNS
CHAIRPERSON

BRUCE S. ANDERSON
RICHARD H. COX
ROBERT G. GIRALD
DAVID A. NOBRIGA
HERBERT M. RICHARDS, JR.

EDWIN T. SAKODA
ACTING DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

MAY -3 1999

Honorable Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

RECEIVED
MAY 7 A9:30

Dear Ms. Soon:

EIS Preparation Notice for the Primary Corridor Transportation...

Thank you for allowing us to review and comment on the subject document.

1 Page 19 of the document acknowledges the requirement for stream channel alteration permits (SCAP). Stream Channel Alteration permits, pursuant to Hawaii Revised Statutes §174C-71, will be required for projects which modify the bed or banks of streams.

2 As much as possible, plans for future public transportation alternatives should avoid adverse impacts to streams, and the draft environmental impact statement should properly disclose impacts.

We look forward to reviewing future documents relating to the Primary Corridor Transportation project.

If you have any questions regarding this letter, please contact Roy Hardy at 587-0274.

Sincerely,

Edwin T. Sakoda

EDWIN T. SAKODA
Acting Deputy Director

DH:ss

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02252R

August 16, 2000

Ms. Linnel Nishioka, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Nishioka:

Subject: Primary Corridor Transportation Project

Thank you for the letter dated May 3, 1999, from Mr. Edwin T. Sakoda regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. Chapter 7 includes a list of potential permits and approvals needed by the project. A stream channel alteration permit may be needed.
2. Potential impacts on streams are discussed in Section 5.8.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KAWELO

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

May 4, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

LOG NO: 23324
DOC NO: 9904SC14

Dear Ms. Soon:

SUBJECT: **Chapter 6E-8 Historic Preservation Comment on an Environmental Impact Statement Preparation Notice (EISPN) for the Primary Corridor Transportation Project**
Honolulu and 'Ewa Districts, O'ahu
TMK: Zones 1 - 3, 9

Thank you for the opportunity to comment on the EISPN for the proposed Primary Corridor Transportation Project. According to your materials, the proposed action addresses existing and future transportation demands and capacity needs on the island of O'ahu in conjunction with the following goals: support of socioeconomic growth on the island and in the corridor; improvement of public transit services; facilitate land use development in the central urban core consistent with the vision for Oahu being developed at community meetings; support of current planning activities and policies. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspections were made in conjunction with this review. Sara Collins and Tonia Moy of my staff recently met with Ms. Faith Miyamoto of your office and representatives of Parsons, Brinckerhoff, Quade, and Douglas, the consultant hired to prepare the EISPN, in order to review the proposed improvements.

1 Section 3.2.4 correctly summarizes the results of our meeting with your project staff and consultant. The parties agreed that the identification, assessment, and any needed treatment of significant historic sites found to be directly or indirectly affected by the undertaking will be carried out pursuant to Section 106 of the National Historic Preservation Act and Section 4(f) of the US Department of Transportation Act. When we receive the pertinent information, we shall be better able to advise you on the following matters: (1) the presence or absence of historic sites within the areas of potential effect and project areas; (2) whether or not any of the identified historic sites

are significant; (3) whether or not the proposed undertaking(s) will have an "adverse effect" on significant historic sites; (4) what actions will be need to mitigate any adverse effects.

2 With regard to traditional cultural properties and any traditional practices associated with affected properties, your project staff and consultant indicated that they would be consulting with the Office of Hawaiian Affairs and interested parties identified during the scoping process.

Should you have any questions about archaeology, please feel free to call Sara Collins at 692-8026. Should you have any questions about architecture, please feel free to call Tonia Moy at 692-8030.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk

RECEIVED
99 MAY 13 P1:19

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

June 3, 1999

REC...
JUN 14 A10

LOG NO: 23537
DOC NO: 9905SC22

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

SUBJECT: **Chapter 6E-8 Historic Preservation Response to a Request for Information on Historic Sites in the Vicinity of the Primary Corridor Transportation Project**
'Ewa and Kona, O'ahu

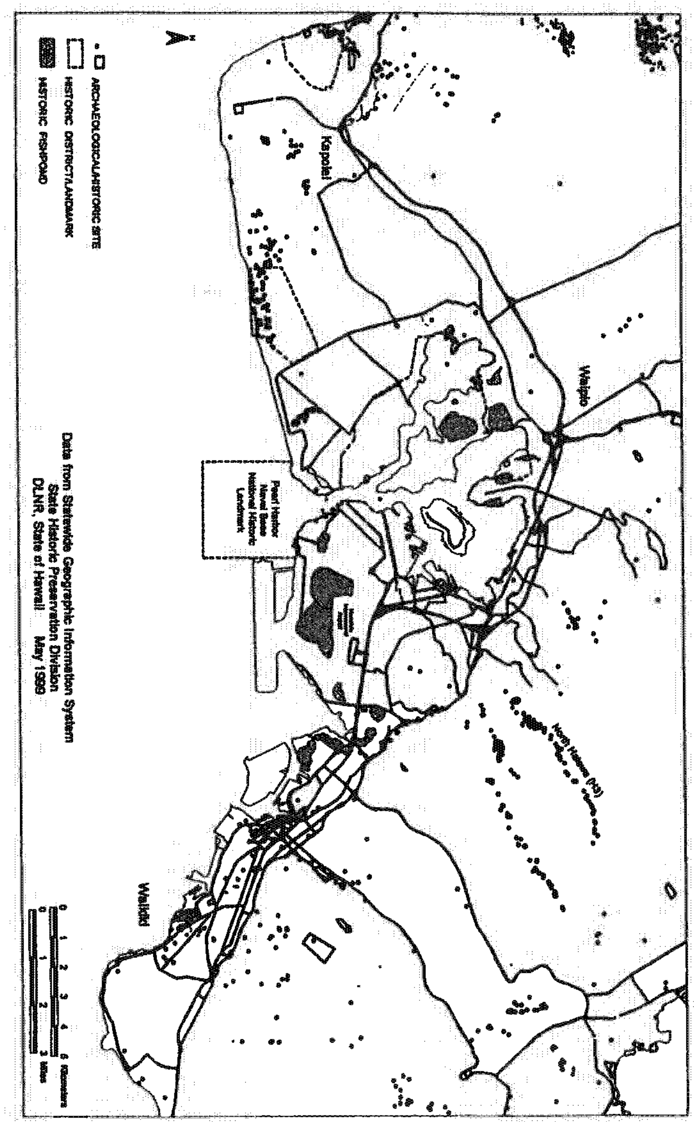
Thank you for your letter of May 7, 1999, in which you request preliminary
information on the presence of significant historic sites known to be in the vicinity of
the proposed Primary Corridor Transportation Project (PCTP) area. We have attached
a map of southern O'ahu, including the PCTP corridor, which shows the general
locations of significant historic sites or site districts (e.g., the Pearl Harbor Naval Base
National Historic Landmark). At this preliminary stage of investigation, prior to issuing
3 the Draft Environmental Impact Statement, we understand that further work in
defining the alternatives and the areas of potential effect (APEs) needs to be done.
We further understand that the City and County of Honolulu has resident on its
Geographic Information System most if not all of these same site data, including site
4 numbers. As your project progresses, should you or your consultant wish to consult
our files for further information on specific sites or site districts, please let us know,
and we can arrange a mutually convenient time to meet.

Should you have any questions, please feel free to call Sara Collins at 692-8026.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk



DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02355R/
TPD6/99-02900R

Mr. Don J. Hibbard, Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: <u>Primary Corridor Transportation Project</u>

Thank you for your letters dated May 4, 1999 and June 3, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. Historic sites issues and Section 106 are discussed in Sections 3.10 and 5.10. Section 106 coordination with SHPD has been initiated and is continuing. Parkland issues and Section 4(f) are discussed in Sections 3.11 and 5.11.
2. Coordination with OHA has occurred, as documented in Section 5.10 and Appendix D.
3. The status of coordination with SHPD is described in Section 5.10 and Appendix D.
4. The approach for studying historic sites is described in Sections 3.10 and 5.10.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
79 SO. NIMITZ HWY. • HONOLULU, HAWAII 96813-4898

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO:
HAR-PM
5990.99

May 6, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, 12th Floor
Honolulu, Hawaii 96813

Dear Ms. Soon:

SUBJECT: Comments on The Primary Transportation Corridor as Proposed by the City and County of Honolulu at a Meeting Held on March 25, 1999, on a Corridor Traversing Through Fort Armstrong And Sand Island at Honolulu Harbor, Honolulu, Oahu

We would like to thank you for meeting with us on March 25, 1999 regarding the subject traffic corridor. We are in receipt of the April 16, 1999 memorandum from Mr. Bob Bramen, and we offer the following preliminary comments. This is a project of great magnitude, and as the Draft Environmental Impact Statement (DEIS) has not been published, we are offering comments on the project as discussed at the subject meeting.

1 1. We request that close scrutiny be given to the traffic studies that are to take place by the applicant, especially where the project intersects with Ala Moana Boulevard near South Street, and where Sand Island Access Road intersects with Nimitz Highway. We are concerned with the large tractor trailer traffic on this corridor as the corridor is proposed to tunnel under the entrance channel to Honolulu Harbor and the tunnel proposed by the Harbors Division under Kalihi Channel. We request that these issues be fully discussed in the DEIS in order to justify this project.

2 2. There are a multitude of permits required for this project. The acceptance of the Final Impact Statement by the State, together with a Conservation District Use Permit, as approved by the Board of Land and Natural Resources (BLNR), is a portion of the permitting process for the project. The U.S. Army Corps of Engineers and various State entities would have to give their concurrence to the project. As of the meeting date, the City and County of Honolulu (City) had stated they had not, as yet, approached the Department of Land and Natural Resources (DLNR), a key governmental agency in this project. Approval of the project by the Harbors Division is a necessity, but it appears that most of the land dispositions required for the project are public lands and will require approval by the BLNR. The permitting process should be clearly defined in the DEIS.

3 3. Concurrence by the Department of Business, Economic Development and Tourism, Hawaii Community Development Authority (HCDA) is necessary. The project would have to comply with HCDA's plans for the area since HCDA is planning the Ilalo Street extension in Kaakaukukui

4 4. The City stated that the Sand Island/Kakaako sewer line would probably have to be relocated, but details were not clear. We are concerned about this rerouting and request that it be implemented in the DEIS.

5 5. We are concerned with the City's ability to construct the tunnel under the entrance channel of Honolulu Harbor without disrupting harbor operations, and request that this issue be addressed in the DEIS.

6 6. The permitting process for the environmental issues is susceptible to massive public and governmental input, which may severely hinder the City's lead time for the project and subsequently impact the tenants of the Harbors Division.

7. The City stated that they would be applying for Federal funds for the project. As such, the City would have to acquire the fee title to the lands or perpetual easements to the lands required for the project. We would like to bring up three points here:

7 a. We understand that the City has long disclaimed ownership, maintenance and responsibility of Sand Island Access Road, and the DLNR was forced to take responsibility for this access road for many years. Although the roads dispute between the City and the State was purportedly solved by Act 288, Session Laws of Hawaii, 1993, and the City Council Resolution No. 93-287, we are not sure how the DLNR will react to this project.

3 b. The lands at Fort Armstrong, Piers 1 and 2, and the Foreign Trade Zone, legally described as the filled lands of Kaakaukukui, have been conveyed to the HCDA by the DLNR. Pursuant to 171-2, HRS, these are privately owned lands and fall under the jurisdiction of the Board of the HCDA, an important entity in this project considering HCDA's proposed Ilalo Street extension and how it may conflict with the proposed corridor.

8 c. The City stated at the meeting that Sand Island Access Road would have to be widened, and lands (an undetermined amount, as presented) would have to be taken

from the container yard under the Harbors Division and lands encumbered by General Lease (GL) No. S-5261 issued to Sand Island Business Association (SIBA). We are concerned that the lands required by the City may have an adverse impact on the users of the container yard, together with additional lands required for construction activities. Additionally, the City should meet with Mr. Walter Arakaki, President of the SIBA, as the road widening would affect the amendment of numerous subleases issued by SIBA to its tenants, and also require an amendment to GL No. S-5261 (requiring BLNR approval).

9 8. It is imperative that our Oahu District Office be included in any discussions regarding traffic flow that may affect our harbor facilities and shipping lanes. They may be contacted at 587-2050.

Our Engineering Branch has made comments on the project, and has forwarded them to the Highways Division for inclusion with Highways Division's comments.

Should your staff have any questions regarding this matter, they may contact Mr. John Dooling, Property Manager, at 587-1943.

Very truly yours,

Thomas T. Fujikawa
Harbors Administrator

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02276R

August 16, 2000

Mr. Thomas T. Fujikawa
Harbors Administrator
State of Hawaii
Department of Transportation
Harbors Division
79 S. Nimitz Highway
Honolulu, Hawaii 96813-4898

Dear Mr. Fujikawa:

Subject: Primary Corridor Transportation Project

Thank you for your letter (HAR-PM 5990.99) dated May 6, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan (ORTP). Traffic impacts are discussed in Section 4.2.
2. Chapter 7 includes a list of potential permits and approvals needed by the project. Further coordination with all affected landowners will occur during subsequent planning.
3. Coordination with HCDA is ongoing.
4. The Sand Island analysis has been shifted to the ORTP. Potential impacts to sewer lines are addressed in Section 5.12.10.
5. The Sand Island analysis has been shifted to the ORTP.
6. The project schedules for the various alternatives are provided in Section 2.5. The Locally Preferred Alternative (LPA) has not been selected. Once the LPA is selected, the project schedule including the permit requirements will be refined.
7. Coordination with DLNR is ongoing, but the Sand Island analysis has been shifted to the ORTP.

8. The Sand Island analysis has been shifted to the ORTP.
9. The Sand Island analysis has been shifted to the ORTP. Coordination with the Harbors Division is ongoing. No impact on harbor facilities and shipping lanes would occur.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

PAUL G. LeMAHIEU, Ph.D.
SUPERINTENDENT

OFFICE OF THE SUPERINTENDENT

May 6, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project - EISPN

The Department of Education has no comment on the proposed project at this time. Please continue to keep us informed as the project progresses.

Very truly yours,

Paul G. LeMahieu

Paul G. LeMahieu, Ph.D.
Superintendent of Education

PLeM:hy

cc: A. Suga, OBS
G. Gill, OEQC

RECEIVED
'99 MAY 18 AM 8:32

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02424R

Paul G. LeMahieu, Ph. D.
Superintendent of Education
State of Hawaii
Department of Education
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Dr. LeMahieu:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 6, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your letter will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

GENEVIEVE SALMONSON
DIRECTOR

MAY 14 1999

May 13, 1999

Cheryl D. Soon
Department of Transportation Services
711 Kapiolani Blvd., #1200
Honolulu, HI 96813

Attn: Kenneth Hamayasu

Dear Ms. Soon:

Subject: Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project

We offer the following comments:

1 — 1. Two-sided pages: In order to reduce bulk and conserve paper, we recommend printing on both sides of the pages in the draft EIS.

2. Maps and figures:

- *Site maps*: Close-up neighborhood maps for each area of each alternative will be required.
- *Figures*: The use of color to distinguish between the various alignments in the figures would be extremely helpful.

3. Acronyms: In the draft EIS please include a list of acronyms found throughout the text.

2 — 4. Flora and Fauna: Section 3.1.4, *Ecosystem*, notes that some species in the corridor are classified as threatened or endangered. In the draft EIS please include a thorough discussion of impacts to threatened or endangered species and related mitigation measures.

3 — 5. Community consultation: Include synopses of the Trans 2K meetings held in the latter part of 1998 since they were preparatory to the development of this EIS.

4 — 6. Secondary Impacts: Be sure to include a full discussion of secondary or indirect impacts, such as growth or shifts in population, for each of the alternatives under consideration.

5 — 7. Mitigation commitments: The last paragraph of Section 1.3, *Planning Process*, states that the federal Record of Decision will document the Locally Preferred Alternative and environmental mitigation commitments. Please bear in mind that the mitigation measures listed in the state final EIS also constitute mitigation commitments which must be implemented.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

c: Robert Bramen, Parsons Brinckerhoff

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR
DEPUTY DIRECTOR

TPD5/99-02425R

August 16, 2000

Ms. Genevieve Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 13, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS). Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The MIS/DEIS will be double-sided and will include an acronym list. Copies of the MIS/DEIS with color figures will be available at public libraries and on CD-ROM. Section 3.3 discusses neighborhoods, with maps delineating the neighborhoods in the area.
2. Section 5.7 discusses the impacts on endangered species.
3. The Oahu Trans 2K meetings have been summarized and those summaries are included in Appendix A.
4. Secondary impacts are discussed in Section 5.13.1.
5. Comment noted.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

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

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO:

AIR-P
99.0323

May 18, 1999

RECEIVED
'99 MAY 21 P12:04

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

Thank you for the opportunity to review the Primary Corridor Transportation Project Environmental Assessment (Environmental Impact Statement Preparation Notice), (EA/EISPN) dated April 1999.

1 In Figure 2.4, Year 2020 Light Rail Transit (LRT) Alternative 1 of the EA/EISPN, the LRT is in close proximity to Honolulu International Airport (HIA). This may have an impact on the future projects planned in the Honolulu International Airport Master Plan. Also, we are concerned about the LRT's impact on the traffic on the access roads to HIA. We request that the Department of Transportation, Airports Division be involved in your scoping process for this project.

If you have any questions, please call Stephen Takashima, Planner, of the Airports Division at 838-8810.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

c: Office of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4829 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02508R

August 16, 2000

Mr. Kazu Hayashida, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Primary Corridor Transportation Project

Thank you for your letter (AIR-p99.0323) dated May 18, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which has been numbered. The following response to your comment is provided:

1. The project is being planned to be consistent with other plans, including those of the Airports Division to improve traffic on Honolulu's airport access roads. Coordination with the Airports Division is ongoing. Section 5.1.3 discusses consistency with land use plans. Potential impacts to utilities are addressed in Section 5.12.10.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

JUN 17 1999

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

JUN -9 1999

'99 JUN 15 A8:16

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO:
HWY-PS
2.4081

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project
Environmental Impact Statement (EIS) Preparation Notice

Thank you for consulting us. We have the following comments on the scope of alternatives and impacts to be considered:

1 1. The Draft EIS should identify "stand-alone" components of alternatives which could be implemented even if other components are not pursued.

2 2. There should be two Enhanced Bus/TSM Alternatives. One should only assume expanded use of City buses. The other should assume expanded use of chartered/subsidized private buses and ferries for peak period transit. Findings from our experimental ferry demonstration project may be applicable.

3 3. The Draft EIS should clarify proposed "local street bus priority measures" and address any potential for conflict with signal preemption by emergency vehicles.

4 4. The Draft EIS should clearly describe and justify proposed improvements/alterations within the existing State highway right-of-way in terms of benefits, costs, traffic impacts, operational requirements, and safety. The full range of environmental impacts, including cumulative, regional and secondary impacts, must be addressed.

5 5. The Draft EIS needs to describe how the proposed Sand Island Bypass and narrowing of Nimitz Highway will accommodate vehicular access and space requirements for future Kewalo Basin and Honolulu Harbor operations. So that you understand the importance of harbor operations, our Harbors Division has provided the enclosed <u>Economic Impact Assessment of Hawaii's Harbors</u>.

6 6. The Draft EIS needs to describe how proposed alternatives will preserve bicycle routes and bicycle safety.

7 7. The Draft EIS should state its assumptions about how travel time and fares affect peak- and off-peak transit use. As one test of these assumptions, the Draft EIS should report the former travel mode of passengers on the experimental limited-stop "City Express". The Draft EIS also should report effects of future fare changes on multi-stop, limited-stop, and express bus ridership.

8 8. The Draft EIS should assume the same transit fares when evaluating alternatives. Alternatives should be compared in terms of:

- Peak and off-peak travel times of transit and private vehicles between screenlines;
- loss of vehicular capacity on highways and arterial streets;
- cumulative effects on the location and duration of traffic congestion;
- cumulative effects on peak vehicular trips and peak person-trips across screenlines;
- costs that will not be covered by transit fares or Federal Transit Administration grants;
- transit use by low income and elderly households;
- impacts on land use and demographics; and
- impacts on our Honolulu International Airport and existing utilities.

9 9. Please consult with us when more details are available regarding proposed improvements within our highway right-of-way.

10 10. As a part of your M.I.S., a highway alternative should be discussed or considered.

11 11. In the future, it would expedite our review of your Draft EIS/MIS if you could send us at least 10 copies of the document.

HWY-PS 2.4081

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

Enclosure

✓ c: Office of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD6/99-02879R

August 16, 2000

Mr. Kazu Hayashida, Director
State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Primary Corridor Transportation Project

Thank you for your letter (HWY-PS 2.4081) dated June 9, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. All alternatives are discussed in detail in Chapter 2. Each alternative is a network of projects with many of the discrete elements serving functions on their own. Benefits are increased as these individual elements are combined. Project components are not assessed individually and are not necessarily interchangeable.
2. All alternatives are discussed in detail in Chapter 2. Transportation Demand Management measures, such as those proposed, are incorporated in all alternatives. For example, all of the alternatives include a vanpool component (use of subsidized vehicles at peak hours).
3. Bus priority measures for the TSM Alternative are described in Section 2.2.2, and in Section 2.2.3 for the BRT Alternative.
4. Project alternatives are discussed in Chapter 2. Chapter 2 discusses how existing transportation right-of-ways (ROWs) are the most feasible for transit system enhancements because of high existing land use densities and limited space in the Primary Urban Center. Costs and adverse impacts are minimized when people-moving capacity can be enhanced within existing transportation ROWs.

5. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan. Potential vehicular traffic impacts are addressed in Section 4.2.
6. Project impacts on bicycle routes and safety are discussed in Section 4.5. Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in only the BRT Alternative. However, bicycles alone cannot accommodate the existing and projected travel demand, and are not appropriate for all travel markets. The use of bicycles would be encouraged by the BRT Alternative, but circulator buses are necessary to reach the large service area and the different types of patrons that use the bus.
7. Financial plans are discussed in Chapter 6.
8. Project alternatives are defined in Chapter 2. Their transportation performance is compared in Chapter 4. Their financial aspects are compared in Chapter 6, including transit fare options. Their impacts on and benefits to low income communities, airports, and utilities are all discussed in Chapter 5.
9. Coordination with the Highways Division is ongoing.
10. All alternatives considered are discussed in Chapter 2. Section 2.1 discusses the evolution of alternatives. A highway alternative alone is not sufficient to satisfy project purposes and needs, and is addressed in Section 2.6. A highway alternative is inconsistent with the public's visions for the island's transportation system, as documented through the Oahu Trans 2K process.
11. Comment noted. The requested number of copies will be provided.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

MAY 20 1999

Ref:PS:EH

RECEIVED
MAY 21 11:24

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

We have reviewed the subject report and offer the following comments for your consideration.

Engineering Branch:

1 We recommend that the proposed improvements located in the flood zone be designed in accordance with Section 7.10-4 Development Standards, Article 7 Special District Regulations of the City and County of Honolulu Land Use Ordinance, latest edition.

Oahu District Land Office:

2 If State lands are impacted, tenants should be involved in the planning process. Compensation should be considered, if applicable.

3 Our understanding is that the DLNR State Historic Preservation Division, State Parks Division and the Commission on Water Resource Management were contacted directly regarding the proposed project.

Thank you for the opportunity to review the subject document. If you have any questions or require further assistance, please contact staff planner Ed Henry at 5787-0380.

Very truly yours,

Dean Y. Uchida,
Administrator

c.c. OEQC
Engineering Branch
ODLO

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02513R

August 16, 2000

Mr. Dean Y. Uchida, Administrator
State of Hawaii
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 20, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The proposed transitways will use existing roadways with minimal improvements required, such that there would be no impacts within the flood zone, as discussed in Section 5.8.
2. Coordination with tenants on State lands will continue during subsequent planning.
3. Coordination with these and other agencies is continuing, as described in Appendices A and D.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO [redacted]

VIRGINIA LOWELL [redacted]
STATE LIBRARIAN

STATE OF HAWAII
DEPARTMENT OF EDUCATION
HAWAII STATE PUBLIC LIBRARY SYSTEM
ADMINISTRATIVE SERVICES BRANCH
KEKUANAOA BUILDING, ROOM B-1
465 SOUTH KING STREET
HONOLULU, HAWAII 96813

May 24, 1999

RECEIVED
'99 MAY 25 P2:16

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Dear Ms. Soon:

Thank you for allowing the Hawaii State Public Library System to review the Primary Corridor Transportation Project.

The HSPLS has no comments at this time.

Thank you.

Sincerely,

Keith Fujio
Admin. Svcs. Officer

cc: Office of Environmental Quality Control

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02581R

Mr. Keith Fujio
Administrative Services Officer
State of Hawaii
Department of Education
Hawaii State Public Library System
Kekuanaoa Building, Room B-1
465 South King Street
Honolulu, Hawaii 96813

Dear Mr. Fujio:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your letter will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to:
File:

May 26, 1999

99-082/epo

Ms. Cheryl D. Soon
Director, Department of
Transportation Services
City and County of Honolulu
Pacific Park Plaza, Suite 1200
711 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Environmental Impact State Preparation Notice (EISPN)
Primary Corridor Transportation Project

1 Thank you for allowing us to review and comment on the subject project. We would like to see addressed in the Draft EIS potential fugitive dust and noise problems during construction activities.

Sincerely,

GARY GILL
Deputy Director for
Environmental Health

c: OEQC

RECEIVED
MAY 27 10:46

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02635R

Mr. Gary Gill
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Gill:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 26, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following response to your comment is provided:

1. Fugitive dust is addressed in Section 5.12.5 and construction noise impacts are addressed in Section 5.12.6.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
David W. Blane
DIRECTOR, OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-8093

May 24, 1999

RECEIVED
MAY 28 A9:30

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

We have reviewed the April 21, 1999, Primary Corridor Transportation Project Environmental Impact Statement Preparation Notice (EISPN) and have the following comments. The primary transportation corridor extends from Kapolei in the Ewa District to the University of Hawaii at Manoa. The corridor alternatives are a No-Build Alternative, an Enhanced Bus/Transportation System Management (TSM) Alternative, a Bus Rapid Transit (BRT) Alternative and a Light Rail Transit (LRT) Alternative. General alignments and other options within each of the alternatives were briefly addressed in the EISPN.

1 The draft EIS should indicate how each alternative would meet ridership demand based on projected population and economic growth for the region relative to the cost of the alternative.
2 The discussion should include ridership projections and identify the costs for a self-sustaining or subsidized bus and/or light rail system.

3 Multi-modal options that might be employed separately or in concert with proposed alternatives, such as increased bikeway infrastructure or a ferry system, are additional alternatives that should be discussed. For example, an exclusive bus or rail system could share the right of way with bicycles if the corridor is planned well. Similarly, the proposed Sand
4 Island Bypass Road and the conversion of Nimitz Highway to a parkway could also incorporate a bike and/or ferry system.

5 Potential impacts to the waterfront and Kakaako Waterfront Park due to the proposed Sand Island Bypass Road should be discussed. Page 17 of the EISPN indicates that there are no extensive wetlands in the corridor. Enclosed is a wetland map of the entire corridor. Please note the extensive wetland in the vicinity of the proposed Sand Island Bypass Road.

6 Best management practices to control non-point source pollution should be discussed in the draft EIS. For more information, consult our Coastal Non-Point Pollution Control Program Management Plan.

Other issues which should be further discussed in the draft EIS include:

7 • Transportation system management (TSM) policies such as downtown parking rate strategies, reduction of parking downtown, peak time tolls and land use policies that could reduce traffic.
8 • The need for supportive facilities, such as park and ride facilities in residential areas, and
9 • The redevelopment potential for areas around transit stops.

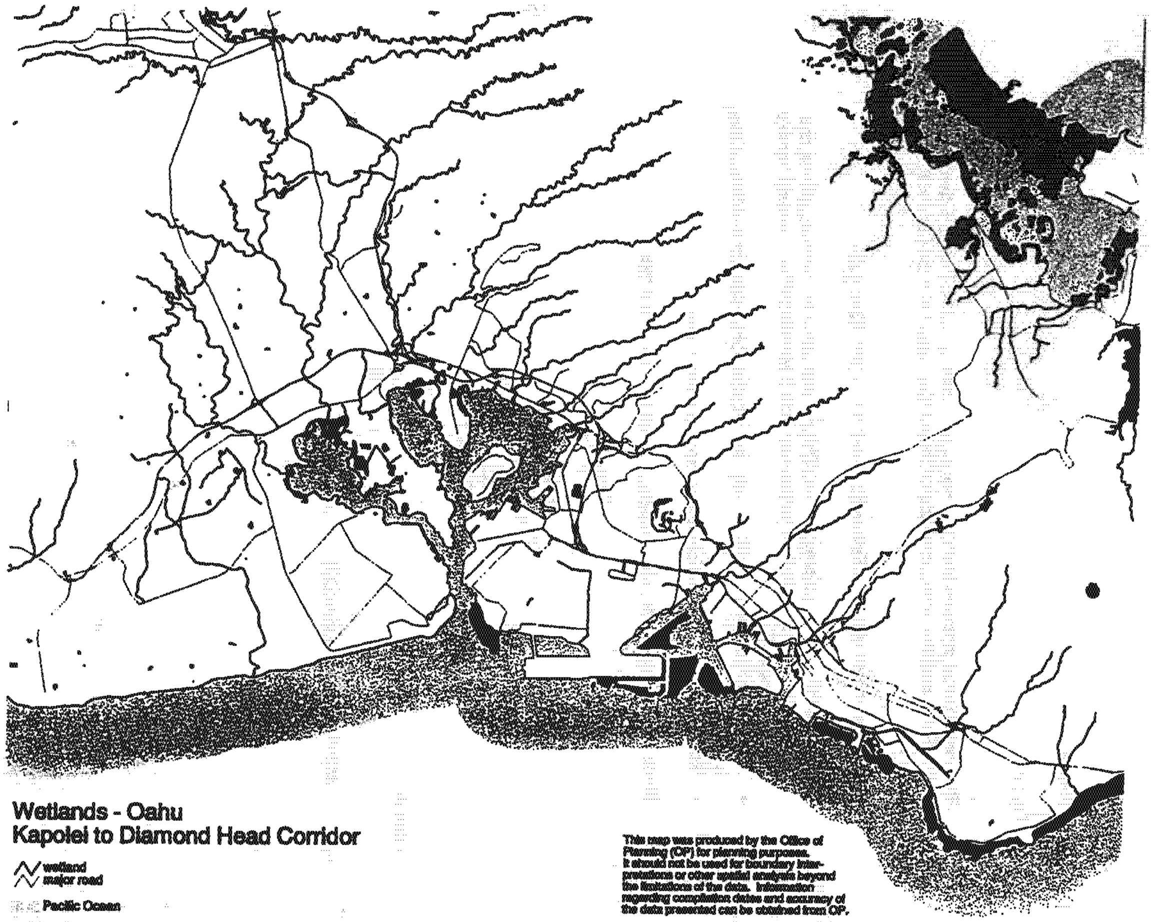
If you have any questions, please contact Christina Meller at 587-2845.

Sincerely,

David W. Blane
Director
Office of Planning

Enclosure

c: Ms. Genevieve Salmonson, OEQC



Wetlands - Oahu
Kapolei to Diamond Head Corridor
wetland
major road
Pacific Ocean
This map was produced by the Office of Planning (OP) for planning purposes. It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD5/99-02650R

Mr. David W. Blane, Director
State of Hawaii
Department of Business, Economic Development and Tourism
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Blane:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The financial plan is described in Chapter 6.
2. The costs of the alternatives are provided in Section 2.3.
3. Project alternatives are discussed in Chapter 2. An increased focus on bicycles as a serious transportation mode for some travel markets is included in all of the alternatives. An intra-island ferry system is currently being demonstrated.
4. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan (ORTP). Moreover, bicycles in combination with ferries could not accommodate the existing or future travel demand.
5. The Sand Island analysis has been shifted to the ORTP.
6. Water resource issues are addressed in Section 5.8.
7. Transportation Demand Management (TDM) programs are included in the build alternatives, but are not expected to address projected increases in travel demand fully in the primary transportation corridor. The advantages of efficient transit would encourage people to use their cars less. The use of specific disincentive and education programs on alternative transportation is a policy decision to be made by the City Council.

8. The project alternatives, including the use of park-and-rides and other transit support facilities are discussed in Chapter 2.
9. One of the purposes of the BRT Alternative is to establish future nodes of redevelopment within the Primary Urban Center.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

PHONE (808) 594-1888

FAX (808) 594-1865

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

RECEIVED
'99 JUN 1 P2:51
TRANSPORTATION SERVICES

May 28, 1999

EIS (99) 298

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapi'olani Boulevard, Suite 1200
Honolulu, Hawai'i 96813

Re: Primary Corridor Transportation Project

Dear Ms. Soon:

Thank you for the opportunity to comment on the Notice of Intent to prepare and Environmental Impact Statement for the Primary Corridor Transportation Project. We would also like to thank Faith Miyamoto from your office for taking the time to review the project with us on May 21, 1999.

At our meeting, we discussed the possible routes and configurations of the system. Our main concern is for routes that will involve coastal or previously coastal areas. In those areas, the likelihood of finding burials, cultural or archaeological resources is much greater. When routes or configurations affect those areas we urge you to prepare detailed archaeological and cultural information and to address mitigation in a manner which will minimize the concerns of the native Hawaiian community.

1 In order to accomplish this task we suggest that:

- An archaeological survey of the project area must be completed.
- A determination of eligibility for the NHR register must be completed for cultural/archaeological sites found within the project area.
- Meaningful, pre-decision consultation with OHA, as required by the National Historic Preservation Law, must occur.

In addition, gathering and religious rights may exist within the project corridor in those areas which have not been previously used for transportation. It is essential that the existence of these rights be determined early. In order to accomplish this, we suggest that you work with

2 a Hawaiian cultural expert. We suggest that this person(s) should be recognized within the Hawaiian community for his/her cultural expertise. Hawaiian culture exists and is practiced every day in Hawaii. We caution that the concerns of the community will not be addressed if the cultural analysis is provided solely by an archeologist or anthropologist.

Again, thank you for the opportunity for early participation in this project. If you have any questions, please contact Lynn Lee, EIS Planner at 594-1936.

Sincerely,

C. Sebastian Aloot

C. Sebastian Aloot
Land and Natural Resources Division Officer

cc: Board of Trustees

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD6/99-02709R

August 16, 2000

Mr. C. Sebastian Aloot
Land and Natural Resources Division Officer
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Dear Mr. Aloot:

Subject: Primary Corridor Transportation Project

Thank you for the letter dated May 28, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. Archaeological and cultural issues are addressed in Sections 3.10 and 5.10. Coordination with the SHPD is continuing on historic sites and sites eligible for the National Register.
2. Traditional cultural properties or practices are addressed in Sections 3.10.2.4 and 5.10.4.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

MAJOR GENERAL EDWARD V. RICHARDSON
DIRECTOR OF CIVIL DEFENSE

ROY C. PRICE, SR.
VICE DIRECTOR OF CIVIL DEFENSE

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

PHONE (808) 733-4300
FAX (808) 733-4287

June 24, 1999

JUN 28 3:41

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Primary Corridor Transportation Project

1 The Primary Corridor Transportation Project could affect between one and five existing outdoor warning sirens currently in place along the corridor, depending upon the exact placement of the new infrastructure. When more detailed information is known as to routes and/or demolition and construction, more specific comments will be provided relating to siren warning infrastructure relocations which must be planned to support the project.

If there are any questions, please contact Mr. Ogasawara of my staff at (808) 733-4300.

Sincerely,

ROY C. PRICE, SR.
Vice Director of Civil Defense

c: Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Oahu Civil Defense Agency

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 16, 2000

TPD6/99-03185R

Mr. Roy C. Price, Sr.
Vice Director of Civil Defense
State of Hawaii
Department of Defense
Office of the Director of Civil Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Mr. Price:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated June 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following response to your comments is provided:

1. Potential impacts to the siren warning system are addressed in Section 5.12.10.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON

Enclosure

cc: Parsons Brinckerhoff Quade and Douglas, Inc.

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-5883 • FAX: (808) 527-5875

JEREMY HARRIS
Mayor

KENNETH E. SPRAGUE, P.E., Ph.D.
Director

BARRY FUKUNAGA
Deputy Director

ENV 99-54

APR 30 1999

MEMORANDUM

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN)
PRIMARY CORRIDOR TRANSPORTATION PROJECT

We have reviewed the subject EISPN and have no comments to offer at this time.

Should you have any questions, please contact Alex Ho at 523-4150.

RECEIVED
MAY 3 A9:17
TRANSPORTATION SERVICES

cc: Office of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02143R

August 16, 2000

MEMORANDUM

TO: KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for your memorandum dated April 30, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your memorandum will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

CHERYL D. SOON

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

May 13, 1999

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT
ENVIRONMENTAL ASSESSMENT (EIS PREPARATION NOTICE)

In response to your letter dated April 21, 1999, regarding the above subject matter, we have reviewed the Environmental Assessment (EIS Preparation Notice) and foresee no significant impact on the services we provide. We will maintain our current level of service.

Should you have any questions, please call Battalion Chief Peter Gaskell of our Administrative Services Bureau at 831-7735.

ATTILIO K. LEONARDI
Fire Chief

AKL/PHG:cn

RECEIVED
MAY 14 3:01

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02379R

August 16, 2000

MEMORANDUM

TO: ATTILIO K. LEONARDI, FIRE CHIEF
FIRE DEPARTMENT

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for your memorandum dated May 13, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you foresee no significant impact on the services you provide. Your memorandum will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

CHERYL D. SOON

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF

WILLIAM B. CLARK
MICHAEL CARVALHO
DEPUTY CHIEFS

OUR REFERENCE CS-DL

May 18, 1999

RECEIVED
MAY 20 9:15

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: LEE D. DONOHUE, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for the opportunity to review and comment on the subject document.

The Honolulu Police Department is in favor of and supports transportation improvements in the primary transportation corridor.

We have no comment to offer at this time relative to the proposed alternatives but may have as the plans are more defined.

If there are any questions, please call me at 529-3255.

LEE D. DONOHUE
Chief of Police

By
~~EUGENE UEMURA~~
Assistant Chief
Support Services Bureau

cc: Ofc. of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4525 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02475R

August 16, 2000

MEMORANDUM

TO: LEE D. DONOHUE, CHIEF OF POLICE
POLICE DEPARTMENT

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for your memorandum dated May 18, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your memorandum will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Cheryl D. Soon
CHERYL D. SOON

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4182 • FAX: (808) 523-4054

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

MICHAEL T. AMII
DEPUTY DIRECTOR

May 24, 1999

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: WILLIAM D. BALFOUR, JR., DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

We have reviewed the environmental assessment preparation notice and have no comment to offer at this time. However, we look forward to reviewing the Draft Environmental Impact Statement (DEIS).

Thank you for the opportunity to present comments for the DEIS. Should you need further information, please contact Mr. John Eveland, Executive Assistant, at 527-6038.

W. D. Balfour
WILLIAM D. BALFOUR, JR.
Director

WDB:cu
(99-0970GT)

cc: Office of Environmental Quality Control

RECEIVED
MAY 25 P2:26

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02578R

August 16, 2000

MEMORANDUM

TO: WILLIAM D. BALFOUR, JR., DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for your memorandum dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project. We understand that you have no comments at this time. Your memorandum will be included in the Major Investment Study/Draft Environmental Impact Statement.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

CHERYL D. SOON

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

1999/CLOG-2692(ASK)
'99 EA Comments - Various Zones

May 26, 1999

MEMORANDUM

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN) FOR PRIMARY CORRIDOR TRANSPORTATION PROJECT

We have reviewed the above-referenced document and have no comments to offer at this time. We look forward to reviewing the draft environmental impact statement for this important and timely project.

1 A matrix of the alternatives and options being considered would help reviewers compare the similarities and differences of the different proposals.

Should you have any questions regarding the above, please contact Ardis Shaw-Kim of out staff at Extension 5349.

JAN NAOE SULLIVAN
Director of Planning
and Permitting

JNS:am

posse doc: 4721
g:corridor.ask

RECEIVED
'99 MAY 27 A9:58

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

TPD5/99-02628R

August 16, 2000

MEMORANDUM

TO: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for the memorandum dated May 26, 1999 from Ms. Jan Naoe Sullivan, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

The comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of the written comments, which have been numbered. The following response is provided:

1. Project alternatives are discussed in detail in Chapter 2.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Cheryl D. Soon
CHERYL D. SOON

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

May 13, 1999

'99 MAY 24 A8:22

TO: MS. CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: CLIFFORD S. JAMILE

SUBJECT: YOUR MEMORANDUM OF APRIL 21, 1999 REGARDING THE ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed primary corridor transportation project.

1 We have no objections to the proposed transportation improvements in the primary transportation corridor of Oahu. The construction plans should be submitted for our review and approval. We reserve further comments until the infrastructure improvement plans are formalized.

If you have any questions, please contact Barry Usagawa at 527-5235.

cc: Office of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02459R

August 16, 2000

MEMORANDUM

TO: CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: PRIMARY CORRIDOR TRANSPORTATION PROJECT

Thank you for your memorandum dated May 13, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which has been numbered. The following response to your comment is provided.

1. Potential construction impacts on utilities are addressed in Section 5.12.10.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Cheryl D. Soon
CHERYL D. SOON

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

OMPO

Oahu Metropolitan Planning Organization

Ocean View Center, Suite 200
707 Richards Street
Honolulu, Hawaii 96813-4623

(808) 587-2015
(808) 523-4178
FAX (808) 587-2018

May 24, 1999

RECEIVED
MAY 25 2:14

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Primary Corridor Transportation Project

We have reviewed the Environmental Assessment (EIS Preparation Notice) for the above-mentioned project and offer the following comments.

1 1. The 2020 Oahu Regional Transportation Plan (2020 ORTP) identified a rapid transit system which extended from Pearl City to the University of Hawaii at Manoa. Although the plan did not specify or recommend a type of system, it assumed attributes of the Honolulu Rapid Transit Program's Locally Preferred Alternative rail rapid transit system. This system assumed that the rapid transit operated on exclusive right-of-way and was of a high-capacity.

The Primary Corridor Transportation Project identified three Light Rail Transit (LRT) alternatives along a similar corridor with the 2020 ORTP, but with limited sections of exclusive bus lanes.

How do these LRT alternatives compare against the person-carrying capacity of the rapid transit system identified in the 2020 ORTP? Will other transit and/or highway projects be needed if the person-carrying capacity of the proposed LRT alternatives identified in the Primary Corridor Study is less than what the rapid transit project assumed in the 2020 ORTP?

2 2. In Section 1.4.4 Land Use Development in the Central Urban Core, it mentioned that one of the major objectives of the 21st Century Oahu Vision was to concentrate new development within the established urban core of Honolulu. Is this an official City land use policy? If not, will the official City land use policy also be tested in the Primary Corridor Transportation Project?

g:admin/A:\MIS\pcts99.dts.wpd

3 3. The Primary Corridor Transportation Project identified many major roadway projects such as a Sand Island Bypass Road via a tunnel under Fort Armstrong Channel, a Nimitz Parkway, the closing of Nimitz Highway between Queen Street and South Street, redesigned freeway ramps, and improvements to H-1 to allow for the p.m. operation of the Zipper Lane.

Many of the related highway projects being proposed in the Primary Corridor Transportation Project must be prioritized within the context of the ORTP. Although these projects may be important to the Primary Corridor Transportation Project, there may not be sufficient funds to implement these projects or there may be other higher priority projects on Oahu that deserve the limited funding resources. These priority decisions must be made in the larger context of the ORTP where all regional Oahu transportation projects are considered.

4 4. In Section 1.4.2 Socioeconomic Growth, the report talked about the projected population increase in 2020. Will the Primary Corridor Transportation Project use 2020 as its horizon year?

OMPO is in the process of updating its 2020 ORTP to 2025 and is expecting to complete this plan in November 2000. DTS and the OMPO Policy Committee should discuss the requirements and analysis needed to ensure the smooth integration of the Primary Corridor Study results into the 2025 ORTP. The horizon year used may be just one of the many issues related to this concern.

Thank you for the opportunity to comment on your document. If you have any questions regarding this matter, please call me.

Sincerely,

Gordon G.W. Lum

Gordon G.W. Lum
Executive Director

c: Office of Environmental Quality Control

g:admin/A:\MIS\pcts99.dts.wpd

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02554R

August 16, 2000

Mr. Gordon G. W. Lum, Executive Director
Oahu Metropolitan Planning Organization
Ocean View Center, Suite 200
707 Richards Street
Honolulu, Hawaii 96813-4623

Dear Mr. Lum:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The proposed project is consistent with the Oahu Regional Transportation Plan (ORTP). As presently designed, the Bus Rapid Transit system proposed in this transit project would have less capacity than that designed in the early 90's.
2. It is City policy to focus growth in the Primary Urban Center and in Kapolei, thereby keeping the country country.
3. This project is one of the named high-priority projects in the ORTP.
4. The project's horizon year is 2025.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

LOTMA Leeward Oahu Transportation Management Association

May 24, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

RECEIVED

Re: Environmental Impact Statement Preparation Notice (EISPN) for Primary Corridor Transportation Project

Dear ~~Ms. Soon~~: Cheryl

After reviewing the EISPN, we offer the following comments and questions on the proposed study alternatives for your consideration:

1 1. **Sec. 2.2 Enhanced Bus/TSM Alternative** - According to Fig.2.2, this alternative proposes to include four (4) new park-and-rides, five (5) new transit centers, and two (2) special freeway ramps, in addition to bus priority treatments on various arterial streets from Kapolei to Waikiki. Surprisingly, major segments of a previously-indicated bus priority arterial (Kamehameha Highway from Wahiawa to Radford Dr.) are not indicated, such as 1) the portion from Wahiawa to its connection with Farrington Highway and on to what appears to be Kamehameha Highway at Waimano Home Road, and 2) from Pearlridge to Radford Dr. Hopefully, this was just an oversight. If not, what is the reason for the change? Since Kamehameha and Farrington Highways are the trunk line routes for buses serving West/Central Oahu, bus priority treatments on these highways will be vital to improving the delivery of transit services and increasing ridership.

2 2. **Sec. 2.3 Bus Rapid Transit (BRT) Alternative** - A faster, more efficient bus service linkage between West Oahu and the PUC will be the key to making the use of transit an attractive and convenient alternative to driving and improving the accessibility to jobs in either direction. Therefore, the study of a bus rapid transit system should be as comprehensive and extensive as possible, in order to provide the community with a clear understanding of estimated costs and benefits of proposed BRT alignments.

3 Based on Fig. 2.3, however, it is not clear what the BRT alternative is, because it seems to involve a variety of proposals and only identifies one BRT alignment (Middle St. to the University of Hawaii). For the area between Kapolei and Middle Street, it only differs from the Enhanced Bus alternative by the addition of a transit center at the Waiawa Interchange and seven (7) special freeway ramps. Then, in addition to the Middle St.-U.H. arterial BRT, there is a light rail route to Waikiki, a Nimitz Parkway, and a Sand Island Bypass. What is interesting is that while this alternative contains an LRT route for Waikiki, none of the LRT alternatives propose LRT for Waikiki.

94-229 Waipahu Depot Road, #407 • Waipahu, Hawaii 96797
Telephone Number (808) 677-RIDE • Facsimile Number (808) 676-4741

The emphasis of this alternative seems to concentrate only on bus services during peak commute periods into and out of the PUC, relying on H-1 and H-2 HOV lanes and A.M./P.M. zipper lanes. The only identified "BRT" route on the map is from Middle Street to the U.H.

4 We would like to suggest that this alternative study a defined BRT route that replicates the Light Rail Alternative #1, extending the U.H.-Middle Street BRT westward to several termini, such as Pearlridge, Waiawa Interchange, Kunia/Ft. Weaver transit centers, and Kapolei? By doing so, a BRT alignment would be in place for later conversion to LRT, in the event it is not financially feasible to initially extend any LRT beyond Middle Street. Since LOTMA and many Leeward/Central Oahu communities have advocated the extension of an LRT alternative beyond Pearlridge, a defined BRT route would serve as a well-thought out intermediate alternative that will be useful in serving major activity and employment centers west of the PUC, including U.H.-West Oahu, Barbers Point Redevelopment, and the water park and sports complexes in Kapolei. It would also provide an effective means to serve the reverse commute market, which at this time must rely heavily on the automobile to get to Kapolei.

5 Because the Nimitz Parkway and Sand Island Bypass involves major capital improvements within the state's jurisdiction, we believe that these options should not be studied at this time. Time and resources could be more effectively spent on thoroughly developing the BRT and LRT alternatives.

6 3. **Light Rail Transit (LRT) Alternatives** - Since none of the LRT alternatives are proposed past Pearlridge, it is unclear why the special freeway ramps and Waiawa Transit Center (as proposed in the BRT alternative) are not included in this alternative.

7 4. During the conceptual engineering phase, will it be possible to mix and match portions of the BRT and LRT alternatives?

Thank you for the opportunity to offer these comments. We look forward to the opportunity to review the Draft EIS.

Sincerely,

Darrlyn T. Bunda

Darrlyn T. Bunda
Executive Director

cc: Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02569R

August 16, 2000

Ms. Darrlyn T. Bunda, Executive Director
Leeward Oahu Transportation Management Association
94-229 Waipahu Depot Road, #407
Waipahu, Hawaii 96797

Dear Ms. Bunda:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. These measures are included in the No-Build Alternative and, therefore, all of the alternatives.
2. A cost-benefit analysis is provided in Chapter 7.
3. Project alternatives are discussed in Chapter 2. All alternatives under consideration include service to Waikiki.
4. Sections 4.1 and 4.2 address transportation impacts of the project. The proposed alternatives would improve transportation in both directions. All of the alternatives include provisions for enhancing mobility within the Ewa area through increasing roadway connectivity and capacity, and enhanced transit service. The Transportation System Management (TSM) and Bus Rapid Transit (BRT) Alternatives increase transit accessibility within and to Kapolei/Ewa, through the use of a "hub-and-spoke" bus network configuration. These alternatives support the development of Kapolei as both a residential and employment center. The TSM and BRT Alternatives would both improve transit service along the Waianae coast. Travel demand forecasting indicates that there will still be substantial travel between the Primary Urban Center (PUC) and other parts of the island, and within the PUC.

5. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan.
6. Project alternatives are described in detail in Chapter 2. The BRT Alternative, which has since replaced the Light Rail Transit Alternatives, does include bus ramps.
7. Project alternatives are discussed in detail in Chapter 2. Each alternative is analyzed as a package; project components are not assessed individually and are not necessarily interchangeable.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

THE OUTDOOR CIRCLE
1314 South King St., Suite 306 • Honolulu, HI 96814
Phone: 808-593-0300 Fax: 808-593-0525

Established 1912
A Non-profit Organization
BRANCHES
OAHU
Kaneohe
Lani-Kailua
North Shore
Waialae Kahala
HAWAI'I
Hilo
Ka'u
Kona
Puna
Waimea
KAUAI
MAUI
MOLOKAI
GARDEN CIRCLE
Lani-Kai

May 18, 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Blvd, Ste. 1200
Honolulu, HI 96813

RE: Primary Corridor Transportation Project

Dear Ms. Soon:

Thank you for the opportunity to comment on the above referenced Environmental Impact Statement Preparation Notice (EISPN). We have reviewed the document and offer the following comments at this time:

The proposed action is intended to address existing and future transportation demand and capacity needs; support socioeconomic growth on the island and in the corridor; improve public transit services; facilitate land use development in the central urban core consistent with the vision for Oahu as being articulated at sommunity meetings; and support current planning activities and policies.

1 We do not understand why the City is using the Visioning Program as justification and background for this transportation study. The community based visioning teams met separately from the Oahu Trans 2K meetings. Instead, thorough studies should be provided showing the need for this plan.

2 We hope that when the public hearing is held on the Draft Environmental Impact Statement (DEIS), it will be truly a public forum. The format at the public scoping meeting did not create an opportunity for the community to publicly ask questions and voice their concerns. By blocking communication, an atmosphere of secrecy prevails. It is important for participants and interested community members to hear what others are asking about the project.

3 We are interested in knowing when the Locally Preferred Alternative (LPA) will be announced to the public. What happens if the LPA is not the best alternative based on preliminary engineering? When will the public be notified and what changes will be made to accommodate this?

4 The Primary Urban Center is the origination point for close to 59% of all island wide travel, why does this project study begin in Kapolei and end at the University of Hawaii? Why doesn't this study continue to Kahala?

5 The DEIS must discuss in detail the fate of the street trees along the transit corridor.
6 Also, if a light rail system with overhead lines is proposed, what kinds of impacts would it make on street trees as well as community efforts to place all above ground wires underground?

Thank you for the opportunity to comment. I look forward to receiving a copy of the Draft Environmental Impact Statement and being kept informed as this project progresses.

Sincerely,

Mary Steiner
CEO

cc: Office of Environmental Quality Control
Parsons Brinckerhoff Quade & Douglas

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02481R

August 16, 2000

Ms. Mary Steiner, CEO
The Outdoor Circle
1314 South King Street, Suite 306
Honolulu, Hawaii 96814

Dear Ms. Steiner:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 18, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The project's purposes and needs are discussed in Chapter 1. The planning for this project has been coordinated with the visioning process because transportation plans address other quality of life issues, included in the visioning process.
2. Appendix A summarizes the efforts that have been made to provide opportunities for public participation. Comments from the public are welcome at any point.
3. It is expected that the City Council will select the Locally Preferred Alternative in late 2000. The City Council will weigh a variety of factors, including engineering, into its decision.
4. The imbalance between travel demand and system capacity is worse in the corridors Ewa of Downtown. While needed, improvements beyond Waikiki and UH-Manoa are lower priority. A circulator service has just begun between Waikiki and Kaimuki, which may help relieve some of the demand.
5. Potential impacts on street trees are addressed in Section 5.7. None of the proposed alternatives will require a catenary system.

6. No overhead lines would be required under any of the alternatives. Efforts to underground wires and other utilities are addressed in Section 5.12.10.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

Monday, May 24, 1999

Kenneth Hamayasu, Chief
Transportation Planning Division
Department of Transportation Services
City and County of Honolulu
711 Kapolei Boulevard, Suite 1200
Honolulu, Hawai'i 96813 FAX 527-6987

RE: Comments on Primary Corridor Transportation Project, Environmental Assessment (Environmental Impact Statement Preparation Notice); Scoping Activity

Dear Mr. Hamayasu,

I am writing to you on behalf of the Hawai'i Bicycling League (HBL). A letter in official stationary will follow in the mail. This letter addresses our concerns with regard to the document entitled, ": Comments on Primary Corridor Transportation Project, Environmental Assessment" (April 1999) connected to the scoping activity held in May 1999.

Access to the report, public input and planning process (for scoping)

1 • Is the report accessible to the public and particularly people with disabilities?

2 • Was the report available on the Internet in a text file format? People with disabilities were not noticeably participating in the O'ahu Trans 2K events. Lack of transportation alternatives is probably the number one reason why persons with disabilities cannot participate in community affairs. Was there electronic access to document and opportunities to provide feedback by May 24, 1999? There was no fax number available on the report to fax back comments – only an address.
• The report was produced in less than a 12 point font. Production of reports in at least a 12 point font makes it easier and slightly more accessible to an aging population. The maps were also difficult to read due to the very small print.

3 • There was only one meeting of which HBL was aware for public participation. Will there be any future meetings regarding scoping? The time was relatively limited for feedback – if HBL could request a slight extension of the feedback period (i.e., about two weeks beyond the May 24th deadline), there would be an opportunity to make members aware of this document and encourage our members to provide additional feedback.

4 • Are there any plans to include other scoping meetings available to other parts of the island not in the primary corridor? Persons living in outlying areas may not have been able to attend the meeting.

3 • The description of events that will coordinate federal and state requirements for movement on this plan (p. 4) was quite useful. It would be very helpful to have the report provide a estimated timeline for the various activities: the scoping activities, the Draft EIS and public hearing (or hearings??), the LPA (locally preferred alternative) will be determined and engineering will be performed during the final EIS. After this, the Governor may accept the final EIS and at the federal level a ROD (record of decision) will be prepared and signed by the Regional Administrator which details the LPA and any environmental mitigation commitments. The purpose of the scoping activity is still unclear.

Assumptions inherent in the planning

5 • All the plans still seem to focus on roads and cars in competition with buses on roads as opposed to planning options that would mindfully increase pedestrian and bicycling options. Any plans or mention of pedestrian, bicycling or access for persons with disabilities is glossed over.

6 • There are assumptions about the increase in population over time (p. 28) and the increase in the number of employees by 37%. There is an assumption or calculation that the speed of buses will be decreased while the number of buses on the road will increase from 525 to 800. There is no discussion about the number of cars increasing (which has been the trend) or that if the buses are slowing down, the cars will probably travel more slowly too.
• There is no discussion of the number of cars on the road, the number of persons per car on the road, or the speeds of cars using the road. Implicitly it appears that the number of car miles will be reduced – but there fails to be evidence of this from the information provided.

7 • Without better information on the decrease in miles traveled overall, there is some question about the air quality maintenance. Anyone who has bicycled or walked near our streets on a Kona wind or no wind day can tell you that the air is substantially dirtier and less hospital to those not driving around in an air conditioned unit (e.g., cars).

5 • There is no detail regarding pedestrian or bicycling access considerations.

8 • There is no discussion of an education process for the public about transportation alternatives and options during the planning, engineering, development and implementation process.

9 • The idea of concentrating growth density along this primary corridor may tend to make parts of the main streets or hubs for transit unliveable for all but the poorest in our communities who cannot afford to live elsewhere.

Attributes in planning that we prefer

5 • We would prefer, in order to make our communities liveable, to plan with the following priorities as objectives of any plan:
  - Pedestrian traffic is first priority
  - Alternative methods of transportation is second priority (buses, bikes, mass transit of other types), and finally,
  - Put the private automobile in third place priority.

This was presented in the vision-like process that was promoted during Mayor Harris's meetings. There was a video which described the traffic planning in Portland, Oregon and this was the premise of the planning there.

5
- Discuss in detail what facilities would make the streets less "mean" and more friendly to pedestrians, bicyclists and persons with disabilities. Consider:
  - Triggers or sensors on the streets that can be triggered by something as "light" as a bicycle (so we don't need to get off our bikes and push a button or ride up on the sidewalk to push the buttons to get the light to change).
  - Reduce and eliminate the triggers on street lamps for pedestrians to press in order to cross the streets. Many or most of these buttons are broken after a period of time and either are permanently pressed in or don't function when pressed so that the pedestrian can cross the street at all. These triggers effectively convey to pedestrians that they are second class citizens because automobile traffic is always given first priority.
  - Discuss disincentives that will cause people to leave their cars at home or not buy them in the first place. Many countries use disincentives effectively without major complaints from citizens. Many citizens suffer in countries were intelligent use of disincentives are not employed and the car remains king (i.e., Bangkok, Thailand). Disincentives are a legitimate policy alternatives and should go hand-in-hand with public education about broadly defined transportation system costs.
  - Assure that transit centers, park & ride facilities and all transportation projects include services to pedestrians, bicyclists and persons with disabilities.
  - Assure that all new transit equipment is accessible.
    - Bike racks should be available or bikes should be able to be brought aboard a light rail, trolleys, limited stop buses and ferries.
    - Do not move to the longer "unfriendly" buses – try double decker buses with the first floor accessible to persons with mobility challenges.
    - Promote bicycles as "circulators."

10
- Assure that the Master Bike Plan that was developed previously and other information such as the City and County curb cut plan are available and participants are aware of these documents and their implications. (Help citizens connect the dots between these planning efforts.)

5
- Assure that if a tunnel is part of the light rail system mentioned on page 13, that there is access to persons walking or bicycling through the tunnel that is clean of debris and sufficiently wide to move along in safe distance from the traffic.
- Assure that new or redeveloped freeways and freeway ramps improve and do not impinge on pedestrian and bicycling facilities. These are opportunities to make facilities MORE accessible to pedestrians and bicyclists and should be developed or redeveloped with that in mind.

8
- Provide education about transportation alternatives and their costs. Most costs for pedestrian walkways and bicyclists are not necessarily capital intensive. Education for the public certainly is not. These costs should be put in a form that people can see the immediate and longer term maintenance costs for building parking lots and structures compared to facilities that improve mobility and assure safety for pedestrians and bicyclists.

11
- Do NOT create substitute or alternative freeway routes out of residential, business, commercial or mixed use streets (see 2.3). Current examples of this type of planning are Wai'alae Avenue, Kina'u Street, and Ward Avenue, to mention but a few.

12
- Water resource use is a concern. There should be a commitment made to use plants that are indigent to the area and reduce the need for further water consumption by choosing plants are salt water or brackish water tolerant and drought resistant (i.e., use of xeroscaping alternatives along the waterfront, along streets, etc. for beautification). Plans to use recycled and "gray" water to provide water for these spots would also be forward thinking.

13
- We strongly support that there is no reduction of green spaces for high density residential areas. During the vision-like process it was very clear that residents from neighborhoods such as Makiki and Moiliili suffer a decreased quality of life with very few green spaces available to densely populated areas.
- Social and economic impacts on people living in the most densely populated should be examined with respect to the amount of road dust and increases in heat and the need for air conditioning. Who are the people (i.e., demographics of the population, age, ethnicity, the number of people in a family unit and space) who are suffering these environmental impacts?

<u>**Other problems with this discussion of transportation**</u>

14
- The boundaries used in various reports are not consistent for planning purposes and in the planning documents. This is confusing for the lay person, even one who attempts to follow along and attend the many meetings related to various plans. This plan discusses the primary urban corridor. How does that relate to the bicycling plans taking place all over the island of O'ahu? How does that relate to the Master Bike Plan for O'ahu? In the longer run (say 20 years'time), wouldn't the primary corridor run from Hawai'i Kai to Kapolei? Making the boundaries consistent in these planning efforts:
  - Reduces confusion for citizens who want to be involved.
  - Decreases inconsistencies in planning efforts and trying to incorporate different planning efforts (i.e., achieving both the results of the Master Bike Plan and the visioning team efforts).
  - Could result in making the process of planning and the technologies used in the process more "transparent" (easily understood, mentally graspable) to the lay person.

15
- The planning process needs to be transparent. Citizens should be able to understand the need for coordination among neighborhoods, see evidence of coordination among state/county/other local agencies in the time lines, budgeting process, plan development and engineering, and implementation processes.

2
- In an effort to make planning transparent, there could be one page documents to be faxed on demand or available via a regularly updated accessible website.

16
- Provide funds for studies to determine what works and what doesn't work to promote cycling and walking locally as substitutes for personal cars.

17 • Focus on the need to make connections with advocacy groups for pedestrians and bicycling. There are few groups and the transportation departments should make an effort to acknowledge the importance of these groups and their activities.

Thank you for this opportunity to provide comments.

Robin Brandt
For Hawai'I Bicycling League
My address: 3227 Melemele Place, Honolulu, HI 96822
Phone (home): 988-5048
E-mail: rbrandt@lava.net

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00407

August 16, 2000

Ms. Robin Brandt
Hawaii Bicycling League
3227 Melemele Place
Honolulu, Hawaii 96822

Dear Ms. Brandt:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. Appendix A summarizes the efforts that have been made to provide opportunities for public participation. Comments on the Major Investment Study/Draft Environmental Impact Statement will be welcomed during the public comment period.
2. The method of disseminating the Major Investment Study/Draft Environmental Impact Statement is still under study. Large fonts were not used to comply with the Major Investment Study/Draft Environmental Impact Statement page limits. Please contact the department if you have difficulty reading the document.
3. The project schedule is provided in Section 2.5. The purpose of the scoping activity is to help focus the Major Investment Study/Draft Environmental Impact Statement on the important issues.
4. Appendix A summarizes the efforts that have been made to provide opportunities for public participation. Oahu Trans 2K meetings were held all around the island, not just in the PUC.
5. Chapter 1 discusses the project's purpose and need, one of which is to make the PUC much more pedestrian friendly. Investment in transit systems promote the pedestrian mode as a viable mode of travel. However, pedestrian travel alone cannot accommodate regional travel demands. Chapter 4 discusses transportation issues. DTS and SDOT will continue to promote alternative transportation (e.g. SDOT will continue to promote the

zipper lane and the Vanpool program, and DTS will continue to promote its limited stop transit services, City Express! and Country Express!). By using existing street capacity as a dedicated transitway, the BRT Alternative would create incentives for the increased use of multiple-occupant vehicles along the alignment of the In-Town BRT. Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in the BRT Alternative. All transit facilities would be equipped for disabled access. Pedestrians and bikes are very much a part of the TSM and BRT Alternatives, but they alone cannot satisfy all of the travel markets that must be accommodated. The transit systems contained in all of the alternatives must be compatible with the Americans with Disabilities Act (ADA) requirements. DTS will continue to support programs to foster alternative transportation, such as the hub-and-spoke bus system and traffic calming, and Vanpool. Transportation Demand Management (TDM) programs are included in the alternatives, but are not expected to address projected increases in travel demand fully in the primary transportation corridor. The advantages of efficient transit would encourage people to use their cars less. The use of specific disincentives and education programs on alternative transportation is a policy decision to be made by the City Council.
6. Extensive traffic modeling was done as part of the planning process. See Chapter 4 for details.
7. Section 5.5 discusses potential air quality impacts, based on projected traffic information.
8. See Appendix A.
9. Environmental justice issues are addressed in Section 5.3.5.
10. Such plans are available with DTS and/or at major state libraries.
11. The highway alternative was considered and rejected, as discussed in Section 2.6.
12. Natural resource issues are addressed in Sections 5.7 and 5.8.
13. Land use issues are discussed in Sections 3.1 and 5.1. Neighborhood impacts and environmental justice are addressed in Section 5.3.
14. The discussion on bicycle plans is in Section 4.5. The primary transportation corridor is defined where most traffic occurs. Congestion problems Koko Head of Kahala are much less severe.
15. Appendix A describes the coordination and outreach efforts involving agencies and the public. A project schedule is provided in Section 2.5; the financial plan is in Chapter 6.

16. Other programs within DTS are focusing on promoting bicycle and pedestrian improvements. However, bicycle and pedestrian modes cannot satisfy all travel markets, so other solutions need to be explored.
17. See Appendix A.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

LIFE OF THE LAND

Ua Mau Ke Ea O Ka 'Aina I Ka Pono
Hawai'i's own Community Action Group
Protecting our Fragile Environment through
Research, Education, Advocacy and Litigation

RECEIVED
MAY 24 3:52

May 22, 1999

Kenneth Hamayasu
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Robert Bramen
Parsons Brinkerhoff Quade & Douglas
1001 Bishop Street, Suite 3000
Honolulu, HI 96813

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

re: Environmental Impact Statement Preparation Notice for the Primary Corridor Transportation Project

Aloha Kenneth Hamayasu and Robert Bramen,

Life of the Land is Hawai'i's own environmental and community action group serving Hawai'i since 1970. Our mission is to preserve and protect the life of the land, to promote sustainable land use and energy policies and open government through research, education, advocacy and litigation.

The following comments constitutes our position on the EIS preparation notice for the proposed project. We have included Enhanced Bus System & Commuter-Based Dedicated Bicycle Lane System Alternatives which are based on minimizing environmental impacts. They are practical, reasonable, and feasible and makes common sense. The alternatives conforms with alternatives that must be evaluated under both the National Environmental Policy Act (NEPA) and the Major Investment Study process.

Table of Contents

1111 Bishop Street * Suite 503 * Honolulu, Hawai'i 96813 * phone (808) 533-3454 * fax (808) 533-0993

Chapter 1: Summary

1.1 The Environmental Review Process

__Status:__ Environmental Impact Statement Preparation Notice (EIS PN) First Notice pending public comment. Numerous meetings (50+) created numerous ideas (2000+) which led the consultant to publish a 44 page document called "Islandwide Mobility Concept Plan". The consultant also wrote 7 pages of text for the Environmental Impact Statement Preparation Notice.

__Approving Agency/Accepting Authority:__ Governor, State of Hawaii * c/o OEQC * 235 S Beretania St. #702 * Honolulu, HI 96813 & US DOT * Federal Transportation Administration.

__Consultant:__ Robert Bramen @ Parsons Brinkerhoff Quade & Douglas * 1001 Bishop Street, Suite 3000 * Honolulu, HI 96813

__Public Comment Deadline:__ May 24, 1999

__Permits Required:__ Sec. 404, 10, 142(e) (sole source aquifer), SCAD, State Historic Preservation Division (SHPD) Review, Coastal Zone Management (CZM) Consistency, National Pollution Discharge Elimination System (NPDES), Water Quality Criteria (WQC), Shoreline Management Area (SMA) Permit, Special Design District, Floodplain Variance, Building Permit, Grubbing Permit, Grading Permit

__Description:__ The City and County of Honolulu Department of Transportation Services (DTS), in cooperation with the U.S. Department of Transportation, Federal Transportation Administration (FTA), will be preparing an

AR00047741

Environmental Impact Statement (EIS) for proposed transit improvements in the primary corridor of Oahu. The corridor extends from Kapolei in the Ewa District to the University of Hawaii at Manoa. Because the project may have substantial impacts, DTS is required by both State and Federal law (Chapter 343 of the Hawaii Revised Statutes and the National Environmental Policy Act) to prepare an Environmental Impact. The EIS will satisfy both State and federal requirements. A public scoping meeting will be held to allow for comment on the project, its impacts, and the technical evaluation.

The project is intended to address transportation requirements; improve public transit services; direct future land use development patterns; and implement existing transportation plans.

1 The alternatives must be considered include a No-Build Alternative, an Enhanced Bus / Transportation System Management (TSM) Alternative, a Super Enhanced Bus / Transportation System Management (TSM) Alternative, a Dedicated Bicycle Lane Alternative, a Bus Rapid Transit (BRT) Alternative, and a Light Rail Transit (LRT) Alternative. Variations on the alternatives are also being addressed, including a Sand Island Bypass Road and Nimitz Parkway.

Over ten detailed technical reports will be prepared on such topics as transportation, land use, social and economic impacts, finance and cost-effectiveness, visual and aesthetic impacts, noise and vibration, park and recreation areas, historic resources, air quality, and hazardous materials. The results of the detailed analysis will be summarized in the Draft EIS.

1.2 An Overview of the Transportation Planning Process

Oahu Metropolitan Planning Organization (OMPO)

The Oahu Metropolitan Planning Organization Policy Committee is the "heart" of the Oahu Metropolitan Planning Organization planning process. It determines the direction of the Oahu Metropolitan Planning Organization effort, considers and approves transportation planning issues, and makes the final approval for Oahu Metropolitan Planning Organization matters. The Policy Committee is made up of 13 members. Five members are from the including the chair of the Council's transportation committee. Three members are State senators, including the chair of the Senate's transportation committee. Three members are State representatives, including the chair of the House's transportation committee. One member is the Director of the State Department of Transportation (DOT) and one member is the Director of the City Department of Transportation Services (DTS). Although not a member of the Policy Committee, the Citizen Advisory Committee Chair has been invited to attend and take part in discussions at Policy Committee meetings.

The Oahu Metropolitan Planning Organization Technical Advisory Committee (OMPO TAC) provides the technical input to OMPO's planning process. The Technical Advisory Committee acts as the technical liaison between the Policy Committee and the OMPO Executive Director, provides advice to the Policy Committee and the OMPO Executive Director on technical matters, and insures the technical competence of the planning process. The Technical Advisory Committee has direct responsibility for land use, transportation-related planning, and transit management. The Technical Advisory Committee members include four directors of the City and the State planning and transportation departments. In addition, representatives of the Federal Highway Administration and Federal Aviation Administration attend TAC meetings as non-voting members.

Oahu Metropolitan Planning Organization Citizen Advisory Committee (OMPO CAC):

the Citizen Advisory Committee assists in developing public involvement programs to solicit general public input for the Policy Committee. Comments received from the Citizen Advisory Committee members and non-members are treated equally. The Citizen Advisory Committee meets about once a month. These meetings are open to the public and provide an opportunity for interested parties to hear and discuss transportation issues with the appropriate project administrators or decision-makers. The Citizen Advisory Committee members are organizations and groups interested in transportation planning on Oahu, representative of a broad range of interests. Citizen Advisory Committee members are appointed by the Policy Committee.

The OMPO Overall Work Program (OWP) serves as the key management tool for monitoring State and City transportation activities on Oahu. It describes transportation-related planning studies to be conducted in a given year. The Overall Work Program defines project objectives and tasks and identifies budgetary and staff requirements needed to carry out the projects. In addressing current transportation issues and problems, the Overall Work Program responds to local planning requirements, federal transportation priorities, and Transportation Equity Act for the 21st Century requirements. The Overall Work Program also includes land use studies as they relate to transportation needs. A draft Overall Work Program is prepared each winter and submitted for review in March. After considerable review and revision by citizens and Federal and local agencies, a final Overall Work Program is adopted in late spring for the next fiscal year.

The Oahu Regional Transportation Plan (ORTP) is a blueprint for identifying the development of future transportation improvements on Oahu. It should be noted, however, that the inclusion of a project into this plan does not guarantee its construction. Rather, it allows a project to begin a series of more detailed evaluations and to be eligible for federal funding. During these more detailed evaluations, a project could be postponed or terminated for any number of reasons, such as environmental impact, cost, or lack of public support.

Under the new Transportation Equity Act for the 21st Century (TEA 21), an area's regional transportation plan must have a minimum twenty year horizon, be fiscally-constrained, and be updated at least every five years. In order to conform to this requirement, the Oahu Metropolitan Planning Organization endorsed a year 2020 regional transportation plan in November 1995. This plan was forwarded to the State Department of Transportation and incorporated, intact, into the Statewide Transportation Plan.

The Transportation Improvement Program (TIP) is a programming document that lists transportation projects that will be undertaken by the State and City and funded in part by federal money. Projects identified in the TIP must not be inconsistent with the Oahu Regional Transportation Plan (ORTP).

The Transportation Improvement Program is closely related to the State's and City/County's Capital Improvement Programs and is prepared every other year in the spring. The Transportation Improvement Program identifies funding amounts by source of funding, jurisdictional responsibility, type of project, and year of funding for these projects. Thus, the Transportation Improvement Program is an important reference document of transportation projects.

The Oahu Transportation Improvement Program is the short-term three-year implementation program for federally-assisted surface transportation projects that support the Oahu Regional Transportation Plan. The Transportation Improvement Program describes and prioritizes federally-assisted and major locally-funded transportation programs and projects selected by the Oahu Metropolitan Planning Organization Policy Committee for implementation during the program period. An annual review and a major biennial update of the Transportation Improvement Program are scheduled, with off-schedule amendments considered as needed. The Transportation Improvement Program is adopted by the Oahu Metropolitan Planning Organization Policy Committee and sent to the Governor for approval. Upon his approval, the Transportation Improvement Program is incorporated as the Oahu element of the Statewide Transportation Improvement Program (STIP). The Statewide Transportation Improvement Program is the official document the U.S. Department of Transportation uses to authorize federal funds for projects in Hawaii. * A Community-Based Transportation Visioning Process Managed by the City and County of Honolulu and the Hawaii Department of Transportation. Contact with questions or problems. Parsons Brinckerhoff 1998

Chapter 2 History

2.1 Jeremy Harris. State of the City Address. January 26, 1999

"Four months ago, as part of my vision we also laid out a conceptual plan for transportation improvements for the 21st century. That plan included improved bus service to Windward, Central, North Shore and Leeward to give better, quicker access to downtown Honolulu. It also included a light rail electric trolley system in the primary urban corridor from Pearl City to the University. It would provide mobility for our growing downtown population and it would be supplemented with parking lots just outside of town, circulator buses within the urban area, and water taxis across the waterfront. That was my vision ...

In the area af transportation a second alternative emerged. That alternative is a bus-rapid transit system that uses dedicated zipper lanes, circulator buses, and express buses in a network that could carry almost as many people as a more costly fixed rail system. Under this proposal, communities around the island from Waianae to Mililani would be served with circulator buses that would move around within their area - taking people to shops, schools and parks. These would connect, at several stops in each community, to bus-rapid transit stations.

Under the plan, the existing Zipper Lane would be reserved solely for bus-rapid transit and would be expanded to include an entry- and exit-way at Pearl City to connect with circulator buses in those surrounding communities.

The Zipper lane would be extended all the way to Nimitz Highway, and it would be made two-directional - carrying people into town in the morning, out of town at night. Using Zipper Lanes as exclusive bus rapid-transit lanes carrying new articulated buses at 90-second intervals, would give us almost the same carrying capacity as a rail system - without the high costs.

Express buses would travel to and from Oahu's communities, pick up their passengers, and travel into Honolulu on a dedicated lane - just as if they were maving on tracks. Our new articulated buses, which can carry more people in comfort, would then move onto Nimitz Highway, where the next segment of our transit plan takes shape.

We're proposing to re-route much of the traffic off Nimitz Highway onto a new Sand Island Parkway and a tunnel under Honolulu Harbor. It's an ambitious plan, but it meets several goals. It frees up the valuable Nimitz waterfront for economic redevelopment, allowing us to make Honolulu a true waterfront city. It also eliminates one of our City's worst traffic bottlenecks. Nimitz Highway can be made into a far more efficient way to get people into town. In our plan, two lanes of Nimitz will become dedicated bus-rapid transit lanes.

These dedicated lanes will carry passengers into town where they will be able to transfer to downtown circulator buses. Riders gaing to the Diamond Head side of town would go through the new tunnel to Seuth Street or Waikiki. The next segment of this alternative would involve the development of a light rail system in the most heavily used corridor, from Kapolei to downtown. Under this plan a light rail electric trolley would run from the periphery of Waikiki along Ala Moana Boulevard, and connect Waikiki, the Convention Center, Ala Moana Shopping Center, Ward Warehouse, the State's Kakaako Makai redevelopment area, Aloha Tower and downtown with a clean and efficient transportation link. It would provide the impetus for the redevelopment of Kakaako and would increase business for merchants downtown.

This light rail electric trolley would link up with the bus-rapid transit system in the Aloha Tower area as well as with articulated buses that would be operating at short intervals providing convenient access to all areas of town. It's an exciting alternative.

I've given direction to the Department of Transportation Services to move forward with our transportation project to the next phase, the federally mandated environmental impact statement/alternative analysis. In that effort, we will evaluate the following three proposals and choose one for action:

1) A light rail electric trolley from Pearl City to UH with circulator buses in local communities.

2) A bus-rapid transit system from Waipahu to UH using dedicated zipper lanes, with a light rail electric trolley from Waikiki to downtown and local community connection through community circulator buses.

3) Expansion of our existing bus system.

As our Department and its consultants go through this federally mandated analysis, I will assemble a policy team of business, council, and vision team members to work with us throughout the evaluation process. Regardless of which technology we ultimately choose, I believe it's vital in our effort to protect our environment and our quality of life, that we position our City as the world leader in electric based transportation.

One new technology that would have applicability for either of the alternatives is the wireless plate system. With this new technology, light rail vehicles ar electric trolley buses could be powered without the need for poles and overhead power lines. Instead, transit vahicles pick up their power from a plate imbedded in the roadway. To protect against electric shock the plate only turns "on" directly under the transit vehicle as it passes by. If such a system was determined to be feasible we might imagine a future time when even Honolulu's private vehicles were electric, picking up their power from the street itself."

2.2 City Blueprints for the Oahu Trans 2K (January - August 1998)

Harris to Unveil City Proposals, Seek Input for '21st Century Oahu' "At the urging of Mayor Jeremy Harris, city officials have spent the past nine months trying to envision and draft a blueprint for the kind of future Oahu could have." David Waite *Honolulu Advertiser*, September 25, 1998.

Mayor Unveils Land-Use Vision - Harris hopes to reduce urban sprawl by limiting growth in population and development to greater Honolulu and Kapolei "Harris first outlined his vision in his State of the City address in January. ... Harris' ideas also include a drive to revitalize the Honolulu waterfront as has been done in Portland, Boston and other major mainland cities." Gordon Y. K. Pang *Honolulu Star Bulletin*, September 24, 1998.

2.3 Oahu Trans 2K

"The Chair introduced Joe Magaldi, Deputy Director of the City's Department of Transportation Services. He gave a presentation on the City's Vision for Oahu. Part of this vision is a study that the City had just begun. They will hald ten community meetings on Oahu to gather input on the type of transportation system people want. These meetings will also include the State's community outreach presentation on their Freeway Management System (FMS). The City Vision for Oahu includes five key elements: ...

As part of this study, the consultant will identify transit lines to increase capacity, look at high speed express service to/from the suburbs; ways to implement a central city trolley; determine initial routes and routes for future expansion; and study opportunities for historic trolley lines. ...

The City's Primary Corridor Transportation Plan (PCTP) will create a future transportation master plan that will support the Vision for Oahu. It involves community-base planning and will be implemented incrementally within our ability to pay. The study will look at areas such as Curitiba, Brazil and Portland Oregon as transit models." OMPO Community Advisory Committee ("OMPO CAC") Minutes September 16, 1998.

850 Meet to 'Vision' Oahu's Future - Concerns about the economy and the environment draw a big crowd: "Mayor Jeremy Harris this week announced the joint city-state effort to incorporate into one 'vision' all aspects of land use, reached through a community consensus. Further meetings will be held." Lori Tighe *Honolulu Star Bulletin*, September 26, 1998

Transportation Takes Input On Transit Plans: "Light-rail transit and other initiatives drew some 300 participants, and Mayor Jeremy Harris said intensive transportation planning will be a joint state and city undertaking between now and January, with many of the ideas coming from the community." Harold Morse *Honolulu Star Bulletin*, September 29, 1998

Editorial: Oahu's Future "The trolley idea is a scaled-down version of the elevated rail transit plan that was narrowly rejected by the City Council in 1992. Harris, as city managing director, was deeply involved in the planning for that project. A trolley might be less effective. The proposals also include diverting traffic from Nimitz Highway to tunnels under Sand Island and Honolulu harbor, building a highway through Waianae mauka of Farrington Highway and creating a bikeway on Ala Wai Boulevard by eliminating the parking lane. All of this would cost money, and it's hard to see where it would come from. Certainly the city doesn't have it. But this would be a plan to be fulfilled over decades. It's never too soon to seek a consensus. Finding the money will have to come later." *Honolulu Star Bulletin*, September 26, 1998

Editorial: New Transit Plans Must Include Public Options: "This time around, city officials say they are determined to go only where the community wants them to go and in a form the community finds acceptable. ... If all this holds, it will mark a refreshing change in transportation planning for Oahu. We have learned one lesson: Any project of this magnitude imposed top-down by government will fail its basic political test." *Honolulu Advertiser*, September 29, 1998

Emotions High as Fight Resumes on Rail Transit: "Residents have a lot to say for and against light rail as the city's second round of meetings, aimed at getting public input, kick off by Gordon Y.K. Pang *Honolulu Star-Bulletin*, November 17, 1998

Opinion Divided on Light Rail - Some residents say planning biased toward popular proposal: "The light-rail proposal prompted the most debate, with some community representatives saying the planning process was weighted toward including light rail. 'They don't even assume that there's a possibility there won't be light rail,' said Richard Port, an Ala Moana area resident who was state Democratic Party chairman from 1994 to 1996. 'It's already a rigged decision.'" Jean Christensen Advertiser Staff Writer *Honolulu Advertiser*, November 17, 1998

Transportation Issues Addressed at Workshop: Light Rail System Urged by Residents: "The first series of workshops ended Oct. 14 ... Among the ideas being proposed is the need for a mass transit system, most likely in the form of a light rail system." Don Robbins *Kanupepa*, October 27, 1998

Parsons Brinckerhoff: "The City and County of Honolulu's Department of Transportation Services (DTS), with the cooperation of the Hawaii Department of Transportation (DOT), is undertaking a major study to examine the future transportation system for Oahu. The study, officially called the Oahu Primary Corridor Transportation Project began in August 1998. It focuses on improving circulation within communities and between them. Moreover, the study

focuses on public transit improvements and more efficient use of existing roads, both to enhance established communities. The study does not focus on building new highways in undeveloped areas.

The project consists of three tracks: community-based planning, project development and delivery-early-start projects and project development-primary corridor. Community outreach will be the first step of a public involvement process that will continue throughout the project; the community-based planning track will identify transportation improvements throughout the island that will improve mobility and enhance the livability of Oahu's communities. Early-start projects will be those that do not require detailed planning or complicated environmental clearances. Primary corridor (from Pearl City to the University of Hawaii Manoa projects will be examined and evaluated through an MIS that will define the characteristics of transit services in the corridor. The transit component will probably be divided into three major subsystems: fixed-route buses that provide local services throughout the communities; high-speed express service from suburbs; and the central city trolley, which will remain at-grade as much as possible to reduce construction costs." A Community-Based Transportation Visioning Process Managed by the City and County of Honolulu and the Hawaii Department of Transportation. Parsons Brinckerhoff 1998

Parsons Brinckerhoff: "The Islandwide Mobility Concept Plan which has emerged from Rounds 1 and 2 of Oahu Trans 2K, including the various public transit alternatives that are under active consideration. The third round of Oahu Trans 2K meetings will be jointly held with another community-based planning project known as 21st Century Oahu. Since last fall, vision teams from the 21st Century Oahu process have been working to develop community goals and prioritize capital improvement projects. The project consists of three tracks: community-based planning, project development and delivery-early-start projects and project development-primary corridor." A Community-Based Transportation Visioning Process Managed by the City and County of Honolulu and the Hawaii Department of Transportation. Parsons Brinckerhoff. 1998

2.4 Phase Three: 21st Century Oahu & Oahu Trans 2K

Mayor Jeremy Harris: "Dear Community Leader: The next phase in our grassroots effort to envision, plan, design and build a sustainable future for Oahu is about to begin with a round of community vision team meetings focusing primarily on transportation. These meetings will complete the integration of two related community-based planning projects known as 21st Century Oahu and Oahu Trans 2K. ... If you previously attended Oahu Trans 2K meetings, you will recognize this as Round 3 of that program. If you have previously participated in the 21st Century Oahu process, you understand how important transportation planning is to implementing your community vision. Please attend any sessions in which you are interested. The meetings will cover: The Islandwide Mobility Concept Plan that has emerged from Rounds 1 and 2 of Oahu Trans 2K, including the various public transit alternatives that are under active consideration; A report back and further refinement of community-specific mobility proposals that emerged from Rounds 1 and 2 of Oahu Trans 2K, which may include traffic calming measures, bikeways, bus stop improvements and neighborhood circulators; Discussion of pending city and state transportation projects; An update on vision team capital improvement requests included in the Mayor's FY 1999-2000 city budget; A look ahead to future planning efforts by the community vision teams. ... Yours truly, Jeremy Harris. Mayor"

Chapter 3 Scoping

3.1 The National Environmental Policy Act (NEPA)

Council on Environmental Quality: Top 40 Questions Asked about NEPA. http://ceq.eh.doe.gov/nepa/regs/40/40p3.htm

1a. Range of Alternatives. What is meant by "range of alternatives" as referred to in Sec. 1505.1(e)?

The phrase "range of alternatives" refers to the alternatives discussed in environmental documents. It includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them. Section 1502.14. A decisionmaker must not consider alternatives beyond the range of alternatives discussed in the relevant environmental documents. Moreover, a decisionmaker must, in fact, consider all the alternatives discussed in an EIS. Section 1505.1(e).

1b. How many alternatives have to be discussed when there is an infinite number of possible alternatives?

A. For some proposals there may exist a very large or even an infinite number of possible reasonable alternatives. For example, a proposal to designate wilderness areas within a National Forest could be said to involve an infinite number of alternatives from 0 to 100 percent of the forest. When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be analyzed and compared in the EIS. An appropriate series of alternatives might include dedicating 0, 10, 30, 50, 70, 90, or 100 percent of the Forest to wilderness. What constitutes a reasonable range of alternatives depends on the nature of the proposal and the facts in each case.

2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?

A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?

A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).

3. No-Action Alternative. What does the "no action" alternative include? If an agency is under a court order or legislative command to act, must the EIS address the "no action" alternative?

A. Section 1502.14(d) requires the alternatives analysis in the EIS to "include the alternative of no action." There are two distinct interpretations of "no action" that must be considered, depending on the nature of the proposal being evaluated. The first situation might involve an action such as updating a land management plan where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases "no action" is "no change" from current management direction or level of management intensity. To construct

an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed. Consequently, projected impacts of alternative management schemes would be compared in the EIS to those impacts projected for the existing plan. In this case, alternatives would include management plans of both greater and lesser intensity, especially greater and lesser levels of resource development.

The second interpretation of "no action" is illustrated in instances involving federal decisions on proposals for projects. "No action" in such cases would mean the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

Where a choice of "no action" by the agency would result in predictable actions by others, this consequence of the "no action" alternative should be included in the analysis. For example, if denial of permission to build a railroad to a facility would lead to construction of a road and increased truck traffic, the EIS should analyze this consequence of the "no action" alternative.

In light of the above, it is difficult to think of a situation where it would not be appropriate to address a "no action" alternative. Accordingly, the regulations require the analysis of the no action alternative even if the agency is under a court order or legislative command to act. This analysis provides a benchmark, enabling decisionmakers to compare the magnitude of environmental effects of the action alternatives. It is also an example of a reasonable alternative outside the jurisdiction of the agency which must be analyzed. Section 1502.14(c). See Question 2 above. Inclusion of such an analysis in the EIS is necessary to inform the Congress, the public, and the President as intended by NEPA. Section 1500.1(a).

4a. Agency's Preferred Alternative. What is the "agency's preferred alternative"?

A. The "agency's preferred alternative" is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. The concept of the "agency's preferred alternative" is different from the "environmentally preferable alternative," although in some cases one alternative may be both. See Question 6 below. It is identified so that agencies and the public can understand the lead agency's orientation.

4b. Does the "preferred alternative" have to be identified in the Draft EIS and the Final EIS or just in the Final EIS?

A. Section 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement . . ." This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS. If the responsible federal official in fact has no preferred alternative at the Draft EIS stage, a preferred alternative need not be identified there. By the time the Final EIS is filed, Section 1502.14(e) presumes the existence of a preferred alternative and requires its identification in the Final EIS "unless another law prohibits the expression of such a preference."

4c. Who recommends or determines tha "preferred alternative?"

A. The lead agency's official with line responsibility for preparing the EIS and assuring its adequacy is responsible for identifying the agency's preferred alternative(s). The NEPA regulations do not dictate which official in an agency shall be responsible for preparation of EISs, but agencies can identify this official in their implementing procedures, pursuant to Section 1507.3.

Even though the agency's preferred alternative is identified by the EIS preparer in the EIS, the statement must be objectively prepared and not slanted to support the choice of the agency's preferred alternative over the other reasonable and feasible alternatives.

5a. Proposed Action v. Preferred Alternative. Is the "proposed action" the same thing as the "preferred alternative"?

A. The "proposed action" may be, but is not necessarily, the agency's "preferred alternative." The proposed action may be a proposal in its initial form before undergoing analysis in the EIS process. If the proposed action is [46 FR 18028] internally generated, such as preparing a land management plan, the proposed action might end up as the agency's preferred alternative. On the other hand the proposed action may be granting an application to a non-federal entity for a permit. The agency may or may not have a "preferred alternative" at the Draft EIS stage (see Question 4 above). In that case the agency may decide at the Final EIS stage, on the basis of the Draft EIS and the public and agency comments, that an alternative other than the proposed action is the agency's "preferred alternative."

5b. Is the analysis of the "proposed action" in an EIS to be treated differently from the analysis of alternatives?

A. The degree of analysis devoted to each alternative in the EIS is to be substantially similar to that devoted to the "proposed action." Section 1502.14 is titled "Alternatives including the proposed action" to reflect such comparable treatment. Section 1502.14(b) specifically requires "substantial treatment" in the EIS of each alternative including the proposed action. This regulation does not dictate an amount of information to be provided, but rather, prescribes a level of treatment, which may in turn require varying amounts of information, to enable a reviewer to evaluate and compare alternatives.

6a. Environmentally Preferable Alternative. What is the meaning of the term "environmentally preferable alternative" as used in the regulations with reference to Records of Decision? How is the term "environment" used in the phrase?

A. Section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision (ROD) must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

The Council recognizes that the identification of the environmentally preferable alternative may involve difficult judgments, particularly when one environmental value must be balanced against another. The public and other agencies reviewing a Draft EIS can assist the lead agency to develop and determine environmentally preferable alternatives by providing their views in comments on the Draft EIS. Through the identification of the environmentally preferable alternative, the decisionmaker is clearly faced with a choice between that alternative and others, and must consider whether the decision accords with the Congressionally declared policies of the Act.

6b. Who recommends or determines what is environmentally preferable?

A. The agency EIS staff is encouraged to make recommendations of the environmentally preferable alternative(s) during EIS preparation. In any event the lead agency official responsible for the EIS is encouraged to identify the environmentally preferable alternative(s) in the EIS. In all cases, commentors from other agencies and the public are

also encouraged to address this question. The agency must identify the environmentally preferable alternative in the ROD.

7. Difference Between Sections of EIS on Alternatives and Environmental Consequences. What is the difference between the sections in the EIS on "alternatives" and "environmental consequences"? How do you avoid duplicating the discussion of alternatives in preparing these two sections?

A. The "alternatives" section is the heart of the EIS. This section rigorously explores and objectively evaluates all reasonable alternatives including the proposed action. Section 1502.14. It should include relevant comparisons on environmental and other grounds. The "environmental consequences" section of the EIS discusses the specific environmental impacts or effects of each of the alternatives including the proposed action. Section 1502.16. In order to avoid duplication between these two sections, most of the "alternatives" section should be devoted to describing and comparing the alternatives. Discussion of the environmental impacts of these alternatives should be limited to a concise descriptive summary of such impacts in a comparative form, including charts or tables, thus sharply defining the issues and providing a clear basis for choice among options. Section 1502.14. The "environmental consequences" section should be devoted largely to a scientific analysis of the direct and indirect environmental effects of the proposed action and of each of the alternatives. It forms the analytic basis for the concise comparison in the "alternatives" section.

8. Early Application of NEPA. Section 1501.2(d) of the NEPA regulations requires agencies to provide for the early application of NEPA to cases where actions are planned by private applicants or non-Federal entities and are, at some stage, subject to federal approval of permits, loans, loan guarantees, insurance or other actions. What must and can agencies do to apply NEPA early in these cases?

A. Section 1501.2(d) requires federal agencies to take steps toward ensuring that private parties and state and local entities initiate environmental studies as soon as federal involvement in their proposals can be foreseen. This section is intended to ensure that environmental factors are considered at an early stage in the planning process and to avoid the situation where the applicant for a federal permit or approval has completed planning and eliminated all alternatives to the proposed action by the time the EIS process commences or before the EIS process has been completed.

Through early consultation, business applicants and approving agencies may gain better appreciation of each other's needs and foster a decisionmaking process which avoids later unexpected confrontations.

Federal agencies are required by Section 1507.3(b) to develop procedures to carry out Section 1501.2(d). The procedures should include an "outreach program", such as a means for prospective applicants to conduct pre-application consultations with the lead and cooperating agencies. Applicants need to find out, in advance of project planning, what environmental studies or other information will be required, and what mitigation requirements are likely, in connection with the later federal NEPA process. Agencies should designate staff to advise potential applicants of the agency's NEPA information requirements and should publicize their pre-application procedures and information requirements in newsletters or other media used by potential applicants.

Complementing Section 1501.2(d), Section 1506.5(a) requires agencies to assist applicants by outlining the types of information required in those cases where the agency requires the applicant to submit environmental data for possible use by the agency in preparing an EIS.

Section 1506.5(b) allows agencies to authorize preparation of environmental assessments by applicants. Thus, the procedures should also include a means for anticipating and utilizing applicants' environmental studies or "early corporate environmental assessments" to fulfill some of the federal agency's NEPA obligations. However, in such cases the agency must still evaluate independently the environmental issues [46 FR 18029] and take responsibility for the environmental assessment.

These provisions are intended to encourage and enable private and other non-federal entities to build environmental considerations into their own planning processes in a way that facilitates the application of NEPA and avoids delay.

9. Applicant Who Needs Other Permits. To what extent must an agency inquire into whether an applicant for a federal permit, funding or other approval of a proposal will also need approval from another agency far the same proposal or some other related aspect of it?

A. Agencies must integrate the NEPA process into other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts. Specifically, the agency must "provide for cases where actions are planned by . . . applicants," so that designated staff are available to advise potential applicants of studies or other information that will forseeable be required for the later federal action; the agency shall consult with the applicant if the agency foresees its own involvement in the proposal; and it shall insure that the NEPA process commences at the earliest possible time. Section 1501.2(d). (See Question 8.)

The regulations emphasize agency cooperation early in the NEPA process. Section 1501.6. Section 1501.7 on "scoping" also provides that all affected Federal agencies are to be invited to participate in scoping the environmental issues and to identify the various environmental review and consultation requirements that may apply to the proposed action. Further, Section 1502.25(b) requires that the draft EIS list all the federal permits, licenses and other entitlements that are needed to implement the proposal.

These provisions create an affirmative obligatian on federal agencies to inquire early, and to the maximum degree possible, to ascertain whether an applicant is or will be seeking other federal assistance or approval, or whether the applicant is waiting until a proposal has been substantially developed before requesting federal aid or approval.

Thus, a federal agency receiving a request for approval or assistance should determine whether the applicant has filed separate requests for federal approval or assistance with other federal agencies. Other federal agencies that are likely to become involved should then be contacted, and the NEPA process coordinated, to insure an early and comprehensive analysis of the direct and indirect effects of the proposal and any related actions. The agency should inform the applicant that action on its application may be delayed unless it submits all other federal applications (where feasible to do so), so that all the relevant agencies can work together on the scoping process and preparation of the EIS.

10a. Limitations on Action During 30-Day Review Period for Final EIS. What actians by agencies and/or applicants are allowed during EIS preparation and during the 30-day review period after publication of a final EIS?

A. No federal decision on the proposed action shall be made or recorded until at least 30 days after the publication by EPA of notice that the particular EIS has been filed with EPA. Sections 1505.2 and 1506.10. Section 1505.2 requires this decision to be stated in a public Record of Decision.

Until the agency issues its Record of Decision, no action by an agency or an applicant concerning the proposal shall be taken which would have an adverse environmental impact or limit the choice of reasonable alternatives. Section 1506.1(a). But this does not preclude preliminary planning or design work which is needed to support an application for permits or assistance. Section 1506.1(d).

When the impact statement in question is a program EIS, no major action concerning the program may be taken which may significantly affect the quality of the human environment, unless the particular action is justified independently of the program, is accompanied by its own adequate environmental impact statement and will not prejudice the ultimate decision on the program. Section 1506.1(c).

10b. Do these limitations on action (described in Question 10a) apply to state or local agencies that have statutorily delegated responsibility for preparation of environmental documents required by NEPA, for example, under the HUD Block Grant program?

A. Yes, these limitations do apply, without any variation from their application to federal agencies.

11. Limitations on Actions by an Applicant During EIS Process. What actions must a lead agency take during the NEPA process when it becomes aware that a non-federal applicant is about to take an action within the agency's jurisdiction that would either have an adverse environmental impact or limit the choice of reasonable alternatives (e.g., prematurely commit money or other resources towards the completion of the proposal)?

A. The federal agency must notify the applicant that the agency will take strong affirmative steps to insure that the objectives and procedures of NEPA are fulfilled. Section 1506.1(b). These steps could include seeking injunctive measures under NEPA, or the use of sanctions available under either the agency's permitting authority or statutes setting forth the agency's statutory mission. For example, the agency might advise an applicant that if it takes such action tha agency will not process its application.

13. Use of Scoping Before Notice of Intent to Prepare EIS. Can the scoping process be used in connection with preparation of an environmental assessment, i.e., before both the decision to proceed with an EIS and publication of a notice of intent?

A. Yes. Scoping can be a useful tool for discovering alternatives to a proposal, or significant impacts that may have been overlooked. In cases where an environmental assessment is being prepared to help an agency decide whether to prepare an EIS, useful information might result from early participation by other agencies and the public in a scoping process.

The regulations state that the scoping process is to be preceded by a Notice of Intent (NOI) to prepare an EIS. But that is only the minimum requirement. Scoping may be initiated earlier, as long as there is appropriate public notice and enough information available on the proposal so that the public and relevant agencies can participate effectively.

However, scoping that is done before the assessment, and in aid of its preparation, cannot substitute for the normal scoping process after publication of the NOI, unless the earlier public notice stated clearly that this possibility was under consideration, and the NOI expressly provides that written comments on tha scope of alternatives and impacts will still be considered.

14a. Rights and Responsibilities of Lead and Cooperating Agencies. What are the respective rights and responsibilities of lead and cooperating agencies? What letters and memoranda must be prepared?

A. After a lead agency has been designated (Sec. 1501.5), that agency has the responsibility to solicit cooperation from other federal agencies that have jurisdiction by law or special expertise on any environmental issue that should be addressed in the EIS being prepared. Where appropriate, the lead agency should seek the cooperation of state or local agencies of similar qualifications. When the proposal may affect an Indian reservation, the agency should consult with the Indian tribe. Section 1508.5. The request for cooperation should come at the earliest possible time in the NEPA process.

After discussions with the candidate cooperating agencies, the lead agency and the cooperating agencies are to determine by letter or by memorandum which agencies will undertake cooperating responsibilities. To the extent possible at this stage, responsibilities for specific issues should be assigned. The allocation of responsibilities will be completed during scoping. Section 1501.7(a)(4).

Cooperating agencies must assume responsibility for the development of information and the preparation of environmental analyses at the request of the lead agency. Section 1501.6(b)(3). Cooperating agencies are now required by Section 1501.6 to devote staff resources that were normally primarily used to critique or comment on the Draft EIS after its preparation, much earlier in the NEPA process -- primarily at the scoping and Draft EIS preparation stages. If a cooperating agency determines that its resource limitations preclude any involvement, or the degree of involvement (amount of work) requested by the lead agency, it must so inform the lead agency in writing and submit a copy of this correspondence to the Council. Section 1501.6(c).

In other words, the potential cooperating agency must decide early if it is able to devote any of its resaurces to a particular proposal. For this reason the regulation states that an agency may reply to a request for cooperation that "other program commitments preclude any involvement or the degree of involvement requested in the action that is the subject of the environmental impact statement." (Emphasis added). The regulation refers to the "action," rather than to the EIS, to clarify that the agency is taking itself out of all phases of the federal action, not just draft EIS preparation. This means that the agency has determined that it cannot be involved in the later stages of EIS review and comment, as well as decisionmaking on the proposed action. For this reason, cooperating agencies with jurisdiction by law (those which have permitting or other approval authority) cannot opt out entirely of the duty to cooperate on the EIS. See also Question 15, relating specifically to the responsibility of EPA.

14b. How are disputes resolved between lead and cooperating agencies concerning the scope and level of detail of analysis and the quality of data in impact statements?

A. Such disputes are resolved by the agencies themselves. A lead agency, of course, has the ultimate responsibility for the content of an EIS. But it is supposed to use the environmental analysis and recommendations of cooperating agencies with jurisdiction by law or special expertise to the maximum extent possible, consistent with its own responsibilities as lead agency. Section 1501.6(a)(2).

If the lead agency leaves out a significant issue or ignores the advice and expertise of the cooperating agency, the EIS may be found later to be inadequate. Similarly, where cooperating agencies have their own decisions to make and they intend to adopt the environmental impact statement and base their decisions on it, one document should include all of the information necessary for the decisions by the cooperating agencies. Otherwise they may be forced to duplicate the EIS process by issuing a new, more complete EIS or Supplemental EIS, even though the original EIS could have sufficed if it had been properly done at the outset. Thus, both lead and cooperating agencies have a stake in producing a document of good quality. Cooperating agencies also have a duty to participate fully in the scoping process to ensure that the appropriate range of issues is determined early in the EIS process.

Because the EIS is not the Record of Decision, but instead constitutes the information and analysis on which to base a decision, disagreements about conclusions to be drawn from the EIS need not inhibit agencies from issuing a joint document, or adopting another agency's EIS, if the analysis is adequate. Thus, if each agency has its own "preferred alternative," both can be identified in the EIS. Similarly, a cooperating agency with jurisdiction by law may determine in its own ROD that alternative A is the environmentally preferable action, even though the lead agency has decided in its separate ROD that Alternative B is environmentally preferable.

14c. What are the specific responsibilities of federal and state cooperating agencies to review draft EISs?

A. Cooperating agencies (i.e., agencies with jurisdiction by law or special expertise) and agencies that are authorized to develop or enforce environmental standards, must comment on environmental impact statements within their jurisdiction, expertise or authority. Sections 1503.2, 1508.5. If a cooperating agency is satisfied that its views are adequately reflected in the environmental impact statement, it should simply comment accordingly. Conversely, if the cooperating agency determines that a draft EIS is incomplete, inadequate or inaccurate, or it has other comments, it should promptly make such comments, conforming to the requirements of specificity in section 1503.3.

14d. How is the lead agency to treat the comments of another agency with jurisdiction by law or special expertise which has failed or refused to cooperate or participate in scoping or EIS preparation?

A. A lead agency has the responsibility to respond to all substantive camments raising significant issues regarding a draft EIS. Section 1503.4. However, cooperating agencies are generally under an obligation to raise issues or otherwise participate in the EIS process during scoping and EIS preparation if they reasonably can do so. In practical terms, if a cooperating agency fails to cooperate at the outset, such as during scoping, it will find that its comments at a later stage will not be as persuasive to the lead agency.

15. Commenting Responsibilities of EPA. Are EPA's responsibilities to review and comment on the environmental effects of agency proposals under Section 309 of the Clean Air Act independent of its responsibility as a cooperating agency?

A. Yes. EPA has an obligation under Section 309 of the Clean Air Act to review and comment in writing on the environmental impact of any matter relating to tha authority of the Administrator contained in proposed legislation, federal construction projects, other federal actions requiring EISs, and new regulations. 42 U.S.C. Sec. 7609. This obligation is independent of its role as a cooperating agency under the NEPA regulations.

16. Third Party Contracts. What is meant by the term "third party contracts" in connection with the preparation of an EIS? See Section 1506.5(c). When can "third party contracts" be used?

A. As used by EPA and other agencies, the term "third party contract" refers to the preparation of EISs by contractors paid by the applicant. In the case of an EIS for a National Pollution Discharge Elimination System (NPDES) permit, the applicant, aware in the early planning stages of the proposed project of the need for an EIS, contracts directly with a consulting firm for its preparation. See 40 C.F.R. 6.604(g). The "third party" is EPA which, under Section 1506.5(c), must select the consulting firm, even though the applicant pays for the cost of preparing the EIS. The consulting firm is responsible to EPA for preparing an EIS that meets the requirements of the NEPA regulations and EPA's NEPA procedures. It is in the applicant's interest that the EIS comply with the law so that EPA can take prompt action on the NPDES permit application. The "third party contract" method under EPA's NEPA procedures is purely voluntary, though most applicants have found it helpful in expediting compliance with NEPA.

If a federal agency uses "third party contracting," the applicant may undertake the necessary paperwork for the solicitation of a field of candidates under the agency's direction, so long as the agency complies with Section 1506.5(c). Federal procurement requirements do not apply to the agency because it incurs no obligations or costs under the contract, nor does the agency procure anything under the contract.

17a. Disclosure Statement to Avoid Conflict of Interest. If an EIS is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement. What criteria must the firm follow in determining whether it has any "financial or other interest in the outcome of the project" which would cause a conflict of interest?

A. Section 1506.5(c), which specifies that a consulting firm preparing an EIS must execute a disclosure statement, does not define "financial or other interest in the outcome of the project." The Council interprets this term broadly to cover any known benefits other than general enhancement of professional reputation. This includes any financial benefit such as a promise of future construction or design work on the project, as well as indirect benefits the consultant is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients). For example, completion of a highway project may encourage construction of a shopping center or industrial park from which the consultant stands to benefit. If a consulting firm is aware that it has such an interest in the decision on the proposal, it should be disqualified from preparing the EIS, to preserve the objectivity and integrity of the NEPA process.

When a consulting firm has been involved in developing initial data and plans for the project, but does not have any financial or other interest in the outcome of the decision, it need not be disqualified from preparing the EIS. However, a disclosure statement in the draft EIS should clearly state the scope and extent of the firm's prior involvement to expose any potential conflicts of interest that may exist.

17b. If the firm in fact has no promise of future work or other interest in the outcome of the proposal, may the firm later bid in competition with others for future work on the project if the proposed action is approved?

A. Yes.

18. Uncertainties About Indirect Effects of A Proposal. How should uncertainties about indirect effects of a proposal be addressed, for example, in cases of disposal of federal lands, when the identity or plans of future landowners is unknown?

A. The EIS must identify all the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are "reasonably foreseeable." Section 1508.8(b). In the example, if there is total uncertainty about the identity of future land owners or the nature of future land uses, then of course, the agency is not required to engage in speculation or contemplation about their future plans. But, in the ordinary course of business, people do make judgments based upon reasonably foreseeable occurrences. It will often be possible to consider the likely purchasers and the development trends in that area or similar areas in recent years; or the likelihood that the land will be used for an energy project, shopping center, subdivision, farm or factory. The agency has the responsibility to make an informed judgment, and to estimate future impacts on that basis, especially if trends are ascertainable or potential purchasers have made themselves known. The agency cannot ignore these uncertain, but probable, effects of its decisions.

19a. Mitigation Measures. What is the scope of mitigation measures that must be discussed?

A. The mitigation measures discussed in an EIS must cover the range of impacts of the proposal. The measures must include such things as design alternatives that would decrease pollution emissions, construction impacts, esthetic intrusion, as well as relocation assistance, possible land use controls that could be enacted, and other possible efforts. Mitigation measures must be considered even for impacts that by themselves would not be considered "significant." Once the proposal itself is considered as a whole to have significant effects, all of its specific effects on the environment (whether or not "significant") must be considered, and mitigation measures must be developed where it is feasible to do so. Sections 1502.14(f), 1502.16(h), 1508.14.

19b. How should an EIS treat the subject of available mitigation measures that are (1) outside the jurisdiction of the lead or cooperating agencies, or (2) unlikely to be adopted or enforced by the responsible agency?

A. All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed as part of the RODs of these agencies. Sections 1502.16(h), 1505.2(c). This will serve to [46 FR 18032] alert agencies or officials who can implement these extra measures, and will encourage them to do so. Because the EIS is the most comprehensive environmental document, it is an ideal vehicle in which to lay out not only the full range of environmental impacts but also the full spectrum of appropriate mitigation.

However, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed. Thus the EIS and the Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies. Sections 1502.16(h), 1505.2. If there is a history of nonenforcement or opposition to such measures, the EIS and Record of Decision should acknowledge such opposition or nonenforcement. If the necessary mitigation measures will not be ready for a long period of time, this fact, of course, should also be recognized.

21. Combining Environmental and Planning Documents. Where an EIS or an EA is combined with another project planning document (sometimes called "piggybacking"), to what degree may the EIS or EA refer to and rely upon information in the project document to satisfy NEPA's requirements?

A. Section 1502.25 of the regulations requires that draft EISs be prepared concurrently and integrated with environmental analyses and related surveys and studies required by other federal statutes. In addition, Section 1506.4 allows any environmental document prepared in compliance with NEPA to be combined with any other agency document to reduce duplication and paperwork. However, these provisions were not intended to authorize the preparation of a short summary or outline EIS, attached to a detailed project report or land use plan containing the required environmental impact data. In such circumstances, the reader would have to refer constantly to the detailed report to understand the environmental impacts and alternatives which should have been found in the EIS itself.

The EIS must stand on its own as an analytical document which fully informs decisionmakers and the public of the environmental effects of the proposal and those of the reasonable alternatives. Section 1502.1. But, as long as the EIS is clearly identified and is self-supporting, it can be physically included in or attached to the project report or land use plan, and may use attached report material as technical backup.

Forest Service environmental impact statements for forest management plans are handled in this manner. The EIS identifies the agency's preferred alternative, which is developed in detail as the proposed management plan. The detailed proposed plan accompanies the EIS through the review process, and the documents are appropriately cross-referenced. The proposed plan is useful for EIS readers as an example, to show how one choice of management options translates into effects on natural resources. This procedure permits initiation of the 90-day public review of proposed forest plans, which is required by the National Forest Management Act.

All the alternatives are discussed in the EIS, which can be read as an independent document. The details of the management plan are not repeated in the EIS, and vice versa. This is a reasonable functional separation of the documents: the EIS contains information relevant to the choice among alternatives; the plan is a detailed description of proposed management activities suitable for use by the land managers. This procedure provides for concurrent compliance with the public review requirements of both NEPA and the National Forest Management Act.

Under some circumstances, a project report or management plan may be totally merged with the EIS, and the one document labeled as both "EIS" and "management plan" or "project report." This may be reasonable where the documents are short, or where the EIS format and the regulations for clear, analytical EISs also satisfy the requirements for a project report.

22. State and Federal Agencies as Joint Lead Agencies. May state and federal agencies serve as joint lead agencies? If so, how do they resolve law, policy and resource conflicts under NEPA and the relevant state environmental policy act? How do they resolve differences in perspective where, for example, national and local needs may differ?

A. Under Section 1501.5(b), federal, state or local agencies, as long as they include at least one federal agency, may act as joint lead agencies to prepare an EIS. Section 1506.2 also strongly urges state and local agencies and the relevant federal agencies to cooperate fully with each other. This should cover joint research and studies, planning activities, public hearings, environmental assessments and the preparation of joint EISs under NEPA and the relevant "little NEPA" state laws, so that one document will satisfy both laws.

The regulations also recognize that certain inconsistencies may exist between the proposed federal action and any approved state or local plan or law. The joint document should discuss the extent to which the federal agency would reconcile its proposed action with such plan or law. Section 1506.2(d). (See Question 23).

Because there may be differences in perspective as well as conflicts among [46 FR 18033] federal, state and local goals for resources management, the Council has advised participating agencies to adopt a flexible, cooperative approach. The joint EIS should reflect all of their interests and missions, clearly identified as such. The final document would then indicate how state and local interests have been accommodated, or would identify conflicts in goals (e.g., how a hydroelectric project, which might induce second home development, would require new land use controls). The EIS must contain a complete discussion of scope and purpose of the proposal, alternatives, and impacts so that the discussion is adequate to meet the needs of local, state and federal decisionmakers.

23a. Conflicts of Federal Proposal With Land Use Plans, Policies or Controls. How should an agency handle potential conflicts between a proposal and the objectives of Federal, state or local land use plans, policies and controls for the area concerned? See Sec. 1502.16(c).

A. The agency should first inquire of other agencies whether there are any potential conflicts. If there would be immediate conflicts, or if conflicts could arise in the future when the plans are finished (see Question 23(b) below), the EIS must acknowledge and describe the extent of those conflicts. If there are any possibilities of resolving the conflicts, these should be explained as well. The EIS should also evaluate the seriousness of the impact of the proposal on the land use plans and policies, and whether, or how much, the proposal will impair the effectiveness of land use control mechanisms for the area. Comments from officials of the affected area should be solicited early and should be carefully acknowledged and answered in the EIS.

23b. What constitutes a "land use plan or policy" for purposes of this discussion?

A. The term "land use plans," includes all types of formally adopted documents for land use planning, zoning and related regulatory requirements. Local general plans are included, even though they are subject to future change. Proposed plans should also be addressed if they have been formally proposed by the appropriate government body in a written form, and are being actively pursued by officials of the jurisdiction. Staged plans, which must go through phases of development such as the Water Resources Council's Level A, B and C planning process should also be included even though they are incomplete.

The term "policies" includes formally adopted statements of land use policy as embodied in laws or regulations. It also includes proposals for action such as the initiation of a planning process, or a formally adopted policy statement of the local, regional or state executive branch, even if it has not yet been formally adopted by the local, regional or state legislative body.

23c. What options are available for the decisionmaker when conflicts with such plans or policies are identified?

A. After identifying any potential land use conflicts, the decisionmaker must weigh the significance of the conflicts, among all the other environmental and non-environmental factors that must be considered in reaching a rational and balanced decision. Unless precluded by other law from causing or contributing to any inconsistency with the land use plans, policies or controls, the decisionmaker retains the authority to go forward with the proposal, despite the potential conflict. In the Record of Decision, the decisionmaker must explain what the decision was, how it was made, and what mitigation measures are being imposed to lessen adverse environmental impacts of the proposal, among the other requirements of Section 1505.2. This provision would require the decisionmaker to explain any decision to override land use plans, policies or controls for the area.

24a. Environmental Impact Statements on Policies, Plans or Programs. When are EISs required on policies, plans or programs?

A. An EIS must be prepared if an agency proposes to implement a specific policy, to adopt a plan for a group of related actions, or to implement a specific statutory program or executive directive. Section 1508.18. In addition, the adoption of official policy in the form of rules, regulations and interpretations pursuant to the Administrative Procedure Act, treaties, conventions, or other formal documents establishing governmental or agency policy which will substantially alter agency programs, could require an EIS. Section 1508.18. In all cases, the policy, plan, or program must have the potential for significantly affecting the quality of the human environment in order to require an EIS. It should be noted that a proposal "may exist in fact as well as by agency declaration that one exists." Section 1508.23.

24b. When is an area-wide or overview EIS appropriate?

A. The preparation of an area-wide or overview EIS may be particularly useful when similar actions, viewed with other reasonably foreseeable or proposed agency actions, share common timing or geography. For example, when a variety of energy projects may be located in a single watershed, or when a series of new energy technologies may be developed through federal funding, the overview or area-wide EIS would serve as a valuable and necessary analysis of the affected environment and the potential cumulative impacts of the reasonably foreseeable actions under that program or within that geographical area.

24c. What is the functian of tiering in such cases?

A. Tiering is a procedure which allows an agency to avoid duplicatian of paperwork through the incorporation by reference of the general discussions and relevant specific discussions from an environmental impact statement of broader scope into one of lesser scape or vice versa. In the example given in Question 24b, this would mean that an overview EIS would be prepared for all of the energy activities reasonably foreseeable in a particular geographic area or resulting from a particular development program. This impact statement would be followed by site-specific or project-specific EISs. The tiering process would make each EIS of greater use and meaning to the public as the plan or program develops, without duplication of the analysis prepared for the previous impact statement.

25a. Appendices and Incorporation by Referenca. When is it appropriate to use appendices instead of including information in the body of an EIS?

A. The body of the EIS should be a succinct statement of all the information on environmental impacts and alternatives that the decisionmaker and the public need, in order to make the decision and to ascertain that every significant factor has been examined. The EIS must explain or summarize methodologies of research and modeling, and the results of research that may have been conducted to analyze impacts and alternatives.

Lengthy technical discussions of modeling methodology, baseline studies, or other work are best reserved for the appendix. In other words, if only technically trained individuals are likely to understand a particular discussion then it should go in the appendix, and a plain language summary of the analysis and conclusions of that technical discussion should go in the text of the EIS.

The final statement must also contain the agency's responses to comments on the draft EIS. These responses will be primarily in the form of changes in the document itself, but specific answers to each significant comment should also be included. These specific responses may be placed in an appendix. If the comments are especially voluminous, summaries of the comments and responses will suffice. (See Question 29 regarding the level of detail required for responses to comments.)

25b. How does an appendix differ from incorporation by reference?

A. First, if at all possible, the appendix accompanies the EIS, whereas the material which is incorporated by reference does not accompany the EIS. Thus the appendix should contain information that reviewers will be likely to want to examine. The appendix should include material that pertains to preparation of a particular EIS. Research papers directly relevant to the proposal, lists of affected species, discussion of the methodology of models used in the analysis of impacts, extremely detailed responses to comments, or other information, would be placed in the appendix.

The appendix must be complete and available at the time the EIS is filed. Five copies of the appendix must be sent to EPA with five copies of the EIS for filing. If the appendix is too bulky to be circulated, it instead must be placed in conveniently accessible locations or furnished directly to commentors upon request. If it is not circulated with the EIS, the Notice of Availability published by EPA must so state, giving a telephone number to enable potential commentors to locate or request copies of the appendix promptly.

Material that is not directly related to preparation of the EIS should be incorporated by reference. This would include other EISs, research papers in the general literature, technical background papers or other material that someone with technical training could use to evaluate the analysis of the proposal. These must be made available, either by citing the literature, furnishing copies to central locations, or sending copies directly to commentors upon request.

Care must be taken in all cases to ensure that material incorporated by reference, and the occasional appendix that does not accompany the EIS, are in fact available for the full minimum public comment period.

26a. Index and Keyword Index in EISs. How detailed must an EIS index be?

A. The EIS index should have a level of detail sufficient to focus on areas of the EIS of reasonable interest to any reader. It cannot be restricted to the most important topics. On the other hand, it need not identify every conceivable term or phrase in the EIS. If an agency believes that the reader is reasonably likely to be interested in a topic, it should be included.

26b. Is a keyword index required?

A. No. A keyword index is a relatively short list of descriptive terms that identifies the key concepts or subject areas in a document. For example it could consist of 20 terms which describe the most significant aspects of an EIS that a future researcher would need: type of proposal, type of impacts, type of environment, geographical area, sampling or

modeling methodologies used. This technique permits the compilation of EIS data banks, by facilitating quick and inexpensive access to stored materials. While a keyword index is not required by the regulations, it could be a useful addition for several reasons. First, it can be useful as a quick index for reviewers of the EIS, helping to focus on areas of interest. Second, if an agency keeps a listing of the keyword indexes of the EISs it produces, the EIS preparers themselves will have quick access to similar research data and methodologies to aid their future EIS work. Third, a keyword index will be needed to make an EIS available to future researchers using EIS data banks that are being developed. Preparation of such an index now when the document is produced will save a later effort when the data banks become operational.

27a. List of Preparers. If a consultant is used in preparing an EIS, must the list of preparers identify members of the consulting firm as well as the agency NEPA staff who were primarily responsible?

A. Section 1502.17 requires identification of the names and qualifications of persons who were primarily responsible for preparing the EIS or significant background papers, including basic components of the statement. This means that members of a consulting firm preparing material that is to become part of the EIS must be identified. The EIS should identify these individuals even though the consultant's contribution may have been modified by the agency.

27b. Should agency staff involved in reviewing and editing the EIS also be included in the list of preparers?

A. Agency personnel who wrote basic components of the EIS or significant background papers must, of course, be identified. The EIS should also list the technical editors who reviewed or edited the statements.

27c. How much information should be included on each person listed?

A. The list of preparers should normally not exceed two pages. Therefore, agencies must determine which individuals had primary responsibility and need not identify individuals with minor involvement. The list of preparers should include a very brief identification of the individuals involved, their qualifications (expertise, professional disciplines) and the specific portion of the EIS for which they are responsible. This may be done in tabular form to cut down on length. A line or two for each person's qualifications should be sufficient.

28. Advance or Xerox Copies of EIS. May an agency file xerox copies of an EIS with EPA pending the completion of printing the document?

A. Xerox copies of an EIS may be filed with EPA prior to printing only if the xerox copies are simultaneously made available to other agencies and the public. Section 1506.9 of the regulations, which governs EIS filing, specifically requires Federal agencies to file EISs with EPA no earlier than the EIS is distributed to the public. However, this section does not prohibit xeroxing as a form of reproduction and distribution. When an agency chooses xeroxing as the reproduction method, the EIS must be clear and legible to permit ease of reading and ultimate microfiching of the EIS. Where color graphs are important to the EIS, they should be reproduced and circulated with the xeroxed copy.

29a. Responses to Comments. What response must an agency provide to a comment on a draft EIS which states that the EIS's methodology is inadequate or inadequately explained? For example, what level of detail must an agency include in its response to a simple postcard comment making such an allegation?

A. Appropriate responses to comments are described in Section 1503.4. Normally the responses should result in changes in the text of the EIS, not simply a separate answer at the back of the document. But, in addition, the agency must state what its responsa was, and if the agency decides that no substantive response to a comment is necessary, it must explain briefly why.

An agency is not under an obligation to issue a lengthy reiteration of its methodology for any portion of an EIS if the only comment addressing the methodology is a simple complaint that the EIS methodology is inadequate. But agencies must respond to comments, however brief, which are specific in their criticism of agency methodology. For example, if a commentor on an EIS said that an agency's air quality dispersion analysis or methodology was inadequate, and the agency had included a discussion of that analysis in the EIS, little if anything need be added in response to such a comment. However, if the commentor said that the dispersion analysis was inadequate because of its use of a certain computational technique, or that a dispersion analysis was inadequately explained because computational techniques were not included or referenced, then the agency would have to respond in a substantive and meaningful way to such a comment.

If a number of comments are identical or very similar, agencies may group the comments and prepare a single answer for each group. Comments may be summarized if they are especially voluminous. The comments or summaries must be attached to the EIS regardless of whether the agency believes they merit individual discussion in the body of the final EIS.

29b. How must an agency respond to a comment on a draft EIS that raises a new alternative not previously considered in the draft EIS?

A. This question might arise in several possible situations. First, a commentor on a draft EIS may indicate that there is a possible alternative which, in the agency's view, is not a reasonable alternative. Section 1502.14(a). If that is the case, the agency must explain why the comment does not warrant further agency response, citing authorities or reasons that support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response. Section 1503.4(a). For example, a commentor on a draft EIS on a coal fired power plant may suggest the alternative of using synthetic fuel. The agency may reject the alternative with a brief discussion (with authorities) of the unavailability of synthetic fuel within the time frame necessary to meet the need and purpose of the proposed facility.

A second possibility is that an agency may receive a comment indicating that a particular alternative, while reasonable, should be modified somewhat, for example, to achieve certain mitigation benefits, or for other reasons. If the modification is reasonable, the agency should include a discussion of it in the final EIS. For example, a commentor on a draft EIS on a proposal for a pumped storage power facility might suggest that the applicant's proposed alternative should be enhanced by the addition of certain reasonable mitigation measures, including the purchase and setaside of a wildlife preserve to substitute for the tract to be destroyed by the project. The modified alternative including the additional mitigation measures should be discussed by the agency in the final EIS.

A third slightly different possibility is that a comment on a draft EIS will raise an alternative which is a minor variation of one of the alternatives discussed in the draft EIS, but this variation was not given any consideration by the agency. In such a cese, the agency should develop and evaluate the new alternative, if it is reasonable, in the final EIS. If it is qualitatively within the spectrum of alternatives that were discussed in the draft, a supplemental draft will not be needed. For example, a commentor on a draft EIS to designate a wilderness area within a National Forest might reasonably identify a specific tract of the forest, and urge that it be considered for designation. If the draft EIS considered designation of a range of alternative tracts which encompassed forest area of similar quality and quantity, no supplemental EIS would have to be prepared. The agency could fulfill its obligation by addressing that specific alternative in the final EIS.

As another example, an EIS on an urban housing project may analyze the alternatives of constructing 2,000, 4,000, or 6,000 units. A commentor on the draft EIS might urge the consideration of constructing 5,000 units utilizing a different configuration of buildings. This alternative is within the spectrum of alternatives already considered, and, therefore, could be addressed in the final EIS.

A fourth possibility is that a commentor points out an alternative which is not a variation of the proposal or of any alternative discussed in the draft impact statement, and is a reasonable alternative that warrants serious agency response. In such a case, the agency must issua a supplement to the draft EIS that discusses this new alternative. For example, a commentor on a draft EIS on a nuclear power plant might suggest that a reasonable alternative for meeting the projected need for power would be through peak load management and energy conservation programs. If the permitting agency has failed to consider that approach in the Draft EIS, and the approach cannot be dismissed by tha agency es unreasonable, a supplement to the Draft EIS, which discusses that alternative, must be prepared. (If necessary, the same supplement should also discuss substantial changes in the proposed action or significant new circumstances or information, as required by Section 1502.9(c)(1) of the Council's regulations.)

If the new alternative was not raised by the commentor during scoping, but could have been, commentors may find that they are unpersuasive in their efforts to have their suggested alternative analyzed in detail by the agency. However, if the new alternative is discovered or developed later, and it could not reasonably have been reised during the scoping process, then the agency must address it in a supplemental draft EIS. The agency is, in any case, ultimately responsible for preparing an adequate EIS that considers all alternatives.

30. Adoption of EISs. When a cooperating agency with jurisdiction by law intends to adopt a lead agency's EIS and it is not satisfied with the adequacy of the document, may the cooperating agency adopt only the part of the EIS with which it is satisfied? If so, would a cooperating agency with jurisdiction by law have to prepare a separate EIS or EIS supplement covering the areas of disagreement with the lead agency?

A. Generally, a cooperating agency may adopt a lead agency's EIS without recirculating it if it concludes that its NEPA requirements and its comments and suggestions have been satisfied. Section 1506.3(a), (c). If necessary, a cooperating agency may adopt only a portion of the lead agency's EIS and may reject that part of the EIS with which it disagrees, stating publicly why it did so. Section 1506.3(a).

A cooperating agency with jurisdiction by law (e.g., an agency with independent legal responsibilities with respect to the proposal) has an independent legal obligation to comply with NEPA. Therefore, if the cooperating agency determines that the EIS is wrong or inadequate, it must prepare a supplement to the EIS, replacing or adding any needed information, and must circulate the supplement as a draft for public and agency review and comment. A final supplemental EIS would be required before the agency could take action. The adopted portions of the lead agency EIS should be circulated with the supplement. Section 1506.3(b). A cooperating agency with jurisdiction by law will have to prepare its own Record of Decision for its action, in which it must explain how it reached its conclusions. Each agency should explain how and why its conclusions differ, if that is the case, from those of other agencies which issued their Records of Decision earlier.

An agency that did not cooperate in preparation of an EIS may also adopt an EIS or portion thereof. But this would arise only in rare instances, because an agency adopting an EIS for use in its own decision normally would have been a cooperating agency. If the proposed action for which the EIS was prepared is substantially the same es the proposed action of the adopting agency, the EIS may be adopted as long es it is recirculated as a final EIS and the agency announces what it is doing. This would be followed by the 30-day review period and issuance of a Record of Decision by the adopting agency. If the proposed action by the adopting agency is not substantially the same as that in [46 FR 18036] the EIS (i.e., if an EIS on one action is being adapted for use in a decision on another action), the

EIS would be treated as a draft and circulated for the normal public comment period and other procedures. Section 1506.3(b).

31a. Application of Regulations to Independent Regulatory Agencies. Do the Council's NEPA regulations apply to independent regulatory agencies like the Federal Energy Regulatory Commission (FERC) and the Nuclear Regulatory Commission?

A. The statutory requirements of NEPA's Section 102 apply to "all agencies of the federal government." The NEPA regulations implement the procedural provisions of NEPA as set forth in NEPA's Section 102(2) for all agencies of the federal government. The NEPA regulations apply to independent regulatory agencies, however, they do not direct independent regulatory agencies or other agencies to make decisions in any particular way or in a way inconsistent with an agency's statutory charter. Sections 1500.3, 1500.6, 1507.1, and 1507.3.

31b. Can an Executive Branch agency like the Department of the Interior adopt an EIS prepared by an independent regulatory agency such as FERC?

A. If an independent regulatory agency such as FERC has prepared an EIS in connection with its approval of a proposed project, an Executive Branch agency (e.g., the Bureau of Land Management in the Department of the Interior) may, in accordance with Section 1506.3, adopt the EIS or a portion thereof for its use in considering the same proposal. In such a case the EIS must, to the satisfaction of the adopting agency, meet the standards for an adequate statement under the NEPA regulations (including scope and quality of analysis of alternatives) and must satisfy the adopting agency's comments and suggestions. If the independent regulatory agency fails to comply with the NEPA regulations, the cooperating or adopting agency may find that it is unable to adopt the EIS, thus forcing the preparation of a new EIS or EIS Supplement for the same action. The NEPA regulations were made applicable to all federal agencies in order to avoid this result, and to achieve uniform application and efficiency of the NEPA process.

32. Supplements to Old EISs. Under what circumstances do old EISs have to be supplemented before taking action on a proposal?

A. As a rule of thumb, if the proposal has not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in Section 1502.9 compel preparation of an EIS supplement.

If an agency has made a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, a supplemental EIS must be prepared for an old EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal. Section 1502.9(c).

33a. Referrals. When must a referral of an interagency disagreement be made to the Council?

A. The Council's referral procedure is a pre-decision referral process for interagency disagreements. Hence, Section 1504.3 requires that a referring agency must deliver its referral to the Council not later than 25 days after publication by EPA of notice that the final EIS is available (unless the lead agency grants an extension of time under Section 1504.3(b)).

33b. May a referral be made after this issuance of a Record of Decision?

A. No, except for cases where agencies provide an internal appeal procedure which permits simultaneous filing of the final EIS and the record of decision (ROD). Section 1506.10(b)(2). Otherwise, as stated above, the process is a pre-decision referral process. Referrals must be made within 25 days after the notice of availability of the final EIS, whereas the final decision (ROD) may not be made or filed until after 30 days from the notice of availability of the EIS. Sections 1504.3(b), 1506.10(b). If a lead agency has granted an extension of time for another egency to take action on a referral, the ROD may not be issued until the extension has expired.

34a. Records of Decision. Must Records of Dacision (RODs) be made public? How should they be made available?

A. Under the regulations, agencies must prepare a "concise public record of decision," which contains the elements specified in Section 1505.2. This public record may be integrated into any other decision record prepared by the agency, or it may be separate if decision documents are not normally made public. The Record of Decision is intended by the Council to be an environmental document (even though it is not explicitly mentioned in the definition of "environmental document" in Section 1508.10). Therefore, it must be made available to the public through appropriate public notice as required by Section 1506.6(b). However, there is no specific requirement for publication of the ROD itself, either in the Federal Register or elsewhere.

34b. May the summary section in the final Environmental Impact Statement substitute for or constitute an agency's Record of Decision?

A. No. An environmental impact statement is supposed to inform the decisionmaker before the decision is made. Sections 1502.1, 1505.2. The Council's regulations provide for a 30-day period after notice is published that the final EIS has been filed with EPA before the agency may take final action. During that period, in addition to the agency's own internal final review, the public and other agencies can comment on the final EIS prior to the agency's final action on the proposal. In addition, the Council's regulations make clear that the requirements for the summary in an EIS are not the same as the requirements for a ROD. Sections 1502.12 and 1505.2.

34c. What provisions should Records of Decision contain pertaining to mitigation and monitoring?

A. Lead agencies "shall include appropriate conditions [including mitigation measures and monitoring and enforcement programs] in grants, permits or other approvals" and shall "condition funding of actions on mitigation." Section 1505.3. Any such measures that are adopted must be explained and committed in the ROD.

The reasonable alternative mitigation measures and monitoring programs should have been addressed in the draft and final EIS. The discussion of mitigation and monitoring in a Record of Decision must be more detailed than a general statement that mitigation is being required, but not so detailed as to duplicate discussion of mitigation in the EIS. The Record of Decision should contain a concise summary identification of the mitigation measures which the agency has committed itself to adopt.

The Record of Decision must also state whether all practicable mitigation measures have been adopted, and if not, why not. Section 1505.2(c). The Record of Decision must identify the mitigation measures and monitoring and enforcement programs that have been selected and plainly indicate that they are adopted as part of the egency's decision. If the proposed action is the issuance of a permit or other approval, tha specific details of the mitigatian measures shall then be included as appropriate conditions in whatever grants, permits, funding or other approvals are being made by the federal agency. Section 1505.3 (a), (b). If the proposal is to be carried out by the [46 FR 18037] federal agency itself, the Record of Decision should delineate the mitigation and monitoring measures in sufficient detail to constitute an enforceable commitment, or incorporete by referenca the portions of the EIS that do so.

34d. What is the enforceability of a Record of Decision?

A. Pursuant to generally recognized principles of federal administrative law, agencies will be held accountable for preparing Records of Decision that conform to the decisions actually made and for carrying out the actions set forth in the Records of Decision. This is based on the principle that an agency must comply with its own decisions and regulations once they are adopted. Thus, the terms of a Record of Decision are enforceable by agencies and private parties. A Record of Decision can be used to compel compliance with or execution of the mitigation measures identified therein.

35. Time Required for the NEPA Process. How long should the NEPA process take to complete?

A. When an EIS is required, the process obviously will take longer than when an EA is the only document prepared. But the Council's NEPA regulations encourage streamlined review, adoption of deadlines, elimination of duplicative work, eliciting suggested alternatives and other comments early through scoping, cooperation among agencies, and consultation with applicants during project planning. The Council has advised agencies that under the new NEPA regulations even large complex energy projects would require only about 12 months for the completion of the entire EIS process. For most major actions, this period is well within the planning time that is needed in any event, apart from NEPA.

The time required for the preparation of program EISs may be greater. The Council also recognizes that some projects will entail difficult long-term planning and/or the acquisition of certain data which of necessity will require more time for the preparation of the EIS. Indeed, some proposals should be given more time for the thoughtful preparation of an EIS and development of a decision which fulfills NEPA's substantive goals.

For cases in which only an environmental assessment will be prepared, the NEPA process should take no more than 3 months, and in many cases substantially less, as part of the normal analysis and approval process for the action.

36a. Environmental Assessments (EA). How long and detailed must an environmental assessment (EA) be?

A. The environmental assessment is a concise public document which has three defined functions. (1) It briefly provides sufficient evidence and analysis for determining whether to prepare an EIS; (2) it aids an agency's compliance with NEPA when no EIS is necessary, i.e., it helps to identify better alternatives and mitigation measures; and (3) it facilitates preparation of an EIS when one is necessary. Section 1508.9(a).

Since the EA is a concise document, it should not contain long descriptions or detailed data which the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. Section 1508.9(b).

While the regulations do not contain page limits for EA's, the Council has generally advised agencies to keep the length of EAs to not more than approximately 10-15 pages. Some agencies expressly provide page guidelines (e.g., 10-15 pages in the case of the Army Corps). To avoid undue length, the EA may incorporate by reference background data to support its concise discussion of the proposal and relevant issues.

36b. Under what circumstances is a lengthy EA appropriate?

A. Agencies should avoid preparing lengthy EAs except in unusual cases, where a proposal is so complex that a concise document cannot meet the goals of Section 1508.9 and where it is extremely difficult to determine whether

the proposal could have significant environmental effects. In most cases, however, a lengthy EA indicates that an EIS is needed.

37a. Findings of No Significant Impact (FONSI). What is the level of detail of information that must be included in a finding of no significant impact (FONSI)?

A. The FONSI is a document in which the agency briefly explains the reasons why an action will not have a significant affect on the human environment and, therefore, why an EIS will not be prepared. Section 1508.13. The finding itself need not be detailed, but must succinctly state the reasons for deciding that the action will have no significant environmental effects, and, if relevant, must show which factors were weighted most heavily in the determination. In addition to this statement, the FONSI must include, summarize, or attach and incorporate by reference, the environmental assessment.

37b. What are the criteria for deciding whether a FONSI should be made available for public review for 30 days before the agency's final determination whether to prepare an EIS?

A. Public review is necessary, for example, (a) if the proposal is a borderline case, i.e., when there is a reasonable argument for preparation of an EIS; (b) if it is an unusual case, a new kind of action, or a precedent setting case such as a first intrusion of even a minor development into a pristine area; (c) when there is either scientific or public controversy over the proposal; or (d) when it involves a proposal which is or is closely similar to one which normally requires preparation of an EIS. Sections 1501.4(e)(2), 1508.27. Agencies also must allow a period of public review of the FONSI if the proposed action would be located in a floodplain or wetland. E.O. 11988, Sec. 2(a)(4); E.O. 11990, Sec. 2(b).

38. Public Availability of EAs v. FONSIs. Must (EAs) and FONSIs be made public? If so, how should this be done?

A. Yes, they must be available to the public. Section 1506.6 requires agencies to involve the public in implementing their NEPA procedures, and this includes public involvement in the preparation of EAs and FONSIs. These are public "environmental documents" under Section 1506.6(b), and, therefore, agencies must give public notice of their availability. A combination of methods may be used to give notice, and the methods should be tailored to the needs of particular cases. Thus, a Federal Register notice of availability of the documents, coupled with notices in national publications and mailed to interested national groups might be appropriate for proposals that are national in scope. Local newspaper notices may be more appropriate for regional or site-specific proposals.

The objective, however, is to notify all interested or affected parties. If this is not being achieved, then the methods should be reevaluated and changed. Repeated failure to reach the interested or affected public would be interpreted as a violation of the regulations.

39. Mitigation Measures Imposed in EAs and FONSIs. Can an EA and FONSI be used to impose enforceable mitigation measures, monitoring programs, or other requirements, even though there is no requirement in the regulations in such cases for a formal Record of Decision?

A. Yes. In cases where an environmental assessment is the appropriate environmental document, there still may be mitigation measures or alternatives that would be desirable to consider and adopt even though the impacts of the proposal will not be "significant." In such cases, the EA should include a discussion of these measures or alternatives to "assist [46 FR 18038] agency planning and decisionmaking" and to "aid an agency's compliance with [NEPA] when no environmental impact statement is necessary." Section 1501.3(b), 1508.9(a)(2). The appropriate mitigation measures can be imposed as enforceable permit conditions, or adopted as part of the agency final decision in the same manner mitigation measures are adopted in the formal Record of Decision that is required in EIS cases.

40. Propriety of Issuing EA When Mitigation Reduces Impacts. If an environmental assessment indicates that the environmental effects of a proposal are significant but that, with mitigation, those effects may be reduced to less than significant levels, may the agency make a finding of no significant impact rather than prepare an EIS? Is that a legitimate function of an EA and scoping?

[N.B.: Courts have disagreed with CEQ's position in Question 40. The 1987-88 CEQ Annual Report stated that CEQ intended to issue additional guidance on this topic. Ed. note.]

A. Mitigation measures may be relied upon to make a finding of no significant impact only if they are imposed by statute or regulation, or submitted by an applicant or agency as part of the original proposal. As a general rule, the regulations contemplate that agencies should use a broad approach in defining significance and should not rely on the possibility of mitigation as an excuse to avoid the EIS requirement. Sections 1508.8, 1508.27.

If a proposal appears to have adverse effects which would be significant, and certain mitigation measures are then developed during the scoping or EA stages, the existence of such possible mitigation does not obviate the need for an EIS. Therefore, if scoping or the EA identifies certain mitigation possibilities without altering the nature of the overall proposal itself, the agency should continue the EIS process and submit the proposal, and the potential mitigation, for public and agency review and comment. This is essential to ensure that the final decision is based on all the relevant factors and that the full NEPA process will result in enforceable mitigation measures through the Record of Decision.

In some instances, where the proposal itself so integrates mitigation from the beginning that it is impossible to define the proposal without including the mitigation, the agency may then rely on the mitigation measures in determining that the overall effects would not be significant (e.g., where an application for a permit for a small hydro dam is based on a binding commitment to build fish ladders, to permit adequate down stream flow, and to replace any lost wetlands, wildlife habitat and recreational potential). In those instances, agencies should make the FONSI and EA available for 30 days of public comment before taking action. Section 1501.4(e)(2).

Similarly, scoping may result in a redefinition of the entire project, as a result of mitigation proposals. In that case, the agency may alter its previous decision to do an EIS, as long as the agency or applicant resubmits the entire proposal and the EA and FONSI are available for 30 days of review and comment. One example of this would be where the size and location of a proposed industrial park are changed to avoid affecting a nearby wetland area.

3.2 The Major Investment Study (MIS)

The following is paraphrased from the Washington State Department of Transportation (WSDOT) Major Investment Study (MIS) Guidelines. September 1996 found at www.wsdot.wa.gov/ppsc/planning/mis.htm

The Federal Highway Administration and Federal Transit Administration developed guidance based on ISTEA which included the requirements for Major Investment Studies (MIS) for Metropolitan Planning guidance. Major Investment Studies are tools to aid the decision making process by providing more complete information on the options for addressing transportation problems. Major Investment Studies can help to level the playing field among modal alternatives by providing a single integrated analysis process that looks at all modes equally.

The Major Investment Study is a sub-element of the Metropolitan Transportation Planning (MTP) process. It focuses on corridor or subarea transportation demand and other problems that may lead to transit or highway investments that have a substantial capital investment and impact on the metropolitan transportation system.

Flexibility is the key to the Major Investment Study process. The goal is to produce the information necessary to make the best investment decision, while minimizing the funding resources needed to produce that information. The guidelines are deliberately generalized to avoid specific recommendations that would not be applicable to all types of studies.

The Major Investment Study process is tied to the development of environmental documentation, so a determination of when to begin Major Investment Study development should be made to coincide with the environmental process. The environmental process will use Major Investment Study analysis as an input if the Major Investment Study is started during the planning process. The Major Investment Study should be concluded before including a project in the TIP. Major investment studies are aimed at deficiencies that have the following characteristics: major demand problem; on a corridor or subarea level; require a substantial capital investment; and have significant impact on the metropolitan transportation system.

Major Investment Study are designed to develop alternatives which represent the full range of modal solutions; to evaluate alternatives; to determine what information is required; and to identify what technical methods should be used. The statement should be based on underlying causes and should not be mode specific. The problem statement should describe the problem itself, not symptoms of the problem. The steering committee determines goals and objectives after the problem statement is completed.

A Major Investment Study should consider all reasonable alternatives, including demand and system management options when appropriate. No alternative should be analyzed after it has been determined to be unfeasible. A Major Investment Study alternative should be a design concept for a transportation mode, operations element, or demand management strategy. The location, general alignment and termini should be identified. Each alternative should be distinguished from other alternatives based on its performance, benefits, cost, and/or impacts. All alternatives should be sufficiently distinctive that they are not confused with other alternatives.

There are different methods for analyzing modal alternatives. While there is no one correct methodology, certain methods work better in certain areas, and the precision needed may differ by problem and by region. The goal is to perform the minimum amount of analysis needed to identify the preferred alternative. When the method of analysis is unclear, it should be determined by a consensus of the Scoping Committee.

After completion of MIS analysis, the findings should be documented. The documentation usually occurs either in the project's environmental document or in a separate report document. There is no formal approval of a Major Investment Study findings. After the lead agency prepares the documentation, it should be distributed to all stakeholders. After an agreed upon and brief period for comment and acceptance of the preferred alternative by the Major Investment Study steering committee, the Major Investment Study will be considered final.

Two options exist within Major Investment Study development for environmental documentation such as environmental impact statements. Table 1 shows the two options. In Option One, the Major Investment Study is completed before the environmental documentetion. In Option Two, the Major Investment Study and environmental document are developed concurrently. The determination of which "option" to use is entirely dependent on what point in the project's life the Major Investment Study is started.

Requirements for analyzing alternatives to capacity expansion projects in the Congestion Management System (CMS) are similar to Major Investment Study requirements, however they are less rigorous. While a Congestion Management System requires some consideration of modal alternatives, a Major Investment Study will analyze alternatives on a specific project/corridor/subarea level, while the Congestion Management System will analyze on more of a system wide level. Some deficiencies that do not require an Major Investment Study will require alternatives analysis under the Congestion Management System. Any deficiency that undergoes a Major Investment Study will meet analysis requirements of the Congestion Management System.

How do Major Investment Studies relate to Least Cost Planning? Least Cost Planning requires that Regional Transportation Plans undergo alternatives analysis. Least cost planning, as defined in Washington State law, will analyze the entire regional plan. Like the Congestion Management System, least cost planning will apply to more of a system level, and will be less rigorous than an Major Investment Study.

3.3 Hawai'i Revised Statutes (HRS 343)

§343-1 Findings and purpose. The legislature finds that the quality of humanity's environment is critical to humanity's well being, that humanity's activities have broad and profound effects upon the interrelations of all components of the environment, and that an environmental review process will integrate the review of environmental concerns with existing planning processes of the State and counties and alert decision makers to significant environmental effects which may result from the implementation of certain actions. The legislature further finds that the process of reviewing environmental effects is desirable because environmental consciousness is enhanced, cooperation and coordination are encouraged, and public participation during the review process benefits all parties involved and society as a whole.

3.4 Hawai'i Administrative Rules (HAR 11-200)

§11-200-1 Purpose. Chapter 343, HRS, establishes a system of environmental review at the state and county levels which shall ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations. The purpose of this chapter is to provide agencies and persons with procedures, specifications of contents of environmental assessments and environmental impact statements, and criteria and definitions of statewide application.

"Cumulative impact" means the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

"Primary impact" or "primary effect" or "direct impact" or "direct effect" means effects which are caused by the action and occur at the same time and place.

"Secondary impact" or "secondary effect" or "indirect impact" or "indirect effect" means effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

§11-200-7 Multiple or phased applicant or agency actions. A group of actions proposed by an agency or an applicant shall be treated as a single action when:

(1) The component actions are phases or increments of a larger total undertaking;

(2) An individual project is a necessary precedent for a larger project;

(3) An individual project represents a commitment to a larger project; or

(4) The actions in question are essentially identical and a single statement will adequately address the impacts of each individual action and those of the group of actions as a whole.

§11-200-14 General provisions. Chapter 343, HRS, directs that in both agency and applicant actions where statements are required, the preparing party shall prepare the EIS, submit it for review and comments, and revise it, taking into account all critiques and responses. Consequently, the EIS process involves more than the preparation of a document; it involves the entire process of research, discussion, preparation of a statement, and review. The EIS process shall involve at a minimum: identifying environmental concerns, obtaining various relevant data, conducting necessary studies, receiving public and agency input, evaluating alternatives, and proposing measures for avoiding, minimizing, rectifying or reducing adverse impacts. An EIS is meaningless without the conscientious application of the EIS process as a whole, and shall not be merely a self-serving recitation of benefits and a rationalization of the proposed action. Agencies shall ensure that statements are prepared at the earliest opportunity in the planning and decision-making process. This shall assure an early open forum for discussion of adverse effects and available alternatives, and that the decision-makers will be enlightened to any environmental consequences of the proposed action. [Eff 12/6/85; am and comp AUG 31 1996] (Auth: HRS §343-5, 343-6) (Imp: HRS §343-6)

§11-200-16 Content requirements. The environmental impact statement shall contain an explanation of the environmental consequences of the proposed action. The contents shall fully declare the environmental implications of the proposed action and shall discuss all relevant and feasible consequences of the action. In order that the public can be fully informed and that the agency can make a sound decision based upon the full range of responsible opinion on environmental effects, a statement shall include responsible opposing views, if any, on significant environmental issues raised by the proposal. [Eff 12/6/85; am and comp AUG 31 1996] (Auth: HRS §343-5, 343-6) (Imp: HRS §343-2, 343-5, 343-6)

§11-200-17 Content requirements; draft environmental impact statement. ... (f) The draft EIS shall describe in a separate and distinct section alternatives which could attain the objectives of the action, regardless of cost, in sufficient detail to explain why they were rejected. The section shall include a rigorous exploration and objective evaluation of the environmental impacts of all such alternative actions. Particular attention shall be given to alternatives that might enhance environmental quality or avoid, reduce, or minimize some or all of the adverse environmental effects, costs, and risks. Examples of alternatives include:

(1) The alternative of no action;

(2) Alternatives requiring actions of a significantly different nature which would provide similar benefits with different environmental impacts;

(3) Alternatives related to different designs or details of the proposed actions which would present different environmental impacts;

(4) The alternative of postponing action pending further study; and,

(5) Alternative locations for the proposed project.

In each case, the analysis shall be sufficiently detailed to allow the comparative evaluation of the environmental benefits, costs, and risks of the proposed action and each reasonable alternative. For any agency actions, the discussion of alternatives shall include, where relevant, those alternatives not within the existing authority of the agency. ...

(I) The draft EIS shall include a statement of the probable impact of the proposed action on the environment, and impacts of the natural or human environment on the project, which shall include consideration of all phases of the action and consideration of all consequences on the environment; direct and indirect effects shall be included. The interrelationships and cumulative environmental impacts of the proposed action and other related projects shall be discussed in the draft EIS. It should be realized that several actions, in particular those that involve the construction of public facilities or structures (e.g., highways, airports, sewer systems, water resource projects, etc.) may well stimulate or induce secondary effects. These secondary effects may be equally important as, or more important than, primary effects, and shall be thoroughly discussed to fully describe the probable impact of the proposed action on the environment. The population and growth impacts of an action shall be estimated if expected to be significant, and an evaluation made of the effects of any possible change in population patterns or growth upon the resource base, including but not limited to land use, water, and public services, of the area in question. Also, if the proposed action constitutes a direct or indirect source of pollution as determined by any governmental agency, necessary data shall be incorporated into the EIS.

§11-200-19 Environmental impact statement style. In developing the EIS, preparers shall make every effort to convey the required information succinctly in a form easily understood, both by members of the public and by public decision-makers, giving attention to the substance of the information conveyed rather than to the particular form, or length, or detail of the statement. The scope of the statement may vary with the scope of the proposed action and its impact. Data and analyses in a statement shall be commensurate with the importance of the impact, and less important material may be summarized, consolidated, or simply referenced. Statements shall indicate at appropriate points in the text any underlying studies, reports, and other information obtained and considered in preparing the statement, including cost benefit analyses and reports required under other legal authorities. Care shall be taken to concentrate on important issues and to ensure that the statement remains an essentially self-contained document, capable of being understood by the reader without the need for undue cross-reference.

3.5 Federal Highway Administration (FHWA)/ Federal Transportation Administration (FTA)

Public Involvement in transportation investment decisionmaking is central. Transportation investment decisions have far-reaching effects. Public input is essential in adequately considering them. An effective public involvement process provides for an open exchange of information and ideas between the public and transportation decisionmakers. The overall objective of an area's public involvement process is that it be proactive, provide complete information, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement. It also provides mechanisms for the agency or agencies to solicit public comments and ideas, identify circumstances and impacts which may not have been known or anticipated by public agencies, and, by doing so, to build support among the public who are stakeholders in transportation investments which impact their communities.
A good indicator of an effective public involvement process is a well informed public which feels it has opportunities to contribute input into transportation decisionmaking processes through a broad array of involvement opportunities at all stages of decisionmaking. In contrast, an ineffective process is one that relies on one or two

public meetings or hearings to obtain input immediately prior to decisionmaking on developed draft plans and programs.

"Six useful key elements in planning for effective public involvement are:

(1) Clearly-defined purpose and objectives for initiating a public dialogue on transportation plans, programs, and projects,

(2) Identification of specifically who the affected public and other stakeholder groups are with respect to the plan(s), program(s), and project(s) under development,

(3) Identification of techniques for engaging the public in the process,

(4) Notification procedures which effectively target affected groups,

(5) Education and assistance techniques which result in an accurate and full public understanding of the transportation problem, potential solutions, and obstacles and opportunities within various solutions to the problem, and,

(6) Follow through by public agencies demonstrating that decisionmakers seriously considered public input." [2] What are some of the key considerations in planning for effective public involvement? *FHWA/FTA Questions and Answers on Public Involvement in Transportation Decisionmaking*

Technical Access "Under the ISTEA and related regulations, the public must have reasonable access to technical assumptions and specifications used in planning and emissions models. This includes access to input assumptions such as population projections, land use projections, fares, tolls, levels of service, the structure and specifications of travel demand and other evaluation tools. To the maximum extent possible, all technical information should be made available in formats which are easily accessible and understandable by the general public. *FHWA/FTA Questions and Answers on Public Involvement in Transportation Decisionmaking*

Chapter 4 Experiences of Other Communities

OMPO: "In Santa Clara, the light rail system really helped reduce traffic congestion by moving masses of people from residential areas to the work centers. In Portland, its fully integrated transportation system reduced traffic congestion, increased mobility, and lowered infrastructure costs. This integrated system even enabled them to convert a freeway into a park. Also, new land use laws helped them determine commuter packages. In both Santa Clara and Portland, transportation developments spurred retail and residential growth along transit lines and around transit malls. In Vancouver, ferries were incorporated as a transportation mode to move people from the residential areas to the downtown business areas. Retail malls developed around the ferry terminals." City and County of Honolulu Transportation Commissioner Paul Leong. OMPO Policy Committee ("OMPO-PC") Minutes. Tuesday, December 1, 1998, 10:30 a.m.

OMPO: "Councilmember Mansho noted that, for the financing of rail design and construction, Portland used local property taxes and a 0.6% payroll tax (like a sales tax on the operating expenses). The biggest difference discovered between Hawaii's initial attempt at acquiring rail and Portland's approach was that Portland's goals included planning livable communities and congestion management. All the statistics and data the Council has been receiving over the past years show that rail doesn't necessarily reduce all the congestion; it manages the congestion. Benefits of rail also include economic stimulus, land use planning, and urban growth boundary lines. These factors played a
Life of the Land

bigger role in our current discussions on rail and the future." OMPO-PC Minutes. Tuesday, December 1, 1998, 10:30 a.m.

SmartGrowth: "As anyone who reads the fiction in The New Yorker knows, American mostly live in banal places with the souls of shopping malls, affording nowhere to mingle except traffic jams, nowhere to walk except in the health club. But economic unsustainability may carry more weight. A conference on 'Alternatives to Sprawl' at the Brookings Institution this year was electrified by a report from the Bank of America endorsing the formerly elitist view that sprawl in California has created 'enormous social, environmental and economic costs, which until now have been hidden, ignored, or quietly borne by society ... Businesses suffer from higher costs, a loss in worker productivity, and underutilized investments in older communities.' 'You can't keep spreading out,' says Mike Burton, executive director of Portland, Ore.'s metropolitan government, Metro. 'The cost to make roads and sewers gets to the point where it doesn't work.'" Paved Paradise By Jerry Adler *www.smartgrowth.org/*

Chapter 5 Alternatives

5.1 A Super Enhanced Bus System Management (TSM) Alternative

Parsons Brinkerhoff Quade & Douglas proposed two versions of the TSM Alternative for the Orange County, California Major Investment Study. One increased existing buses by approximately 49% the other by approximately 116%.

Honolulu should evaluate two different expanded bus-only scenarios. The first would encourage a "balanced" approach relying on increased efficiency for both buses and cars. The second would "encourage" people to take buses. The second approach, the "Enhanced Bus System (EBS) would not decrease the current level of congestion. It would instead focus on developing a highly efficient bus system. People would then face two options: car congestion and bus efficiency. This would cause people to shift from cars to buses which would indirectly reduce congestion while sharply reducing air pollution, non-point-source-pollution (oil, metals) and make the city more "sustainable."

"Any successful transportation plan will make it easier and more pleasant to drive, not more difficult" Islandwide Mobility Concept Plan, page 2. This point rather succinctly summarizes all the proposed plans by the consultant. They are designed to increase the joy of driving. A super enhanced bus system is based on the opposite. By having congestion, people find the bus to be more desirable. At the same time, the super-availability of the bus and the variety of routes offered, would lead to widespread enjoyment of the bus.

2 An Enhanced Bus System is a reasonable and viable alternative (CEQ Q1a,b). The alternative is "practical' and "feasible from the technical and economic standpoint and using common sense" (CEQ Q2a). It is an environmental preferable alternative (CEQ 6a) since it would result in less vehicular air pollution and oil/heavy metal non-point-source runoff than other alternatives listed in the Environmental Impact Statement Preparation Notice. It is "the alternative that causes less damage to the biological and physical environment" and it is "the alternative which greatly protects, preserves, and enhances historic, cultural, and natural resources." Furthermore the Enhanced Bus System is a viable option under the Major Investment Study process.

The Enhanced Bus System would further expand on the Express Bus & Circulator Bus System. The system would provide high capacity; frequent service; ziplane and busways; express routes from outer communities; bus priority measures on arterial routes; local bus routes; neighborhood circulators; transit centers to transfer between routes and modes.

Express Buses should run every 15-20 minutes during the full rush hour and every 30-45 minutes during the rest of the day. There should be two separate but linked Express Bus systems: one offering service to Honolulu and one

offering service to Kapolei (which is our "second city"). Circulator buses should offer more complete service to the military bases (including Helemano). Regional bus service should link neighboring communities (such as Wahiawa,
2 Mililani, Waipio and Waikele).

The number of buses acquired by this alternative would be at least twice that of the regular bus expansion alternative.

At $250 a ticket, enforcement of the two-person HOV lane could initially finance a large part of this alternative. It has been alleged that there is no place to pull over vehicles who's occupant appears to be driving solo. It has also been alleged that it is inefficient to mail tickets to apparent violators because many people state that they had a
3 hidden passenger. However, at $250 a ticket, it is profitable for the police to follow a car for up to 20 miles and pull the car over somewhere else. If tickets led to drivers obeying the HOV lanes, then the lanes would suddenly lose 30% of the vehicles currently occupying them. The HOV lanes would move faster, appear to be more appealing than the regular lanes, and lead to greater carpooling.

As drivers shifted to HOV lanes and buses, congestion would decrease. The expansion of the zipper lane to Middle Street would make transit more efficient.

5.2 A Commuter-Based Dedicated Bicycle Lane System Alternative

"A successful Transportation Demand Management (TDM) must evaluate all forms of alternative modes of transportation designed to reduce the use of single occupant vehicles. This includes buses, carpools, vans and bicycles. The bicycle component of TDM must include bicycle use for recreation and business commutes as well as bicycle parking." San Francisco Bicycle Plan

A Commuter-Based Dedicated Bicycle Lane System Alternative is a reasonable and viable alternative (CEQ Q1a,b). The alternative is "practical' and "feasible from the technical and economic standpoint and using common sense" (CEQ Q2a). it is the most environmental preferable alternative (CEQ 6a) since it would result the least vehicular air pollution and oil/heavy metal non-point-source runoff than other alternatives listed in the Environmental Impact Statement Preparation Notice. It is "the alternative that causes the least damage to the biological and physical environment" and it is "the alternative which greatly protects, preserves, and enhances historic, cultural, and natural resources." Furthermore the Commuter-Based Dedicated Bicycle Lane System Alternative is a viable option under the Major Investment Study process.

"Honolulu is already a great city for bicycles - and it has a potential to be one of the best! It has physical beauty, mild
4 year-around climate, relatively flat coastal plain and a compact form making it ideal for bicycle transportation." The Honolulu Bikeway System Master Plan (www.co.honolulu.hi.us/dts/)

"The potential is great for bicycles to become a significant transportation mode in urban Honolulu. Already, more than three times as many commuters use bicycles to get to work as the national average, despite a scarcity of well located bikeways and sufficient end-of-transit facilities" The Honolulu Bikeway System Master

"Bicycling is a very popular form of recreation for Honolulu residents." The Honolulu Bikeway System Master

"Bicycling is a pollution-free, economical and healthy alternative transportation mode for many work, shopping and recreational trips in Honolulu. The limited supply and high cost of parking as well as traffic congestion and the City's compactness make bicycling an attractive option for many."

"The key to a successful implementation strategy, as evidenced by the experience of other cities, has been the routinization of bicycle planning considerations in the on-going planning and design phases of a capital construction project. In particular, the inclusion of bicycle design standards must be at a phase sufficiently early in the project's development that there are no adverse cost implications that might curtail their inclusion." San Francisco Bicycle Plan

Bicycle Lanes can be classified by the amount of multi-use activity: dedicated bike path; dedicated lane; dedicated half-lane; car/bike lane designated as a multiuse lane; and non-bike-designated car lane.

"Many parents prohibit their children from riding bicycles to school due to fears about safety on the streets." The Honolulu Bikeway System Master Plan

Currently, during the rush hour, residents of Palolo can travel to Hotel Street equally quickly by car or bike. Many chose cars because of the inherent danger associated with riding bicycles in a congested vehicle area.

Some of the members of Life of the Land have been injured while on their bicycles in the downtown area. Many of our members would chose to use bicycles some or all of the time if dedicated bicycle lanes provided a safe, convenient commute.

"The City should install on-street bicycle parking in retail districts, activity centers or developments in areas where businesses or landlords are not individually responsible for off-street parking. This program must include bicycle parking in both the public right-of-way and in the private off-street parking lots of existing businesses, including supermarkets, super drugstores, retail stores, shopping malls, and employment sites." San Francisco Bicycle Plan

4

California found the four most common forms of accidents caused by automobile drivers to bike riders were: Opening car door when unsafe; failure to yield when turning left; unsafe turn and/or without signaling; and unsafe speed.

"It should be noted at the outset that a wide spectrum of traditional funding sources is available for bicycle programs and projects. Following the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, several new funding opportunities became available for bicycle projects and programs. The opportunities to develop regional funding requests that included a greater emphasis on air quality, congestion mitigation, and balanced transportation systems allowed bicycle programs to be evaluated routinely along with highway and transit requests. These Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funds were further expanded via the federal government's annual consideration of worthy demonstration projects." San Francisco Bicycle Plan

Commuter biking will increase with the creation of dedicated bike lanes that connect residential areas with the downtown and with the university. The route most suggested by environmentalists has been Young Street. The proposal by the consultant in this study - to reduce the car lanes on the Nimitz - provides another opportunity. One possible dedicated bicycle route would be from the University area along (a) Dole Street; (b) a dedicated bike lane over the H-1; (c) a dedicated lane along Isenburg; (d) conversion of Young Street to five lanes (parking on each side; one-lane-one-way car traffic; and two-way bicycle traffic); (e) a dedicated bike path through or around the edge of Thomas Square; (f) Hotel Street; (g) a dedicated path paralleling the current pedestrian path by the City and State Governmental buildings; (h) dedicated lane on Richards; (i) dedicated lanes on Nimitz.

5.3 A Light Rail Transit (LRT) Alternative.

"DTS would like to lay out an entire system that doesn't require the whole system to be in place in order to be of value. DTS would develop a program that could be implemented incrementally, in phases, according to ability to pay. The policy makers will need to decide what the ability to pay is for each particular phase." Policy Committee Meeting OMPO Policy Committee. August 4, 1998, 10:30 a.m.

Chapter 6 Assumptions & Models Common to all Alternatives

6.1 Road Network Assumptions

There may be an increase in vehicle-miles due to the building of alternate routes (Sand Island Parkway; Nimitz Highway); providing radio coverage/electronic signs on traffic jams; and/or the ending of the Hawaii and/or Asian recessions;

6.2 Travel Demand Management Assumptions

There may be an decrease in vehicle-miles due to people shifting from one-person per vehicle to carpools, rail and/or buses, perhaps due to the availability of all-day express buses.

5 There may be a shift in destinations due to the development of the Second City; building the Natatorium; expanding the Aloha Tower Marketplace; development of cruise ship berths; and/or building the Waipio/Kalaeloa Sports Complexes.

There may be an increase in bus use with no decrease in vehicle-miles due to the availability of all-day express buses that will encourage people (elderly and youth) who would stay home without the service. This phenomena was written about regarding the Mililani Trolley in the latest issue of Ka Nupepa.

<u>OMPO</u>: "Gordon Lum explained that ... OMPO is also in the process of finalizing the development of new travel forecasting models. ... These models will also be more sensitive to some of our travel needs, including transit forecasts. In order to ensure that these models are used by OMPO staff as well as the agencies, OMPO requires this in-house capability. Otherwise, OMPO would have to continue to rely upon consultants to use these models." OMPO-PC Minutes Tuesday, September 1, 1998, 10:30 a.m

6.3 Population Growth Assumptions

5 There may be an increase in vehicle-miles and bus/train use due to population growth, tourism growth and/or the rejuvenation of Waikiki, since under the existing limits of the Waikiki Special District (WSD) the floor area of Waikiki has already been zoned to expand from the current 7M square feet to 14M square feet, in effect, doubling in size.

6.4 Models: Outcome Success vs. Failure

5 The model may measure success or failure through the use of indices such as the "Time Of Travel" (TOT) and/or the "Level Of Service" (LOS) or through some other means. The model should clearly identify why a particular measure of success was chosen.

Determining whether a project will be successful or not frequently boils down to the model chosen, the assumptions (often unstated) assumed and the data used. It sort of seems to make sense that if there are more buses and or trains, the number of vehicles on the role will decrease. But this does not necessarily follow.

6.5 Sensitivity Analysis of the Model

5 How dependent is the models solution on the model, assumptions and data used? When the data is chosen, the assumptions are assumed and the model is used, a result will follow. But how will the result change under minimal alterations of the given?

Chapter 7 Environmental Consequences

7.1 Unusual Impacts?

"Cities like Honolulu have grown up next to deep harbors and at the intersections of railroads and rivers." Islandwide Mobility Concept Plan, page 10

6 "Freeway ramps have attracted development of shopping malls and 'big box' stores. Neighborhood shopping districts have thrived where pedestrians walk. Islandwide Mobility Concept Plan, page 10. Perhaps that is why Office Depot is arriving, they will be next to a not-yet-publicly-announced freeway ramp. We thought it was because of the million dollar financial package.

7.2 Cumulative and Secondary Impacts

"Cumulative impact" means the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (HAR §11-200-1)

"Primary impact" or "primary effect" or "direct impact" or "direct effect" means effects which are caused by the action and occur at the same time and place. (HAR §11-200-1)

7 "Secondary impact" or "secondary effect" or "indirect impact" or "indirect effect" means effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (HAR §11-200-1)

A group of actions proposed by an agency or an applicant shall be treated as a single action when: (1) The component actions are phases or increments of a larger total undertaking; (2) An individual project is a necessary precedent for a larger project; (3) An individual project represents a commitment to a larger project; or (4) The actions in question are essentially identical and a single statement will adequately address the impacts of each individual action and those of the group of actions as a whole. (HAR §11-200-7)

7 "Promoting economic development is also critical to maintaining the health of our island communities." Islandwide Mobility Concept Plan, page vi. "Honolulu must find a way to preserve, maintain, and protect the quality of life of its people and the health of its environment, while providing for the growth necessary for prosperity." Islandwide Mobility Concept Plan, page 2. (Are they stating that: "stability requires growth")

7.3 Air Quality Impacts

8 How will air quality change as a result of secondary growth resulting from the new bus and/or bus/rail system? It should be realized that several actions, in particular those that involve the construction of public facilities ... may well stimulate or induce secondary effects. These secondary effects may be equally important as, or more important than, primary effects, and shall be thoroughly discussed ... and an evaluation made of the effects of any possible change in population patterns or growth upon the resource base" (HAR §11-200-17(i))

7.4 Water Resources Impacts

9 It should be realized that several actions, in particular those that involve the construction of public facilities ... may well stimulate or induce secondary effects. These secondary effects may be equally important as, or more important than, primary effects, and shall be thoroughly discussed ... and an evaluation made of the effects of any possible change in population patterns or growth upon the resource base, including ... water" (HAR §11-200-17(l))

7.5 Transportation Model Impacts

10 Should we be moving toward greater use of mass transit OR greater usa of cars OR be designing a system that has something for everything and has a huge price tag for our recession-based economy? "Road building and automobile use have a synergistic relationship that is ultimately unsustainable, since it leads to ever more road building, cars, congestion, and reduction in tha quality of the environment. Islandwide Mobility Concept Plan, page 10. Dedicated Ramps provide direct access to and from zipper lanes, busways, and HOV lanes. ...Oahu has an extensive network of freeways ... some physicol modifications will help to maintain the effectiveness of the overall system. Also, the expansion of the Zipper Lane ... Interchange improvements and selective widenings will also help to alleviate bottlenecks and improve freeway safety. ... The feasibility of using a zipper lane for the afternoon rush hour out of town is being studied. ... Kamehameha Highway to be widened from two to four lanes from Ka Uka Boulevard to Mililani ... Kunia Road ... plans to extend this widening to Anonui Road in the near future. ... widen Puuloa Road" Islandwide Mobility Concept Plan, page 30, 34, 35

7.6 Community Impacts

11 The Draft EIS needs a thorough Community Impact Assessment which includes supporting sustainable livable communities; promoting community values and thriving neighborhoods; contributing to general well-being; embracing the concerns of neighborhoods and communities.

Chapter 8 Questions

8.1 Cumulative and Secondary Impacts

12 Q1. The redevelopment of Kakaako would be much easier if a trolley were built. Therefore it must be included as a secondary impact. "a light rail electric trolley ... would provide the impetus for the redevelopment of Kakaako" Mayor Jeremy Harris State of the City 1998.

8.2 Social and Economic Impacts

13 Q1. Will the development of transportation hubs (buses, light and/or heavy rail) lead to greater development near the
hubs? Q2. Will the transportation improvements occur faster, keep pace with, or trail the expected growth in
14 population and tourism? Q3. If the improvements exactly matches the growth in population, will the new arrivals pay
for the needed infrastructural changes or will the existing residents pay for system improvements that will benefit the
15 new arrivals? Q4. Will the project strengthen communities/ohana or will it divide poor communities for the benefit
of richer communities? Q5. Will the building of the Natatorium encourage greater vehicle use? Q6. Will the building
16 of cruise ship berths at or near the Aloha Tower Marketplace encourage more vehicle use? Q7. Will the building
parking structures near the proposed cruise ship berths at or near the Aloha Tower Marketplace encourage more
13 vehicle use? Q8. Will "transportation developments spurred retail and residential growth along transit lines and
around transit malls"? Q9. Some of the proposed transportation plans are designed to free up valuable waterfront for
17 development. Such development would constitute a secondary or indirect impact to the PUC EIS and to the PUC
18 NEPA right? Q10. Will the desired increase in tourism encourage greater vehicular use?

8.3 Air Quality Impacts

8 Q1. How will air quality change as a result of secondary growth resulting from the new bus and/or bus/rail system?
19 Q2. How do the Enhanced Bus Alternative and the Commuter-Based Dedicated Bicycle Lane System Alternative
compare to the other alternatives?

8.4 Noise Impacts

20 Q1. Bus stop announcements can be heard at a 1000 feet. Is the City planning to introduce noise pollution to the
quiet suburbs and agricultural lands? "Increase access to information through audible 'next stop' announcers"
19 Islandwide Mobility Concept Plan, page v. Q2. How do the Enhanced Bus Alternative and the Commuter-Based
Dedicated Bicycle Lane System Alternative compare to the other alternatives?

8.5 Water Resources Impacts

9 Q1. How will water quality change as a result of secondary growth resulting from the new bus and/or bus/rail
system? Q2. How do the Enhanced Bus Alternative and the Commuter-Based Dedicated Bicycle Lane System
19 Alternative compare to the other alternatives?

8.6 Aesthetic Impacts

21 Q1. Are visual impacts afterthoughts or are they part of the planning process? If so, how? Q2. How do the Enhanced
19 Bus Alternative and the Commuter-Based Dedicated Bicycle Lane System Alternative compare to the other
alternatives?

8.7 Transportation Impacts

22 Q1. Will each alternative (the Enhanced Bus Alternative and the Commuter-Based Dedicated Bicycle Lane System)
proposed increase/decrease mass transit system gridlock? Q2. How can we adopt transportation policies that will
23 decrease gridlock? Q3. Can the proposed trolley (1998-99) be expanded into the elevated rail transit plan (1992)?
24 Q4. Will privatization of the bus service into one or more separate competing companies (as in done in Queens, New
York) help or hinder services on Oahu? Q5. How significant would the use of one-way rush-hour traffic on
25 Dillingham be on congestion? Q6. How significant would the use of one-way rush-hour traffic on Nimitz be on
congestion? see Tim Tucker's column in Island Voices (Honolulu Advertiser, May 18, 1999, page A-6). Q7. How
26 significant would Employer Trip Reduction (ETR) Plans be in reducing congestion? Q8. The Draft Environmental
27 Impact Statement may need to include an explanation of the timing for the proposal. Q9. What will the secondary
7 impact be? Q10. If the Zipper Lane has not convinced enough people to carpool, how will each proposal solve that? 28
Q11. The Coast Guard held a meeting regarding the Sand Island Parkway and the Truman-Hobbs Act. The census
29 was that federal money would not be available. Has anything changed? Q12. Is a state highway financed by federal $
30 part of the City plan? Q13. Is there a reasonable chance that the building of the Sand Island Parkway increase
31 vehicle use? Q14. Is there a reasonable chance that the alteration of the Nimitz Highway increase vehicle use.

8.8 Scoping Impacts

30 Q1 How can alterations to the Zipper Lane be part of the City Plan when it is totally under State control? Q2. Does
32 the PUC plan include Express Buses which operate partially outside of the PUC? Q3. The map of the PUC includes
33 Waiawa and Iroquois Point but not Kahala Mall. Is that correct? Q4. How can the MIS analyze "high-speed express
34 service from suburbs" If that is beyond the scope of the PUC? Q5. How can the contractor for the City state that the
30 City plan includes three state programs, one of which is enforcement? "Specific elements include ... AHI ... ITS ...
enforcement activities in State DOT's Safe Communities program." Islandwide Mobility Concept Plan, page v. Q6.
35 What are the acceptance criteria of the FHWA/FTA for the NEPA document? Does this plan conform to State DOT
36 plans? Q7. Inclusion of the ideas generated from the 21st Century Vision, Oahu Trans 2K, and related scoping
meetings. Q8. Explanation of how ideas were filtered from the meetings to determination inclusion/exclusion from
37 the proposal. Q9. Explanation of how the weight of different proposals was determined. Q10. The baseline plans for
38 rail/trolley must be included, at least in the appendix.

8.9 Transportation Model Impacts

5 Q1. Which Travel Forecast models are used? Why? Q2. How sensitive are the models to changes in input? Which
variables have the highest elasticity (smallest change in output, largest change in output, greatest chance the "desired
plan" is the wrong plan)?

8.10 Community Impacts

39 Q1 How will the residential and business communities be affected by the building and operation of buses/rails
40 traveling through their communities? Q2. Will the need for new transmission facilities result in commercialization
of poorer neighborhoods (Economic Justice)? Q3. This following statement is a positive statement about rural
41 lifestyles, right?? "Even something relatively simple like having streets without sidewalks can affect community
42 character." Islandwide Mobility Concept Plan, page v. Q4. Can the public participate in the Draft/Final MIS?

8.11 Population Impacts

43 Q1. What are the source of the growth projections? Q2. If the purpose of the Second City was to move people out of
44 downtown, why are we trying to move more people into downtown?

8.12 Energy Impacts

45 Q1. Shouldn't any project which would require new overhead lines automatically be rejected? Q2. Can electric buses be used?

8.13 Funding Impacts

46 Q1 Does the amount of federal matching funds vary depending on the option chosen? Please elaborate.

8.14 Sustainability Impacts

47 Q1. How do you define "sustainability"? "This Mobility Concept plan ... is not only sustainable over the long run, but absolutely necessary to shape an economically robust future for Oahu." Islandwide Mobility Concept Plan, page iv.

Mahalo for this opportunity to comment on this EISPN.

Henry Curtis

Henry Curtis
Executive Director
Life of the Land

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02555R

August 16, 2000

Mr. Henry Curtis, Executive Director
Life of the Land
1111 Bishop Street, Suite 503
Honolulu, Hawaii 96813

Dear Mr. Curtis:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 22, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. Chapter 2 discusses the full range of alternatives that have been considered. The build alternatives incorporate the use of bus priority lanes. They also include implementation of the State and County bicycle master plans. A bicycle lane alternative would not satisfy all of the travel markets and growth in travel demand that is expected through the year 2025.
2. Chapter 2 discusses the full range of alternatives that have been considered. The TSM and BRT Alternatives enhance bus and automobile efficiency to varying degrees. The features you suggest are included in the TSM and BRT Alternatives. Headways are described for each alternative in Chapter 2.
3. HOV enforcement is increasing.
4. Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives. However, bicycles alone cannot accommodate the existing and projected travel demand, and are not appropriate for all travel markets. The TSM and BRT Alternatives are multimodal alternatives that increase pedestrian, bicycle and disabled access to transit and other alternative modes.

5. The project planning was based on assumptions about future growth, as detailed in Chapter 4, which discusses the traffic modeling.
6. Impacts are discussed in Chapter 4 and 5, and are summarized in the Executive Summary.
7. Cumulative impacts are addressed in Section 5.13.1.
8. Air quality impacts are discussed in Section 5.5. Cumulative impacts are discussed in Section 5.13.1.
9. Water resource issues are addressed in Section 5.8. Cumulative issues are addressed in Section 5.13.1.
10. This document describes three reasonable transportation alternatives. The City Council will consider various factors in selecting the Locally Preferred Alternative (LPA).
11. Sections 3.3 and 5.3 discuss the communities in the Primary Urban Center (PUC) and how they may be affected by the project.
12. Section 5.1 discusses redevelopment potential for Kakaako and other areas.
13. One of the purposes of transit is to focus growth by encouraging increased density. Total growth would be constant across all alternatives. The project schedule is provided in Section 2.5.
14. The financing plans for the alternatives are described in Chapter 6. Financing comes from a variety of sources, including federal and State grants, user fees, and proceeds from municipal bonds.
15. Potential impacts on communities are addressed in Sections 3.3 and 5.3, and also in Section 5.13.
16. Future levels of travel activity have been predicted based on accepted government projections that included the development projects you named.
17. Redevelopment of waterfront areas is not included in the alternatives discussed.
18. Yes. Predictions of future travel activity levels included assumptions about increases in tourism and other economic activities.
19. The following sections describe various types of impacts: Section 5.5 discusses air quality impacts, Section 5.6 discusses noise impacts, Section 5.8 discusses water quality, and Section 5.4 discusses visual impacts. The Enhanced Bus Alternative is similar to the TSM Alternative.
20. Potential noise impacts are addressed in Section 5.6.
21. The visual environment and potential impacts are addressed in Sections 3.4 and 5.4.
22. Chapter 4 discusses the potential traffic impacts of each of the proposed alternatives, including vehicle hours of delay (VHD). The project itself is intended to help alleviate the traffic problems of the island, especially in the PUC. Increasing the people-carrying capacity of existing roadway lanes is a policy that would reduce gridlock.
23. A fully grade-separated transit system was considered but rejected, as discussed in Section 2.6.

24. Privatization speaks to how bus service is provided, not the level of bus service, per se. Privatization alone would not be expected to affect levels of roadway congestion. However, the TSM and BRT Alternatives provide for the privatization of selected bus services.
25. The commercial uses along Nimitz Highway and Dillingham Boulevard require two-directional vehicular access. If these roads were converted to one-way access, the circuitous routes that would be required would increase regional levels of congestion.
26. These and other Transportation Demand Management (TDM) measures are included in all of the alternatives.
27. Section 2.5 discusses the project timeline.
28. By rewarding people with travel time savings, parking discounts, and subsidized vehicles, programs such as Vanpool are expected to induce ridesharing. The intent of the zipper lane is also to reward people who rideshare with travel time savings. We hope that the travel time savings will induce people to use the zipper lane.
29. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan (ORTP).
30. Once the City Council selects the LPA, the State and the City will work together to implement the different elements of the preferred alternative.
31. The Sand Island analysis has been shifted to the ORTP.
32. Yes.
33. The analysis of future travel demand and existing infrastructure capacity indicates that the major shortfall in transportation capacity extends from the PUC to the Ewa area.
34. The PUC is so important in terms of islandwide trip generation and trip attraction that transportation planning for the PUC cannot be limited to only the PUC. Connections between the PUC and other parts of the island must also be considered.
35. The acceptance criteria are described in various rules, regulations, and guidances. Plan conformance is addressed in Section 5.1.3.
36. The Oahu Trans 2K meetings have been summarized and those summaries are included in Appendix A. Chapter 2 discusses how these ideas were screened and utilized.
37. The evaluation of the alternatives is provided in Chapter 7.
38. Rail is not an alternative considered under this Major Investment Study/Draft Environmental Impact Statement. The alternatives are described in Chapter 2. Conceptual plans are provided in Appendix B.
39. Potential impacts on communities are addressed in Sections 3.3 and 5.3, and also in Section 5.13.
40. Environmental justice issues are addressed in Section 5.3.5.
41. The statement is neither positive nor negative.
42. Appendix A summarizes the efforts that have been made to provide opportunities for public participation.

43. As described in Chapter 1, Section 3.1, and Section 4.2.5, the Department of Business, Economic Development, and Tourism (DBEDT) is the source of the growth projections.
44. The project does both. The project will improve transportation connections between Downtown and Kapolei. It is both State and City policy to direct growth to both cities.
45. No overhead lines would be required under any of the alternatives. The BRT Alternative includes the use of electric vehicles.
46. Yes, different federal funding lines have different restrictions, as described in Chapter 6.
47. There are many definitions, but applying that to a transportation project means saving energy and encouraging compact land use development patterns.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

May 3, 1999

City and County of Honolulu
Department of Transportation Services
711 Kapiolani Blvd., Suite 1200
Honolulu HI 96813

Attn: Kenneth Hamayasu

Dear Mr. Hamayasu:

Subject: EISPN for Honolulu Primary Transportation Corridor Improvements

In response to the notice of preparation of an EIS that appeared in the April 23, 1999, Environmental Notice, I have the following comments.

In developing plans for transporation improvements, I believe the following should be taken into account:

1 1) Scenic viewplanes;
2 2) Whether the improvements will encourage or discourage urban sprawl and encroachments into rural areas;
3 3) Emissions produced by the various options;
4 4) Whether the improvements will encourage more vehicular traffic (as, say, road improvements tend to do) or will discourage use of automobiles for commuting.

Thank you for your attention to my concerns.

Sincerely,

Patricia Tummons

Patricia Tummons

187-C Hokulani Street
Hilo HI 96720

RECEIVED
MAY 5 P12:52
TRANSPORTATION SERVICES

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02206R

August 16, 2000

Ms. Patricia Tummons
187-C Hokulani Street
Hilo, Hawaii 96720

Dear Ms. Tummons:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 3, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. The visual environment and potential impacts on scenic viewplanes are addressed in Sections 3.4 and 5.4.
2. Potential impacts on communities are addressed in Sections 5.3 and 5.13.
3. Air quality impacts are discussed in Section 5.5.
4. Chapter 4 discusses traffic modeling.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

Douglas Meller
2749 Rooke Avenue
Honolulu, HI 96817

email: meller@hgea.org

RECEIVED
MAY 25 2:06

May 24, 1999

Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard Suite 1200
Honolulu, Hawaii 96813

Subject: Primary Corridor Transportation Project Environmental Impact Statement (EIS) Preparation Notice

Dear Mrs. Soon:

These are personal comments. They have not been encouraged, reviewed, or approved by my employer.

I request that the Draft EIS consider the following alternatives:

1 1. Eliminating bus stops to improve bus operating speeds. (It is inefficient to have bus stops a few hundred feet apart.)

2 2. Chartering and/or subsidizing private buses and ferries for peak period transit. (The City's current private bus charters and the State DOT's proposed ferry demonstration project will provide useful data.)

3 3. Regulating public and private parking charges to encourage car-pooling and use of public transit. (Other cities regulate parking charges to reduce traffic.)

4 4. Providing light rail and/or bus rapid transit without a Sand Island Bypass. (Because of cost and impacts, decisions about a Sand Island Bypass should be "uncoupled" from decisions on transit alternatives.)

5 I also request that the Draft EIS compare the various alternatives in terms of the following impacts:

1. peak and off-peak transit/bus travel time between several screenlines.
2. peak and off-peak private vehicle travel time between several screenlines.
3. peak and daily vehicle trips across several screenlines.
4. peak and daily person-trips across several screenlines.
5. per cent of Oahu voters who will ride public transit.

Sincerely,

Doug Meller

Douglas Meller

cc: Office of Environmental Quality Control

a:\PCOR1

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD5/99-02583R

August 16, 2000

Mr. Douglas Meller
2749 Rooke Avenue
Honolulu, Hawaii 96817

Dear Mr. Meller:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated May 24, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS). Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided:

1. All alternatives and the proposed stops are described in Chapter 2. Both the City Express! and the Country Express! Services are limited-stop bus services, and more limited stop services will be provided under the Transportation System Management (TSM) and Bus Rapid Transit (BRT) Alternatives.
2. All alternatives are discussed in detail in Chapter 2. The TSM and BRT Alternatives include incentives for HOV vehicles (carpooling), and other measures to enhance the operational efficiency of the existing transportation network including private sector transit services (using unused equipment and capacity).
3. Project alternatives are defined in Chapter 2. At this point, regulation of parking fees are not included in the alternatives that received detailed analysis in the MIS/DEIS.
4. The Sand Island analysis has been shifted to the Oahu Regional Transportation Plan.

5. Chapter 4 discusses traffic modeling.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

DECISION ANALYSTS HAWAII, INC.
BRUCE STEVEN PLASCH, President
QUANTITATIVE CONSULTING SERVICES: Economic • Financial • Demographic • Statistical

JUN - 9

June 8, 1999

Ms. Cheryl Soon, Director
Department of Transportation Services
CITY & COUNTY OF HONOLULU
711 Kapiolani Boulevard
Honolulu, HI 96813

Re: "O'ahu Transit 2K, Islandwide Mobility Concept Plan"

Dear Cheryl:

I am sending the following suggestions and comments on "O'ahu Transit 2K, Islandwide Mobility Concept Plan" in response to a recent presentation by the Parsons Brinckerhoff/Carter & Burgess Team to the Land Use and Transportation Committee of the Chamber of Commerce.

For the most part, this is an excellent and informative document. However, some of the assertions which are made to support arguments are inaccurate or overstate the situation, thereby undermining the credibility of the report and the overall planning effort. My comments focus on the shortcomings within the document, rather than on the "good" parts. As such, these critical comments and suggested additions do not reflect my overall impression of the document, which is favorable.

Many of my comments address assertions made in the Concept Plan about the economic, social, and environmental costs of sprawl and our reliance on automobiles. While I am not advocating an increased reliance on automobiles or increased sprawl, it is important, for the sake of good planning, to prevent half-truths and fiction from becoming accepted as fact.

1 • **Definition of "Sprawl"**

In view of the extensive use of the term "sprawl" in the report, a clear definition of it is in order. For example, is Mililani an example of suburban sprawl which should be discouraged, or is it the type of compact development which should be encouraged?

• **Sprawl vs. Centralized Development**

2 On page 2, the observation that "widespread urban and suburban sprawl" seems to be contradicted by the more accurate statement on page 9, "O'ahu's development pattern is highly centralized." This compactness is the result of deliberate land-use policies originated in the 1960s and 1970s—policies which were designed to protect the lands farmed by O'ahu Sugar Co., Ltd., limit growth in rural communities, and protect environmentally sensitive areas.

• **Benefits and Costs of Sprawl vs. Compact Development**

3 The discussions in various sections on the benefits and costs of sprawl versus compact development present only one side of an ongoing and as-yet-unresolved debate. A cogent summary of the issues is provided by Dowell Myers and Alicia Kitsue, "The Debate Over Future Density of Development: An Interpretive Review," 1999. This paper can be downloaded from the Lincoln Institute (www.lincolninst.edu).

Also, much of this discussion seems academic in that many key development decisions have already been made by the City and the State.

• **Economic Decline of Commercial Areas**

4 On page 2, the following statement is made: "The economic patterns generated by automobile dependence contributes [sic] to the decline of neighborhood retail and office districts and the small businesses that formerly thrived in them." Which communities have suffered a decline because of dependence on the automobile? If, from page 10, Kaimuki is the example, I disagree; local businesses adjusted to the development of the H-1, and the area exhibits considerable economic health.

• **Development and Service Costs**

The statement on page 2 that "sprawl has resulted in extremely high costs to provide streets, utilities, schools, parks, police and fire protection, and other services to a far-flung population." While this is true, two comments are in order. First, *suburban* development of densities significantly higher than the housing densities which are selling in 'Ewa and Central O'ahu risk rejection by potential homebuyers.

5 Second, as a general rule, the overall cost of suburban development falls between the costs of urban in-fill and urban redevelopment.

In-fill development is generally the least expensive form of development, provided that: large vacant parcels are available in sufficient size to allow economies of scale, the terrain is relatively level, soils can accommodate foundations, access is adequate, existing infrastructure is relatively new and has excess capacity, restrictive building practices will not be imposed (e.g., restricted hours to protect neighbors from noise), etc. Based on my work, the supply of such land within the Primary Urban Center (PUC) is quite limited.

AR00047769

5 On the other hand, redevelopment within the PUC can be quite expensive, particularly when: a premium must be paid to assemble small parcels, usable structures must be purchased then torn down and removed, infrastructure must be replaced due to age and/or inadequate capacity, and construction practices must minimize adverse impacts to neighbors.

- **Infrastructure Financing**

6 On page 8, it is stated that older established neighborhoods must subsidize the high cost of infrastructure development in outlying (i.e., suburban) areas because "...sprawl does not support itself through the additional [tax] revenue it generates..."

To the best of my knowledge, no in-depth study exists to support this claim. The studies which do exist are for mainland communities, the findings of which cannot be safely generalized to Hawai'i because of different financing approaches and tax structures.

Furthermore, the argument is open to challenge based on the fact that developers in 'Ewa and Central O'ahu, and in turn new home buyers, are financing most of the required infrastructure development—either directly or through various charges. In addition, the State receives the equivalent of a large up-front exaction in the form of excise taxes on the sales of homes and on construction expenditures. Also, much of the City's CIP funding has been for projects in *established* neighborhoods and for projects which serve residents islandwide. Although my findings on this subject are limited somewhat by data shortcomings, they are summarized in "Cost to Government of Supporting New Development in 'Ewa and Central O'ahu," May 1995, which is on file with the City.

- **City Policy on Urbanizing Agricultural Lands**

7 The statements on pages 8 and 13 regarding the need to protect prime agricultural land from residential sprawl appears hypocritical in view of recent City actions. Past government policy has been to direct development to the marginal agricultural lands in 'Ewa while protecting 'Ewa's "Golden Triangle," which encompasses some of the best farm land in the State. Rather than continuing the policy of protecting this prime agricultural land, the City's most recent Development Plan for 'Ewa supports urbanizing this land.

- **Economic and Environmental Costs of Urbanizing Agricultural Lands**

8 On page 8, the following statement is made: "If left unchallenged, this trend towards 'residential sprawl' [onto agricultural lands] could create serious economic and environmental problems."

While prime agricultural land should be protected, the reality is that urbanization of agricultural land results in a relatively small economic loss for two reasons. First, ample land is available for agriculture due to the enormous contraction of plantation agriculture—even with extensive urbanization, the supply of agricultural land would

8 still exceed the demand. Second, per acre returns and employment from agriculture are small compared to most urban uses of land.

Furthermore, farming is not free of adverse environmental impacts. Typically, suburban development of farm land results in less pollution, not more.

- **Factors Affecting Suburban Growth**

9 The fifth paragraph on page 9 attributes growth in Central, Windward, and East O'ahu "...at least partially to transportation policies that favored the automobile over other forms of transportation." To be fair, growth in these areas also reflected deliberate State and City development policies from the 1960s to the present, as well as strong consumer preferences for single-family homes.

- **Credit for Affordable Housing**

On page 10, the following statement is made: "Due to prior government policies, most new affordable for-sale housing is found in 'Ewa and Central O'ahu." The second part of this sentence would have been true even without government intervention. Lower housing prices are required to attract a large number of new home buyers in outlying areas which typically lack the full complement of jobs, stores, services, recreational opportunities, etc. However, government intervention did change the *mix* of housing in 'Ewa and Central O'ahu, but this change in mix occurred at the cost of slowing development of these projects and increasing the price of market housing islandwide.

- **Strategy for the PUC**

On page 10, a statement is made to the effect that approximately 44,000 new homes will have to be developed in the PUC over the next 20 years (about 2,200 new homes per year). This number of new homes within the PUC, plus homes to replace those which will be lost to redevelopment, appears somewhat high for the following reasons:

— O'ahu has yet to break out of its anemic economic growth

10 — The PUC appears to lack sufficient vacant land that is suitable for substantial new development.

— Redevelopment will be slow and costly, and is likely to be opposed by many residents in the affected communities.

Regardless of the number of homes planned for development in the PUC, many neighborhoods are in very poor condition and should be redeveloped. The challenge will be to redevelop to higher densities with attractive projects that preserve ocean and mountain views; this has not been the case with a great many past projects.

- **Land-Use Implications**

11 The document correctly argues that transportation has had a profound impact on the form and type of development on O'ahu. Presumably, the analysis of transporta-

12 tion alternatives will address the likely impacts on future development patterns, including impacts on both residential development and job creation in the PUC and outlying areas. Depending upon the transportation alternative selected, increased mobility could accelerate residential development in outlying areas while concentrating job creation in the PUC, thereby thwarting the balanced development planned for 'Ewa.

Along these same lines, it should be made very clear to residents that they are choosing far more than a transportation system: they are also choosing a related land-use development scheme. Such clarification is particularly important for those communities which will experience extensive changes, possibly because they are to be redeveloped to higher densities.

- **Implementation of the Plan**

12 As the consulting team is surely aware, it is important to go beyond the desires of the community to dispassionately and realistically assess what can actually be implemented successfully. For example, major components of land-use and transportation plans from the 1960s, 1970s, and 1980s were eventually abandoned or reversed as a result of changing values, unacceptable costs, market rejection, and/or community opposition—thereby contributing to some of today's problems. Examples of government plans which were ultimately rejected or reversed include:

— land use plans to direct residential, resort and commercial development to East Honolulu, Windward O'ahu, the North Shore and Wai'anae in order to preserve low-rise development in the PUC and to protect agricultural lands in 'Ewa and Central O'ahu;

— redevelopment of the PUC with low-rise garden apartments so as to protect rural communities and prime agricultural lands;

— development of the marginal agricultural lands in 'Ewa while protecting the prime agricultural lands;

— a second cross-town freeway;

— a highway around Kaena Point; and

— a mass transit system.

- **Implications of Computers and Electronic Communications**

13 Continuing rapid advances in computers and electronic communications are likely to have significant and possibly profound implications on travel and development patterns. Regardless of location, current technology allows near instantaneous exchanges of documents, inexpensive video conferencing, access to research materials, etc. As a result, many workers are being freed from spending long hours in town, and so may choose to live in suburban and rural communities.

The implications of how this technology will affect travel and development patterns should be addressed.

- **Extensive Network of Freeways**

14 For accuracy, the statement on page 34 regarding the existence of an extensive network of freeways should be written to include highways. Most people would not regard three freeways as an "extensive network."

- **Benefits and Costs of Automobile Travel**

15 On pages 2 and 3, the material on the benefits and costs of automobiles comes across as biased, since it recognizes the high costs associated with automobiles but does not acknowledge the many personal benefits which may justify the high costs, such as: faster door-to-door travel, travel to destinations not served by transit systems, fast and convenient travel to multiple destinations, the ability to transport large items safely (e.g., groceries and recreational equipment on weekends), etc. Personal time saved and increased mobility can translate into a more productive workforce.

A balanced transportation plan must take into account the benefits and the costs of various alternatives, not just the cost of one and the benefits of another.

- **Area Required for Home-Based Vehicles**

16 On page 11, it is stated that 350 square feet are required to accommodate each home-based vehicle, for a total of 2,800 acres of space needed for all the home-based vehicles in the PUC.

The requirement of 350 square feet per automobile corresponds to a two-car garage for each vehicle. Is this correct? Is this based on one parking space at home and a second one at a destination?

Even if this figure is correct, it should be made clear that the 2,800 acres of space does not correspond to 2,800 acres of land used only for parking. Because of shared use, the effective land area is much smaller. For example, many homes have rooms or decks over garages, and many parking structures feature multiple stories.

- **Marginal vs. Sunk Costs Associated with Automobile Travel**

17 Because of their many benefits, most families will choose to own one or more automobiles. Once ownership occurs, many of the costs associated with car ownership are "sunk" costs which will have no bearing on the decision to commute to work by car or by some other mode of transportation because they must be paid regardless. Sunk costs include the cost of the car itself, automobile insurance, the cost of the home garage, the cost of roads, etc. These last two costs occur even without automobile ownership.

The automobile costs which affect one's choice of transportation mode are the much lower marginal costs, including the dollar cost of fuel and parking, and the time cost of door-to-door travel.

The analysis should address both the total costs and the marginal costs of the various transportation alternatives.

18

- **Unused Equipment and Capacity**

  Greater effort should be expended on using Honolulu's unused transportation equipment and capacity to help resolve transportation problems. This might include some of the tourist buses and vans which go unused during peak commuter periods, particularly in the early morning.

  Also, most cars travel during rush hour with three empty seats. Theoretically, capacity exists for over a three-fold increase in the number of commuters with no increase in the number of automobiles on the road.

19

- **Road Pricing**

  Highway capacity is a scarce resource which, in congested areas, is allocated to those commuters willing to suffer travel delays while other commuters adjust their schedules to travel before or after rush hour in order to avoid the delays.

  Like other scarce resources, most economists would argue that sensible road pricing during rush hour would be a better approach to allocating scarce highway capacity. The objective would be to maintain a good flow of traffic at all times by providing an *economic* incentive designed to induce commuters to (1) double up, thereby reducing the cost to these commuters while also reducing the number of cars on the road; (2) travel by express bus; (3) avoid the trip by using electronic communications; (4) travel at a different time; etc. Such an economic solution, in combination with other transportation alternatives, may be more effective and far less expensive than a purely engineering solution.

  This alternative should be presented, along with an honest assessment of its merits. The challenge will be to design an approach that is *politically* acceptable because it works better than other alternatives, and is regarded as fair.

I hope that these comments are helpful.

Yours truly,

Bruce

Bruce S. Plasch
President

cc: R. Bramen, Parsons Brinckerhoff/Carter & Burgess Team
D. Bunda, Leeward Oahu Transportation Management Association

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD6/99-02858R

August 16, 2000

Mr. Bruce S. Plasch, President
Decisions Analysts Hawaii, Inc.
1655 Kamole Street
Honolulu, Hawaii 96821

Dear Mr. Plasch:

Subject: Primary Corridor Transportation Project

Thank you for your letter dated June 8, 1999, regarding the Environmental Impact Statement (EIS) Preparation Notice, Primary Corridor Transportation Project.

Your comments are appreciated and will be included in the Major Investment Study/Draft Environmental Impact Statement. Enclosed is a copy of your written comments, which have been numbered. The following responses to your comments are provided.

1. Sprawl typically means land-intensive, low-density, single-family, unattached, residential developments that are located far from employment centers.
2. The current land use patterns on Oahu contain elements of both sprawl and centralized development. There is no contradiction.
3. If present patterns of sprawl continue, Oahu's open green spaces would all be converted to low-density residential developments. Therefore, in order to keep the country country, more compact forms of land development are necessary.
4. Socio-economic data is provided in Section 3.3. Comment noted.
5. Higher density developments can be affordable and attractive, as has been demonstrated many times on the mainland and throughout the world. Oahu is not large enough to accommodate unconstrained growth, while still preserving the natural values treasured by residents and visitors.
6. The outreach conducted for this project demonstrated widespread public support for the preservation of Oahu's natural values, which can occur only if sprawl is contained.
7. It is the desire to preserve prime agricultural lands that motivates the City to try to focus growth in designated areas such as Kapolei. If growth can be focused at Oahu's first and second cities, substantial prime agricultural land will remain on Oahu.
8. Continued agriculture on Oahu is part of the vision for the island articulated by the public in the Oahu Trans 2K outreach process.
9. The City is working with the State to develop consistent policies and investments that encourage concentrating growth in Oahu's first and second cities.

10. The vision for the PUC is being developed through the PUC DP update process now underway.
11. Sections 3.1 and 5.1 discuss the land use implications of the proposed project.
12. Section 2.5 provides the implementation schedule, and Chapter 6 provides the financing methods for all alternatives.
13. Experience to date has not shown a substantial impact of telecommunications on travel demand on Oahu.
14. Section 3.2 describes the existing transportation network in the study area.
15. The elements of benefits and costs, that are included in the cost-benefit analysis, are defined in Chapter 7. There are benefits and costs of automobile and transit travel that are not included in the cost-benefit analysis. There are multiple criteria upon which to evaluate the alternatives, and combining them all into a quantitative cost-benefit analysis is not appropriate.
16. Parking spaces per automobile typically range from 300 to 400 square feet, according to the Urban Land Institute and the National Parking Association's The Dimensions of Parking.
17. It is agreed that these costs should be recognized. However, continuing policies that facilitate automobile travel benefit only one segment of the population and have impacts on society at large and the environment that need to be considered.
18. Project alternatives are discussed in detail in Chapter 2. The TSM and BRT Alternatives include incentives for HOV vehicles (carpooling), and other measures to enhance the operational efficiency of the existing transportation network including private sector transit services (using unused equipment and capacity).
19. Transportation Demand Management (TDM) programs are included in the alternatives, but are not expected to address projected increases in travel demand fully in the primary transportation corridor. The advantages of efficient transit would encourage people to use their cars less. The use of specific disincentives and education programs on alternative transportation is a policy decision to be made by the City Council.

Should you have any questions regarding the project, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure

cc: Parsons Brinckerhoff Quade & Douglas, Inc.

A copy of the following August 21, 2000 letter from the Department of Transportation Services to participants at the May 11, 1999 scoping meeting letter was sent to the following on August 22, 2000:

Mr. W. K. Luke
1848 Puowaina Drive, Suite F
Honolulu, Hawaii 96813-1706

Ms. Darrlyn Bunda
95-1523 Alnamakua St., #95
Mililani, Hawaii 96789

Ms. Linda Starr
Kuliouou/Kalani Iki N.B. No. 2
P.O. Box 240310
Honolulu, Hawaii 96824

Mr. Dick Poirier
95-584 Naholoholo Street
Mililani, Hawaii 96789

Mr. Clifton Takamura
2249 Date Street, #3
Honolulu, Hawaii 96826

Mr. Richard Port
1600 Ala Moana Boulevard, #3100
Honolulu, Hawaii 96815

Mr. Jim Yamamoto
R.M. Towill Corp.
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

Ms. Michelle Matson
3230 Collins Street
Honolulu, Hawaii 96815

Ms. Mary Steiner
The Outdoor Circle
1314 S. King Street, Suite 308
Honolulu, Hawaii 96814

Mr. Wendell Lum
45-135 Lilipuna Road
Kaneohe, Hawaii 96744

Ms. Shannon Wood
P.O. Box 1013
Kailua, Hawaii 96734

Ms. Lynne Matusow
60 N. Beretania Street, #1804
Honolulu, Hawaii 96817

Ms. Pamela Young
P.O. Box 4444
Honolulu, Hawaii 96812

Mr. Richard Quinn
1133 Waimanu Street, #1104
Honolulu, Hawaii 96814

Ms. Chrisjen Mitchell
3071 Pualei Circle, #104
Honolulu, Hawaii 96815

Mr. William Rosa
3578 Alohea Avenue
Honolulu, Hawaii 96816-2281

Mr. Todd Boulanger
Na Kama Hele
P.O. Box 22424
Honolulu, Hawaii 96823-2424

Mr. Brian Yoshida
Moanalua Valley Community Association
1425 Ala Aolani Street
Honolulu, Hawaii 96819

Mr. Donald Lubitz
P.O. Box 418
Honolulu, Hawaii 96809-0418

Mr. Milton Ragsdale
2426 Armstrong Street
Honolulu, Hawaii 96822

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00414

August 21, 2000

Dear Participant:

Subject: Primary Corridor Transportation Project

On May 11, 1999, you participated in a public scoping meeting on the Primary Corridor Transportation Project at Washington Middle School. The function of the scoping meeting was to invite public comment on the purpose of and need for the project, the alternatives under consideration and the environmental studies to be conducted.

The oral and written comments we received that evening or shortly thereafter are summarized in the attached table along with responses to the issues raised. Many of the responses reference further information that is provided in the Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS) for the project, which will be released shortly. Your comments were important input to the development of the MIS/DEIS.

The MIS/DEIS document will be available for your review at various libaries and at the Department of Transportation Services after August 23, 2000. Should you have comments on the MIS/DEIS, please submit them by November 6, 2000.

Thank you for working with us to develop transportation solutions for our island. Should you have any questions regarding the Primary Corridor Transportation Project, please contact Faith Miyamoto at (808) 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Attachment

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS

Name and Organization	Comment	Response
Darrlyn Bunda, Leeward Oahu Transportation Management Association	Favored extending the LRT alignment to Waiawa Interchange.	The BRT Alternative, which has since replaced the LRT Alternative, has an In-Town component that goes as far as the Middle Street Interchange. There is an additional Regional BRT component that would service riders as far as Ewa/Kapolei.
	Waiawa Interchange needs to be reconfigured to serve buses/HDVs and to provide better access to the community, such as Leeward Community College.	Under the BRT Alternative, H-1 around the Waiawa Interchange would be widened and improved with a PM zipper lane. Section 2.2.3 discusses this and other improvements to the existing freeway system in detail.
Todd Boulanger, Na Kama Hele	Requested analysis of how the alternatives integrate bicycling and pedestrian trips.	Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives, although the BRT Alternative would do the most to improve bicycle facilities. However, pedestrians and bikes alone cannot satisfy all of the travel markets that must be accommodated. Chapter 1 discusses the project's purposes and needs, which include making the PUC more pedestrian friendly, and Chapter 4 discusses all modes of transportation. Investments in transit systems promote the pedestrian and bicycles modes as viable modes of travel. DTS will also continue to support programs to foster alternative transportation, such as the hub-and-spoke bus system and traffic calming, and Vanpool.
	Requested consideration of biking as a low cost area circulator.	Both SDOT and DTS have developed master plans to enhance the network of bicycle facilities and increase bicycling as a serious transportation mode for some travel markets. Improvement of bicycle facilities is included in all of the alternatives. Pedestrians and bikes are very much a part of the TSM and BRT Alternatives, but they alone cannot satisfy all of the travel markets that must be accommodated.
	Requested analysis of bikes and pedestrian access impacts along certain corridors, such as the tunnel, King Street and Kapiolani Boulevard.	Bicycle and pedestrian access is described in Sections 4.5 and 4.6.
	Requested analysis of impacts to the safety of pedestrians and cyclists from articulated buses as opposed to shorter or double deck buses.	Bicycle and pedestrian access is described in Sections 4.5 and 4.6.
	Questioned predicted reduction of regional vehicle miles traveled (VMT) from the project.	Extensive traffic modeling was done as part of the planning process. See Chapter 4 for details.
	Requested that disincentives to driving (e.g., road pricing, etc.) be included as alternatives, as well as measures to make walking as the preferred mode within the city.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Name and Organization	Comment	Response
Todd Boulanger, Na Kama Hele	Requested analysis of air and water quality impacts.	Impacts to air quality and water quality are discussed in Sections 5.5 and 5.8, respectively.
	Requested analysis of the socio-economic and environmental impacts on poor families having to depend on automobiles for their transportation.	Environmental justice issues are addressed in Section 5.3.
	Requested that the project conducts a more extensive and diverse public outreach program for scoping, and gave suggestions on how this can be accomplished.	Appendix A summarizes the efforts that have been made to provide opportunities for public participation. Comments from the public are welcome at any point. However, to be part of the official record, comments on the Draft EIS need to be made by the close of the comment period on the Draft EIS.
	Requested analysis of how bus fare increases affect future ridership, road congestion, land use, pollution, parking demand and the success the alternatives.	Financial plans are discussed in Chapter 6, and travel demand is discussed in Chapter 4.
Donald Lubitz	Suggested that right-of-way or corridor be reserved now in anticipation that an expanded transit system would be needed in the future.	Because of existing development patterns in the PUC, the rights-of-way of future transportation systems are primarily the existing transportation rights-of-way. This is why the need is to increase people-carrying capacity within the existing transportation rights-of-way.
	Suggested that the City transit system be used to support education programs for visitors and residents (e.g., provide transportation to education sites).	The PCTP would serve several travel markets, including students and visitors.
W-K Luke	Requested that public places of the project (e.g., transit centers) include amenities for socializing, and cultural elements consistent with area (e.g., Chinatown).	Transit centers and other public spaces included in the project would be designed to be pedestrian-friendly and contribute to a sense of community. Transit centers and stops in special districts such as Chinatown would be designed to blend in and enhance the existing cultural setting.
	Requested spot improvements to improve bus service.	Refinements to the existing bus system are made on an ongoing basis as the need arises.
Wendell Lum	Requested cost and funding information and analysis of impacts to the economy.	A financial analysis is provided in Chapter 6. Impacts on the economy are discussed in Section 5.1.
	Suggested that transportation investment be in the Central and Leeward areas where residential growth is occurring.	Transportation investments will be made throughout the primary transportation corridor. These investments are intended to help facilitate growth in Ewa and the PUC.
Christen Mitchell	As part of the No-Build, suggested a mixed-use land use pattern, and a continuous bikeway through the corridor.	The transportation improvements contained in the No-Build Alternative would do less than the other alternatives to help foster a mixed land use pattern. The transportation improvements in the No-Build would encourage continued suburbanization and loss of open space. The bicycle facilities in the existing State and County Bicycle Master Plans are included in the No-Build Alternative.
	Suggested private-public partnerships for mixed-use development at transit stations.	There are several ways to encourage "joint development" at transit centers and transit stops. Public-private partnerships are certainly being considered.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Name and Organization	Comment	Response
Christen Mitchell	Requested analysis of transportation malls' impact on the surrounding community, pedestrian access, safety and crime, and landscaping.	The social impacts of the project on the neighborhoods is discussed Section 5.3. Pedestrian access issues are addressed in Section 4.6. Landscaping issues are addressed in Section 5.7. In general, transit centers and transit stops are intended to help focus growth along the alignment and help develop a pedestrian and transit-oriented setting.
	Criticized advertising for the scoping meeting.	Appendix A summarizes the efforts that have been made to provide opportunities for public participation, including comments from the business community.
	Critical of overhead wires and motorized ferries on the Ala Wai.	Neither overhead lines nor ferries on the Ala Wai are proposed as elements of the PCTP.
Michelle Matson	Requested that potential impacts to businesses be considered in planning the project.	General economic impacts are discussed in Section 5.1. Chapter 4 discusses impacts on parking areas and loading zones.
	Supports Sand Island Bypass and Nimitz Parkway elements of the project for waterfront development.	The Sand Island component of this project is being addressed in the current update to the Regional Transportation Plan. It is not part of this project at the current time.
Lynne Matusow	Requested deleting the LRT and Ala Moana Waterfront Loop elements from the alternatives.	The LRT Alternative has been replaced by the BRT Alternative. The Ala Moana Waterfront Loop is no longer part of the project.
	Suggested a transit system similar to Curitiba, Brazil.	The In-Town BRT system would be a transit system similar to Curitiba, Brazil, adapted to local conditions. The Curitiba situation is in some ways simpler because more space is available to construct new transportation systems.
	Project should consider that certain streets are used for parades and block parties.	The route of the In-Town BRT system would be modified to accommodate special events. This topic is discussed in more detail in Section 4.6.
	Does not favor the use of overhead wires for the LRT.	Overhead lines are not proposed as a part of the PCTP. The LRT Alternative has been replaced by the BRT Alternative.
	Transit improvements should be extended into Waikiki.	The In-Town BRT would extend throughout Waikiki.
Dick Poirier	Supported congestion pricing and other types of user fees, such as charging for accessing the HOV lanes, as a viable alternative.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.
	Requested the Ewa terminus of LRT Alternative be extended to the Waiawa Interchange area.	The BRT Alternative would accommodate future phased extensions of the system if viable.
	Requested that alternatives for road pricing be studied.	Travel Demand Management (TDM) programs are included in the alternatives, but they are not expected to fully address projected increases in travel demand in the primary transportation corridor. Improved transit service would encourage people to use their cars less. The use of specific travel disincentives is a policy decision to be made by the City Council.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Comment	Response	Comment
Richard Port	Expressed concern about the cost of the alternatives, noting that revenues do not cover operating costs and that the transit system would compete with private operators.	Methods of financing the construction and operation of the alternatives are discussed in Chapter 6.
	Favors expanding the existing bus system, including use of articulated buses.	All of the alternatives would expand the bus system and use articulated vehicles. They vary by the degree and means that they would use to improve transit service.
Richard Quinn	Suggested decentralized transportation systems geared to individual neighborhoods because advances in technology would result in a greater degree of trips within the neighborhood for working and shopping.	While land use changes that would improve the ability of walking to satisfy more trip purposes are desired, walking alone is not expected to address all of the expected increase in travel demand.
Milton Ragsdale	Suggested new alternatives and modifications to certain elements of proposed alternatives - fixed rail along H-1 median from Pearlridge Shopping Center to Kahala Mall, with a subway from Middle Street Transit Center to Ala Moana, and a BRT connecting University/King Transit Center to Manoa Recreation Center or UH quarry area.	These suggestions would be less cost-effective than the alternatives currently under study. Chapter 2 discusses the evolution of the alternatives that receive detailed assessment.
	All BRTs and LRTs should have space or racks for bicycles.	Bicycles will be accommodated on the BRT vehicles.
William Rosa	Requested bus service be more frequent, and that traffic calming be used in downtown areas.	Chapter 2 describes the frequency of bus services for each of the proposed alternatives. The BRT Alternative would provide the greatest frequency of transit service. Traffic calming would continue to be an option wherever an opportunity for implementation is identified.
Linda Starr, Neighborhood Board #2, Kuliouou Kalani Iki	Does not favor special bus ramps- because it would waste resources.	Special bus ramps have been included in the BRT Alternative to decrease travel times for transit patrons.
	Requested studying metering at freeway on ramps.	The Hawaii Department of Transportation has been studying ramp metering.
	Feels that people from Kapolei to Pearlridge would not want to change modes, and thet they would want the convenience of riding an express bus into town.	All of the alternatives include selected express routes. Some degree of transfers and modal switches would be necessary for the system to work cost-effectively.
Mary Steiner, The Outdoor Circle	Requested clarification on certain elements of the project, such as details of the transit centers, landscape plans, impact to street trees, and project limits.	Project elements are described in Chapter 2. Landscaping and impacts to trees would be minimized to the extent practicable, and are described in Section 5.7. Further details would be developed in subsequent planning after City Council selects an LPA.
	Criticized lack of public participation.	Appendix A details the extent of efforts made to solicit public participation.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Comment	Response	Comment
Clifton Takamura	Provided suggestions on how to improve existing bus system.	Improvements to the bus system occur on an ongoing basis.
	Suggested using the old OR&L right-of-way as an alignment.	The alignment of the OR&L right-of-way is not appropriate for modern, high-speed transit vehicles. Some of the right-of-way is being proposed for bicycle use.
	Asked whether the proposed transit system will be a moneymaker, and whether it will be used by visitors.	Publicly-funded transit systems are not intended to made a profit. Creation of a profit is not one of the project purposes. Both visitors and residents are expected to use transit under any of the alternatives.
	Favored a system that uses a combination of LRT and buses.	The LRT has been replaced by the BRT Alternative, which would have In-Town and Regional systems that combine traditional buses and more technologically advanced energy-efficient vehicles.
Shannon Wood	Suggested expansion of alternatives to include more freeways, water-based transportation, and expansion of LRT system to Mililani, Hawaii Kai and Waikiki.	Chapter 2 describes the evolution of the alternatives that receive detailed treatment in the MIS/DEIS.
	Requested impacts analysis in the event of a natural disaster, and if the price of fossil fuel rises substantially.	Improved transit would enhance mobility during a natural disaster and if fossil fuel prices rise substantially.
Jim Yamamoto	LRT system should serve Bethel Street.	The LRT has been replaced by the BRT Alternative. There would be a transit stop in the vicinity of Bethel Street.
	Requested analysis of why people drive.	People travel for many reasons, and these factors have been included in the travel demand forecasts prepared for this project.
	Suggested multi-modal efforts to address transportation issues.	The TSM and BRT Alternatives are multi-modal alternatives, as described in Chapter 2.
Brian Yoshida, Moanalua Community Association	Supported the LRT alternative, but would also like to see the project include roadway widening on the H1 Freeway, and extending the Nimitz viaduct to Downtown.	The LRT Alternative has been replaced by the BRT Alternative. The H1 Freeway widening and Nimitz viaduct have been or are being considered under separate projects.
	Requested analysis of disruption of traffic during construction, projected ridership of different alternatives, and projected fares for the LRT.	Construction-phase impacts, including impacts on traffic, are discussed in Section 5.12. Ridership projections are presented in Chapter 4. Fares and project financing plans are presented in Chapter 6.
Pamela Young	Additional right-of-way requirements should be disclosed.	Right-of-way requirements are discussed in Section 5.2.
	Questioned the need for LRT, especially since the Leeward and Central Oahu areas contain a third of Oahu's population.	The LRT Alternative has been replaced by the BRT Alternative. Chapter 1 discusses the need for the project. There is a substantial imbalance now and in the future between travel demand and transportation system capacity for travelers in the Primary Transportation Corridor, which includes Leeward and the southern portion of the Central District.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Comment	Response	Comment
Anonymous	Criticized the lack of opportunity for exchange of comments, questions and answers before the whole audience.	Comment noted.
	Expressed frustration on the lack of progress on needed transportation improvements.	DTS shares the commentors frustration about the lack of progress on this important quality of life issue.
	Supports a "traditional" looking LRT system rather than a "modern" looking LRT system.	The LRT Alternative has been replaced by the BRT Alternative. The final look of the BRT vehicles, if this alternative is selected, has not yet been selected.
Unknown, Agency	Will project be used to assist in urban planning?	Yes. Project is coordinating with current planning efforts to update the PUC DP, sustainability plans of other DP areas and the recently completed Ewa DP. Overall land use objectives are to encourage urban growth in the PUC and Ewa, and discourage suburban sprawl in other areas. Transportation is one tool to help facilitate these land use objectives. Improved transit service will make in-town living more attractive.
	Need land use controls to discourage/prevent gentrification around future transit stations	Will ensure that future development is consistent with community visions and desires.
	Is the third light rail transit LRT Alternative a first phase of the first and second LRT Alternatives?	The LRT Alternative has been replaced by the BRT Alternative.
	Does BRT Alternative include LRT from downtown to Waikiki?	None of the alternatives moving forward include LRT technology.
	Do any of the alternatives include service between the airport and Waikiki?	Ridership estimates will include all travel markets, including demand between the airport and Waikiki. However, addressing the airport/Waikiki travel market is not a major purpose of this project. Airport travelers would need to get to the Middle Street Transit Center to access the system.
	Is modifying the H-1 Zipper Lane to carry P.M. peak traffic possible?	Yes. The BRT Alternative includes a PM zipper lane.
	Is it possible to come up with defensible ridership projections?	Ridership projections are described in Chapter 4.
	Is there a cost per new rider threshold for receiving federal funds as a transit "new start"?	To receive federal funding, a project must be on the federal "new start" list. There are many rating criteria that score projects on the "new start" list, including cost per new rider. The FTA will use many other criteria, such as ridership, to evaluate the project. After determining eligibility, the project would compete with other transit projects across the nation for federal funds.
	Transit center locations in Waipahu should follow the Waipahu Special Area Plan.	There are no site-specific locations for the Waipahu transit centers. However, they will be located strategically to serve BRT treatments on Fort Weaver Road and other roadways.
	Has a site for the LRT maintenance yard for the Waikiki/Downtown line been selected?	The LRT Alternative has been replaced by the BRT Alternative. In-Town BRT vehicles would be maintained at the Middle Street Transit Center.

SUMMARY OF COMMENTS RECEIVED AT THE AGENCY INFORMATION AND SCOPING MEETINGS (CONTINUED)

Comment	Response	Comment
Unknown, Agency	Will lanes be used exclusively for the LRT?	The LRT Alternative has been replaced by the BRT Alternative. The In-Town BRT would use both exclusive and semi-exclusive lanes.
	Disagreed that communities do not want more lanes for automobiles.	Comment noted.
	Will there be any grade-separated sections for the LRT?	The LRT Alternative has been replaced by the BRT Alternative. No grade-separations are proposed.
	People are asking for a more balanced transportation system.	That is what this project is trying to accomplish. Chapter 1 describes the project purposes and needs in more detail.
	Will this project do anything to alleviate the problem of motorists using residential side streets to avoid congestion on the main arterial streets?	By enhancing transit service, more people would be encouraged to use transit instead of private automobiles.
	What are bus ramps?	Ramps that are restricted to buses and certain vehicles, such as vanpools. Their objective is to provide transit priority, thereby rewarding transit patrons with shorter travel times.
	The DPs contain lists of cultural assets and resources, and important viewplanes and visual resources.	The information in the DP's was used in the preparation of the MIS/DEIS.
	What are the costs of the alternatives?	Cost estimates are discussed in Chapter 2.
	What are committed projects?	Projects that are listed in the Oahu Regional Transportation Plan as proposed for completion by the year 2005.
	What is the time horizon for this project?	Planning is based on travel demand forecasts and land use projected for 2025.

Primary Corridor Transportation Project

Appendix D

Agency Correspondence

APPENDIX D
AGENCY CORRESPONDENCE

This appendix contains a record of all the agency correspondence regarding the following regulations:

- Cooperating agencies as required in the Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act
- Section 106 of the National Historic Preservation Act
- Section 7 of the Endangered Species Act
- Section 404 of the Clean Water Act
- Section 4(f) of the U.S. Department of Transportation Act
- Section 6(f) of the Land and Water Conservation Fund
- Use of Conservation District under Chapter 205 of the Hawaii Revised Statutes

A summary of the correspondence and consultation activities is provided below. Copies of these documents are provided in this appendix.

D.1 COOPERATING AGENCY LETTERS

May 5, 1999 letter from the Federal Highway Administration (FTA) to the Federal Highway Administration (FHWA) inviting them to be a cooperating agency

June 14, 1999 letter from the FHWA to the FTA accepting invitation to be a cooperating agency

May 5, 1999 letter from the FTA to the U.S. Army Corps of Engineers (USACE) inviting them to be a cooperating agency

June 16, 2000 letter from USACE to FTA accepting invitation to be a cooperating agency

July 27, 2000 letter from the State of Hawaii Department of Transportation (SDOT) to City and County of Honolulu, Department of Transportation Services (DTS) requesting to be a cooperating agency

D.2 SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

Minutes of April 8, 1999 meeting with State Historic Preservation Division (SHPD) to discuss definition of the project's Area of Potential Effect (APE) and the methods to identify potential historic properties within the APE

May 7, 2000 letter from the DTS to the SHPD confirming the agreements made during the April 8, 1999 meeting

Minutes of May 21, 2000 meeting with the Office of Hawaiian Affairs to discuss potential archaeological and cultural issues of the project

Minutes of June 17, 1999 meeting with the SHPD to discuss the results of the project's first phase to identify potential historic properties

Minutes of October 13, 1999 meeting with the SHPD to discuss the list of potential historic properties in the APE

Minutes of November 12, 1999 meeting with the SHPD to discuss changes that were made to the project, and how these changes would affect the identification of potential historic properties

February 8, 2000 letter from the DTS to the SHPD submitting the results of the inventory survey,

February 25, 2000 letter from the DTS to the SHPD requesting concurrence that the APE be reduced because of changes made to the project

March 8, 2000 letter from the State Historic Preservation Officer (SHPO) concurring with the reduction of the APE

D.3 SECTION 7 OF THE ENDANGERED SPECIES ACT

May 12, 1999 letter from the FTA to the U.S. Fish and Wildlife Service (USFWS) requesting a list of potential Federal Trust species that may be in the project area

May 24, 1999 letter from the USFWS to the DTS providing a list of Federal Trust species that may potentially be in the project area

D.4 SECTION 404 OF THE CLEAN WATER ACT

May 4, 2000 letter from DTS to FHWA requesting concurrence with project purpose and need and alternatives per the Memorandum of Understanding (MOU) that integrates the National Environmental Policy Act (NEPA) and Clean Water Act Section 404 processes for surface transportation projects in the State of Hawaii

June 26, 2000 letter from FHWA to DTS informing DTS that they intend to contact FTA directly if they have any recommendations or concerns

August 17, 2000 letter from DTS to FHWA informing FHWA that the Bus Rapid Transit (BRT)/Sand Island Scenic Parkway (SISP) Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

May 4, 2000 letter from DTS to the U.S. Army Corps of Engineers (ACOE) requesting concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

June 8, 2000 letter from ACOE to DTS stating concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

July 19, 2000 letter from DTS to ACOE informing ACOE that the BRT/SISP Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

May 4, 2000 letter from DTS to the National Marine Fisheries Service (NMFS) requesting concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

June 9, 2000 letter from NMFS to DTS stating concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

July 19, 2000 letter from DTS to NMFS informing NMFS that the BRT/SISP Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

May 4, 2000 letter from DTS to USFWS requesting concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

June 12, 2000 letter from USFWS to DTS stating concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

August 17, 2000 letter from DTS to USFWS informing USFWS that the BRT/SISP Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

May 4, 2000 letter from DTS to the U.S. Environmental Projection Agency (USEPA) requesting concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

June 14, 2000 letter from USEPA to DTS stating non-concurrence with the project purpose and need and alternatives per the Section 404/NEPA MOU

July 19, 2000 letter from DTS to USEPA informing USEPA that the BRT/SISP Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

May 4, 2000 letter from DTS to the SDOT requesting concurrence with project purpose and need and alternatives per the Section 404/NEPA MOU

June 14, 2000 letter from SDOT to DTS stating non-concurrence with the project purpose and need and alternatives per the Section 404/NEPA MOU

August 17, 2000 letter from DTS to SDOT informing SDOT that the BRT/SISP Alternative is no longer being considered in the MIS/DEIS, and the Section 404/NEPA MOU no longer applies to the project

D.5 SECTION 4(F) OF THE U.S. DEPARTMENT OF TRANSPORTATION ACT

November 10, 1999 letter from DTS to the Aloha Stadium manager requesting Section 4(f) coordination regarding the use of the Aloha Stadium overflow parking lot as a park-and-ride facility

August 21, 2000 letter from Aloha Stadium manager to DTS concurring with the assessment of the impact of the proposed facilities as stated in the MIS/DEIS

D.6 SECTION 6(F) OF THE LAND AND WATER CONSERVATION FUND

August 21, 2000 letter from DTS to the U.S. Department of the Interior, National Park Service requesting concurrence that the use of the Aloha Stadium overflow parking lot as a park-and-ride facility is consistent with the provisions of Section 6(f)

D.7 USE OF CONSERVATION DISTRICT

September 28, 1999 letter from DTS to the State of Hawaii Department of Land and Natural Resources, Land Division (DLNR-LD) regarding the need for a Conservation District Use Permit (CDUP) for the project

October 19, 1999 from DLNR-LD to DTS stating that a CDUP would be required if a tunnel is constructed under Fort Armstrong Channel, the proposal under the SISP, which has since been dropped as an alternative in the MIS/DEIS

BENJAMIN J. CAYETANO
GOVERNOR

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

LEADING HAWAII INTO THE NEW MILLENNIUM
1959 2000+

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

July 27, 2000

IN REPLY REFER TO:
STP 8.9624

AUG 1 23

Ms. Cheryl Soon
Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza, Suite 1200
711 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Study (PCTS), Cooperating Agency

In accordance with the recommendations from the meeting held on July 17, 2000, with our staffs and the Federal Highway Administration, we are requesting that the Hawaii Department of Transportation (HDOT) be designated as a cooperating agency for the PCTS.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

c: Mr. Leslie T. Rogers, Federal Transit Administration, Region IX
Mr. Abraham Wong, Federal Highway Administration
Mr. Gordon G.W. Lum, Oahu Metropolitan Planning Organization

U.S. Department
of Transportation
Federal Transit
Administration

REGION IX
Arizona, California,
Hawaii, Nevada, Guam

201 Mission Street
Suite 2210
San Francisco, CA 94105-1839
415-744-3133
415-744-2728 (fax)

MAY 5 1999

Mr. Abraham Wong, Division Administrator
Federal Highway Administration, Hawaii Division
U. S. Department of Transportation
P. O. Box 50206
Honolulu, Hawaii 96850

Dear Mr. Wong: Abe

Re: Primary Corridor Transportation Project

The Federal Transit Administration (FTA), in cooperation with the City and County of Honolulu Department of Transportation Services (DTS) is initiating an environmental impact statement (EIS) for proposed transportation improvements in the Primary Transportation Corridor of the City and County of Honolulu. Since some of the proposed improvements may require Federal Highway Administration (FHWA) approval, we are requesting FHWA to be a joint lead agency.

The Primary Corridor Transportation Project proposes transportation improvements in the primary transportation corridor of Oahu. The corridor extends from Kapolei in the Ewa District to the University of Hawaii at Manoa. The proposed action is intended to address existing and future transportation demand and capacity needs; support socioeconomic growth on the island and in the corridor; improve public transit services; facilitate land use development in the central urban core consistent with the vision for Oahu; and support current planning activities and policies. The alternatives under consideration include a No-Build and several build alternatives that would include an Enhanced Bus/Transportation System Management (TSM) Alternative, a Bus Rapid Transit Alternative, and a Light Rail Transit Alternative. The build alternatives include highway improvements, such as modified freeway ramps and other roadway improvements to provide priority treatment for buses, and transit centers. A Sand Island Bypass Road, including a tunnel from Sand Island to Kakaako, and a conversion of a portion of the existing Nimitz Highway to a parkway, could be part of the build alternatives. Detailed technical reports will be prepared on topics such as transportation, land use, social and economic impacts, finance and cost-effectiveness, visual and aesthetic impacts, noise and vibration, parks and recreation areas, historic resources, air quality and hazardous materials.

Your agency's involvement should entail those areas under its jurisdiction and no direct writing or analysis will be necessary for the document's preparation. The following are activities we will take to maximize interagency cooperation:

1. Invite you to coordination meetings;
2. Consult with you on any relevant technical studies that will be required for the project;
3. Organize joint field reviews with you;
4. Provide you with project information, including study results;
5. Encourage your agency to use the above documents to express your views on subjects within your jurisdiction or expertise; and
6. Include information in the project environmental documents that joint lead and cooperating agencies need to discharge their National Environmental Policy Act (NEPA) responsibilities and any other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

You have the right to expect that the EIS will enable you to discharge your jurisdictional responsibilities. Likewise you have the obligation to tell us if, at any point in the process, your needs are not being met. We expect that at the end of the process the EIS will satisfy your NEPA requirements including those related to project alternatives, environmental consequences and mitigation. Further, we intend to utilize the EIS and our subsequent record of decision as our decision -making documents and as the basis for permit applications.

We look forward to your response to this request and your role as a joint lead agency on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during the preparation of this EIS, please contact Mr. Robert Hom, Director, Office of Planning and Program Development, at (415) 744-3116.

Sincerely,

Leslie Rogers

Leslie T. Rogers
Regional Administrator

cc:
Kenneth Hamayasu
City & County of Honolulu, DTS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Hawaii Division
Box 50206
300 Ala Moana Blvd., Room 3-306
Honolulu, HI 96850
June 14, 1999

IN REPLY REFER TO
HPR-HI
[720.200]

RECEIVED
JUN 16 P12:04

Leslie Rogers, Regional Administrator
Federal Transit Administration
201 Mission Street
Suite 2210
San Francisco, CA 94105

Subject: Primary Corridor Transportation Project: Cooperating Agency Decision and Comments

In response to your letter of May 5, 1999, we elect to be a cooperating agency on the Primary Corridor Transportation Project (PCTP) proposed by the City and County of Honolulu. Alternatives presented by the City are primarily transit options. We understand that if future conditions warrant, our role could be changed to joint lead agency, and that change can readily be accommodated. We agree with your understanding stated in the May 5 letter that the EIS will enable FHWA to discharge its jurisdictional responsibilities and that the EIS will satisfy our NEPA requirements including those related to project alternatives, environmental consequences and mitigation. Please keep this office fully informed about any highway related impacts or improvements for the PCTP. We are committed to being involved and responsive to FTA, our State, City, and MPO partners, and the public throughout the study effort.

We would like to take this opportunity to remind you that the DEIS/MIS must be fully coordinated with the Oahu Metropolitan Planning Organization (OMPO.) Assumptions on land-use, demographics, traffic, and other data must be consistent between the PCTP and the OMPO planning process, including the Oahu Regional Transportation Plan (ORTP) update. OMPO is responsible for regional transportation planning on Oahu, and the MIS is really a subarea or corridor planning study that is of regional nature, so it should be carried out in the OMPO forum.

The cost for the PCTP alternatives must be determined and considered on a regional basis. The PCTP preferred alternative and all of its transit and highway elements must be fully incorporated into the ORTP by including it in the ORTP update or a plan amendment. Funds for the project must be reasonably available, and as part of the ORTP, the project must be considered with respect to all other transportation priorities in the ORTP to determine its priority and validity in the regional perspective. The project as a whole could consume funding for other priority projects included or being considered for inclusion in the ORTP and the tradeoffs must be presented to the stakeholders and the public for their consideration.

Alternatives presented by the City thus far are primarily transit options. While this focus is due to the high capacity transit placeholder in the existing ORTP, the MIS requirements call for all reasonable alternatives to be considered within the MIS, therefore highway options should be considered now rather than after the MIS is completed by the City. The HDOT and OMPO should ensure that the study includes multi-modal alternatives that support their transportation plans for the corridor.

Please feel free to contact Jonathan Young at (808) 541-2700, ext. 325, if you have any questions.

Sincerely yours,

Abraham Wong

Abraham Wong
Division Administrator

cc: Toru Hamayasu (DTS)
Kazu Hayashida (HDOT)
Gordon Lum (OMPO)
Pericles Manthos (HWY)
Julia Tsumoto (STP)

U.S. Department
of Transportation
Federal Transit
Administration

REGION IX
Arizona, California,
Hawaii, Nevada, Guam

201 Mission Street
Suite 2210
San Francisco, CA 94105-1839
415-744-3133
415-744-2728 (fax)

MAY 5 1999

Lieutenant Colonel Wally Z. Walters
District Engineer
Honolulu Engineer District
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858-5440

Dear Lieutenant Colonel Walters:

Re: Primary Corridor Transportation Project

The Federal Transit Administration (FTA), in cooperation with the City and County of Honolulu Department of Transportation Services (DTS) is initiating an environmental impact statement (EIS) for proposed transportation improvements in the Primary Transportation Corridor of the City and County of Honolulu. Since the project will almost certainly require a Section 404 permit and because of your agency's legal jurisdiction over such permits, we are requesting the Corp of Engineers to be a cooperating agency.

The Primary Corridor Transportation Project proposes transportation improvements in the primary transportation corridor of Oahu. The corridor extends from Kapolei in the Ewa District to the University of Hawaii at Manoa. The proposed action is intended to address existing and future transportation demand and capacity needs; support socioeconomic growth on the island and in the corridor; improve public transit services; facilitate land use development in the central urban core consistent with the vision for Oahu; and support current planning activities and policies. The alternatives under consideration include a No-Build and several build alternatives that would include an Enhanced Bus/Transportation System Management (TSM) Alternative, a Bus Rapid Transit Alternative, and a Light Rail Transit Alternative. The build alternatives include highway improvements, such as modified freeway ramps and other roadway improvements to provide priority treatment for buses, and transit centers. A Sand Island Bypass Road, including a tunnel from Sand Island to Kakaako, and a conversion of a portion of the existing Nimitz Highway to a parkway, could be part of the build alternatives. Detailed technical reports will be prepared on topics such as transportation, land use, social and economic impacts, finance and cost-effectiveness, visual and aesthetic impacts, noise and vibration, parks and recreation areas, historic resources, air quality and hazardous materials.

Your agency's involvement should entail those areas under its jurisdiction and no direct writing or analysis will be necessary for the document's preparation. The following are activities we will take to maximize interagency cooperation:

1. Invite you to coordination meetings;
2. Consult w... you on any relevant technical studies th... will be required for the project;
3. Organize joint field reviews with you;
4. Provide you with project information, including study results;
5. Encourage your agency to use the above documents to express your views on subjects within your jurisdiction or expertise; and
6. Include information in the project environmental documents that cooperating agencies need to discharge their National Environmental Policy Act (NEPA) responsibilities and any other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

You have the right to expect that the EIS will enable you to discharge your jurisdictional responsibilities. Likewise you have the obligation to tell us if, at any point in the process, your needs are not being met. We expect that at the end of the process the EIS will satisfy your NEPA requirements including those related to project alternatives, environmental consequences and mitigation. Further, we intend to utilize the EIS and our subsequent record of decision as our decision-making documents and as the basis for permit applications.

We look forward to your response to this request and your role as a cooperating agency on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during the preparation of this EIS, please contact
Mr. Robert Hom, Director, Office of Planning and Program Development, at (415) 744-3116.

Sincerely,

F. James Kenna
for Leslie T. Rogers
Regional Administrator

cc:
Kenneth Hamayasu
City & County of Honolulu, DTS

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

June 16, 1999

Regulatory Branch

COPY

RECEIVED
99 JUN 17 12:26

Mr. Leslie T. Rogers
Regional Administrator
U.S. Department of Transportation
Federal Transit Administration, Region IX
201 Mission Street, Suite 2210
San Francisco, California 94105-1839

Dear Mr. Rogers:

This is in response to your request that the U.S. Army Corps of Engineers participate as a cooperating agency in preparation of the environmental documents for the proposed Primary Corridor Transportation project. Our understanding is that the Federal Transit Administration will act as the lead federal agency.

Under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, the Corps has jurisdiction over waters of the U.S. that may be impacted by the proposed project. Therefore, the Corps will participate as a cooperating agency as provided by 40 CFR 1501.6.

If you have any further questions, please contact Mr. Alan Everson of my staff at (808) 438-9258 ext. 11.

Sincerely,

Wally Z. Walters
Lieutenant Colonel, U.S. Army
District Engineer

Copy Furnished:

City and County of Honolulu, Department of Transportation Services, 650 South King St., Honolulu, Hawaii 98813

DRAFT

To: File

From: Jason Yazawa

Date: April 30, 1999

Subject: Primary Corridor Transportation Project
Meeting with State Historic Preservation Division (SHPD)
Held on April 8, 1999

In Attendance: Sara Collins, SHPD
Tonia Moy, SHPD
Faith Miyamoto, DTS
David Atkin, PB
Jason Yazawa, PB

Meeting Summary

DTS and PB provided a briefing on the proposed project (status, purpose and need, alternatives, etc.)

DTS and PB proposed that the method of identifying historic buildings, in accordance with Section 106 of the National Historic Preservation Act, be the following:

- secondary data search (previous transit report, Registers, etc.);
- windshield survey to develop a "long list" of possible eligible sites;
- consultation with SHPD to screen the long list and develop a "short list";
- inventory survey the screened short list to evaluate significance (eligibility for the National Register); and
- SHPD agreement on significance evaluations.

DTS and PB proposed that the Area of Potential Effect (APE) for historic buildings be one lot deep from the transit (LRT or BRT) corridor because improvements will be at-grade.

SHPD agreed with the approach above to identify historic buildings. SHPD also generally agreed with the dimensions of the APE along the transit corridor. However, the APE around new ramps, park-and-ride lots or transit centers where such facilities might rise above the grade would be determined on a case-by-case basis.

With regards to archaeological sites, DTS and PB will request SHPD to provide a list of known archaeological sites in the corridor. DTS and PB believe this should suffice with regards to Section 106 requirements because the corridor is generally a built-up, urban

environment and most improvements would be done on existing streets and highways. SHPD agreed, and commented that a more detailed study could be done at a later time if needed. SHPD has GIS records of archaeological sites, which they would share with DTS and PB.

With regards to traditional cultural practices, SHPD recommended that DTS and PB consult with the Office of Hawaiian Affairs (OHA).

Once all historic properties are identified, the Federal Transit Administration will make an effect determination, which would be submitted to the State Historic Preservation Officer for concurrence.

SHPD stated that project compliance with Section 106 would cover State requirements as specified in Chapter 6E of the Hawaii Revised Statutes.

Action Items:

1. PB team to conduct windshield survey to develop "long list" of buildings that could potentially be eligible for the National Register.
2. PB team to coordinate with SHPD to screen "long list" to develop a "short list" of potential sites.
3. PB team to conduct additional studies of "short list" with scope to be determined in consultation with SHPD.
4. PB team to request from SHPD a list of known archaeological sites in the project area that are on or eligible for the National Register.
5. PB team and DTS to meet with OHA to discuss traditional cultural properties in the project area.

cc. Attendees
Susan Killen, PB
Robert Bramen, PB
Ann Yoklavich, Mason Architects
Glenn Mason, Mason Architects

DEPAR ENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD99-00292

May 7, 1999

Dr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Attention: Ms. Sara Collins

Dear Dr. Hibbard:

Subject: Primary Corridor Transportation Project

This letter is to follow up on the April 8, 1999 meeting with your staff regarding compliance with Section 106 of the National Historic Preservation Act and Chapter 6E of the Hawaii Revised Statutes.

At that meeting, the approach to identify historic properties (i.e., sites on or eligible for the National Register) that could potentially be affected by the subject project was proposed. Your staff agreed with the approach presented to identify historic buildings, and recommended consultation with the Office of Hawaiian Affairs to identify traditional cultural properties in the project area. I have enclosed for your review and comment draft minutes of the meeting.

With regard to archaeological sites, your staff agreed to provide a list of known archaeological sites in the project area (see enclosed project area map) that are on or eligible for the National Register as well as other pertinent information, such as GIS mapping and files. This information is now formally requested. We would appreciate receiving this information as soon as possible so we can determine whether the proposed project would affect these sites.

If you have any questions, please feel free to contact Faith Miyamoto of the Transportation Planning Division, at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

PB

Memorandum

DRAFT

To: File

From: Jason Yazawa

Date: June 11, 1999

Subject: Primary Corridor Transportation Project
Scoping Meeting with the Office of Hawaiian Affairs (OHA)
Held on May 21, 1999

In Attendance: Faith Miyamoto, DTS
C. Sebastian Aloot, OHA
Lynn Lee, OHA
Susan Killen, PB
Jason Yazawa, PB

Meeting Summary

Ms. Miyamoto provided a short briefing on the status of the project, noting that an Environmental Impact Statement (EIS) Preparation Notice and a Notice of Intent were recently issued, and that a public scoping meeting was held. Ms. Miyamoto indicated that the comment period ends on May 24th, but we would work with OHA to get their comments incorporated into the Draft EIS. As background for the discussion, Ms. Killen provided a briefing on the alternatives currently being considered.

Ms. Lee questioned why transportation improvements between Kapolei and Honolulu were being proposed when the vision for Kapolei is to develop a city where people live and work. Ms. Lee thought that the proposed improvements were inconsistent with this vision. Ms. Killen stated that there would still be a need for people to travel between Kapolei and Honolulu. However, the proposed transportation improvements for Kapolei are transit-related, and are meant to provide people with transportation options to driving their cars. Ms. Lee was in agreement with providing transit priority improvements. It was suggested that a glossary would be useful as a guide to the project maps provided.

The Sand Island Bypass / Nimitz Parkway improvements, which are included as part of the BRT and LRT Alternatives, were discussed. Ms. Lee stated that OHA would have concerns about impacts to burials, archaeology and water quality. Mr. Aloot stated that the Sand Island property is categorized as 5A lands, meaning that it was obtained by the State from the federal government before Statehood, and is, therefore, not part of the public land trust (5F lands) for which OHA is entitled to 20

percent revenues. The status of the Sand Island property is in dispute. Therefore, Mr. Aloot stated that this issue would likely be raised (maybe by OHA) during the planning of this project.

Ms. Lee asked what kind of land uses would be expected on Sand Island after the bypass is completed. Ms. Killen answered that Matson and SeaLand would probably remain. However, more commercial uses and greenways along the waterfront would be expected.

Ms. Lee recommended that a cultural impact assessment be conducted for the Sand Island project. The assessment should include fishing practices, burials and archaeological resources. Ms. Lee noted that the manner in which Sand Island was filled might be important in determining the extent of any burials, and that many families still have strong connections to Sand Island. Ms. Lee stated that Mokauea Island contains about a half-dozen houses on leases from the Department of Land and Natural Resources.

Ms. Lee noted that the Burial Council will not be handling all the burial issues associated with Sand Island. Ms. Lee recommended that consultants from the Hawaiian community be used to help the project resolve issues of handling burials and other artifacts. Mr. Aloot stated that OHA has a Cultural Rights Specialist who could help link the project with the proper community groups.

In response to a question from Ms. Lee regarding the inclusion of the Bypass in the BRT and LRT Alternatives, Ms. Killen stated that for the EIS, the alternatives will include a scenario without the Sand Island Bypass / Nimitz Parkway improvements.

Ms. Lee did not know of any cultural/traditional practices in other parts of the project. Generally, the mauka areas (say areas mauka of Queen Street) are less likely to contain burials. Ms. Lee suggested that there be a check for sinkholes in the Fort Weaver Road area.

For compliance with Section 106 of the National Historic Preservation Act, Ms. Lee recommended consultation with Hui Malama o Kapuna and the Pearl Harbor Hawaiian Civic Club. Ms. Lee agreed to provide contact names and telephone numbers.

The meeting concluded with an agreement to continue to coordinate throughout the duration the project.

Distribution: Meeting participants
Bob Bramen, PB
David Atkin, PB

Memorandum

To: File

From: Jason Yazawa

Date: June 17, 1999

Subject: Primary Corridor Transportation Project
Meeting regarding historic resources held on June 17, 1999

In Attendance: Faith Miyamoto, DTS
Don Hibbard, State Historic Preservation Division (SHPD)
Tonia Moy, SHPD
Glenn Mason, Mason Architects Inc.
Ann Yaklovich, Mason Architects Inc.
Susan Killen, PBQD
Jason Yazawa, PBQD

Meeting Summary

The purpose of this meeting was to discuss the screening of the windshield survey list. In a meeting with SHPD staff on April 8, 1999, it was agreed that a windshield survey be conducted to identify potential historic resources, apart from known resources that were identified from previous reports and listing in the National and Hawaii Registers of Historic Places.

Ms. Killen and Mr. Yazawa provided a short briefing on the status of the project and the alternatives currently being considered. Included in this discussion was an explanation on the possible appearance of the catenaries (poles and overhead wires) under the LRT Alternative.

Ms. Yaklovich provided a briefing on the screening of the initial windshield survey list. The initial survey, conducted on all the affected roadways (LRT, BRT, etc.) of the alternatives, identified 242 sites. In consultation with SHPD, the area of potential effect (APE) of any BRT improvement (e.g., semi-exclusive and exclusive bus lanes: but excluding ramps) would be limited to the roadway. By only including sites along the LRT alignments, 187 sites remained on the list. The second screening involved eliminating sites that are younger than 50 years. In consultation with SHPD, 1952 was set as the cut-off year. After the date research, 112 sites remained. These sites were evaluated on whether they have integrity (a criterion for eligibility to the National Register). Although some of the sites had integrity, Mason Architects judged them not likely to be eligible for the National Register for other reasons. Mason Architects

produced assessment sheets of the sites, which included photography. Copies of the sheets were submitted to SHPD. After evaluating the integrity and potential eligibility the 112 sites, 32 sites remained, which represent sites recommended for an inventory survey.

SHPD staff agreed to review the screening of the windshield survey, which produced the list of sites recommended for further study. Mr. Hibbard stated that they can respond in writing in a couple of weeks.

Mr. Hibbard had the following concerns or provided the following information regarding historic resources:

- changes in curb heights at transit stations should be minimized or be consistent with surrounding curb heights if they are at or adjacent to an historic property;
- all lava rock curbs and sidewalks should be retained;
- check whether there are any 50+ year old traffic signals along the project, since they may be considered historic;
- Bachman Hall and Sinclair Library at the University of Hawaii may be eligible properties;
- the trees along Kapiolani Boulevard are considered an historic landscape; and
- catenaries in the Capitol District may not be a concern because there are already street lamps in the district (response to a PBQD question).

A list of known sites within the project's APE was submitted to SHPD. SHPD staff agreed to review the list, and to alert DTS if there are known sites missing other than those above.

Distribution: meeting participants
Bob Bramen, PB
David Atkin, PB

PB

Memorandum

DRAFT

To: File

From: Jason Yazawa

Date: October 13, 1999

Subject: Primary Corridor Transportation Project
Meeting with State Historic Preservation Division (SHPD)
Held on September 28, 1999

In Attendance: Don Hibbard, SHPD
Sara Collins, SHPD
Tonia Moy, SHPD
Faith Miyamoto, DTS
Ann Yoklavich, Mason
David Atkin, PB
Jason Yazawa, PB

Meeting Summary

Mr. Jason Yazawa, of Parsons Brinckerhoff (PB), provided a briefing on the changes made to the proposed project since the last meeting with staff from the State Historic Preservation Division (SHPD) held on June 17, 1999.

Mr. Yazawa also briefed SHPD staff on the upcoming historic building survey work for the CityTram Waikiki Branch and Sand Island Bypass/Nimitz Parkway elements of the project. Mason Architects will conduct a windshield survey and screening, the same methods used in the previous survey work. SHPD staff agreed with this work.

The archaeological and cultural survey work on the Sand Island Bypass portion of the project was discussed. Mr. Yazawa informed SHPD staff that during a consultation meeting with the Office of Hawaiian Affairs held on May 21, 1999, project staff were informed about native Hawaiians who reside on Mokauea Island under lease from the State Department of Land and Natural Resources. Ms. Sara Collins, an archaeologist with SHPD, was not aware of any other archaeological or cultural resources on or near Sand Island mainly because most, if not all, the island was created by fill material from Honolulu Harbor and Keehi Lagoon. Mr. Don Hibbard, the administrator of SHPD, recalled a report about Sand Island. Ms. Collins said she would try to find it.

Ms. Collins stated that the natural shoreline in the vicinity of Sand Island Bypass/Nimitz Parkway is along Nimitz Highway. The area makai of Nimitz Highway is fill material. Ms. Collins stated that construction at Pier 39-40 (Young Brothers terminal) uncovered

a burial, but this discovery is unusual because the current Pier 39-40 is beyond the natural shoreline. A known archaeological resource in the project area is a buried fishpond in the vicinity of Nimitz Highway near Keehi Interchange. Mr. Yazawa stated that the unstable soil conditions in this area might require deep foundations for the alternative alignment of the Bypass near Nimitz Highway. Ms. Collins stated that during construction monitoring would be needed in this area if this alignment is selected.

With regards to the Waikiki Branch of the CityTram, Ms. Collins stated that there could be potential burials along Richards and Kamakee Streets. Mr. David Atkin noted, however, that construction on city streets for CityTram would only involve repavement, and that deep excavation would not be necessary. Ms. Collins is also aware of burials in the Fort DeRussy area, along Kalia Road. These burials are only 4 to 6 feet below the surface. The recent Hale Koa Hotel construction uncovered many burials. However, Ms. Collins said that no burials have been uncovered so far at the Hilton Hawaiian Village construction site (old dome).

Ms. Collins is mindful that archaeological surveys would not be possible because any resource in the project area would be buried. The use of existing data, such as the City's Geographic Information System, would be acceptable to identify archaeological sites. However, Ms. Collins raised the possibility of an "adverse effect" on unknown burials because monitoring (arguably a form of data recovery) would be required along certain sections and stations of the CityTram. The new Section 106 regulations require an "adverse effect" determination if data recovery is required, even though the resource does not have to be preserved (under the old regulations, this would be a "no adverse effect" determination). Ms. Collins raised the possibility of conducting a phased Section 106 process to address the problem of unknown archaeological sites. Ms. Collins was not sure if a phased Section 106 process is applicable to the project. Mr. Hibbard questioned how such a process could be used since Section 106 is used in the National Environmental Policy Act process to select the preferred alternative. Mr. Yazawa said he would research into the new regulations to see if a phased Section 106 process makes sense for the project.

The group discussed reconciling the "Mason list" of 32 potential historic building sites within the Area of Potential Effect (APE) and the "SHPD list" of approximately 80 potential sites. The goal of this discussion is to come up with one list of potential historic sites (excluding the CityTram Waikiki Branch and Sand Island Bypass, which will be discussed at a later date), which will be the subject of further research (i.e., inventory survey). The following was agreed to by the group to reconcile the lists:

- Despite changes made to the proposed project (see above), alternative corridors for the CityTram have not been eliminated (e.g., North and South King Streets), and these corridors may be used as alternatives in the upcoming draft environmental impact statement (EIS). Therefore, no historic resource within these corridors' APE can be eliminated at this time.
- The 50-year cut-off used to produce the Mason list was set at 1952. The SHPD list contains many buildings constructed in the late 1950s and early 1960s. It was agreed that the cut-off year be moved to 1959, except in cases where a building

may be exceptionally important, such as the old Kamehameha Drive-In Theater (the last of its kind). Some of the buildings identified by SHPD staff require date research.

- Some of the sites on the SHPD list were included in the 1989 inventory survey report prepared for the Honolulu Rapid Transit Project. SHPD staff agreed that the information provided in the 1989 report is acceptable for the current project.
- Ms. Ann Yoklavich, of Mason Architects, questioned the integrity of some of the buildings on the SHPD list because she felt that they were altered too much. SHPD staff requested that most of these buildings remain on the list.

Ms. Yoklavich will prepare a new list combining the Mason and SHPD lists, and taking into account the discussion above. SHPD suggested that the project use a "Kauai-Inventory-type form" in conducting the inventory survey.

Mr. Yazawa informed SHPD staff that the project plans to secure the State Historic Preservation Officer's (SHPO) concurrence on the National Register eligible properties in the APE prior to public release of the Draft EIS. Since the current schedule has the Draft EIS completed in early 2000. The concurrence request letter to the SHPO would be submitted in November or December.

<u>Action Items:</u>

1. Ms. Collins to find a report about archaeological resources on Sand Island.
2. Mr. Yazawa to research the possibility of using a phased Section 106 process.
3. Mason Architects to conduct windshield survey and screening of the CityTram Waikiki Branch and Sand Island Bypass elements of the project.
4. PB, DTS, SHPD and Mason Architects to discuss results of Mason Architect's windshield survey and screening.
5. Ms. Yaklovich to prepare a new list of potential historic buildings requiring an inventory survey.
6. Mason Architects to conduct inventory survey.

cc. Attendees
Susan Killen, PB
Robert Bramen, PB

Memorandum

To: Attendees

From: Colette Sakoda

Date: November 12, 1999

Subject: Primary Corridor Transportation Project
Meeting with State Historic Preservation Division
Held on November 8, 1999

In Attendance: Don Hibbard, SHPD
Tonia Moy, SHPD
Faith Miyamoto, DTS
Barbara Shideler, Mason Architects
Glenn Mason, Mason Architects
Susan Killen, PB
Colette Sakoda, PB

Meeting Summary

Susan Killen provided a briefing on the changes made to the proposed project that consists of the Sand Island Parkway and Waikiki extension alternatives appended to the CityTram route. Also discussed was the technology update in that there will be no overhead catenary; instead the vehicle will be electrically powered through a power strip embedded at surface level in the street pavement.

Barbara Shideler reviewed the supplemental list of properties located within the expanded project alignments with the group. Criteria utilized in the selection of the sites were:

1. Properties and buildings with dates before 1960
2. Area of Potential Effects (APE) for historic buildings would be one lot deep from an affected roadway
3. Records research of the National Register and Hawaii Register, review of Historic Sites Inventory Report for the Honolulu Rapid Transit Development Project (1989), and windshield survey

The supplemental list geographically consisted of potential sites along the Sand Island Parkway, Waikiki, and Kakaako extensions of the CityTram route. This list will be combined with the original list contained in the Historical/Cultural Resources Impacts Technical Report, May 1999.

Potential impacts on trees on Kapiolani Boulevard are still an issue for further evaluation. It may in part depend on whether the CityTram is curb side running or requiring taking the median within the Kapiolani Boulevard right-of-way, both of which are possible locations of some significant trees. Another issue that is being investigated by PB is the potential impact

on existing curbs. Depending again on the location, some curbs may require section 106 review due to historic significance.

Don Hibbard reviewed and approved the inventory survey form proposed for use by Mason Architects. The format is the same that was utilized for a Kauai project previously reviewed and approved by the State Historic Preservation Division.

Susan Killen recommended that for the next phase of the evaluation, priority be placed on properties most vulnerable due to proposed transit station locations, park and ride facilities, and stops. Properties that would not be affected should be looked at to possibly shorten the list.

Our target is to submit the Draft EIS to the Federal Transit Administration (FTA) in January, 2000. The APE list with a preliminary determination of potential effects will be included in the document.

Action Items:

1. Mason Architects will proceed with inventory survey with priority on properties that would be most vulnerable due to proximity to proposed transit stations, park and ride facilities, and stops.
2. PB will continue research on proposed locations of trees on Kapiolani Boulevard relative to the CityTram use of right-of-way; research will also continue on potential effects on existing curbs by the alignment.

cc: Attendees
Susan Killen
Robert Bramen

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00058

February 8, 2000

Don J. Hibbard, Ph.D.
Administrator, State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Attention: Ms. Tonia Moy

Dear Dr. Hibbard:

Subject: Primary Corridor Transportation Project

As part of the ongoing Section 106 consultation process for the subject project, under separate cover, the following was transmitted for your information:

1. One (1) set of completed inventory survey cards for sites built prior to 1960 in the area of potential effect (APE)
2. List of Potential and Known Historic Resources
3. Preliminary Effect Assessment of Historic Period Resources

Should you have any questions regarding this matter, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

February 25, 2000

TPD00-00090

Don J. Hibbard, Ph.D.
Administrator, State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Attention: Ms. Tonia Moy

Dear Dr. Hibbard:

Subject: Primary Corridor Transportation Project

The purpose of this letter is to request the reduction of the Area of Potential Effect (APE) agreed upon during discussions held in April, 1999.

At the November 18, 1999 coordination meeting, the following major changes to the proposed in-town transit alignment and technology were discussed:

1. Figure 1 illustrates the revised transit alignment. Figures 2 and 3 are artist's renderings of what a transit stop at a median and at curbside would look like. North King, South Beretania, and South King Streets are no longer being considered as parts of the transit alignment. A Waikiki branch has now been added to the alignment.

2. The system alternatives currently under consideration do not include overhead catenary, as the previous alternatives did. Potential vehicle technologies include Tram-on-Tires, hybrid powered, fuel cell or embedded power collection system, Articulated Electric Hybrid (diesel, propane, or fuel cell), and Articulated Electric Bus powered by touchable embedded power collection system.

We believe that the above provides justification for the reduction of the APE from one parcel deep along the current in-town transit alignment to only the road right-of-way. Please advise us of your decision in this matter.

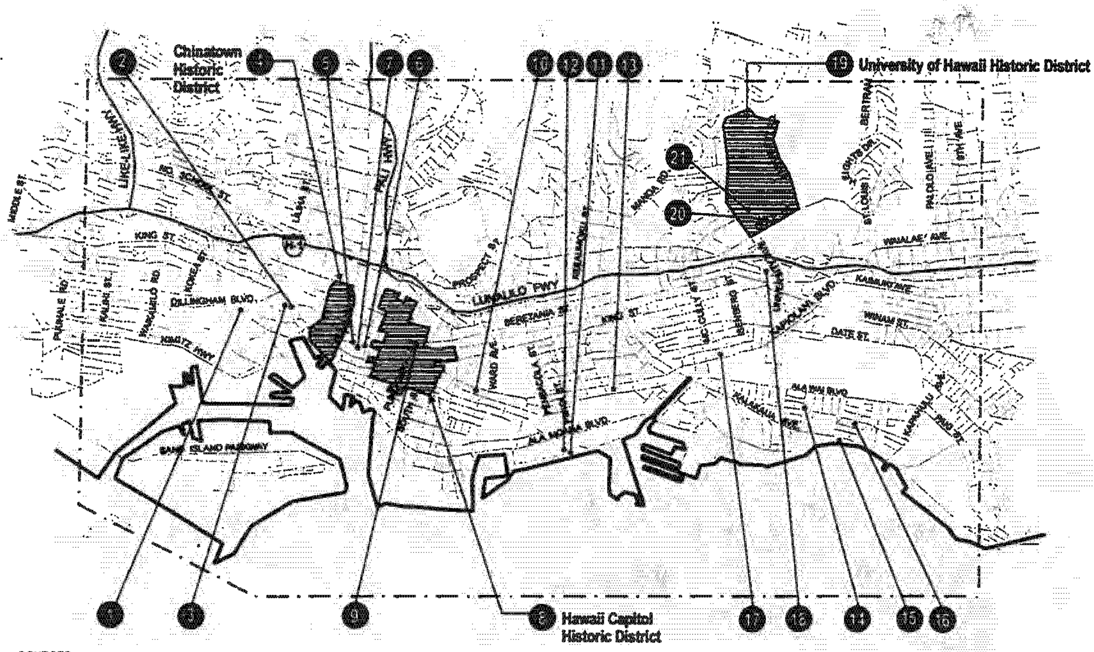
Should you have any questions or wish to discuss this matter further, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures



SOURCES:
ESRI Atlas GIS v4.0 1998; Information Delivery System (IDS), March 1998; City and County of Honolulu, October 1998; Mason Architects Inc., May 1999.

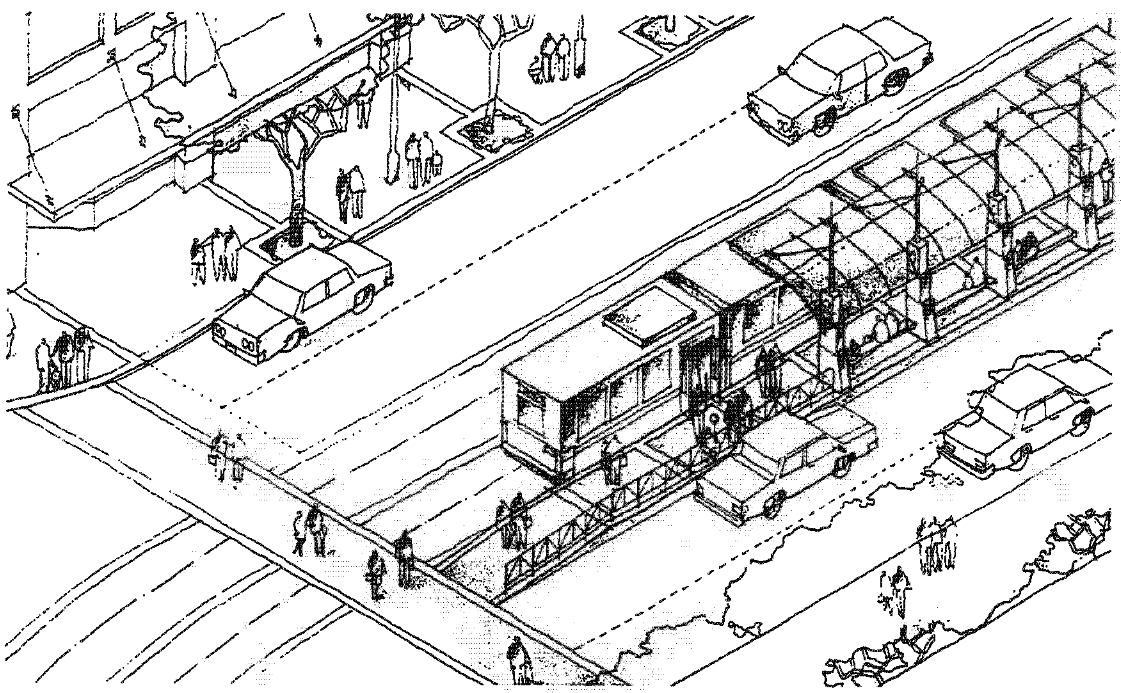
* Numbers correspond to Historic-Period Resources listed on Table 3.10-1

N

Scale: 0 .25 .50 mi

Scale: 0 .5 1 km

	Historic-Period Resources; Kalihi To University Of Hawaii	Figure 1



	Typical In-Town BRT Median Stop	Figure 2

	Typical In-Town BRT Curb Transit Stop	Figure 3

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KAWELO

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

March 8, 2000

Ms. Cheryl D. Soon
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

LOG NO: 25048
DOC NO: 0003tm03
Architecture

Dear Ms. Soon:

SUBJECT: Section 106 Consultation
Primary Corridor Transportation
TMK: Various, Oahu

Thank you for your letter regarding the reduction of the Area of Potential Effect (APE) for the Primary Corridor Transportation Project (PCTP). Since the new proposed system no longer utilizes overhead catenary, we concur that the APE may be reduced to road right-of-way along the in-town transit alignment for most of the project. However, wherever there will be a transit station or special ramp or park-and-ride facility, we believe the APE should include the neighboring parcels.

Thank you for the opportunity to comment. Should you have further questions, please call Tonia Moy at 692-8030.

Aloha,

TIMOTHY E. JOHNS
State Historic Preservation Officer

TM:jk

U.S. Department
of Transportation
Federal Transit
Administration

REGION IX
Arizona, California,
Hawaii, Nevada, Guam

201 Mission Street
Suite 2210
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

MAY 12 1999

Mr. Robert Smith
Ecological Region Manager
Fish & Wildlife Service
U.S. Department of the Interior
300 Ala Moana Boulevard, Suite 3108
Honolulu, Hawaii 96850

Dear Mr. Smith:

Subject: Primary Corridor Transportation Project
Section 7 Consultation

The Federal Transit Administration and the City & County of Honolulu are currently preparing a National Environmental Policy Act environmental impact statement (EIS) for the subject project. As shown on Figure 1.1 of the enclosed EIS Preparation Notice, the study area is from Kapolei to Kahala. The alternatives currently being considered for analysis in the Draft EIS include an Enhanced Bus/Transportation System Management (TSM) Alternative, Bus Rapid Transit (BRT) Alternative and Light Rail Transit (LRT) Alternative.

To be in compliance with Section 7 of the Endangered Species Act, we request that the U.S. Fish & Wildlife Service identify the listed and proposed to be listed endangered and threatened species in the project area.

If you have any questions or need additional information, please call Kenneth Hamayasu of the City and County of Honolulu Department of Transportation Services at 527-6978.

Sincerely,

Leslie T. Rogers
Regional Administrator

Enclosure
cc:
Kenneth Hamayasu
City & County of Honolulu, DTS

RECEIVED

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: LTG

MAY 24 1999

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Re: Notice to Prepare Draft Environmental Impact Statement and Request for a Species List for the Primary Corridor Transportation Project, Oahu, Hawaii (ER 99/397)

Dear Ms. Soon:

The U.S. Fish and Wildlife Service (Service) has reviewed your April 21, 1999, letter notifying us that you intend to prepare a Draft Environmental Impact Statement (DEIS) for the proposed project referenced above. We have also reviewed a letter received from the Federal Transit Administration (FTA), dated May 12, 1999, requesting a list of endangered and threatened species found within the proposed project area. The proposed project is sponsored by the City and County of Honolulu Department of Transportation Services (DTS) and the U. S. Department of Transportation, FTA. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Department of the Interior concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The proposed project involves improving Oahu's primary transportation corridor, which extends from Kapolei in the Ewa District, past Pearl Harbor, Honolulu International Airport, downtown Honolulu, and continues eastward to the University of Hawaii at Manoa. The corridor is approximately 27 miles in length and at most 4 miles in width. The alternatives currently being considered include a No-Build Alternative, Enhanced Bus/Transportation System Management Alternative, a Bus Rapid Transit, and a Light Rail Transit alternative.

The Service has reviewed the information that was provided in your letter and pertinent information in our files, including maps and records prepared by the Hawaii Heritage Program of The Nature Conservancy. The Hawaiian hoary bat (*Lasiurus cinereus semotus*), federally listed as endangered, has been sporadically sighted within the metropolitan area of the proposed project. The following waterbird species, federally listed as endangered, have been observed in wetland areas within the project area:

a. Hawaiian coot (*Fulica americana alai*);
b. Hawaiian duck (*Anas wyvilliana*);
c. Hawaiian common moorhen (*Gallinula chloropus sandvicensis*); and
d. Hawaiian stilt (*Himantopus mexicanus knudseni*).

The following federally endangered plant species have been observed within the Ewa area of the Primary Transportation Corridor (refer to Figure 1.1 of the DEIS Preparation Notice):

a. *Abutilon menziesii* (ko`oloa`ula);
b. *Centaurium sebaeoides* (`awiwi); and
c. *Marsilea villosa* (`ihi`ihi).

In addition, the plant *Torulinium odoratum* subsp. *auriculatum* (pu`uka`a), a Species of Concern, has been reported within the Ewa area of the Primary Transportation Corridor. However, it has not been observed there since 1916. The term "Species of Concern" describes species that are of concern to the Service, but require further biological research and field study to resolve their conservation status. These species are not currently federally protected.

The DEIS should address any potential project-related impacts to these and other native Hawaiian species and propose mitigation measures that avoid unnecessary impacts and minimize unavoidable impacts. For example, we recommend that these measures include avoidance of unnecessary destruction of vegetated areas containing ko`oloa`ula or any other federally listed plant species.

The Service appreciates the opportunity to provide this technical assistance, and we look forward to reviewing a copy of the DEIS when it is available. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Leila Gibson by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,

Robert P. Smith

Robert P. Smith
Pacific Islands Manager

cc: FWS - Region 1, Portland
OEPC, Washington, D.C.
FTA, San Francisco
USEPA, Honolulu
DOFAW, Hawaii
CZMP, Hawaii

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00243

May 4, 2000

Mr. Abraham Wong, Division Administrator
Hawaii Division
Federal Highway Administration
U.S. Department of Transportation
Box 50206
Honolulu, Hawaii 96850

Dear Mr. Wong:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species,

including threatened and endangered species, regarding the BRT/SISP Alternative. Although the SISP component would not have any long-term impacts, construction related impacts are anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

Chapter 1 Purpose and Need
Chapter 2 Alternatives Considered
Appendix B Conceptual Design Drawings, Bus Rapid Transit
Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Hawaii Division
300 Ala Moana Blvd., Room 3-306
Box 50206
Honolulu, HI 96850
June 26, 2000

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Dear Ms. Soon:

Thank you for the opportunity to participate in the Primary Corridor Transportation Project during the project development process under the National Environmental Policy Act and Clean Water Act Section 404 Memorandum of Understanding. As a Federal cooperating agency to the Federal Transit Administration, we will be communicating our recommendations and concerns directly to our Federal transportation partner.

We believe the multi-modal framework proposed for this important transportation project is unique in terms of its potential mobility benefits and project development challenges. We look forward to working with you on this innovative corridor project. Laura Kong will be our point of contact for this project. If you have any questions or need assistance, please do not hesitate to call her at (808) 541-2700, extension 328 (Email: laura.kong@fhwa.dot.gov).

Sincerely,

Abraham Wong

Abraham Wong
Division Administrator

cc: Leslie Rodgers, FTA
Robert Horn, FHWA, Western Resource Center

AWong:di

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 17, 2000

TPD6/00-03037R

Mr. Abraham Wong, Division Administrator
Hawaii Division
Federal Highway Administration
U.S. Department of Transportation
Box 50206
Honolulu, Hawaii 96850

Dear Mr. Wong:

Subject: Primary Corridor Transportation Project

Thank you for your June 26, 2000 letter regarding participation during the project development process under the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii." The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of and consultation on the project progressed, it was agreed that the Sand Island Scenic Parkway would best be reviewed in the context of the Oahu Regional Transportation Plan. Therefore, this letter is to inform you that the discussion of Sand Island Scenic Parkway will continue in that arena and that it will be separated from the Primary Corridor Transportation Project Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS).

The time and effort expended to review the project documents are greatly appreciated. The comments and recommendations included in your June 26, 2000 letter to Leslie Rogers, Regional Administrator, Federal Transit Administration have been reviewed. Close coordination will continue to ensure that the comments and concerns that were not addressed by the elimination of the BRT/SISP Alternative are resolved.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D Soon

CHERYL D. SOON
Director

cc: Ms. Donna Turchie
Federal Transit Administration -Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00240

May 4, 2000

Mr. George Young
Chief, Regulatory Branch
U. S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

Dear Mr. Young:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process. Initial discussions regarding this project have taken place with members of your staff.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species, including threatened and endangered species, regarding the BRT/SISP Alternative. Although the

SISP component would not have any long-term impacts, construction related impacts are anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

Chapter 1 Purpose and Need
Chapter 2 Alternatives Considered
Appendix B Conceptual Design Drawings, Bus Rapid Transit
Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

June 8, 2000

Regulatory Branch

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

This letter responds to your request, dated May 4, 2000, for our participation in the Primary Corridor Transportation Project under the Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii.

We have reviewed the preliminary draft chapters and appendices you provided and concur that the information to date is adequate for this stage and the project may proceed to the next stage without modification.

If you have any questions concerning this matter, please contact William Lennan of my staff at 438-6986, and reference File No. 990000338.

Sincerely,

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

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

July 19, 2000

TPD00-00368

Mr. George P. Young, P.E.
Chief, Regulatory Branch
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Attention: Mr. William Lennan
File No. 990000338

Dear Mr. Young:

Subject: Primary Corridor Transportation Project

In May of this year, your assistance and formal participation was requested in the project development process for the Primary Corridor Transportation Project. This was done pursuant to the "Memorandum of Understanding (MOU), National Environmental Policy Act and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii." The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of the project progressed, concerns were expressed regarding SISP's role. Therefore, this letter is to inform you that the SISP portion of the subject project will not be pursued at this time. The BRT/SISP Alternative will be deleted from consideration in the Major Investment Study/Draft Environmental Impact Statement that is being prepared.

We thank you for the time and effort expended to review the project documents in a timely manner. Although the decision to defer SISP will annul the MOU process, we will continue to keep you informed about the subject project.

Should you have any questions concerning this matter, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Ms. Donna Turchie
Federal Transit Administration – Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00242

May 4, 2000

Mr. John Naughton
Pacific Islands Area Office
National Marine Fisheries Service
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawaii 96814-4700

Dear Mr. Naughton:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process. Initial discussions regarding this project occurred at an agency coordination meeting held in August 1999.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species, including threatened and endangered species, regarding the BRT/SISP Alternative. Although the

SISP component would not have any long-term impacts, construction related impacts are anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

Chapter 1 Purpose and Need
Chapter 2 Alternatives Considered
Appendix B Conceptual Design Drawings, Bus Rapid Transit
Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
Pacific Island Area Office
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawaii 96814-0047

June 9, 2000

Cheryl D. Soon
Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Blvd., Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

The National Marine Fisheries Service (NMFS) has received the information sent by you on the Primary Corridor Transportation Project, City and County of Honolulu, dated May 4, 2000. We have reviewed the components of the Draft EIS for the project under the multi-agency Memorandum of Understanding (MOU), Integration Process for Surface Transportation in the State of Hawaii. We offer the following comments for your consideration concerning the adequacy of the information provided to date.

NMFS believes that the majority of the proposed Primary Corridor Project will have minimal impacts on those resources and habitats for which we have a responsibility. The exception will be the alternative which includes the proposed tunnel under the Fort Armstrong Channel of Honolulu Harbor and the proposed improvements to the Kalihi Channel crossing. However, we have reviewed the information submitted and concur that it is adequate for this early stage of the project. We have no objection with the project proceeding to the next stage, as presented in the components of the Draft EIS.

We appreciate the opportunity to review the project at this early stage under the MOU. Should you have any questions please contact John Naughton (973-2935x211) of my staff at our Pacific Islands Area Office in Honolulu.

Sincerely,

C. Karnella

Charles Karnella
Administrator
Pacific Islands Area Office

cc: Federal Transit Administration, Region 9

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

July 19, 2000

TPD00-00364

Mr. Charles Karnella, Administrator
Pacific Islands Area Office
Southwest Region
National Marine Fisheries Service
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawaii 96814-0047

Attention: Mr. John Naughton

Dear Mr. Karnella:

Subject: <u>Primary Corridor Transportation Project</u>

In May of this year, your assistance and formal participation was requested in the project development process for the Primary Corridor Transportation Project. This was done pursuant to the "Memorandum of Understanding (MOU), National Environmental Policy Act and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii." The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of the project progressed, concerns were expressed regarding SISP's role. Therefore, this letter is to inform you that the SISP portion of the subject project will not be pursued at this time. The BRT/SISP Alternative will be deleted from consideration in the Major Investment Study/Draft Environmental Impact Statement that is being prepared.

We thank you for the time and effort expended to review the project documents in a timely manner. Although the decision to defer SISP will annul the MOU process, we will continue to keep you informed about the subject project.

Should you have any questions concerning this matter, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Ms. Donna Turchie
Federal Transit Administration

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00241

May 4, 2000

Mr. Paul Henson, Field Supervisor
Division of Ecological Services
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Dear Mr. Henson:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process. Initial discussions regarding this project occurred at an agency coordination meeting held in August 1999.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species, including threatened and endangered species, regarding the BRT/SISP Alternative. Although the

SISP component would not have any long-term impacts, construction related impacts are anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

Chapter 1 Purpose and Need
Chapter 2 Alternatives Considered
Appendix B Conceptual Design Drawings, Bus Rapid Transit
Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,
Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

JUN 12 2000

In Reply Refer To: GCS

Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Blvd. Suite 1200
Honolulu HI 96813

Re: Primary Corridor Transportation Project

Dear Ms. Soon:

The U.S. Fish and Wildlife Service (Service) has reviewed the portions of the Draft Environmental Impact Statement (DEIS) sent to us for early participation in the environmental review process of the Primary Corridor Transportation Project. The project sponsors are the Federal Transit Administration and the City and County of Honolulu. A variety of transportation improvements are proposed that would result in a one kilometer long tunnel under the Fort Armstrong Channel of Honolulu Harbor and replacement of the existing Kalihi Channel Bridge with either an enlarged new bridge or a tunnel under the Kalihi Channel.

The Service is a signatory agency to the 1995 Memorandum of Understanding (MOU) that integrates the environmental review process of the National Environmental Policy Act (NEPA) and the Clean Water Act (CWA) section 404 for transportation projects in the State of Hawaii. This MOU provides structured coordination for resources agencies, including the Service, to participate in the project development and review process when aquatic resource impacts may be substantial. The MOU also requires that the Service provide written concurrence or non-concurrence on: NEPA-defined purpose and need, CWA section 404 basic and overall project purpose, criteria for alternative selection, project alternatives to be considered in the draft EIS, and the preferred alternative.

The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) alternative, which includes a tunnel under the entrance to Honolulu Harbor, will substantially impact aquatic resources; especially during the construction phase of the project. These impacts will require careful review by the Service as specific construction plans are developed, and in coordination with other federal environmental review agencies, such as the National Marine Fisheries Service, U.S.

Environmental Protection Agency, and the U.S. Army Corps of Engineers. Based upon the documents we have reviewed, the Service concurs that the information presented to us is adequate in describing NEPA project purpose and need, CWA section 404 basic and overall purpose, criteria for alternative selection, criteria to be considered in the DEIS, and the preferred alternative.

As described in the MOU, participation by the Service in the coordinated environmental review of this transportation project does not imply endorsement of all aspects of the plan. The Service will work with all federal and state agencies involved to place a high priority on the avoidance of adverse impacts to waters of the US, coral reef ecosystems, associated sensitive species, and threatened and endangered species.

The Service appreciates the opportunity to provide comments on the proposed project. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Gordon Smith at 808/541-3441.

Sincerely,

for Paul Henson
Field Supervisor
Ecological Services

CC: NMFS-PAIO
USEPA, Honolulu
DLNR-DAR, Honolulu
DOH-CWB, Honolulu
DBEDT-CZM, Honolulu
FTA, San Francisco

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

July 19, 2000

TPD 00-00367

Mr. Paul Henson, Field Supervisor
Ecological Services
Pacific Islands Ecoregion
Fish and Wildlife Service
U.S. Department of the Interior
Box 50088
Honolulu, Hawaii 96850

Attention: Mr. Gordon Smith

Dear Mr. Henson:

Subject: Primary Corridor Transportation Project

In May of this year, your assistance and formal participation was requested in the project development process for the Primary Corridor Transportation Project. This was done pursuant to the "Memorandum of Understanding (MOU), National Environmental Policy Act and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii". The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of the project progressed, concerns were expressed regarding SISP's role. Therefore, this letter is to inform you that the SISP portion of the subject project will not be pursued at this time. The BRT/SISP Alternative will be deleted from consideration in the Major Investment Study/Draft Environmental Impact Statement that is being prepared.

We thank you for the time and effort expended to review the project documents in a timely manner. Although the decision to defer SISP will annul the MOU process, we will continue to keep you informed about the subject project.

Should you have any questions concerning this matter, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Ms. Donna Turchie
Federal Transit Administration – Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00239

May 4, 2000

Mr. David J. Farrel, Chief (CMD-2)
Federal Activities Office
Region IX
U. S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105

Dear Mr. Farrel:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process. Initial discussions regarding this project have taken place with Dr. Wendy Wiltse of your Honolulu office.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species, including threatened and endangered species, regarding the BRT/SISP Alternative. Although the SISP component would not have any long-term impacts, construction related impacts are

anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

- Chapter 1 Purpose and Need
- Chapter 2 Alternatives Considered
- Appendix B Conceptual Design Drawings, Bus Rapid Transit
- Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
- Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,
Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)
Dr. Wendy Wiltse, U. S. Environmental Protection Agency (with enclosures)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 14, 2000

Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Dear Ms. Soon:

The Environmental Protection Agency (EPA) has reviewed the City and County of Honolulu's Purpose & Need statement, Range of Alternatives, and associated materials for the **Primary Corridor Transportation Project**. Our review is pursuant to the Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii. Wendy Wiltse of our Honolulu office has also participated in this review.

Chapter 1: Purpose & Need and *Chapter 2: Alternatives Considered* do an excellent job of explaining the extensive public participation process that has contributed to this project. In addition, we are particularly pleased with the goals of the *Islandwide Mobility Concept Plan*, which focuses on improved transit, strengthened connections between communities, and fostering livable communities. It appears that this project will provide significant long-term benefits to both the residents of and visitors to Oahu.

While we support the purpose and need of this project in concept, we have significant concerns about the details of both the Purpose & Need statement and the Range of Alternatives. For this reason, the intent of this letter is to state our non-concurrence on both the Purpose & Need statement and the Range of Alternatives. We would be pleased to work with you to resolve these issues. Our concerns and recommendations are stated below:

Purpose & Need Statement #5: "Improve access to Sand Island and to the Koko Head end of the PUC, including Waikiki." This statement is very broad and includes five "sub-objectives": 1) improve access to Sand Island to increase the efficiency of the movement of goods, 2) open up the use of Sand Island's recreational resources, 3) rejuvenate the urban waterfront of Sand Island, 4) improve the entryway and access to and from Waikiki along a scenic coastal route, and 5) provide a Downtown bypass for those travelers who travel between Keehi Interchange and Kakaako/Waikiki.

We have two main concerns. First, this Purpose & Need statement is far too broad, and second, only the Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative fully meets the five "sub-objectives" laid out in the Purpose & Need statement #5. Neither of the other alternatives fully meet the purposes of Purpose & Need statement #5. The Transportation System Management (TSM) Alternative does not address any of the issues laid out in Purpose & Need statement #5, and the Bus Rapid Transit (BRT) Alternative only partially fulfills the "sub-objectives" laid out in Purpose & Need statement #5.

Recommendation: Re-draft a more concise Purpose & Need statement #5 that focuses on supportable community needs, which are clearly laid out in the "Need" section of the Purpose & Need statement.

Range of Alternatives: The BRT/SISP Alternative is the only alternative that currently meets all of the Purpose & Need statements. Our concern is that the range of alternatives is much too narrow. In addition, the BRT/SISP Alternative includes a major highway component, which could have significant environmental impacts as a result of creek crossings, proximity to fragile, coastal ecosystems, road runoff, beach erosion, etc.

Recommendation: Once the Purpose & Need statement is re-drafted, re-visit each alternative to ensure that they all meet Purpose & Need. In addition, any significant highway component under consideration should analyze the potential environmental impacts, and an appropriate number of alternatives should be developed accordingly.

Bus Priority/Express Improvements: The TSM Alternative, BRT Alternative, and BRT/SISP Alternative all call for bus priority/express improvements. Our concern is that these improvements may impact curbside parking.

Recommendation: Address the impacts to parking, including a demonstration of how the park and ride stations will accommodate both lost curbside parking spaces, as well as increased park and ride demand.

Transit Technology for the In-Town BRT System: Embedded plate technology is being considered for the In-Town BRT system. Our concern is for the environmental consequences of the additional electricity demanded by this system.

Recommendation: Describe the source of electricity for the embedded plate technology system, and discuss any environmental impacts that may be associated with the generation of the additional electricity needed to operate the embedded plate system.

BRT/SISP Induced Demand: The BRT/SISP Alternative will increase road capacity relative to the BRT Alternative, reducing the level of BRT service needed. Our concern is that the BRT/SISP Alternative will result in more cars entering Kakaako at Ala Moana and South Street, as well as Waikiki.

Recommendation: Analyze the ability of Ala Moana Blvd. to handle increased traffic between South Street and Waikiki, especially with the BRT in operation.

<u>BRT/SISP Lane Numbers & Traffic Flow</u>: The BRT/SISP Alternative calls for a four lane tunnel under the Fort Armstrong Channel and an eight lane bridge over the Kalihi Channel. Hawaii Department of Transportation (HDOT) and the Corps of Engineers (COE) are currently working on initial studies of the development of a tunnel under Kalihi Channel. Our concern is that the BRT/SISP Alternative does not specify the number of lanes contemplated by HDOT and COE for the Kalihi tunnel.

Recommendation: Clarify the number of lanes planned by HDOT and COE for the Kalihi tunnel to demonstrate the compatibility of the BRT/SISP Alternative and the HDOT/COE Kalihi tunnel project.

Thank you for this opportunity to comment. Again, we are happy to work with you to modify the Purpose & Need statement and Range of Alternatives so that EPA can concur on this stage of the project. Please have your staff contact Nova Blazej, our principal reviewer on this project, should you have any questions concerning our comments or recommendations. Nova can be reached at 415-744-2089 or *blazej.nova@epa.gov.*

Sincerely,

Dave Farrel, Chief
Federal Activities Office

cc: Leslie Rogers, FTA
Donna Turchie, FTA
Laura Kong, FHWA

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 17, 2000

TPD6/00-02880R

Mr. Dave Farrel, Chief
Federal Activities Office
Region IX
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105-3901

Dear Mr. Farrel:

Subject: Primary Corridor Transportation Project

Thank you for your June 14, 2000 letter that provided comments on the Purpose and Need statement, Range of Alternatives, and associated materials for the subject project. This was done pursuant to the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii." The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of and consultation on the project progressed, it was agreed that the Sand Island Scenic Parkway would best be reviewed in the context of the Oahu Regional Transportation Plan. Therefore, this letter is to inform you that the discussion of Sand Island Scenic Parkway will continue in that arena and that it will be separated from the Primary Corridor Transportation Project Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS).

The time and effort expended to review the project documents in a timely manner are greatly appreciated. In order to bring closure to the MOU process, the following responses to your comments are provided:

Purpose and Need Statement #5 - As a result of the decision to separate Sand Island Scenic Parkway from the MIS/DEIS for the subject project, this statement has been eliminated.

Range of Alternatives - The BRT/SISP Alternative is no longer being considered in the MIS/DEIS. Chapter 2 of the MIS/DEIS includes a description of the alternatives evaluated and a discussion of the alternatives that were considered and eliminated.

Bus Priority/Express Improvements - The parking impacts are discussed in Section 4.3 of the MIS/DEIS.

Transit Technology for the In-Town BRT System - The additional electricity demanded by the embedded plate technology is discussed in Section 5.9 of the MIS/DEIS.

BRT/SISP Induced Demand - The BRT/SISP Alternative is no longer being considered in the MIS/DEIS.

BRT/SISP Lane Numbers and Traffic Flow - The BRT/SISP Alternative is no longer being considered in the MIS/DEIS.

A copy of the MIS/DEIS will be transmitted for your review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

CHERYL D. SOON
Director

cc: Wendy Wiltse
Environmental Protection Agency - Honolulu

Donna Turchie
Fedral Transit Administration - Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00244

May 4, 2000

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Subject: Primary Corridor Transportation Project

We are writing to request your assistance and formal participation in an important transportation project in the City and County of Honolulu known as the Primary Corridor Transportation Project. We understand that the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii" (copy enclosed), looks towards consultation in the project development process.

The Federal Transit Administration and the City and County of Honolulu are currently preparing a NEPA environmental impact statement (EIS) for the subject project. Transportation improvements are being proposed for the primary transportation corridor, which stretches from Kapolei to Kahala. One of the alternatives being considered (Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP)) includes an approximately one kilometer (0.6 mile) tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing. These actions would require an individual permit from the U.S. Army Corps of Engineers. The NEPA EIS that is being prepared for the subject project proposes increasing bridge capacity across Kalihi Channel. However, the preferred option is a tunnel to replace the Kalihi Channel Bridge, as recommended in the State of Hawaii's long-range harbor master plan. Initial studies of this tunnel are currently being conducted and its impacts will be documented in a separate environmental document by the State of Hawaii Department of Transportation.

As set forth in the MOU, the involvement of the signatory agencies would be limited to issues pertaining to waters of the United States, including wetlands, and associated sensitive species, including threatened and endangered species, regarding the BRT/SISP Alternative. Although the

SISP component would not have any long-term impacts, construction related impacts are anticipated. The impacts to water quality from the dredging of the Fort Armstrong Channel would be similar in many respects to the water quality impacts of normal maintenance dredging in Honolulu Harbor. Widening of the existing Kalihi Channel Bridge and construction of a new bridge would require pile driving and demolition, which may result in increased turbidity. The impacts of the proposed construction in the Fort Armstrong and Kalihi Channels would be mostly indirect and limited to those associated with increased suspended solids and turbidity loads. The project should not impact any sensitive species.

Enclosed are copies of the following components of the Draft EIS that is being prepared:

Chapter 1 Purpose and Need
Chapter 2 Alternatives Considered
Appendix B Conceptual Design Drawings, Bus Rapid Transit
Appendix C Conceptual Design Drawings, Sand Island Scenic Parkway and Marina Road
Appendix D Screening of Alternatives

Your expeditious review of these documents and concurrence on the NEPA purpose and need, Section 404 basic and overall project purpose, criteria for alternative selection and project alternatives to be evaluated in the Draft EIS will be greatly appreciated.

The MOU states that concurrence or non-concurrence must be a written determination that either the information to date is adequate for this stage and the project may proceed to the next stage without modification, that the information to date is not adequate for this stage, or that the potential adverse impacts of the project are severe.

We ask for your attention to this matter to expedite the concurrence process. In order to facilitate your review, Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a meeting where we can discuss your input and review.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosures

cc: Mr. Leslie Rogers, Federal Transit Administration (without enclosures)

BENJAMIN J. CAYETANO
GOVERNOR

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

1959 2000+

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

June 22, 2000

IN REPLY REFER TO:
STP 8.9581

Ms. Cheryl Soon
Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza, Suite 1200
711 Kapiolani Boulevard
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

Thank you for your letter of May 4, 2000, requesting our participation as a consulting agency under the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii."

We are pleased with the City's initiative in developing an islandwide mobility concept. However, we cannot concur at this stage because we believe that there are other transportation alternatives and needs which should be considered.

Some of our specific concerns include:

1. Purpose No. 5, regarding improved access to Sand Island is inconsistent with the other purposes as it relates to the performance of the proposed alternatives. Only one alternative, the BRT/SISP, seems to fully satisfy this purpose; and thus, the project presentations are biased toward that alternative.

2. We have serious concerns with the BRT/SISP alternative. These would include the right-of-way requirements and its impact on the planned surface facilities for our harbor operations; potential conflicts of the landside access to Fort Armstrong with our passenger and cargo movements in the Pier 1 and 2 areas; and the loss of lands and the loss of best use revenues which could be generated through the development of these lands (e.g., KIPA, Kapalama storage areas, Keehi Industrial Lots project).

3. The goals and objectives of our 2020 Commercial Harbor Plan, which addresses the efficient movement of goods and freight in the area, should be recognized. Aside from accommodating the stakeholders' needs, the harbor plans address safety concerns, and call for the separation of cargo and cruise ship movements. We do not want to compromise our harbor requirements.

4. There would be a significant impact of the Project's funding requirements on the rest of the transportation program. Also, it would appear that the requirements are understated in that it assumes certain improvements to be part of the state's program. HDOT has not committed to implement or fund any proposal or component at this time.

5. The impact of the reduction of lanes on Nimitz Highway/Ala Moana Boulevard, and the reduced capacity on other highway facilities have not been adequately addressed.

6. The purpose is too narrow, pre-empting the consideration of even those roadway improvements which have been identified in the Oahu Regional Transportation Plan (e.g., Nimitz Viaduct project).

We strongly recommend that joint meetings with all affected agencies be held to facilitate coordination. We are aware that there have been briefings held on the various components of the project, but an overview of all the impacts and concerns related to the entire project would be most helpful. We look forward to working with you to resolve these issues so that we can concur on this stage of the project.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

c: Hon. Calvin K. Kawamoto
Hon. Kenneth T. Hiraki
Hon. Sam Callejo, Office of the Governor
Mr. Abraham Wong, Federal Highway Administration
Mr. Leslie T. Rogers, Federal Transit Administration
Mr. Gordon G. W. Lum, Oahu Metropolitan Planning Organization

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

August 17, 2000

TPD6/00-03050R

Mr. Kazu Hayashida
Director of Transportation
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Primary Corridor Transportation Project

Thank you for your June 22, 2000 letter regarding participation during the project development process under the "Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawaii." The Bus Rapid Transit/Sand Island Scenic Parkway (BRT/SISP) Alternative, which included a tunnel under the Fort Armstrong Channel of Honolulu Harbor and improvements to the Kalihi Channel crossing, was the trigger for the MOU coordination. As the agency review of and consultation on the project progressed, it was agreed that the Sand Island Scenic Parkway would best be reviewed in the context of the Oahu Regional Transportation Plan. Therefore, this letter is to inform you that the discussion of Sand Island Scenic Parkway will continue in that arena and that it will be separated from the Primary Corridor Transportation Project Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS).

The time and effort expended to review the project documents are greatly appreciated. Close coordination will continue to ensure that the comments and concerns that were not addressed by the elimination of the BRT/SISP Alternative are resolved.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Ms. Donna Turchie
Federal Transit Administration -Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

15

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR
DEPUTY DIRECTOR

November 10, 1999

TPD99-00647

Mr. Edwin Hayashi, Stadium Manager
Aloha Stadium
State of Hawaii
P. O. Box 30666
Honolulu, Hawaii 96820

Dear Mr. Hayashi:

Subject: Primary Corridor Transportation Project

The Federal Transit Administration and the City and County of Honolulu are currently preparing an Environmental Impact Statement (EIS) for the subject project.

The purpose of this letter is to initiate Section 4(f) coordination regarding the potential use of the Aloha Stadium parking lot by the subject project. We would like to meet with you to discuss our preliminary plans and issues of concern to your agency.

Ms. Faith Miyamoto of the Transportation Planning Division will be contacting you to schedule a convenient time for this meeting. We look forward to working together on this project.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Mr. Robert Hom, Federal Transit
Administration, Region IX

BENJAMIN J. CAYETANO
Governor

ALOHA STADIUM
An Agency of the State of Hawaii

EDWIN K. HAYASHI
Stadium Manager

MILTON HIROHATA
Deputy Manager

August 21, 2000

AUG 22 12 32

Ms. Cheryl D. Soon, Director
Department of Transportation Services
CITY AND COUNTY OF HONOLULU
711 Kapiolani Boulevard, Suite 1200
Honolulu, HI 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

We have reviewed the updated information on the proposed transit facilities at Aloha Stadium provided in the Major Investment Study/Draft Environmental Impact Statement for the Primary Corridor Transportation Project, and concur with the assessment of the impact of the proposed facilities as stated in the document.

Continued coordination will be imperative to ensuring that both our goals are realized. We look forward to working together with you.

Sincerely,

Edwin K. Hayashi

Edwin K. Hayashi
Stadium Manager

EKH:dh

P.O. Box 30666 • Honolulu, Hawaii 96820-0666 • Tel: 808.486.9555 • Fax 808.486.9520

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
PHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD00-00397

August 21, 2000

Mr. Gary Munsterman
Western Region
National Park Service
U. S. Department of Interior
600 Harrison Street, Suite 600
San Francisco, California 94107-1372

Dear Mr. Munsterman:

Subject: Primary Corridor Transportation Project

In its May 25, 2000 letter, the Federal Transit Administration (FTA) initiated coordination with the National Park Service regarding the subject project. The focus of the letter was the possible project impact on Sand Island State Recreation Area, a Section 6(f) property. Sand Island State Recreation Area would be impacted only if the Bus Rapid Transit/Sand Island Scenic Parkway Alternative is implemented. Subsequent to the May 25, 2000 FTA letter, continued agency review of and consultation on the project progressed, resulting in agreement that Sand Island Scenic Parkway would best be reviewed in the context of the Oahu Regional Transportation Plan. Therefore, this letter is to inform you that the discussion of Sand Island Scenic Parkway will continue in that arena and that it will be separated from the Primary Corridor Transportation Project Major Investment Study/Draft Environmental Impact Statement (MIS/DEIS). This action will eliminate the need to discuss the project impact on Sand Island State Recreation Area.

The only other Section 6(f) property that would be affected by the subject project is Aloha Stadium. Both of the build alternatives evaluated in the MIS/DEIS include a park-and-ride lot at the site of the overflow parking lot. Presently, the existing overflow parking lot has space for about 1,000 cars. It is estimated that up to 500 spaces would be needed to service existing and potential transit patrons in the Pearl City to Foster Village region. The improved transit service that would be provided by both build alternatives would, in turn, improve transit access to the Stadium.

In terms of the possible impact of the proposed park-and-ride facility, the Aloha Stadium overflow parking lot would function both as a park-and-ride lot for the proposed transit system and as an overflow lot for Stadium activities. Because the times of use would be different for transit commuters and stadium patrons, both of these uses could be accommodated with little overlap. Continued coordination will be necessary to ensure that parking in the lot is available to Stadium patrons on those occasions when the Stadium activities overlap with the park-and-ride hours.

The Aloha Stadium property, which is a portion of the former Halawa/Aiea Veterans Housing Area, G.S.A. No. N-Haw-495A, was originally owned by the Department of the Interior and was transferred to the City and County of Honolulu with a reversionary clause that in the event of any breach of certain use conditions or covenants stated in the Quitclaim Deed dated June 30, 1967, the property would revert to the United States. Subsequently and with the approval of the Department of the Interior, the property was transferred on October 27, 1970 to the State of Hawaii with similar use provisions.

We are, therefore, requesting your concurrence that the use being proposed is consistent with the provision under which this property was acquired from the Federal government. Previously, by letter dated July 15, 1992, the National Park Service found that a similar proposed use (transit station, aerial guideway structure and park-and-ride facility) at the same location would be compatible with the terms of the transfer. We are hoping for a favorable response to the current request. Your immediate attention to this matter would be greatly appreciated.

Should you have any questions regarding this matter, please contact Kenneth Hamayasu at (808) 527-6978.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Mr. Edwin Hayashi, Stadium Manager
Aloha Stadium

Ms. Donna Turchie
Federal Transit Administration, Region IX

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PARK PLAZA • 711 KAPIOLANI BOULEVARD, SUITE 1200 • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TPD99-00563

September 28, 1999

Mr. Dean Y. Uchida, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Subject: Primary Corridor Transportation Project

As part of the subject project, the City and County of Honolulu Department of Transportation Services is studying the possibility of constructing a downtown bypass road on Sand Island, which would include a tunnel beneath the Fort Armstrong Entrance Channel to Honolulu Harbor. Members of your staff have attended meetings at which preliminary plans were presented. At one meeting, it was suggested that a boundary interpretation be requested to determine the potential involvement of conservation lands.

Enclosed is a map showing the proposed bypass road and tunnel. Although the precise roadway alignment has not yet been selected, all of the options include a tunnel beneath the Fort Armstrong Channel. Most of the options also involve an easement or other conveyance along the portion of the alignment that would extend through Sand Island State Recreation Area, with restoration of the park after completion of tunnel construction.

We therefore formally request a determination of the possible involvement of the project with conservation lands, and the need for a Conservation District Use Application.

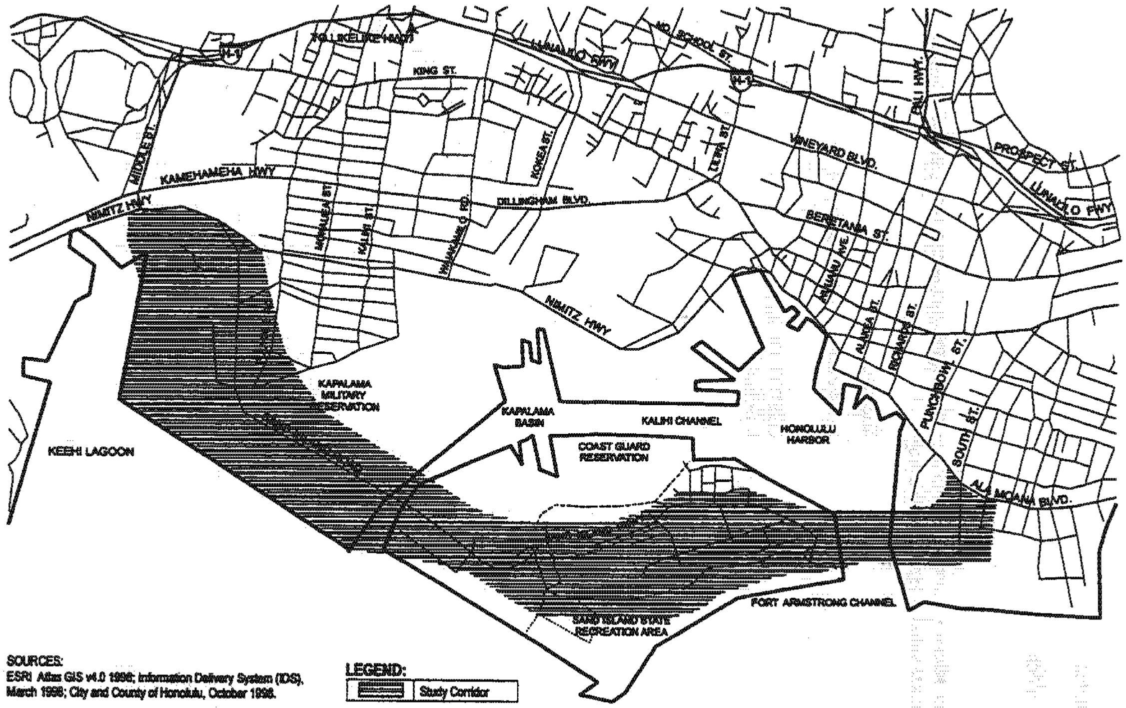
Please call Faith Miyamoto of the Transportation Planning Division at 527-6976 with any questions. We look forward to working together on this project.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

Enclosure



SOURCES:
ESRI Atlas GIS v4.0 1996; Information Delivery System (IDS), March 1996; City and County of Honolulu, October 1996.

LEGEND:

Study Corridor

Scale: 0 .50 1.0 mi

Scale: 0 1.0 2.0 km

Sand Island Bypass

Figure 1

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

OCT 19 1999

Ref.: PB: SL

The Honorable Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza
711 Kapiolani Blvd., Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Primary Corridor Transportation Project

Thank you for your September 28, 1999 letter regarding the need for a Conservation District Use Application. It is our understanding that the proposed bypass road would extend under the Fort Armstrong Channel. Construction methods would involve excavation of the seabed and placement of reinforced concrete tunnel segments followed by backfilling. Since this project would cause substantial disturbance of the seabed, it meets the definition of land use under Title 13-5, Hawaii Administrative Rules. Therefore, a Conservation District Use Application would be required.

Please feel free to call Sam Lemmo of the Planning Branch at 587-0381, should you have any questions on this matter.

Aloha,

Dean Y. Uchida, Administrator
Land Division

cc: Chairperson's Office
Oahu Board Member

Appendix E
Cash Flow Analysis

TABLE E-1
NO-BUILD ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

NO BUILD ALTERNATIVE	2001-2010 TOTAL	2001-2025 TOTAL	2001	2002	2003	2004	2005
CAPITAL COSTS							
Bus Acquisitions	$135,939	$414,403	$12,131	$12,440	$12,751	$13,070	$13,396
Handi-Van Vehicle Acquisitions	$16,873	$51,825	$3,015	$1,623	$1,426	$0	$1,664
Total Capital Costs	$152,812	$466,228	$15,146	$14,063	$14,177	$13,070	$15,061
OPERATING COSTS							
Bus O&M	$1,283,719	$4,212,129	$110,116	$113,821	$117,649	$121,607	$125,698
Handivan O&M	$133,180	$431,902	$11,496	$11,867	$12,250	$12,645	$13,054
Total O&M Costs	$1,416,898	$4,644,030	$121,612	$125,688	$129,899	$134,252	$138,752
Total Capital and Operating Costs	*$1,569,711*	*$5,110,258*	*$136,758*	*$139,750*	*$144,076*	*$147,322*	*$153,812*
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$240,999	$771,366	$11,191	$12,918	$20,662	$23,328	$23,328
5309 Fixed Guideway Modernization	$8,318	$24,002	$657	$715	$788	$867	$867
5309 (Bus Discretionary)	$0	$0	$0	$0	$0	$0	$0
5309 New Start	$0	$0	$0	$0	$0	$0	$0
Federal Highway Authority (FHWA) Flexible Funds	$0	$0	$0	$0	$0	$0	$0
State Special Highway Fund	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds	$2,000	$2,000	$2,000				
Local Cash Revenues							
City Highway Funds	$74,755	$398,200	$2,797	$3,809	$4,832	$5,864	$6,907
Total Capital Revenue	*$326,072*	*$1,195,568*	*$16,645*	*$17,443*	*$26,282*	*$30,059*	*$31,102*
OPERATING REVENUES							
Passenger (Bus)	$363,164	$896,132	$30,985	$32,064	$33,180	$34,334	$35,529
Handivan Fares	$11,564	$37,540	$998	$1,030	$1,064	$1,098	$1,134
General Fund Revenues (for transit subsidy)	$1,000,170	$3,668,358	$77,629	$80,594	$89,656	$92,820	$96,089
5307 Formula Preventive Maintenance	$42,000	$42,000	$12,000	$12,000	$6,000	$6,000	$6,000
Total O&M Revenues	*$1,416,898*	*$4,644,030*	*$121,612*	*$125,688*	*$129,899*	*$134,252*	*$138,752*
Total Capital and Operating Revenues	*$1,742,971*	*$5,839,598*	*$138,257*	*$143,131*	*$156,181*	*$164,311*	*$169,854*
Additions to Cash	$173,260	$729,339	$1,498	$3,380	$12,105	$16,990	$16,041
Less General Fund Adjustment	$171,762	$727,841	$0	$3,380	$12,105	$16,990	$16,041
BEGINNING CASH BALANCE	*$13,485*	*$35,960*	*$0*	*$1,498*	*$1,498*	*$1,498*	*$1,498*
ADDITIONS TO CASH	*$173,260*	*$729,339*	*$1,498*	*$3,380*	*$12,105*	*$16,990*	*$16,041*
ENDING CASH BALANCE	*$14,983*	*$37,458*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*
Maximum G.O. Bonding Capacity	*$897,636*	*$1,735,052*	$290,362	$340,905	$401,738	$471,543	$541,884
Capacity Remaining after Issuance of Bonds	*$897,636*	*$1,735,052*	$288,362	$340,905	$401,738	$471,543	$541,884
% of Maximum G.O. Bonding Capacity Used			$0	$0	$0	$0	$0
General Fund Contribution to Transit Project							
Transit O&M subsidy			$77,629	$80,594	$89,656	$92,820	$96,089
Plus Debt Service Payment for Debt Issued before 99			$14,243	$15,862	$15,402	$15,736	$15,494
Plus Debt Service Payment for Debt Issued after 99			$449	$449	$449	$449	$449
Less Highway Fund Contribution for Debt Service			$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	$254,260	$635,650	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$44,425	$305,187	$0	$997	$1,996	$3,250	$3,895
Less Preventive Maintenance Contribution from Sec 5307	$127,337	$422,654	$0	$2,384	$10,109	$13,739	$12,147
Net Contribution	$549,894	$2,280,613	$48,495	$49,699	$49,576	$48,190	$52,165
Average Annual Net Contribution	$56,789	$91,945					

TABLE E-1
NO-BUILD ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

NO BUILD ALTERNATIVE	2006	2007	2008	2009	2010	2011	2012
CAPITAL COSTS							
Bus Acquisitions	$13,731	$14,068	$14,420	$14,781	$15,150	$15,529	$15,917
Handi-Van Vehicle Acquisitions	$1,791	$1,748	$1,792	$1,837	$1,977	$1,930	$1,978
Total Capital Costs	**$15,522**	**$15,817**	**$16,212**	**$16,618**	**$17,127**	**$17,459**	**$17,895**
OPERATING COSTS							
Bus O&M	$129,926	$134,296	$138,814	$143,483	$148,309	$153,297	$158,454
Handivan O&M	$13,476	$13,910	$14,359	$14,823	$15,301	$15,795	$16,304
Total O&M Costs	**$143,401**	**$148,206**	**$153,172**	**$158,306**	**$163,610**	**$169,092**	**$174,758**
Total Capital and Operating Costs	***$158,924***	***$164,023***	***$169,385***	***$174,923***	***$180,737***	***$186,551***	***$192,653***
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$29,328	$29,328	$29,328	$29,328	$32,261	$32,261	$32,261
5309 Fixed Guideway Modernization	$867	$867	$867	$867	$954	$954	$954
5309 (Bus Discretionary)	$0	$0	$0	$0	$0	$0	$0
5309 New Start	$0	$0	$0	$0	$0	$0	$0
Federal Highway Authority (FHWA) Flexible Funds	$0	$0	$0	$0	$0	$0	$0
State Special Highway Fund	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							
Local Cash Revenues							
City Highway Funds	$7,960	$9,024	$10,099	$11,184	$12,280	$13,387	$14,505
Total Capital Revenue	***$38,155***	***$39,219***	***$40,294***	***$41,379***	***$45,495***	***$46,602***	***$47,720***
OPERATING REVENUES							
Passenger (Bus)	$36,765	$38,044	$39,369	$40,739	$42,156	$43,623	$45,142
Handivan Fares	$1,170	$1,208	$1,247	$1,287	$1,329	$1,373	$1,417
General Fund Revenues (for transit subsidy)	$105,466	$108,955	$112,557	$116,280	$120,125	$124,096	$128,199
5307 Formula Preventive Maintenance							
Total O&M Revenues	***$143,401***	***$148,206***	***$153,172***	***$158,306***	***$163,610***	***$169,092***	***$174,758***
Total Capital and Operating Revenues	***$181,557***	***$187,426***	***$193,466***	***$199,685***	***$209,104***	***$215,694***	***$222,478***
Additions to Cash	$22,633	$23,402	$24,081	$24,761	$28,367	$29,143	$29,824
Less General Fund Adjustment	$22,633	$23,402	$24,081	$24,761	$28,367	$29,143	$29,824
BEGINNING CASH BALANCE	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*
ADDITIONS TO CASH	*$22,633*	*$23,402*	*$24,081*	*$24,761*	*$28,367*	*$29,143*	*$29,824*
ENDING CASH BALANCE	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***
Maximum G.O. Bonding Capacity	**$612,025**	**$681,547**	**$750,717**	**$822,806**	**$897,636**	**$975,114**	**$1,055,357**
Capacity Remaining after Issuance of Bonds	**$612,025**	**$681,547**	**$750,717**	**$822,806**	**$897,636**	**$975,114**	**$1,055,357**
% of Maximum G.O. Bonding Capacity Used	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
General Fund Contribution to Transit Project							
Transit O&M subsidy	$105,466	$108,955	$112,557	$116,280	$120,125	$124,096	$128,199
Plus Debt Service Payment for Debt Issued before 99	$16,158	$15,930	$15,665	$15,740	$15,023	$14,708	$12,949
Plus Debt Service Payment for Debt Issued after 99	$449	$449	$449	$449	$449	$449	$449
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$15,157	$13,398
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$4,856	$5,861	$6,856	$7,860	$8,854	$9,895	$10,926
Less Preventive Maintenance Contribution from Sec 5307	$17,777	$17,542	$17,225	$16,901	$19,513	$19,248	$18,898
Net Contribution	**$55,614**	**$58,105**	**$60,763**	**$63,882**	**$63,404**	**$69,528**	**$72,949**
Average Annual Net Contribution							

TABLE E-1
NO-BUILD ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

NO BUILD ALTERNATIVE	2013	2014	2015	2016	2017	2018	2019
CAPITAL COSTS							
Bus Acquisitions	$16,315	$16,723	$17,141	$17,570	$18,009	$18,459	$18,920
Handi-Van Vehicle Acquisitions	$2,028	$2,182	$2,130	$2,184	$2,238	$2,409	$2,351
Total Capital Costs	**$18,343**	**$18,905**	**$19,271**	**$19,753**	**$20,247**	**$20,868**	**$21,272**
OPERATING COSTS							
Bus O&M	$163,784	$169,293	$174,988	$180,874	$186,959	$193,247	$199,748
Handivan O&M	$16,831	$17,375	$17,935	$18,515	$19,112	$19,729	$20,365
Total O&M Costs	**$180,614**	**$186,668**	**$192,923**	**$199,388**	**$206,071**	**$212,976**	**$220,113**
Total Capital and Operating Costs	***$198,957***	***$205,573***	***$212,194***	***$219,141***	***$226,318***	***$233,844***	***$241,384***
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$32,261	$32,261	$32,261	$35,487	$35,487	$35,487	$35,487
5309 Fixed Guideway Modernization	$954	$954	$954	$1,049	$1,049	$1,049	$1,049
5309 (Bus Discretionary)	$0	$0	$0	$0	$0	$0	$0
5309 New Start	$0	$0	$0	$0	$0	$0	$0
Federal Highway Authority (FHWA) Flexible Funds	$0	$0	$0	$0	$0	$0	$0
State Special Highway Fund	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							
Local Cash Revenues							
City Highway Funds	$15,634	$16,775	$17,927	$19,090	$20,265	$21,452	$22,651
Total Capital Revenue	***$48,849***	***$49,989***	***$51,141***	***$55,626***	***$56,802***	***$57,988***	***$59,187***
OPERATING REVENUES							
Passenger (Bus)	$32,253	$32,561	$32,873	$33,187	$33,504	$33,824	$34,148
Handivan Fares	$1,463	$1,510	$1,560	$1,610	$1,661	$1,716	$1,770
General Fund Revenues (for transit subsidy)	$146,899	$152,597	$158,490	$164,592	$170,906	$177,436	$184,194
5307 Formula Preventive Maintenance							
Total O&M Revenues	***$180,614***	***$186,668***	***$192,923***	***$199,388***	***$206,071***	***$212,976***	***$220,113***
Total Capital and Operating Revenues	***$229,463***	***$236,657***	***$244,064***	***$255,015***	***$262,872***	***$270,964***	***$279,300***
Additions to Cash	$30,506	$31,084	$31,870	$35,873	$36,555	$37,121	$37,915
Less General Fund Adjustment	$30,506	$31,084	$31,870	$35,873	$36,555	$37,121	$37,915
BEGINNING CASH BALANCE	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*
ADDITIONS TO CASH	*$30,506*	*$31,084*	*$31,870*	*$35,873*	*$36,555*	*$37,121*	*$37,915*
ENDING CASH BALANCE	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***	***$1,498***
Maximum G.O. Bonding Capacity	**$1,133,190**	**$1,214,098**	**$1,287,875**	**$1,335,141**	**$1,385,604**	**$1,435,925**	**$1,487,508**
Capacity Remaining after Issuance of Bonds	**$1,133,190**	**$1,214,098**	**$1,287,875**	**$1,335,141**	**$1,385,604**	**$1,435,925**	**$1,487,508**
% of Maximum G.O. Bonding Capacity Used	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
General Fund Contribution to Transit Project							
Transit O&M subsidy	$146,899	$152,597	$158,490	$164,592	$170,906	$177,436	$184,194
Plus Debt Service Payment for Debt Issued before 99	$13,506	$10,554	$7,233	$8,189	$7,105	$7,066	$6,307
Plus Debt Service Payment for Debt Issued after 99	$449	$449	$449	$449	$449	$449	$449
Less Highway Fund Contribution for Debt Service	$13,955	$11,003	$7,682	$8,638	$7,554	$7,515	$6,756
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$11,966	$12,994	$14,072	$15,140	$16,216	$17,279	$18,397
Less Preventive Maintenance Contribution from Sec 5307	$18,541	$18,091	$17,798	$20,734	$20,339	$19,842	$19,519
Net Contribution	**$90,966**	**$96,087**	**$101,194**	**$103,292**	**$108,925**	**$114,890**	**$120,853**
Average Annual Net Contribution							

TABLE E-1
NO-BUILD ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

NO BUILD ALTERNATIVE	2020	2021	2022	2023	2024	2025	TOTAL
CAPITAL COSTS							
Bus Acquisitions	$19,394	$19,878	$20,375	$20,885	$21,407	$21,942	$414,403
Handi-Van Vehicle Acquisitions	$2,410	$2,470	$2,659	$2,596	$2,660	$2,727	$51,825
Total Capital Costs	$21,804	$22,349	$23,034	$23,480	$24,067	$24,669	$466,228
OPERATING COSTS							
Bus O&M	$206,466	$213,412	$220,590	$228,011	$235,680	$243,607	$4,212,129
Handivan O&M	$21,022	$21,701	$22,401	$23,124	$23,871	$24,642	$431,902
Total O&M Costs	$227,488	$235,113	$242,991	$251,135	$259,551	$268,249	$4,644,030
Total Capital and Operating Costs	*$249,292*	*$257,462*	*$266,026*	*$274,615*	*$283,619*	*$292,918*	*$5,110,258*
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$35,487	$35,487	$39,035	$39,035	$39,035	$39,035	$771,366
5309 Fixed Guideway Modernization	$1,049	$1,049	$1,154	$1,154	$1,154	$1,154	$24,002
5309 (Bus Discretionary)	$0	$0	$0	$0	$0	$0	$0
5309 New Start	$0	$0	$0	$0	$0	$0	$0
Federal Highway Authority (FHWA) Flexible Funds	$0	$0	$0	$0	$0	$0	$0
State Special Highway Fund	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							$2,000
Local Cash Revenues							
City Highway Funds	$23,862	$25,085	$26,320	$27,567	$28,827	$30,099	$398,200
Total Capital Revenue	*$60,398*	*$61,621*	*$66,509*	*$67,757*	*$69,017*	*$70,289*	*$1,195,568*
OPERATING REVENUES							
Passenger (Bus)	$34,474	$34,804	$35,137	$35,472	$35,812	$36,154	$896,132
Handivan Fares	$1,828	$1,888	$1,948	$2,012	$2,077	$2,145	$37,540
General Fund Revenues (for transit subsidy)	$191,186	$198,421	$205,906	$213,652	$221,662	$229,951	$3,668,358
5307 Formula Preventive Maintenance							$42,000
Total O&M Revenues	*$227,488*	*$235,113*	*$242,991*	*$251,135*	*$259,551*	*$268,249*	*$4,644,030*
Total Capital and Operating Revenues	*$287,886*	*$296,734*	*$309,501*	*$318,892*	*$328,568*	*$338,538*	*$5,839,598*
Additions to Cash	$38,594	$39,272	$43,475	$44,277	$44,950	$45,620	$729,339
Less General Fund Adjustment	$38,594	$39,272	$43,475	$44,277	$44,950	$45,620	$727,841
BEGINNING CASH BALANCE	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$35,960*
ADDITIONS TO CASH	*$38,594*	*$39,272*	*$43,475*	*$44,277*	*$44,950*	*$45,620*	*$729,339*
ENDING CASH BALANCE	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	*$1,498*	
Maximum G.O. Bonding Capacity	$1,538,094	$1,589,088	$1,641,810	$1,671,015	$1,700,803	$1,735,052	
Capacity Remaining after Issuance of Bonds	$1,538,094	$1,589,088	$1,641,810	$1,671,015	$1,700,803	$1,735,052	
% of Maximum G.O. Bonding Capacity Used	$0	$0	$0	$0	$0	$0	
General Fund Contribution to Transit Project							
Transit O&M subsidy	$191,186	$198,421	$205,906	$213,652	$221,662	$229,951	$3,668,358
Plus Debt Service Payment for Debt Issued before 99	$6,306	$6,304	$1,717	$1,715	$3,424	$0	$262,336
Plus Debt Service Payment for Debt Issued after 99	$449	$0	$0	$0	$0	$0	$8,985
Less Highway Fund Contribution for Debt Service	$6,755	$6,304	$1,717	$1,715	$3,424	$0	$295,576
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$635,650
Less Highway Fund Contribution for transit capital match	$19,501	$20,615	$21,713	$22,871	$24,013	$25,166	$305,187
Less Preventive Maintenance Contribution from Sec 5307	$19,093	$18,657	$21,763	$21,406	$20,936	$20,455	$422,654
Net Contribution	$127,166	$133,723	$137,005	$143,949	$151,287	$158,904	
Average Annual Net Contribution							

TABLE E-2
TSM ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

TSM ALTERNATIVE	2001-2010 TOTAL	2001-2025 TOTAL	2001	2002	2003	2004	2005
CAPITAL COSTS							
Transit Centers/Park-n-Ride Lots - Federal	$1,936	$1,936	$280	$1,656	$0	$0	$0
Transit Centers/Park-n-Ride Lots - City	$99,560	$99,560	$22,825	$33,545	$21,587	$0	$0
Bus Acquisitions	$159,324	$485,620	$14,226	$14,581	$14,946	$15,320	$15,703
Handi-Van Vehicle Acquisitions	$17,025	$51,977	$0	$3,091	$1,663	$1,461	$1,664
Expansion of Bus Maintenance Facility	$0	$25,154	$0	$0	$0	$0	$0
Bus Priority Treatment - Federal	$7,182	$7,182	$0	$248	$4,452	$128	$2,354
Bus Priority Treatment - City	$11,510	$11,510	$975	$7,412	$0	$0	$0
Zipper Lane	$34,576	$34,576	$0	$4,526	$30,050	$0	$0
Total Capital Costs	*$331,113*	*$717,515*	*$38,305*	*$65,059*	*$72,699*	*$16,908*	*$19,720*
OPERATING COSTS							
Bus O&M	$1,312,026	$4,453,659	$110,533	$114,682	$118,987	$123,454	$128,088
Handivan O&M	$133,180	$431,902	$11,496	$11,867	$12,250	$12,645	$13,054
Total O&M Costs	$1,445,206	$4,885,560	$122,029	$126,549	$131,237	$136,099	$141,142
Total Capital and Operating Costs	$1,776,318	$5,603,075	$160,334	$191,608	$203,935	$153,008	$160,862
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$240,999	$771,366	$11,191	$12,918	$20,662	$23,328	$23,328
5309 Fixed Guideway Modernization	$8,318	$24,002	$657	$715	$788	$867	$867
5309 New Start	$43,636	$43,636	$0	$20,478	$10,794	$0	$0
FHWA/Other Federal & State Highway Revenue	$34,191	$34,191	$280	$6,430	$25,000	$128	$2,354
Local Bond Revenues							
G.O. Bonds	$55,000	$55,000	$30,000	$20,000	$5,000		
Local Cash Revenues							
City Highway Funds	$74,755	$398,200	$2,797	$3,809	$4,832	$5,864	$6,907
Total Capital Revenue	$456,899	$1,326,394	$44,925	$64,351	$67,075	$30,187	$33,456
OPERATING REVENUES							
Passenger & Handivan Fares (Bus)	$366,115	$1,228,839	$31,028	$32,153	$33,319	$34,526	$35,778
Passenger & Handivan Fares (Bus)	$11,564	$37,540	$998	$1,030	$1,064	$1,098	$1,134
5307 Formula Preventive Maintenance	$42,000	$42,000	$12,000	$12,000	$6,000	$6,000	$6,000
General Fund Revenues (for transit subsidy)	$1,025,527	$3,577,181	$78,002	$81,366	$90,854	$94,475	$98,230
Total O&M Revenues	$1,445,206	$4,885,560	$122,029	$126,549	$131,237	$136,099	$141,142
Total Capital and Operating Revenues	$1,902,104	$6,211,955	$166,954	$190,900	$198,312	$166,286	$174,598
Additions to Cash	$125,786	$608,879	$6,620	-$708	-$5,623	$13,278	$13,735
Less General Fund Adjustment	$114,697	$600,655	$0	$0	$0	$13,278	$13,735
BEGINNING CASH BALANCE	*$11,090*	*$8,224*	*$0*	*$6,620*	*$5,912*	*$289*	*$289*
ADDITIONS TO CASH	*$25,765*	*$41,851*	*$6,620*	*-$708*	*-$5,623*	*$13,278*	*$13,735*
ENDING CASH BALANCE	*$11,090*	*$8,224*	*$6,620*	*$5,912*	*$289*	*$289*	*$289*
Maximum G.O. Bonding Capacity	860,746	1,735,052	*$293,162*	*$296,112*	*$353,028*	*$424,222*	*$496,042*
Capacity Remaining after Issuance of Bonds	860,746	1,735,052	*$263,162*	*$296,112*	*$353,028*	*$424,222*	*$496,042*
% of Maximum G.O. Bonding Capacity Used			*$0*	*$0*	*$0*	*$0*	*$0*
General Fund Contribution to Transit Project							
Transit O&M subsidy			$78,002	$81,366	$90,854	$94,475	$98,230
Plus Debt Service Payment for Debt Issued before 99			$14,243	$15,862	$15,402	$15,736	$15,494
Plus Debt Service Payment for Debt Issued after 99			$0	$2,696	$4,493	$4,942	$4,942
Less Highway Fund Contribution for Debt Service			$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M			$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$32,803	$278,968	$0	$0	$0	$2,508	$3,434
Less Preventive Maintenance Contribution from Sec 5307	$81,893	$321,687	$0	$0	$0	$10,771	$10,302
Net Contribution	$669,604	$2,242,049	$48,419	$56,098	$66,923	$58,048	$61,104
Average Annual Net General Fund Contribution	$66,960	$89,682					

TABLE E-2
TSM ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

TSM ALTERNATIVE	2006	2007	2008	2009	2010	2011	2012
CAPITAL COSTS							
Transit Centers/Park-n-Ride Lots - Federal	$0	$0	$0	$0	$0	$0	$0
Transit Centers/Park-n-Ride Lots - City	$0	$0	$1,062	$20,541	$0	$0	$0
Bus Acquisitions	$16,095	$16,485	$16,897	$17,320	$17,753	$18,196	$18,651
Handi-Van Vehicle Acquisitions	$1,791	$1,748	$1,792	$1,837	$1,977	$1,930	$1,978
Expansion of Bus Maintenance Facility	$0	$0	$0	$0	$0	$1,199	$0
Bus Priority Treatment - Federal	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - City	$189	$2,935	$0	$0	$0	$0	$0
Zipper Lane	$0	$0	$0	$0	$0	$0	$0
Total Capital Costs	***$18,075***	***$21,168***	***$19,752***	***$39,697***	***$19,730***	***$21,326***	***$20,629***
OPERATING COSTS							
Bus O&M	$132,897	$137,886	$143,062	$148,432	$154,005	$159,786	$165,784
Handivan O&M	$13,476	$13,910	$14,359	$14,823	$15,301	$15,795	$16,304
Total O&M Costs	**$146,373**	**$151,796**	**$157,421**	**$163,255**	**$169,305**	**$175,581**	**$182,089**
Total Capital and Operating Costs	***$164,448***	***$172,964***	***$177,173***	***$202,952***	***$189,035***	***$196,907***	***$202,718***
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$29,328	$29,328	$29,328	$29,328	$32,261	$32,261	$32,261
5309 Fixed Guideway Modernization	$867	$867	$867	$867	$954	$954	$954
5309 New Start	$94	$1,467	$531	$10,270	$0	$0	$0
FHWA/Other Federal & State Highway Revenue	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							
Local Cash Revenues							
City Highway Funds	$7,960	$9,024	$10,099	$11,184	$12,280	$13,387	$14,505
Total Capital Revenue	**$38,250**	**$40,687**	**$40,825**	**$51,649**	**$45,495**	**$46,602**	**$47,720**
OPERATING REVENUES							
Passenger & Handivan Fares (Bus)	$37,075	$38,419	$39,812	$41,255	$42,750	$44,300	$45,906
Passenger & Handivan Fares (Bus)	$1,170	$1,208	$1,247	$1,287	$1,329	$1,373	$1,417
5307 Formula Preventive Maintenance							
General Fund Revenues (for transit subsidy)	$108,128	$112,169	$116,362	$120,713	$125,227	$129,908	$134,765
Total O&M Revenues	**$146,373**	**$151,796**	**$157,421**	**$163,255**	**$169,305**	**$175,581**	**$182,089**
Total Capital and Operating Revenues	**$184,623**	**$192,482**	**$198,246**	**$214,904**	**$214,800**	**$222,182**	**$229,808**
Additions to Cash	$20,175	$19,518	$21,073	$11,952	$25,765	$25,276	$27,090
Less General Fund Adjustment	$20,080	$18,051	$20,542	$3,244	$25,765	$25,276	$27,090
BEGINNING CASH BALANCE	*$289*	*$383*	*$1,851*	*$2,382*	*$11,090*	*$11,090*	*$11,090*
ADDITIONS TO CASH	*$20,175*	*$19,518*	*$21,073*	*$11,952*	*$25,765*	*$25,276*	*$27,090*
ENDING CASH BALANCE	***$383***	***$1,851***	***$2,382***	***$11,090***	***$11,090***	***$11,090***	***$11,090***
Maximum G.O. Bonding Capacity	***$567,758***	***$638,955***	***$709,908***	***$783,895***	***$860,746***	***$940,374***	***$1,022,905***
Capacity Remaining after Issuance of Bonds	***$567,758***	***$638,955***	***$709,908***	***$783,895***	***$860,746***	***$940,374***	***$1,022,905***
% of Maximum G.O. Bonding Capacity Used	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***
General Fund Contribution to Transit Project							
Transit O&M subsidy	$108,128	$112,169	$116,362	$120,713	$125,227	$129,908	$134,765
Plus Debt Service Payment for Debt Issued before 99	$16,158	$15,930	$15,665	$15,740	$15,023	$14,708	$12,949
Plus Debt Service Payment for Debt Issued after 99	$4,942	$4,942	$4,942	$4,942	$4,942	$4,942	$4,942
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$4,345	$4,790	$6,148	$3,244	$8,334	$9,122	$10,379
Less Preventive Maintenance Contribution from Sec 5307	$15,735	$13,261	$14,394	$0	$17,431	$16,154	$16,711
Net Contribution	**$65,322**	**$71,164**	**$72,601**	**$94,325**	**$75,601**	**$80,456**	**$81,740**
Average Annual Net General Fund Contribution							

TABLE E-2
TSM ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

TSM ALTERNATIVE	2013	2014	2015	2016	2017	2018	2019
CAPITAL COSTS							
Transit Centers/Park-n-Ride Lots - Federal	$0	$0	$0	$0	$0	$0	$0
Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$0	$0
Bus Acquisitions	$19,118	$19,595	$20,085	$20,587	$21,102	$21,630	$22,170
Handi-Van Vehicle Acquisitions	$2,028	$2,182	$2,130	$2,184	$2,238	$2,409	$2,351
Expansion of Bus Maintenance Facility	$23,955	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - Federal	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - City	$0	$0	$0	$0	$0	$0	$0
Zipper Lane	$0	$0	$0	$0	$0	$0	$0
Total Capital Costs	***$45,100***	***$21,778***	***$22,216***	***$22,771***	***$23,340***	***$24,039***	***$24,522***
OPERATING COSTS							
Bus O&M	$172,009	$178,466	$185,164	$192,116	$199,328	$206,811	$214,575
Handivan O&M	$16,831	$17,375	$17,935	$18,515	$19,112	$19,729	$20,365
Total O&M Costs	**$188,839**	**$195,840**	**$203,100**	**$210,630**	**$218,440**	**$226,540**	**$234,940**
Total Capital and Operating Costs	***$233,939***	***$217,618***	***$225,315***	***$233,401***	***$241,780***	***$250,579***	***$259,462***
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$32,261	$32,261	$32,261	$35,487	$35,487	$35,487	$35,487
5309 Fixed Guideway Modernization	$954	$954	$954	$1,049	$1,049	$1,049	$1,049
5309 New Start	$0	$0	$0	$0	$0	$0	$0
FHWA/Other Federal & State Highway Revenue	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							
Local Cash Revenues							
City Highway Funds	$15,634	$16,775	$17,927	$19,090	$20,265	$21,452	$22,651
Total Capital Revenue	**$48,849**	**$49,989**	**$51,141**	**$55,626**	**$56,802**	**$57,988**	**$59,187**
OPERATING REVENUES							
Passenger & Handivan Fares (Bus)	$47,569	$49,294	$51,081	$52,933	$54,851	$56,840	$58,900
Passenger & Handivan Fares (Bus)	$1,463	$1,510	$1,560	$1,610	$1,661	$1,716	$1,770
5307 Formula Preventive Maintenance							
General Fund Revenues (for transit subsidy)	$139,807	$145,036	$150,459	$156,088	$161,927	$167,984	$174,270
Total O&M Revenues	**$188,839**	**$195,840**	**$203,100**	**$210,630**	**$218,440**	**$226,540**	**$234,940**
Total Capital and Operating Revenues	**$237,688**	**$245,830**	**$254,241**	**$266,257**	**$275,241**	**$284,528**	**$294,127**
Additions to Cash	$3,749	$28,212	$28,926	$32,855	$33,461	$33,950	$34,665
Less General Fund Adjustment	$6,614	$28,212	$28,926	$32,855	$33,461	$33,950	$34,665
BEGINNING CASH BALANCE	*$11,090*	*$8,224*	*$8,224*	*$8,224*	*$8,224*	*$8,224*	*$8,224*
ADDITIONS TO CASH	*$3,749*	*$28,212*	*$28,926*	*$32,855*	*$33,461*	*$33,950*	*$34,665*
ENDING CASH BALANCE	***$8,224***	***$8,224***	***$8,224***	***$8,224***	***$8,224***	***$8,224***	***$8,224***
Maximum G.O. Bonding Capacity	***$1,103,173***	***$1,186,672***	***$1,263,208***	***$1,313,408***	***$1,366,994***	***$1,420,638***	***$1,476,122***
Capacity Remaining after Issuance of Bonds	***$1,103,173***	***$1,186,672***	***$1,263,208***	***$1,313,408***	***$1,366,994***	***$1,420,638***	***$1,476,122***
% of Maximum G.O. Bonding Capacity Used	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***

	2013	2014	2015	2016	2017	2018	2019
General Fund Contribution to Transit Project							
Transit O&M subsidy	$139,807	$145,036	$150,459	$156,088	$161,927	$167,984	$174,270
Plus Debt Service Payment for Debt Issued before 99	$13,506	$10,554	$7,233	$8,189	$7,105	$7,066	$6,307
Plus Debt Service Payment for Debt Issued after 99	$4,942	$4,942	$4,942	$4,942	$4,942	$4,942	$4,942
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$6,614	$12,419	$13,484	$14,536	$15,597	$16,645	$17,747
Less Preventive Maintenance Contribution from Sec 5307	$0	$15,793	$15,442	$18,319	$17,864	$17,305	$16,919
Net Contribution	**$107,815**	**$88,494**	**$89,882**	**$92,537**	**$96,687**	**$102,216**	**$107,028**
Average Annual Net General Fund Contribution							

TABLE E-2
TSM ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

TSM ALTERNATIVE	2020	2021	2022	2023	2024	2025	TOTAL
CAPITAL COSTS							
Transit Centers/Park-n-Ride Lots - Federal	$0	$0	$0	$0	$0	$0	$1,936
Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$0	$99,560
Bus Acquisitions	$22,725	$23,293	$23,875	$24,472	$25,084	$25,711	$485,620
Handi-Van Vehicle Acquisitions	$2,410	$2,470	$2,659	$2,596	$2,660	$2,727	$51,977
Expansion of Bus Maintenance Facility	$0	$0	$0	$0	$0	$0	$25,154
Bus Priority Treatment - Federal	$0	$0	$0	$0	$0	$0	$7,182
Bus Priority Treatment - City	$0	$0	$0	$0	$0	$0	$11,510
Zipper Lane	$0	$0	$0	$0	$0	$0	$34,576
Total Capital Costs	***$25,135***	***$25,763***	***$26,534***	***$27,068***	***$27,744***	***$28,438***	***$717,515***
OPERATING COSTS							
Bus O&M	$222,630	$230,988	$239,658	$248,655	$257,989	$267,674	$4,453,659
Handivan O&M	$21,022	$21,701	$22,401	$23,124	$23,871	$24,642	$431,902
Total O&M Costs	**$243,652**	**$252,689**	**$262,059**	**$271,779**	**$281,861**	**$292,316**	**$4,885,560**
Total Capital and Operating Costs	***$268,787***	***$278,452***	***$288,593***	***$298,847***	***$309,605***	***$320,754***	***$4,106,824***
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$35,487	$35,487	$39,035	$39,035	$39,035	$39,035	$771,366
5309 Fixed Guideway Modernization	$1,049	$1,049	$1,154	$1,154	$1,154	$1,154	$24,002
5309 New Start	$0	$0	$0	$0	$0	$0	$43,636
FHWA/Other Federal & State Highway Revenue	$0	$0	$0	$0	$0	$0	$34,191
Local Bond Revenues							
G.O. Bonds							$55,000
Local Cash Revenues							
City Highway Funds	$23,862	$25,085	$26,320	$27,567	$28,827	$30,099	$398,200
Total Capital Revenue	**$60,398**	**$61,621**	**$66,509**	**$67,757**	**$69,017**	**$70,289**	**$1,326,394**
OPERATING REVENUES							
Passenger & Handivan Fares (Bus)	$61,035	$63,247	$65,541	$67,917	$70,379	$72,930	$1,228,839
Passenger & Handivan Fares (Bus)	$1,828	$1,888	$1,948	$2,012	$2,077	$2,145	$37,540
5307 Formula Preventive Maintenance							
General Fund Revenues (for transit subsidy)	$180,789	$187,553	$194,570	$201,850	$209,405	$217,242	$3,577,181
Total O&M Revenues	**$243,652**	**$252,689**	**$262,059**	**$271,779**	**$281,861**	**$292,316**	**$4,885,560**
Total Capital and Operating Revenues	***$304,050***	***$314,309***	***$328,568***	***$339,536***	***$350,878***	***$362,605***	***$6,211,955***
Additions to Cash	$35,263	$35,857	$39,975	$40,689	$41,272	$41,851	$608,879
Less General Fund Adjustment	$35,263	$35,857	$39,975	$40,689	$41,272	$41,851	$600,655
BEGINNING CASH BALANCE	*$8,224*	*$8,224*	*$8,224*	*$8,224*	*$8,224*	*$8,224*	*$161,065*
ADDITIONS TO CASH	*$35,263*	*$35,857*	*$39,975*	*$40,689*	*$41,272*	*$41,851*	*$608,879*
ENDING CASH BALANCE	***$8,224***	***$8,224***	***$8,224***	***$8,224***	***$8,224***	***$8,224***	
Maximum G.O. Bonding Capacity	***$1,530,938***	***$1,586,427***	***$1,641,229***	***$1,670,847***	***$1,700,803***	***$1,735,052***	
Capacity Remaining after Issuance of Bonds	***$1,530,938***	***$1,586,427***	***$1,641,229***	***$1,670,847***	***$1,700,803***	***$1,735,052***	
% of Maximum G.O. Bonding Capacity Used	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***	
General Fund Contribution to Transit Project							
Transit O&M subsidy	$180,789	$187,553	$194,570	$201,850	$209,405	$217,242	
Plus Debt Service Payment for Debt Issued before 99	$6,306	$6,304	$1,717	$1,715	$3,424	$0	
Plus Debt Service Payment for Debt Issued after 99	$4,942	$4,942	$2,246	$449	$0	$0	
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	
Less Highway Fund Contribution for transit capital match	$18,835	$19,932	$21,013	$22,154	$23,278	$24,412	
Less Preventive Maintenance Contribution from Sec 5307	$16,428	$15,926	$18,963	$18,536	$17,994	$17,440	
Net Contribution	**$112,948**	**$119,116**	**$114,732**	**$119,499**	**$127,730**	**$131,565**	
Average Annual Net General Fund Contribution							

TABLE E-3
BUS RAPID TRANSIT ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

BRT ALTERNATIVE WITH 50% NEW START & FHWA	10 YR TOTAL 2001-2010	25 YR TOTAL 2001-2025	2001	2002	2003	2004	2005
CAPITAL COSTS							
BRT Transit Centers/Park-n-Ride Lots - Federal/State	*$1,895*	*$1,895*	$1,895	$0	$0	$0	$0
BRT Transit Centers/Park-n-Ride Lots - City	$29,270	$29,270	$2,590	$9,284	$0	$510	$2,924
In-Town BRT Transit Centers/Park-n-Ride Lots - Federal/State	*$1,431*	*$1,431*	$0	$0	$68	$1,363	$0
In-Town BRT Transit Centers/Park-n-Ride Lots - City	$73,113	$73,113	$4,232	$30,874	$21,587	$0	$0
Bus Acquisitions	*$186,522*	*$568,683*	$16,649	$17,065	$17,492	$17,929	$18,377
Handi-Van Vehicle Acquisitions	*$17,025*	*$51,977*	$0	$3,091	$1,663	$1,461	$1,664
Bus Maintenance Facility	*$30,339*	*$30,339*	$0	$0	$0	$0	$0
Bus Priority Treatment - Federal/State	*$7,182*	*$7,182*	$0	$248	$4,452	$128	$2,354
Bus Priority Treatment - City	$7,539	$7,539	$657	$3,768	$0	$0	$0
Zipper Lane	*$165,341*	*$165,341*	$0	$78,481	$32,460	$0	$26,864
Direct Access Ramps	*$72,617*	*$72,617*	$0	$0	$0	$0	$0
In-Town BRT	$289,667	$384,946	$0	$22,816	$131,198	$135,644	$0
Total Capital Costs	*$881,932*	*$1,394,335*	$26,023	$165,627	$208,920	$157,034	$52,183
OPERATING COSTS							
Bus O&M	*$1,279,151*	*$4,737,038*	$110,533	$114,682	$118,987	$119,281	$122,323
Handivan O&M	*$133,180*	*$431,902*	$11,496	$11,867	$12,250	$12,645	$13,054
In-Town BRT O&M	*$78,451*	*$360,142*	$0	$0	$0	$5,542	$8,624
Debt Service Payment							
Transportation System Revenue Bond	*$0*	*$0*	$0	$0	$0	$0	$0
Total O&M Costs	*$1,490,782*	*$5,529,082*	$122,029	$126,649	$131,237	$137,469	$144,001
Total Capital and Operating Costs	$2,372,714	$6,923,417	$148,052	$292,176	$340,157	$294,503	$196,184
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	*$240,999*	*$771,366*	$11,191	$12,918	$20,662	$23,328	$23,328
5309 Fixed Guideway Modernization	*$8,318*	*$24,002*	$657	$715	$788	$867	$867
5309 New Start	*$182,100*	*$182,100*	$0	$10,000	$30,000	$45,000	$44,300
FHWA/Other Federal & State Highway Revenue	*$201,895*	*$201,895*	$1,895	$25,000	$25,000	$25,000	$25,000
Local Bond Revenues							
G.O. Bonds	**$320,000**	**$320,000**	**$20,000**	**$115,000**	**$130,000**	**$55,000**	
Transportation Revenue Bonds	***$0***	***$0***					
Local Cash Revenues							
City Highway Fund	*$55,383*	*$338,150*	$1,087	$2,052	$3,026	$4,009	$5,001
Total Capital Revenue	*$1,008,696*	*$1,837,513*	$34,830	$165,686	$209,476	$153,204	$98,496
OPERATING REVENUES							
Passenger Fares (Bus)	*$344,070*	*$1,180,756*	$31,028	$32,153	$33,319	$32,730	$33,078
Handivan Fares	*$11,564*	*$37,540*	$998	$1,030	$1,064	$1,098	$1,134
In-Town BRT Fares	*$28,020*	*$128,628*	$0	$0	$0	$1,980	$3,080
Highway Fund Revenues (New Revenues)	*$0*	*$0*	$0	$0	$0	$0	$0
5307 Formula Preventive Maintenance	*$42,000*	*$42,000*	$12,000	$12,000	$6,000	$6,000	$6,000
General Fund Revenues (Transit Operating Support)	*$1,065,128*	*$4,140,158*	$78,002	$81,366	$90,854	$95,661	$100,710
Total O&M Revenues	*$1,490,782*	*$5,529,082*	$122,029	$126,549	$131,237	$137,469	$144,001
Total Capital and Operating Revenues	$2,499,478	$7,366,595	$156,859	$292,235	$340,713	$290,673	$242,497
Additions to Cash (in 2010 and 2025)	$126,764	$443,179	$8,807	$59	$556	-$3,830	$46,313
Less General Fund Adjustment (in 2010 and 2025)	$45,648	$428,821	$0	$0	$0	$0	$6,231
BEGINNING CASH BALANCE (in 2010 and 2025)	$0	$81,116	$0	$8,807	$8,866	$9,422	$5,592
ADDITIONS TO CASH (in 2010 and 2025)	$126,764	$443,179	$8,807	$59	$556	-$3,830	$46,313
ENDING CASH BALANCE (in 2010 and 2025)	$81,116	$95,474	$8,807	$8,866	$9,422	$5,592	$45,674
Maximum G.O. Bonding Capacity (in 2010 and 2025)	**$653,656**	**$1,123,338**	**$293,062**	**$324,783**	**$272,740**	**$219,110**	**$243,484**
Capacity Remaining after Issuance of Bonds (2010 and 2025)	**$653,656**	**$1,123,338**	**$273,062**	**$209,783**	**$142,740**	**$164,110**	**$243,484**
% of Maximum G.O. Bonding Capacity Used (2010 and 2025)			**7%**	**35%**	**48%**	**25%**	**0%**
General Fund Contribution to Transit Project in 2010 and 2025							
Transit O&M subsidy			$78,002	$81,366	$90,854	$95,661	$100,710
Plus Debt Service Payment for Debt Issued before 99			$14,243	$15,862	$15,402	$15,736	$15,494
Plus Debt Service Payment for Debt Issued after 99			$0	$1,797	$12,130	$23,811	$28,753
Less Highway Fund Contribution for Debt Service			$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	*$254,260*	*$635,650*	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	*$8,485*	*$192,614*	$0	$0	$0	$0	$408
Less Preventive Maintenance Contribution from Sec 5307	*$37,163*	*$236,207*	$0	$0	$0	$0	$5,823
Net Contribution	*$946,726*	*$3,453,075*	*$48,419*	*$55,199*	*$74,560*	*$91,382*	*$94,899*
Average Annual Net Contribution	*$94,673*	*$138,123*					

TABLE E-3
BUS RAPID TRANSIT ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

BRT ALTERNATIVE WITH 50% NEW START & FHWA	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
CAPITAL COSTS							
BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$0	$0
BRT Transit Centers/Park-n-Ride Lots - City	$426	$8,342	$256	$4,827	$0	$0	$0
In-Town BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$0	$0
In-Town BRT Transit Centers/Park-n-Ride Lots - City	$0	$0	$806	$15,614	$0	$0	$0
Bus Acquisitions	$18,837	$18,307	$19,790	$20,285	$20,792	$21,312	$21,845
Handi-Van Vehicle Acquisitions	$1,791	$1,748	$1,792	$1,837	$1,977	$1,930	$1,978
Bus Maintenance Facility	$0	$1,486	$28,853	$0	$0	$0	$0
Bus Priority Treatment - Federal/State	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - City	$189	$2,936	$0	$0	$0	$0	$0
Zipper Lane	$27,536	$0	$0	$0	$0	$0	$0
Direct Access Ramps	$1,840	$35,892	$1,703	$33,183	$0	$0	$0
In-Town BRT -	$0	$0	$0	$0	$0	$0	$0
Total Capital Costs	$50,619	$69,712	$53,200	$75,845	$22,769	$23,242	$23,823
OPERATING COSTS							
Bus O&M	$125,442	$131,734	$138,340	$145,274	$152,555	$160,200	$168,224
Handivan O&M	$13,476	$13,910	$14,359	$14,823	$15,301	$15,795	$16,304
In-Town BRT O&M	$11,929	$12,376	$12,839	$13,320	$13,820	$14,337	$14,874
Debt Service Payment							
Transportation System Revenue Bond	$0	$0	$0	$0	$0	$0	$0
Total O&M Costs	$150,847	$158,020	$165,538	$173,417	$181,676	$190,331	$199,403
Total Capital and Operating Costs	$201,466	$227,731	$218,738	$249,262	$204,445	$213,573	$223,226
CAPITAL REVENUES							
Federal Transportation Administration							
5307 Formula Grant	$29,328	$29,328	$29,328	$29,328	$32,261	$32,261	$32,261
5309 Fixed Guideway Modernization	$867	$867	$867	$867	$954	$954	$954
5309 New Start	$44,300	$8,500	$0	$0	$0	$0	$0
FHWA/Other Federal & State Highway Revenue	$25,000	$25,000	$25,000	$25,000	$0	$0	$0
Local Bond Revenues							
G.O. Bonds							
Transportation Revenue Bonds							
Local Cash Revenues							
City Highway Fund	$6,002	$7,012	$8,032	$9,061	$10,100	$11,148	$12,205
Total Capital Revenue	$105,497	$70,708	$63,227	$64,256	$43,314	$44,362	$45,420
OPERATING REVENUES							
Passenger Fares (Bus)	$33,406	$34,818	$36,290	$37,825	$39,423	$41,089	$42,826
Handivan Fares	$1,170	$1,208	$1,247	$1,287	$1,329	$1,373	$1,417
In-Town BRT Fares	$4,261	$4,421	$4,585	$4,758	$4,936	$5,121	$5,313
Highway Fund Revenues (New Revenues)	$0	$0	$0	$0	$0	$0	$0
5307 Formula Preventive Maintenance							
General Fund Revenues (Transit Operating Support)	$112,010	$117,573	$123,416	$129,548	$135,988	$142,748	$149,847
Total O&M Revenues	$150,847	$158,020	$165,538	$173,417	$181,676	$190,331	$199,403
Total Capital and Operating Revenues	$256,344	$228,728	$228,765	$237,674	$224,990	$234,693	$244,823
Additions to Cash (in 2010 and 2025)	$54,879	$996	$10,027	-$11,589	$20,545	$21,121	$21,597
Less General Fund Adjustment (in 2010 and 2025)	$14,954	$3,388	$0	$529	$20,545	$21,121	$21,597
BEGINNING CASH BALANCE (in 2010 and 2025)	$45,674	$85,598	$83,206	$93,233	$81,116	$81,116	$81,116
ADDITIONS TO CASH (in 2010 and 2025)	$54,879	$996	$10,027	-$11,589	$20,545	$21,121	$21,597
ENDING CASH BALANCE (in 2010 and 2025)	$85,598	$83,206	$93,233	$81,116	$81,116	$81,116	$81,116
Maximum G.O. Bonding Capacity (in 2010 and 2025)	$323,225	$402,950	$482,964	$566,577	$653,656	$744,152	$838,230
Capacity Remaining after Issuance of Bonds (2010 and 2025)	$323,225	$402,950	$482,964	$566,577	$653,656	$744,152	$838,230
% of Maximum G.O. Bonding Capacity Used (2010 and 2025)	0%	0%	0%	0%	0%	0%	0%
General Fund Contribution to Transit Project in 2010 and 2025							
Transit O&M subsidy	$112,010	$117,573	$123,416	$129,548	$135,988	$142,748	$149,847
Plus Debt Service Payment for Debt Issued before 99	$16,158	$15,930	$15,665	$15,740	$15,023	$14,708	$12,949
Plus Debt Service Payment for Debt Issued after 99	$28,753	$28,753	$28,753	$28,753	$28,753	$26,753	$28,753
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$1,754	$249	$0	$529	$5,546	$6,499	$7,441
Less Preventive Maintenance Contribution from Sec 5307	$13,201	$3,140	$0	$0	$15,000	$14,621	$14,157
Net Contribution	*$98,140*	*$115,041*	*$124,007*	*$129,685*	*$115,393*	*$121,261*	*$126,126*
Average Annual Net Contribution							

TABLE E-3
BUS RAPID TRANSIT ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

BRT ALTERNATIVE WITH 50% NEW START & FHWA	2021	2022	2023	2024	2025	TOTAL
CAPITAL COSTS						
BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$1,895
BRT Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$29,270
In-Town BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$1,431
In-Town BRT Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$73,113
Bus Acquisitions	$27,261	$27,963	$28,662	$29,379	$30,113	$568,683
Handi-Van Vehicle Acquisitions	$2,470	$2,659	$2,596	$2,660	$2,727	$51,977
Bus Maintenance Facility	$0	$0	$0	$0	$0	$30,339
Bus Priority Treatment - Federal/State	$0	$0	$0	$0	$0	$7,182
Bus Priority Treatment - City	$0	$0	$0	$0	$0	$7,539
Zipper Lane	$0	$0	$0	$0	$0	$165,341
Direct Access Ramps	$0	$0	$0	$0	$0	$72,617
In-Town BRT	$0	$0	$0	$0	$0	$384,946
Total Capital Costs	$29,751	$30,622	$31,257	$32,039	$32,840	$1,394,335
OPERATING COSTS						
Bus O&M	$261,046	$274,093	$287,790	$302,166	$317,256	$4,737,038
Handivan O&M	$21,701	$22,401	$23,124	$23,871	$24,642	$431,902
In-Town BRT O&M	$20,708	$21,482	$22,286	$23,121	$23,987	$360,142
Debt Service Payment						
Transportation System Revenue Bond	$0	$0	$0	$0	$0	$0
Total O&M Costs	$303,455	$317,976	$333,200	$349,158	$365,884	$5,529,082
Total Capital and Operating Costs	$333,206	$348,598	$364,458	$381,197	$398,724	$6,923,417
CAPITAL REVENUES						
Federal Transportation Administration						
5307 Formula Grant	$35,487	$39,035	$39,035	$39,035	$39,035	$771,366
5309 Fixed Guideway Modernization	$1,049	$1,154	$1,154	$1,154	$1,154	$24,002
5309 New Start	$0	$0	$0	$0	$0	$182,100
FHWA/Other Federal & State Highway Revenue	$0	$0	$0	$0	$0	$201,895
Local Bond Revenues						
G.O. Bonds						$320,000
Transportation Revenue Bonds						$0
Local Cash Revenues						
City Highway Fund	$22,168	$23,326	$24,494	$25,672	$26,861	$338,150
Total Capital Revenue	$58,704	$63,515	$64,684	$65,862	$67,051	$1,837,513
OPERATING REVENUES						
Passenger Fares (Bus)	$62,155	$64,780	$67,517	$70,368	$73,341	$1,180,756
Handivan Fares	$1,888	$1,948	$2,012	$2,077	$2,145	$37,540
In-Town BRT Fares	$7,395	$7,673	$7,959	$8,259	$8,566	$128,628
Highway Fund Revenues (New Revenues)	$0	$0	$0	$0	$0	$0
5307 Formula Preventive Maintenance						$42,000
General Fund Revenues (Transit Operating Support)	$232,016	$243,576	$255,713	$268,454	$281,833	$4,140,158
Total O&M Revenues	$303,455	$317,976	$333,200	$349,158	$365,884	$5,529,082
Total Capital and Operating Revenues	$362,159	$381,491	$397,884	$415,020	$432,936	$7,366,595
Additions to Cash (in 2010 and 2025)	$28,953	$32,894	$33,426	$33,823	$34,211	
Less General Fund Adjustment (in 2010 and 2025)	$28,953	$32,894	$33,426	$33,823	$34,211	
BEGINNING CASH BALANCE (in 2010 and 2025)	$14,358	$14,358	$14,358	$14,358	$14,358	
ADDITIONS TO CASH (in 2010 and 2025)	$28,953	$32,894	$33,426	$33,823	$34,211	
ENDING CASH BALANCE (in 2010 and 2025)	$14,358	$14,358	$14,358	$14,358	$14,358	
Maximum G.O. Bonding Capacity (in 2010 and 2025)	$1,033,351	$1,086,282	$1,105,832	$1,114,871	$1,123,338	
Capacity Remaining after Issuance of Bonds (2010 and 2025)	$1,033,351	$1,086,282	$1,105,832	$1,114,871	$1,123,338	
% of Maximum G.O. Bonding Capacity Used (2010 and 2025)	0%	0%	0%	0%	0%	
General Fund Contribution to Transit Project in 2010 and 2025						
Transit O&M subsidy	$232,016	$243,576	$255,713	$268,454	$281,833	
Plus Debt Service Payment for Debt Issued before 99	$8,304	$1,717	$1,715	$3,424	$0	
Plus Debt Service Payment for Debt Issued after 99	$28,753	$26,956	$16,623	$4,942	$0	
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	
Less Highway Fund Contribution for transit capital match	$16,218	$17,201	$18,242	$19,265	$20,293	
Less Preventive Maintenance Contribution from Sec 5307	$12,735	$15,692	$15,184	$14,559	$13,918	
Net Contribution	*$194,294*	*$195,529*	*$195,798*	*$199,171*	*$203,796*	
Average Annual Net Contribution						

TABLE E-3
BUS RAPID TRANSIT ALTERNATIVE
CASH FLOW ANALYSIS ($ YOE, 000)

BRT ALTERNATIVE WITH 50% NEW START & FHWA	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
CAPITAL COSTS								
BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$0	$0	$0
BRT Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$0	$0	$0
In-Town BRT Transit Centers/Park-n-Ride Lots - Federal/State	$0	$0	$0	$0	$0	$0	$0	$0
In-Town BRT Transit Centers/Park-n-Ride Lots - City	$0	$0	$0	$0	$0	$0	$0	$0
Bus Acquisitions	$22,391	$22,950	$23,524	$24,112	$24,715	$25,333	$25,966	$26,615
Handi-Van Vehicle Acquisitions	$2,028	$2,182	$2,130	$2,184	$2,238	$2,409	$2,351	$2,410
Bus Maintenance Facility	$0	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - Federal/State	$0	$0	$0	$0	$0	$0	$0	$0
Bus Priority Treatment - City	$0	$0	$0	$0	$0	$0	$0	$0
Zipper Lane	$0	$0	$0	$0	$0	$0	$0	$0
Direct Access Ramps	$0	$0	$0	$0	$0	$0	$0	$0
In-Town BRT	$0	$0	$0	$0	$0	$0	$0	$95,289
Total Capital Costs	**$24,418**	**$25,133**	**$25,654**	**$26,296**	**$26,953**	**$27,742**	**$28,318**	**$124,315**
OPERATING COSTS								
Bus O&M	$176,650	$185,493	$194,779	$204,527	$214,761	$225,503	$236,781	$248,619
Handivan O&M	$16,831	$17,375	$17,935	$18,515	$19,112	$19,729	$20,365	$21,022
In-Town BRT O&M	$15,430	$16,009	$16,608	$17,230	$17,875	$18,544	$19,240	$19,960
Debt Service Payment								
Transportation System Revenue Bond	$0	$0	$0	$0	$0	$0	$0	$0
Total O&M Costs	**$208,911**	**$218,877**	**$229,323**	**$240,272**	**$251,747**	**$263,776**	**$276,385**	**$289,601**
Total Capital and Operating Costs	**$233,330**	**$244,010**	**$254,978**	**$266,568**	**$278,701**	**$291,518**	**$304,703**	**$413,916**
CAPITAL REVENUES								
Federal Transportation Administration								
5307 Formula Grant	$32,261	$32,261	$32,261	$35,487	$35,487	$35,487	$35,487	$35,487
5309 Fixed Guideway Modernization	$954	$954	$954	$1,049	$1,049	$1,049	$1,049	$1,049
5309 New Start	$0	$0	$0	$0	$0	$0	$0	$0
FHWA/Other Federal & State Highway Revenue	$0	$0	$0	$0	$0	$0	$0	$0
Local Bond Revenues								
G.O. Bonds								
Transportation Revenue Bonds								
Local Cash Revenues								
City Highway Fund	$13,273	$14,350	$15,437	$16,533	$17,640	$18,757	$19,884	$21,021
Total Capital Revenue	**$46,487**	**$47,564**	**$48,651**	**$53,069**	**$54,176**	**$55,293**	**$56,420**	**$57,557**
OPERATING REVENUES								
Passenger Fares (Bus)	$44,637	$46,521	$48,489	$50,538	$52,674	$54,899	$57,218	$59,635
Handivan Fares	$1,463	$1,510	$1,560	$1,610	$1,661	$1,716	$1,770	$1,828
In-Town BRT Fares	$5,511	$5,718	$5,931	$6,154	$6,383	$6,623	$6,871	$7,129
Highway Fund Revenues (New Revenues)	$0	$0	$0	$0	$0	$0	$0	$0
5307 Formula Preventive Maintenance								
General Fund Revenues (Transit Operating Support)	$157,301	$165,127	$173,343	$181,970	$191,029	$200,539	$210,526	$221,008
Total O&M Revenues	**$208,911**	**$218,877**	**$229,323**	**$240,272**	**$251,747**	**$263,776**	**$276,385**	**$289,601**
Total Capital and Operating Revenues	**$255,398**	**$266,441**	**$277,974**	**$293,341**	**$305,924**	**$319,069**	**$332,805**	**$347,158**
Additions to Cash (in 2010 and 2025)	$22,069	$22,432	$22,997	$26,774	$27,223	$27,551	$28,102	-$66,758
Less General Fund Adjustment (in 2010 and 2025)	$22,069	$22,432	$22,997	$26,774	$27,223	$27,551	$28,102	$0
BEGINNING CASH BALANCE (in 2010 and 2025)	$81,116	$81,116	$81,116	$81,116	$81,116	$81,116	$81,116	$81,116
ADDITIONS TO CASH (in 2010 and 2025)	$22,069	$22,432	$22,997	$26,774	$27,223	$27,551	$28,102	-$66,758
ENDING CASH BALANCE (in 2010 and 2025)	$81,116	$81,116	$81,116	$81,116	$81,116	$81,116	$81,116	$14,358
Maximum G.O. Bonding Capacity (in 2010 and 2025)	**$930,767**	**$1,027,301**	**$747,303**	**$789,671**	**$836,005**	**$883,032**	**$932,588**	**$982,226**
Capacity Remaining after Issuance of Bonds (2010 and 2025)	**$930,767**	**$1,027,301**	**$747,303**	**$789,671**	**$836,005**	**$883,032**	**$932,588**	**$982,226**
% of Maximum G.O. Bonding Capacity Used (2010 and 2025)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
General Fund Contribution to Transit Project in 2010 and 2025								
Transit O&M subsidy	$157,301	$165,127	$173,343	$181,970	$191,029	$200,539	$210,526	$221,008
Plus Debt Service Payment for Debt Issued before 99	$13,506	$10,554	$7,233	$8,189	$7,105	$7,066	$6,307	$6,306
Plus Debt Service Payment for Debt Issued after 99	$28,753	$28,753	$28,753	$28,753	$28,753	$28,753	$28,753	$28,753
Less Highway Fund Contribution for Debt Service	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400	$18,400
Less Highway Fund Contribution for Transit O&M	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426	$25,426
Less Highway Fund Contribution for transit capital match	$8,389	$9,323	$10,306	$11,274	$12,249	$13,208	$14,220	$0
Less Preventive Maintenance Contribution from Sec 5307	$13,680	$13,109	$12,691	$15,500	$14,974	$14,343	$13,882	$0
Net Contribution	***$133,665***	***$138,176***	***$142,506***	***$148,312***	***$155,838***	***$164,980***	***$173,657***	***$212,241***
Average Annual Net Contribution								

Glossary
Acronyms
Bibliography
List of Preparers
List of Recipients

Glossary

GLOSSARY

ARTERIAL ROADWAY

A roadway with partial control of access, with some intersections at-grade and intended to move high volumes of traffic over long distances at high speed.

ARTICULATED VEHICLE

A vehicle which is jointed in a fashion which allows passenger access through the joint. Allows longer vehicles to turn at a shorter radius.

AT-GRADE

On the ground surface or that surface at which highest pedestrian and vehicular traffic occurs.

BELOW-GRADE

Placed below the ground surface as with a subway.

BUS LANE

A lane of a road or street specifically designated for buses (may or may not be exclusive).

BUS RAPID TRANSIT (BRT)

BRT involves major investments in infrastructure, equipment, operational improvements, and technology that substantially upgrade bus system performance by providing faster operating speeds, greater reliability of service, and increased convenience and passenger amenities.

CAPITAL COSTS

Nonrecurring costs required to construct transit systems, including costs of right-of-way, facilities, rolling stock, power distribution, and the associated administrative and design costs, and financing charges during construction.

CARPOOL

A group of passengers and drivers organized to utilize one automobile on a regular basis, riding together, for the same trip purpose (generally the work trip).

CENTRAL BUSINESS DISTRICT

The single business and commercial region which dominates the financial life of an urban region and may also contain a very substantial portion of the specialty commercial activity.

CENTRAL OAHU

The DPA which contains the wide plateau between the Waianae and Koolau Mountain ranges. It includes the more recently developed Mililani, Waipio, Waikele and Kunia. Portions within the primary transportation corridor include Waipahu, Kunia, Waikele and Waipahu.

CIRCULATOR

Circulator routes provide service within a neighborhood or activity center. These routes are designed to accommodate shorter passenger trips that either could not be served by line haul transit or would cause localized overcrowding on line haul routes. These routes typically connect to line haul routes at a commercial or activity center, and route alignment may be circuitous in order to provide more convenient passenger access and neighborhood coverage.

COLLECTOR

Collector routes provide service between residential areas and line haul routes. Some routes also operate through downtown Honolulu. Collector service often may be coordinated with a line haul route to reduce transfer wait time.

CONSIST

A make up of transit vehicles forming a train (e.g. 2, 4, 6, etc.)

CURB LANE

A road or street lane adjacent to the curb at its side.

DBA

Abbreviation for decibels of sound pressure as read on the "A" scale.

DEVELOPMENT PLAN AREA (DPA)

The City and County of Honolulu prepares a Development Plan (DP) for each of the eight DPAs on the island of Oahu, as defined by the General Plan. Each DPA has its own detailed land use and public facilities maps, as well as policies and conceptual schemes in line with the development objectives and policies in the General Plan.

DISTRIBUTION

The process of letting passengers off at a number of different locations.

ELEVATED GUIDEWAY

A guideway which is positioned above the normal activity level (e.g. elevated over a street).

EMISSIONS

Particulate, gaseous, noise or electro-magnetic by-products of the transit system or vehicle.

ENVELOPE

Definition of the vertical and horizontal space required for both the transit vehicle and/or the guideway.

EWA

The DPA containing the second city of Kapolei, Barbers Point Naval Air Station, Campbell Industrial Park, and the Ewa villages. It is also used to indicate direction.

EXPRESS SERVICE

Transit service where a very limited number of stops are made en route.

GENERAL PLAN

The General Plan (revised 1992) of the City and County of Honolulu includes broad statements on the objectives and policies of the City and County with regard to overall physical and economic development of the island, as well as the health and safety of the island's residents.

GRADE-SEPARATED

Crossing lines of traffic vertically separated from each other and do not share a common intersection.

HEADWAY

The time interval between identical points on successive vehicles passing the same point along the way.

HEAVY RAIL TRANSIT

Rail transit mode characterized by exclusive grade-separated operation (aerial or subway in many cases) and higher average operating speeds and passenger capacities. Usually heavy rail involves a higher degree of automation and central control than does light rail.

HIGH-OCCUPANCY VEHICLE (HOV)

Typically includes carpools with two or more people, vanpools, and buses.

HUB-AND-SPOKE NETWORK

A transit structure, which is characterized by primary, or trunk, routes and collector routes that converge at transit centers throughout a service area. Collector, or feeder, routes serve residential areas or special generators and connect to trunk routes at transit centers. Hub-and-spoke represents an effective system design to minimize duplicative line haul service or connect relatively independent communities within a single metropolitan area.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

ITS are technologies that provide incident management, transit priority, and traveler information along major streets and highways.

INTERCHANGE

The system of interconnecting ramps between two or more intersecting roadways or guideways which are grade-separated.

KOKO HEAD

Geographical area in the southeast corner of Oahu. Used to indicate direction pointing to this area.

LEVEL-OF-SERVICE (LOS)

The LOS is an industry-accepted standard for measuring the efficiency of traffic conditions, with a LOS of A indicating the best traffic conditions and F indicating the worst.

LIGHT RAIL TRANSIT (LRT)

Transit mode characterized by its ability to operate in both at-grade and/or grade-separated environment, and usually operating in smaller trains consisting of 2, 4, or 6 vehicles.

LINE HAUL

A transit system which offers service along a line or corridor.

LINK

A representative portion of a transportation network which joins two modes.

LINKED TRIP

Total passenger (fare-paying) trips. Linked trips exclude transfers; consequently, the number of linked trips must always be less than (or equal to) the number of unlinked (boarding) trips.

LOCAL SERVICE

A type of operation involving frequent stops and consequent low speeds, the purpose of which is to deliver and pick up transit passengers as close to their destinations or origins as possible.

MAKAI

Hawaiian terminology meaning direction pointing to the ocean.

MAUKA

Hawaiian terminology meaning direction pointing to the mountains.

MODE

A particular form or method of travel.

MONORAIL

A guideway where vertical vehicle support and lateral guidance is provided by a single track or rail.

NETWORK

A system of real or hypothetical interconnecting links that form the configuration of transit routes and stops which constitute the total system.

NO-BUILD CONDITION (NO-BUILD)

A project alternative which includes the existing transportation system and committed transportation projects within the 2025 planning horizon, minor transit service expansions and adjustments. All elements of the No-Build Alternative also are part of each of the other alternatives. The No-Build Alternative also serves as the baseline for establishing environmental impacts of the other alternatives.

OFF-PEAK

Those periods of the day where demand for transit service is not at a maximum.

ON-DEMAND

Transit service rendered upon the specific demand of a passenger

OPERATING COSTS

Recurring costs incurred in operating transit systems, including wages and salaries, maintenance of facilities and equipment, fuel, supplies, employee benefits, insurance, taxes, and other administrative costs. Amortization of facilities and equipment is not included.

PARK-AND-RIDE FACILITY

The transfer point of an intermodal trip where the driver of an automobile parks her or his automobile and changes to the transit mode.

PATRONAGE

The number of person-trips carried by a transit system over a specified time period.

PEAK HOUR

The hour of the day in which the maximum demand for service is experienced.

PEAK PERIOD

A specified time period for which the volume of traffic is greater than that during other similar periods (i.e., peak hour, peak 5 minutes, etc.).

PERSON-TRIP

A trip made by a person by any travel mode.

PRIMARY TRANSPORTATION CORRIDOR

The corridor connecting Kapolei and Kahala, the two areas on Oahu that are projected to assume the largest increases in population, employment, and residential growth over the next twenty years.

PRIMARY URBAN CENTER (PUC)

The DPA which extends from Waialae-Kahala to Pearl City, and is bounded on the north (mauka) by the Koolau mountain range and on the south (makai) by the coastline. The PUC consists of 3 sub-regions: the Heart of Honolulu, the Salt Lake/Airport area, and the Heart of Pearl Harbor.

QUEUE JUMP LANE

A queue jump lane is a short exclusive lane that allows buses to move to the head of a line of traffic.

REVENUE SERVICE

The time during which a transit vehicle is in service and available to passengers for transportation. This term also applies to revenue car-miles and to revenue car-hours. The time during which a vehicle is not available is deadheading time.

RIGHT-OF-WAY (ROW)

The corridor (horizontal and vertical space) occupied by the transportation way.

ROUTE

The course followed by a transit vehicle as a part of the transit system.

SCREENLINES

Screenlines are imaginary lines or a distinct geographic features, such as a river, which cross transportation facilities being analyzed.

SECTION 4(F)

Section 4(f) is from the U.S. Department of Transportation Act. It permits the use of land for a transportation project from a significant publicly-owned public park, recreation area, wildlife and waterfowl refuge, or a historic site, only when it has been determined that there is no feasible and prudent alternative to such use and the project includes all possible planning to minimize harm to the property resulting from such use.

TRANSFER

The portion of a trip between two connecting transit routes, both of which are used for completion of the trip.

TRANSIT

A transportation system principally for moving people in an urban area and made available to the public usually through paying a fare.

TRANSITWAY

Specifically designed way traversed by transit vehicles constrained to the way.

TRANSIT CENTER

Transit centers are transportation facilities also referred to as intermodal transfer facilities, transportation centers, stations, and terminals. They provide passengers access to the transportation system and are points of transfer between routes and/or modal interchange.

TRANSIT STOP

The optional stop for a particular trip to leave the transit system.

TRANSPORTATION DEMAND MEASURES (TDM)

TDM elements include a variety of measures to reduce vehicle demands, including an integrated high-occupancy vehicle (HOV) lane system, park-and-ride lots, bicycle facilities, Transportation Management Associations (TMAs), and measures to encourage reductions in work trips.

TRANSPORTATION SYSTEM MANAGEMENT (TSM)

TSM consists of transportation improvements designed to improve public transit service without major capital investments. TSM techniques include re-structuring of the bus route system, creation of transit centers and park-and-ride facilities, priority treatment for transit vehicles by signal control measures, and added service and/or frequency to major activity centers.

TRAVEL TIME

The time required to travel between two points, not including terminal or waiting time.

TRIP

The one-way movement of one person between origin and destination, including the walk to and from the means of transportation.

TRIPS, HOME-BASED

Trips having either origin or destination at the home.

TRIPS, NON-HOME BASED

Trips having neither origin or destination at the home.

URBAN CORE

The portion of the primary transportation corridor between Middle Street on the west and Waikiki/U.H. Manoa on the east.

ZIPPER LANE

The zipper lane is a peak-period contraflow lane created by a movable barrier adjacent to the highway median. There is currently a zipper lane on a portion of H-1 to serve the Koko Head-bound peak morning traffic. Access is restricted to high-occupancy vehicles with three or more occupants and motorcycles.

Acronyms

ACRONYMS

ACHP	-	Advisory Council on Historic Preservation
ACOE	-	Army Corps of Engineers
ADA	-	Americans with Disabilities Act
AGT	-	Automated Guideway Transit
AMR	-	Aliamanu Military Reservation
APE	-	area of potential effect
ATDC	-	Aloha Tower Development Corporation
BMP	-	Best Management Practice
BRT	-	Bus Rapid Transit
Btu	-	British Thermal Units
CE	-	considered eligible
CERCLA	-	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	-	Comprehensive Environmental Response, Compensation, and Liability Information Systems
CIP	-	Capital Improvement Program
CFR	-	Code of Federal Regulations
CMP	-	Containment Management Plan
CO	-	carbon monoxide
CORRACTS	-	Corrective Action Reports
CZM	-	Coastal Zone Management
dB	-	decibels
dBA	-	decibels on A-weighted scale
DBEDT	-	State Department of Business, Economic Development, and Tourism
DE	-	determined eligible
DEIS	-	Draft Environmental Impact Statement
DHHL	-	Department of Hawaiian Homelands
DLNR	-	Department of Land and Natural Resources
DOT	-	Department of Transportation
DP	-	Development Plan
DPA	-	Development Plan Area
DPP	-	Department of Planning and Permitting
DTS	-	Department of Transportation Services
EIS	-	Environmental Impact Statement
EJC	-	Estate of James Campbell
EPA	-	Environmental Protection Agency
ERNS	-	Emergency Response Notification System
FEIS	-	Final Environmental Impact Statement
FEMA	-	Federal Emergency Management Agency
FHWA	-	Federal Highway Administration
FINDS	-	Facility Index System
FIRM	-	Flood Insurance Rate Maps
FPPA	-	Federal Farmland Protection Act
FTA	-	Federal Transit Administration
FWS	-	U.S. Fish & Wildlife Service
FY	-	Fiscal Year
HAR	-	Hawaii Administrative Rules
HCC	-	Honolulu Community College
HCDA	-	Hawaii Community Development Authority
HCDCH	-	Housing and Community Development Corporation of Hawaii
HCHD	-	Hawaii Capitol Historic District

HDOH	-	Hawaii Department of Health
HDOT	-	Hawaii Department of Transportation
HECO	-	Hawaiian Electric Company
HOV	-	High Occupancy Vehicle
HR	-	Hawaii Register
HRS	-	Hawaii Revised Statutes
HMIRS	-	Hazardous Materials Incident Report System
HT	-	Heavy Trucks
HWMP	-	Honolulu Waterfront Master Plan
ITS	-	Intelligent Transportation Systems
KSBE	-	Kamehameha Schools / Bernice Pauahi Bishop Estate
Ldn	-	Day-Night equivalent sound level measured in dBA
LDV	-	Light-duty Vehicles
Leq	-	equivalent sound level measured in dBA
Lmax	-	maximum noise level measured in dBA
LOS	-	Level-of-Service
LOTMA	-	Leeward Oahu Transportation Management Association
LPA	-	Locally Preferred Alternative
LQG	-	large quantity generators
LRT	-	Light Rail Transit
LU	-	Landscape Units
LUO	-	Land Use Ordinance
LUST	-	Leaking Underground Storage Tank
MAGLEV	-	Magnetically Levitated Vehicles
MIS	-	Major Investment Study
MLTS	-	Material Licensing Tracking System
MOA	-	Memorandum of Agreement
MOU	-	Memorandum of Understanding
MT	-	Medium Trucks
NAAQS	-	National Ambient Air Quality Standards
NAC	-	Noise Abatement Criteria
NASBP	-	Naval Air Station Barbers Point
NAS	-	Naval Air Station
NBC	-	Neil Blaisdell Center
NCP	-	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	-	National Environmental Policy Act
NFRAP	-	no further remedial action planned
NHL	-	National Historic Landmark
NMFS	-	National Marine Fisheries Service
NOA	-	Notice of Availability
NOI	-	Notice of Intent
NPL	-	National Priority List
NRCS	-	Natural Resources Conservation Service
NRHP	-	National Register of Historic Places
OCHMP	-	Oahu Commercial Harbors Master Plan
OHA	-	Office of Hawaiian Affairs
OMPO	-	Oahu Metropolitan Planning Organization
OR&L	-	Oahu Railway and Land Co.
ORTP	-	Oahu Regional Transportation Plan
OP	-	Office of Planning (formerly Office of State Planning)
PADS	-	PCB Activity Database System
PCB	-	polychlorinated biphenyls
PCTP	-	Primary Corridor Transportation Project
PPE	-	Personal Protective Equipment

PUC	-	Primary Urban Center
RAATS	-	RCRA Administration Action Tracking System
RCRA	-	Resource Conservation and Recovery Act
RCRIS	-	Resource Conservation and Recovery Information Systems
ROD	-	Record of Decision
RORO	-	roll-on, roll-off
ROW	-	right-of-way
SCE	-	Southern California Edison
SCORP	-	State Comprehensive Outdoor Recreation Plan
SDG&E	-	San Diego Gas and Electric
SDOT	-	State Department of Transportation
SHPD	-	State Historic Preservation Division
SHPO	-	State Historic Preservation Officer
SIAR	-	Sand Island Access Road
SIP	-	Statewide Implementation Plan
SLUC	-	State Land Use Commission
SMA	-	Special Management Area
SMF	-	Soil Management Facility
SOBA	-	Southern Oahu Basal Aquifer
SOODS	-	Southern Oahu Ocean Disposal Site
STIP	-	Statewide Transportation Improvement Plan
TAMC	-	Tripler Army Medical Center
TAZ	-	Transportation Analysis Zone
TBD	-	to be determined at a later date
TCP	-	traditional cultural properties
TDM	-	Transportation Demand Management
TIP	-	Transportation Improvement Program
TMA	-	Transportation Management Association
TMK	-	tax map key
TOD	-	transit oriented development
TRI	-	Travel Rate Index
TRIS	-	Toxic Release Inventory System
TSCA	-	Toxic substances Control Act
TSD	-	transport, store, dispose
TSM	-	Transportation System Management
UC	-	under construction
UH	-	University of Hawaii
UHHD	-	University of Hawaii Historic District
UST	-	underground storage tank
VHD	-	vehicle hours delay
VHT	-	vehicle hours traveled
VMT	-	vehicle miles traveled
VPH	-	vehicles per hour

Bibliography

BIBLIOGRAPHY

Advisory Council on Historic Preservation. "36 CFR 800 – Protection of Historic Properties", Federal Register. wais.access.gpo.gov. Vol. 64, Number 95. May 1999.

American Business Directories. 1999 Hawaii Business Directory: The Ultimate Sales and Credit Tool. 1998.

American Business Directories, A Division of American Business Information Services, Inc. 1998 Hawaii Business Directory. 1998.

Bernick, Michael and Cervero, Robert. Transit Villages in the 21st Century. 1997.

Bruner, Phil. Impact Analysis on Native Waterbirds and Migratory Shorebirds for the Proposed Nimitz Highway Improvement Project, Oahu Hawaii. February 1995.

Bruner, Phil. Report on the Findings of a White Tern (*Gygis alba*) Survey Along Portion of the Proposed Route for Honolulu Rapid Transit. May 1992.

California State Department of Transportation. Energy and Transportation Systems. July 1983.

Char and Associates. Botanical Resources Study: Sand Island Scenic Parkway/Marina Road. 1999.

CD Systems Corp. 1997 Hawaii Business Directory. 1997.

City and County of Honolulu. Central Oahu Development Plan. 1983.

City and County of Honolulu. Ewa Development Plan. 1997.

City and County of Honolulu. Fiscal Year 1998 Development Plan Annual Review. September 1, 1998.

City and County of Honolulu. General Plan. 1992.

City and County of Honolulu. Honolulu Bicycle Master Plan. April 1999.

City and County of Honolulu. Primary Urban Center (PUC) Development Plan. Revised Ordinances of Honolulu, Chapter 24, Article 2. 1990.

City and County of Honolulu. Proposed Central Oahu Development Plan (Administrative Review Draft). 1999.

City and County of Honolulu. Proposed Primary Urban Center Development Plan (Administrative Review Draft). 1999.

City and County of Honolulu. Revised Charter of the City and County of Honolulu. 1992.

City and County of Honolulu Department of Parks and Recreation. Index of Oahu Parks and Facilities. April 1997.

City and County of Honolulu Department of Transportation Services. Primary Corridor Transportation Project Draft Conceptual Design Drawings. May and November 1999.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan, Fiscal Year 1988, Technical Report. February 1988.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan Update, Technical Report. December 1985.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan Update, Fiscal Year 1987, Technical Report. December 1986.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan Update, Fiscal Year 1990, Technical Report. March 1989.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan Update, Fiscal Year 1992, Technical Report. May 1991.

City and County of Honolulu Department of Transportation Services. Short Range Transit Plan Update, Fiscal Year 1993, Technical Report. April 1992.

City and County of Honolulu Department of Transportation Services, Parsons Brinckerhoff Quade & Douglas, Inc. Environmental Assessment (Environmental Impact Statement Preparation Notice) for the Primary Corridor Transportation Project. April 1999.

Deleuw, Cather and Company. Indirect Energy Consumption for Transportation Projects. Prepared for Caltrans. October 1976.

Energy and Environmental Analysis, Inc. Fourteenth Periodical Report. December 12, 1988.

Federal Highway Administration. FHWA Publication No. FHWA-PD-94-023. The National Bicycling and Walking Study: Transportation Choices for a Changing America. Washington, D.C.: U.S. Department of Transportation. 1994.

Federal Transit Administration. 1997 National Transit Database.

Federal Transit Administration, Office of Planning. Technical Guidance on Section 5309 New Starts Criteria. July 1999.

Foster Botanical Gardens, Exceptional Trees. April 1999.

Hawaii Coastal Zone Management Program, Office of State Planning. Hawaii's Coastal Nonpoint Pollution Control Program Management Plan. June 1996.

Hawaii Community Development Authority. Kakaako Community Development District Makai Area Plan. August 1998.

Hawaii Community Development Authority. Kakaako Community Development District Plan. 1982.

Hawaii Community Development Authority. Makai Area Plan. adopted 1983, revised August 1998.

Hawaii Community Development Authority. Mauka Area Plan. 1997.

Hawaii Department of Health. 1996-1998 Waterbody Assessment Report. March 1998.

Kober/Hansen/ Mitchell Architects, Inc. Conceptual Design Study for the Iwilei Project. Prepared for Department of Business, Economic Development and Tourism, Housing Development Corporation of Hawaii. July 1998.

Mason Architects. Primary Corridor Transportation Project. Product 7-12: Historical/Cultural Resources Impacts Technical Report. May 1999.

Mink, John F. and Stephen Lau. Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii, Water Resources Research Center Technical Report No. 179. February 1990.

Oahu Metropolitan Planning Organization. Oahu Regional Transportation Plan. November 1995.

Oak Ridge National Laboratory for U.S. Department of Energy. Transportation Energy Data Book: Edition 16. 1996.

Parsons Brinckerhoff/Carter Burgess Team. Islandwide Mobility Concept Plan. Primary Corridor Transportation Project. March 1999.

Parsons Brinckerhoff Quade & Douglas, Inc. Honolulu Rapid Transit Program Final Environmental Impact Statement. July 1992.

Parsons Brinckerhoff Quade & Douglas, Inc. Primary Corridor Transportation Project Environmental Baseline Report. April 1999.

Parsons Brinckerhoff Quade & Douglas. Primary Transportation Corridor Project: Land Use Impacts of Transit Systems. April 20, 1999.

Parsons Brinckerhoff Quade & Douglas. Primary Corridor Transportation Project Transit Report. August 1999.

Parsons Brinckerhoff Quade & Douglas. Primary Corridor Transportation Project Transit Alternatives Analysis. November 10, 1999.

Parsons Brinckerhoff Quade & Douglas. Primary Corridor Transportation Project Detailed Progress Report to the City Council. November 1999.

Parsons Brinckerhoff Quade & Douglas, Inc. Technical Paper on Current Transit Quality of Service in the Primary Corridor. March 1999.

Parsons Brinckerhoff Quade & Douglas, Inc. Vehicle Miles Traveled. January 6, 1999.

R.M. Towill Corp. Draft Environmental Assessment. Interstate Route H-1 Widening Westbound Direction Kaonohi Street to Waiau Interchange. Prepared for the State of Hawaii, Department of Transportation, Highways Division. June 1999.

RS Means. Heavy Construction Costs Data, 12th annual edition, 1998.

Spencer Mason Architects. Historic Site Inventory Report for the Honolulu Rapid Transit Development Project. August 19, 1989.

State of Hawaii, Hawaii Administrative Rules, Chapter 11-60, Air Pollution Control.

State of Hawaii, Hawaii Revised Statutes, as amended.

State of Hawaii, Department of Business, Economic Development and Tourism. The Hawaii State Plan. June 1991.

State of Hawaii, Department of Business, Economic Development and Tourism. The State of Hawaii Data Book: A Statistical Abstract. 1997.

State of Hawaii, Department of Business, Economic Development and Tourism, Office of State Planning. Honolulu Waterfront Master Plan - Final Report, Executive Summary. October 1989.

State of Hawaii, Department of Business, Economic Development and Tourism, Research and Economic Analysis Division. Population and Economic Projections for the State of Hawaii to 2025. January 2000 (draft) and February 2000 (final).

State of Hawaii, Department of Land and Natural Resources. State Historic Preservation Division files. 1999.

State of Hawaii, Department of Land and Natural Resources, Division of State Parks, Existing State Parks and Other Areas, Fiscal Year 1997-98.

State of Hawaii, Department of Transportation. Bike Plan Hawaii. April 1994.

State of Hawaii, Department of Transportation, Harbors Division. Oahu Commercial Harbors 2020 Master Plan. May 1997.

U.S. Department of Energy, Office of Transportation Technologies, Transportation Energy Data Book: Edition 16 – 1996.

U.S. Department of the Air Force. Comprehensive Plan – Future Land Use Plan, Hickam Air Force Base, Oahu, Hawaii. October 1998.

U.S. Department of the Interior, National Park Service, Interagency Resources Division. National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties. 1994.

U.S. Department of the Army, Fort Shafter Army Base, Oahu, Hawaii. Fort Shafter Installation Master Plan. 1985.

U.S. Department of the Navy. Ford Island Concept Plan. 1998.

U.S. Department of the Navy. Pearl Harbor Naval Complex Master Plan. October 1991.

U.S. Department of Transportation, Federal Highway Administration, Office of Environmental Policy. Visual Impact Assessment for Highway Projects. FHWA-HI-88-054, 1988.

U.S. Department of Transportation, Federal Highway Administration. Florida Department of Transportation. East-West Multimodal Corridor Study: Draft Environmental Impact Statement Major Investment Study. October 1995.

U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Mobile Sources, Emission Control Technology Division, Test and Evaluation Branch. MOBILE5A User's Guide (Mobile Source Emission Factor Model), Ann Arbor, Michigan. May 1994.

U.S. Fish and Wildlife Service. National Wetland Inventory Maps. Circa 1977.

Wentworth, Chester K. Geology and Ground-water Resources of the Honolulu-Pearl Harbor Area Oahu, Hawaii, Board of Water Supply. 1951.

List of Preparers

LIST OF PREPARERS

PUBLIC AGENCIES

<u>**Federal Transit Authority (U.S. Department of Transportation)**</u>. Federal agency responsible for MIS/DEIS. Key personnel include:

<u>Washington, D.C</u>

Carol Braegelmann, Realty Specialist
- -M.P., Planning, University of Virginia
- -B.C.P., City Planning, University of Virginia
- -American Institute of Certified Planners

<u>San Francisco</u>

Donna Turchie, Senior Transportation Representative, Region IX
- -B.A., Anthropology, University of California, Berkeley
- -California State Teaching Credential, California State University, Hayward

<u>**City and County of Honolulu**</u> Honolulu, Hawaii. Local agency proposing project. Key personnel include:

<u>Department of Transportation Services</u>

Cheryl D. Soon, AICP, Director, Department of Transportation Services
- -Masters in City Planning, Harvard University
- -B.A., Colby College
- -American Institute of Certified Planners

Joseph M. Magaldi, Jr., Deputy Director, Department of Transportation Services
- M.B.A., Pepperdine University
- B.A., University of Hawaii

Kenneth Hamayasu, Chief, Transportation Planning Division (TPD), Department of Transportation Services
- B.S.C.E., University of Hawaii
- Professional Engineer in Hawaii

Kenneth Banao, Planner, TPD, Department of Transportation Services
- B.B.A., University of Hawaii

Tanya Dote, Planner, TPD, Department of Transportation Services
- B.B.A., University of Hawaii

Phyllis Kurio, Transportation Planner, TPD, Department of Transportation Services
- B.A., University of Hawaii

Faith Miyamoto, Environmental Planner, TPD, Department of Transportation Services
- M.S., University of Hawaii
- B.A., University of California, Berkeley

Bruce Nagao, Environmental Planner, TPD, Department of Transportation Services
- B.F.A., University of Hawaii

Isidro M. Baquilar, Chief Project Engineer, Department of Transportation Services
- B.S.C.E., Mapua Institute of Technology, Manila
- M.E., Mapua Institute of Technology, Manila
- Professional Engineer in Hawaii

Paul Steffens, Chief, Public Transit Division
- B.S.B.A., University of Nevada
- M.A., Naval War College, Newport, Rhode Island

PRIME CONSULTANT

Parsons Brinckerhoff Quade & Douglas, Inc. General engineering, planning and environmental consultant. Key personnel include:

Robert Bramen, Senior Vice President, Certified Senior Project Manager/Senior Professional Associate
- Project Manager
- Education
  - M. Architecture, University of Pennsylvania
  - M. City Planning, University of Pennsylvania
  - B. Architecture, University of California, Berkeley
- Registered Architect in California and Massachusetts
- Certified Planner

Susan Killen, Supervising Environmental Planner, Senior Professional Associate
- Planning
- Education
  - Graduate Studies, Urban Planning, Antioch University
  - M.Ed., Education, Central Washington State University
  - B.A., Art/Education, Seattle University
- Certified Planner

David Atkin, Senior Supervising Environmental Planner, Certified Senior Project Manager, Senior Professional Associate
- Planning
- Education
  - Ph.D., Biology (Ecology), Princeton University
  - B.S., Biology (Marine), Stanford University

Mark Scheibe, Assistant Vice President, Professional Associate
- Planning and Engineering
- Education
  - M.S., Transportation Engineering, Northwestern University
  - B.S., Civil Engineering, University of Santa Clara
- Professional Engineer in Oklahoma, California, Washington, New Mexico, Arizona, Alaska, Oregon and Texas

Dexter Eji, Supervising Engineer
- Civil
- Education
  - B.S., Civil Engineering, Walla Walla College
  - Post graduate work in Structural Engineering at University of Hawaii
- Professional Engineer in Hawaii

Clyde Shimizu, Senior Supervising Civil Engineer
- Civil
- Education
  - B.S., Civil Engineering, University of Hawaii
- Professional Engineer in Hawaii, California

Robert Ball, Engineering Manager
- Civil
- Education
  - M.B.A., Civil Engineering, City University
  - B.S., Civil Engineering, Lakehead University
- Professional Engineer in California and Nevada

Bryan Porter, Project Manager, Senior Supervising Planner
- Employment Analyst
- Education
  - M.A., Public Administration, California State University
  - B.A., Political Science, University of California at Berkeley

Jim Ryan, Senior Planning Manager
- Transportation Planning
- Education
  - M.S.C.E., Transportation Planning, Cornell University
  - B.S., Civil Engineering, University of Delaware

Brian Pearson, Senior Engineering Manager
- Civil
- Education
  - M.S., Civil Engineering, California State University, Los Angeles
  - B.S., Civil Engineering, San Jose State University
  - Additional Studies: Professional Program in Urban Transportation, Carnegie-Mellon University
  - Certificate Program in Public Works Management, University of California at Los Angeles
  - Executive Program, Graduate School of Management, University of California at Irvine
- Professional Engineer in California

Wayne Yoshioka, Senior Supervising Transportation Engineer
- Transportation
- Education
  - B.S., Civil Engineering, University of Hawaii
  - Graduate Courses, University of Hawaii
  - Graduate Courses, University of Colorado, Denver
- Professional Engineer in Colorado

Colette Sakoda, Supervising Environmental Planner
- Planning
- Education
  - M.C.P. City & Regional Planning, University of California, Berkeley
  - M.P.A, Public Administration, California State University at Fullerton
  - B.A., Journalism & American Studies, University of Hawaii

Chris Forinash, Travel Demand Modeler/Transportation Planner
- Planning
- Education
  - M.S., Civil Engineering, Northwestern University
  - B.S., Engineering, Duke University

Dawn McKinstry, Senior Project Manager/Professional Associate, Supervising Transportation Planner
- Planning
- Education
  - B.S., Urban Planning, University of Utah
  - Additional Studies: University of Louisville, Traffic Noise Analysis State-of-the-Art Workshop

David Freytag, Project Manager, Lead Environmental Planner/GIS Coordinator
- Energy Analyst
- Education
  - M.U.P., Urban and Regional Planning, College of Architecture, Texas A&M University
  - B.S., Environmental Design, College of Architecture, Texas A&M University

Steven Wolf, Senior Project Manager/Senior Professional Associate, Lead Noise and Vibration Specialist
- Noise Analyst
- Education
  - B.S. Mathematics, Long Island University
  - Graduate Studies, Applied Mechanics, Polytechnic Institute of Brooklyn

Kevin Keller, GIS Technician/CADD Operator
- Noise Analyst
- Education
  - B.A., Geography, California State University Fullerton

Jan Reichelderfer, Geologist/Environmental Planner
- Planning
- Education
  - Professional Certificate, Environmental Planning, University of Hawaii
  - M.S., Geology, University of Illinois, Urbana, Illinois
  - B.S., Geology, University of Delaware, Newark, Delaware
- Certified Professional Geologist

Jason Yazawa, Planner II
- Planning
- Education
  - M.U.R.P., Urban and Regional Planning, University of Hawaii
  - B.A., Economics, University of Hawaii
- Certified Planner

Kathryn Ortega, Assistant Planner
- Planning
- Education
    - M.U.R.P., Urban and Regional Planning, University of Hawaii
    - B.A., Biology and Geography, Mary Washington College, Fredericksburg, VA

Cheryl Yoshida, Transportation Engineer
- Transportation
- Education
    - B.S., Civil Engineering, University of Washington
- Professional Engineer in Washington

Nami Ohtomo, Planner I
- Planning
- Education
    - M.P.P., Public Policy, University of Michigan
    - M.S., Natural Resources and Environment, University of Michigan
    - A.B., East Asian Languages and Civilizations, Harvard-Radcliffe Colleges

Jovalene Yoshioka, Document Production
Zam Criste, Graphics
Edie Sagarang, Graphics
Michael Cashman, Word Processing
Jodi Javonillo, Word Processing
Corinne Tam, Word Processing

SUBCONSULTANTS

Air Survey Hawaii, Aerial Photography
Jay Whiteford

B.D. Neal & Associates, Air Quality Analysis
Barry D. Neal

Carter & Burgess, Inc., Transportation Planning
Anthony J. Catalina, Project Manager, Senior Transportation Planner
Rodney L. Smith, Senior Transportation Planner
Derek Crider, Associate, Transit Planner

Citizen Planner Institute, Public Outreach
Harrison Rue

ControlPoint Surveying, Inc., Land Surveyors
Alden Kajioka

C.L. McMillan, Inc., Public Outreach
Cynthia McMillan

Geolabs-Hawaii, Geotechnical Engineering
Clayton Mimura

Helber Hastert and Fee, Land Use Planners
Mark Hastert
Tom Fee

John Hara and Associates, Architects
John Hara

Julian Ng, Inc., Traffic Engineering
Julian Ng

Kaku Associates, Inc., Traffic Engineering
Dick Kaku
Bruce Chow

Lea + Elliot, Transit Technology Consultants
Charles Elms
Steven Perliss, P.E.

Maliu Communications, LLC, Public Outreach/Media Communications
Chris Parsons

Mason Architects, Historic Architectural Consultants
Glenn Mason
Ann Yoklavich
Barbara Shideler

McNeil Wilson Communications, Inc., Media Consultants
Carolyn Tanaka
David Wilson
John Williamson
Mia Sakuma

Norma Wong, Public Policy/Financial Analysis Consultant
Norma Wong

PlanPacific, Land Planners
John Whalen
Lisa Leonillo Imata
Robin Foster

Sharon Greene and Associates, Financial Analysis Consultants
Ben Darche
Sharon Greene
Rakhi Basu

TAM PLAN, Transit Planning Consultant
Ryan Tam

Urbanworks, Architects
Lorrin Matsunaga
Kyle Hamada
Mike Toma

Kaku Associates, Inc., Traffic Engineering
Dick Kaku
Bruce Chow

Lea + Elliot, Transit Technology Consultants
Charles Elms
Steven Perliss, P.E.

Maliu Communications, LLC, Public Outreach/Media Communications
Chris Parsons

Mason Architects, Historic Architectural Consultants
Glenn Mason
Ann Yoklavich
Barbara Shideler

McNeil Wilson Communications, Inc., Media Consultants
Carolyn Tanaka
David Wilson
John Williamson
Mia Sakuma

Norma Wong, Public Policy/Financial Analysis Consultant
Norma Wong

PlanPacific, Land Planners
John Whalen
Lisa Leonillo Imata
Robin Foster

Sharon Greene and Associates, Financial Analysis Consultants
Ben Darche
Sharon Greene
Rakhi Basu

TAM PLAN, Transit Planning Consultant
Ryan Tam

Urbanworks, Architects
Lorrin Matsunaga
Kyle Hamada
Mike Toma

List of Recipients

LIST OF DEIS RECIPIENTS

Federal Agencies

Army Engineer District
Coast Guard, 14th Coast Guard District
Environmental Protection Agency, Office of Federal Activities and Pacific Islands Contact Office
Federal Aviation Administration
Federal Emergency Management Agency
Federal Highway Administration (5)
Fish and Wildlife Service, Office of Environmental Services
Geological Survey
National Marine Fisheries Service
National Park Service
National Resources Conservation Service
Naval Base, Pearl Harbor

State Agencies

Governor
Lieutenant Governor
Department of Accounting and General Services
Housing and Community Development Corporation of Hawaii
Department of Agriculture
Department of Business, Economic Development and Tourism (DBEDT)
DBEDT, Energy Resources & Technology Division
DBEDT, Office of Planning
DBEDT, Land Use Commission
Convention Center Authority
Department of Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health Attn: EPO (3)
Department of Land and Natural Resources (DLNR) (3)
DLNR, Historic Preservation Division
Department of Transportation (10)
Office of Hawaiian Affairs
University of Hawaii (UH)
UH, Environmental Center (4)
UH, Facilities Planning and Management Office
UH, Water Resources Research Center
UH, Marine Programs
Office of Environmental Quality Control (5)
Aloha Tower Development Corporation
Hawaii Community Development Authority
Aloha Stadium Authority

City Agencies

Board of Water Supply
Department of Budget and Fiscal Services

Department of Community Services
Department of Customer Services
Department of Planning and Permitting (5)
Department of Parks and Recreation
Department of Environmental Services
Department of Design and Construction
Department of Transportation Services
Department of Facility Maintenance
Fire Department
Police Department

Congressional Representatives

The Honorable Daniel K. Inouye
The Honorable Daniel K. Akaka
The Honorable Patsy T. Mink
The Honorable Neil Abercrombie

State Senators

The Honorable Whitney T. Anderson
The Honorable Jan Yagi Buen
The Honorable Robert Bunda
The Honorable Suzanne Chun Oakland
The Honorable Carol Fukunaga
The Honorable Colleen Hanabusa
The Honorable David Y. Ige
The Honorable Marshall K. Ige
The Honorable Les Ihara, Jr.
The Honorable Lorraine R. Inouye
The Honorable Brian Kanno
The Honorable Cal Kawamoto
The Honorable Matt Matsunaga
The Honorable Ron Menor
The Honorable Norman Mizuguchi
The Honorable Bob Nakata
The Honorable Norman Sakamoto
The Honorable Sam Slom
The Honorable Rod Tam
The Honorable Brian T. Taniguchi

State House of Representatives

The Honorable Felipe P. Abinsay, Jr.
The Honorable Lei Ahu Isa
The Honorable Dennis A. Arakaki
The Honorable Emily J. Auwae
The Honorable Romy M. Cachola
The Honorable Ed Case
The Honorable Iris Ikeda Catalani
The Honorable Jerry L. Chang

The Honorable Willie C. Espero
The Honorable Galen Fox
The Honorable Nestor R. Garcia
The Honorable Kenny Goodenow
The Honorable Kenneth T. Hiraki
The Honorable Ken Ito
The Honorable Michael Puamamo Kahikina
The Honorable Marilyn B. Lee
The Honorable Bertha F. K. Leong
The Honorable Sylvia J. Luke
The Honorable Barbara Marumoto
The Honorable Bob McDermott
The Honorable Charlotte Nekota
The Honorable Colleen Meyer
The Honorable Mark Moses
The Honorable Bob Nakasone
The Honorable Charlotte Nekota
The Honorable Tom Okamura
The Honorable Marcus R. Oshiro
The Honorable David A. Pendleton
The Honorable Scott K. Saiki
The Honorable Alexander C. Santiago
The Honorable Calvin K. Y. Say
The Honorable Brian Schatz
The Honorable David D. Stegmaier
The Honorable Nathan Suzuki
The Honorable Mark K. Takai
The Honorable Roy M. Takumi
The Honorable Cynthia Henry Thielen
The Honorable Brian Y. Yamane
The Honorable Nobu Yonamine
The Honorable Terry Nui Yoshinaga

City Council

The Honorable Mufi Hannemann
The Honorable John Henry Felix
The Honorable Duke Bainum
The Honorable John DeSoto
The Honorable Steve Holmes
The Honorable Donna Mercado Kim
The Honorable Rene Mansho
The Honorable Andy Mirikitani
The Honorable Jon Yoshimura

Neighborhood Boards

Hawaii Kai Neighborhood Board No. 1
Kuliouou/Kalani Iki Neighborhood Board No. 2
Waialae/Kahala Neighborhood Board No. 3
Kaimuki Neighborhood Board No. 4
Diamond Head/Kapahulu/St. Louis Heights Neighborhood Board No. 5

Palolo Neighborhood Board No. 6
Manoa Neighborhood Board No. 7
McCully/Moiliili Neighborhood Board No. 8
Waikiki Neighborhood Board No. 9
Makiki/Lower Punchbowl/Tantalus Neighborhood Board No. 10
Ala Moana/Kakaako Neighborhood Board No. 11
Nuuanu/Punchbowl Neighborhood Board No. 12
Downtown Neighborhood Board No. 13
Liliha/Kapalama Neighborhood No. 14
Kalihi Palama Neighborhood Board No. 15
Kalihi Valley Neighborhood Board No. 16
Aliamanu/Salt Lake/Foster Village Neighborhood Board No. 18
Aiea Neighborhood Board No. 20
Pearl City Neighborhood Board No. 21
Waipahu Neighborhood Board No. 22
Ewa Neighborhood Board No. 23
Waianae Coast Neighborhood Board No. 24
Mililani/Waipio/Melemanu Neighborhood Board No. 25
Wahiawa Neighborhood Board No. 26
North Shore Neighborhood Board No 27
Koolauloa Neighborhood Board No. 28
Kahaluu Neighborhood Board No. 29
Kaneohe Neighborhood Board No. 30
Kailua Neighborhood Board No. 31
Waimanalo Neighborhood Board No. 32
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34
Mililani Mauka/Launani Valley Neighborhood Board No. 35

News Media

Honolulu Advertiser
Honolulu Star-Bulletin

Libraries

University of Hawaii Hamilton Library, Hawaiian Collection
Legislative Reference Bureau
DBEDT Library
Honolulu Municipal Reference and Records Center
State Main Library
Kaimuki Regional Library
Hilo Regional Library
Maui Regional Library - Kahului
Lihue Regional Library
Kaneohe Regional Library
Pearl City Regional Library
Hawaii Kai Regional Library
Aiea Library
Aina Haina Library
Ewa Beach Community-School Library
Kahuku Community-School Library
Kailua Library

Kalihi-Palama Library
Library for the Blind and Physically Handicapped
Liliha Library
Manoa Library
McCully-Moiliili Library
Mililani Library
Salt Lake-Moanalua Public Library
Wahiawa Library
Waialua Library
Waianae Library
Waikiki-Kapahulu Library
Waimanalo Community-School Library
Waipahu Library

Miscellaneous

Ala Moana Center
Aloha Cargo Transport
American Lung Association
Chamber of Commerce of Hawaii
Charley's Taxi
Chinatown Task Force
Common Cause/Hawaii
Conservation Council for Hawaii
Construction Industry Legislative Organization
Decision Analysts Hawaii
Downtown Business Council
Estate of James Campbell
Gem of Hawaii Inc.
Hawaii Bicycling League
Hawaii Hotel Association
Hawaii Pilots Association
Hawaii Society, AIA
Hawaii Stevedores, Inc.
Hawaii Transportation Association
Hawaii Visitors and Convention Bureau
Hawaiian Electric Co., Inc.
Hawaiian Telephone Co.
Hawaii's Thousand Friends
Historic Hawaii Foundation
Joint Waikiki Transportation Committee
Kakaako Improvement Association
Kalihi-Palama Community Council
Kamehameha Schools/Bishop Estate
League of Women Voters
Leeward Oahu Transportation Management Association
Life of the Land
Malama o Manoa
Oahu Metropolitan Planning Organization
Oceanic Cablevision
Pacific Resources, Inc.
Pearl City Shopping Center
Pearlridge Center

Sand Island Business Association
Sea-Land Services
Sierra Club, Hawaii Chapter
The Gas Company
The Outdoor Circle
Tummons, Patricia
Victoria Ward, Ltd.
Waikiki Improvement Association
Waikiki Residents Association
Waldren Steamship Company

Major Investment Study/ Draft Environmental Impact Statement

Primary Corridor Transportation Project

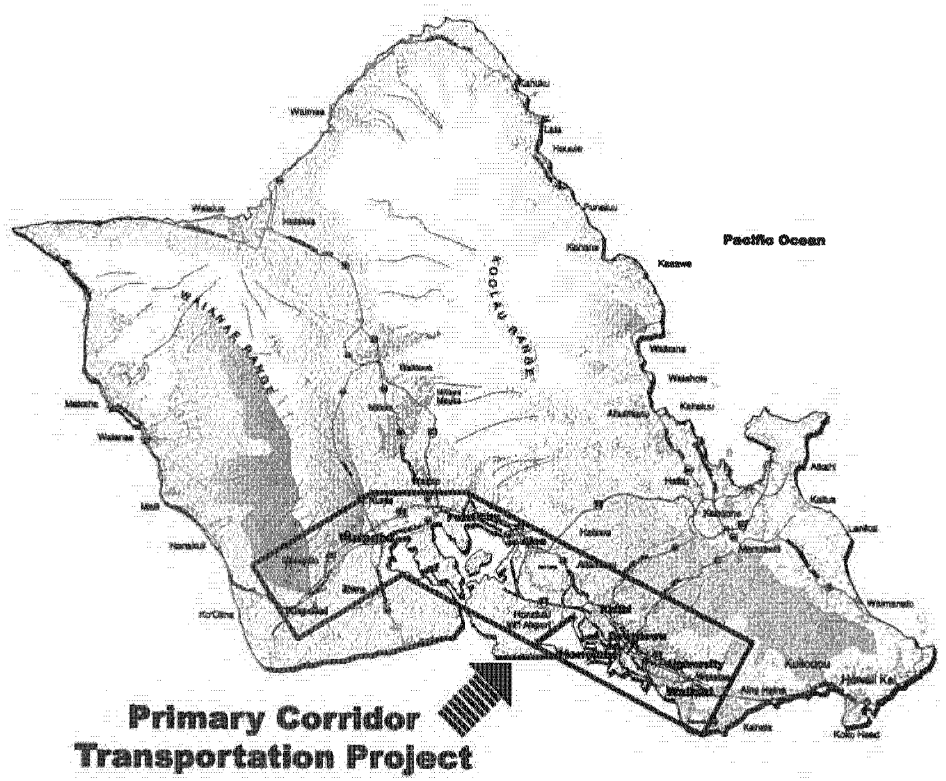
US Department of Transportation
Federal Transit Administration

City and County of Honolulu
Department of Transportation Services

August 2000

PRIMARY CORRIDOR TRANSPORTATION PROJECT

BUS RAPID TRANSIT ALTERNATIVE



DRAFT

Conceptual Design Drawings

TECHNICAL APPENDIX B

Department of Transportation Services
City & County of Honolulu

IZE

August 2000

PRIMARY CORRIDOR TRANSPORTATION PROJECT
INDEX OF DRAWINGS

GENERAL

SHEET NO.	DRAWING NO.	TITLE
1.	G-1	INDEX OF DRAWINGS
2.	G-2	GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS

REGIONAL BUS RAPID TRANSIT

SHEET NO.	DRAWING NO.	TITLE	
3.	BRT-1	PLAN & TYPICAL SECTIONS	STA. 6+409 TO STA. 7+300
4.	BRT-2	PLAN & TYPICAL SECTIONS	STA. 7+300 TO STA. 8+700
5.	BRT-3	PLAN & TYPICAL SECTIONS	STA. 8+700 TO STA. 10+100
6.	BRT-4	PLAN & TYPICAL SECTIONS	STA. 10+100 TO STA. 11+450
7.	BRT-5	PLAN & TYPICAL SECTIONS	STA. 11+450 TO STA. 12+900
8.	BRT-6	PLAN & TYPICAL SECTIONS	STA. 12+900 TO STA. 14+400
9.	BRT-7	PLAN & TYPICAL SECTIONS	STA. 14+400 TO STA. 15+800
10.	BRT-8	PLAN & TYPICAL SECTIONS	STA. 15+800 TO STA. 17+200
11.	BRT-9	PLAN & TYPICAL SECTIONS	STA. 17+200 TO STA. 18+600
12.	BRT-10	PLAN & TYPICAL SECTIONS	STA. 18+600 TO STA. 20+000
13.	BRT-10A	PLAN & TYPICAL SECTIONS	STA. H-2 18+100 TO STA. H-2 18+900
14.	BRT-11	PLAN & TYPICAL SECTIONS	STA. 20+000 TO STA. 21+300
15.	BRT-12	PLAN & TYPICAL SECTIONS	STA. 21+300 TO STA. 22+700
16.	BRT-13	PLAN & TYPICAL SECTIONS	STA. 22+700 TO STA. 24+150
17.	BRT-14	PLAN & TYPICAL SECTIONS	STA. 24+150 TO STA. 25+500
18.	BRT-15	PLAN & TYPICAL SECTIONS	STA. 25+500 TO STA. 26+700
19.	BRT-16	PLAN & TYPICAL SECTIONS	STA. 26+700 TO STA. 28+100
20.	BRT-17	PLAN & TYPICAL SECTIONS	STA. 28+100 TO STA. 29+500
21.	BRT-18	PLAN & TYPICAL SECTIONS	STA. 29+500 TO STA. 30+700
22.	BRT-19	PLAN & TYPICAL SECTIONS	STA. 30+700 TO STA. 32+100
23.	BRT-20	PLAN & TYPICAL SECTIONS	STA. 32+100 TO STA. 33+600
24.	BRT-21	PLAN & TYPICAL SECTIONS	STA. 33+600 TO STA. 34+616

IN-TOWN BUS RAPID TRANSIT

SHEET NO.	DRAWING NO.	TITLE	
25.	TRM-1	PLAN & TYPICAL SECTIONS	STA. 10+000 TO STA. 10+700
26.	TRM-2	PLAN & TYPICAL SECTIONS	STA. 10+700 TO STA. 12+100
27.	TRM-3	PLAN & TYPICAL SECTIONS	STA. 12+100 TO STA. 13+500
28.	TRM-4	PLAN & TYPICAL SECTIONS	STA. 13+500 TO STA. 14+800
29.	TRM-5	PLAN & TYPICAL SECTIONS	STA. 14+800 TO STA. 16+200
30.	TRM-6	PLAN & TYPICAL SECTIONS	STA. 16+200 TO STA. 17+500
31.	TRM-7	PLAN & TYPICAL SECTIONS	STA. 17+500 TO STA. 18+800
32.	TRM-8	PLAN & TYPICAL SECTIONS	STA. 18+800 TO STA. 19+900
33.	TRM-9	PLAN & TYPICAL SECTIONS	STA. 19+900 TO STA. 20+100
34.	TRM-10	PLAN & TYPICAL SECTIONS	WAI STA. 14+800 TO WAI STA. 16+350
35.	TRM-11	PLAN & TYPICAL SECTIONS	WAI STA. 16+350 TO WAI STA. 17+400
36.	TRM-12	PLAN & TYPICAL SECTIONS	WAI STA. 17+400 TO WAI STA. 18+700
37.	TRM-13	PLAN & TYPICAL SECTIONS	WAI STA. 18+700 TO WAI STA. 20+500
38.	TRM-14	PLAN & TYPICAL SECTIONS	WAI STA. 20+500 TO WAI STA. 22+100
39.	TRM-15	TYPICAL INTERSECTION & STOP LAYOUT	DILLINGHAM BOULEVARD
40.	TRM-16	TYPICAL INTERSECTION LAYOUT	KAPIOLANI BOULEVARD
41.	TRM-17	TYPICAL STOP LAYOUT	KAPIOLANI BOULEVARD
42.	TRM-18	TYPICAL INTERSECTION LAYOUT	UNIVERSITY AVENUE
43.	TRM-19	TYPICAL INTERSECTION & STOP LAYOUT	KALAKAUA AVENUE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

SCALE: NOT TO SCALE

INDEX OF DRAWINGS

DRAWING NO. G-1

DATE: 7-24-00 | SHEET NO.

GENERAL NOTES

1. THE INDICATED LOCATION OF ALL PROPOSED FACILITIES IS CONCEPTUAL. THE INDICATED ALIGNMENTS AND STOP LOCATIONS HAVE BEEN DEVELOPED FOR BUDGETARY PURPOSES AND ARE NOT TO BE CONSTRUED AS A COMMITTMENT BY THE DEPARTMENT OF TRANSPORTATION SERVICES TO ANY SPECIFIC ROUTE ALIGNMENT OR STOP LOCATION.
2. RELOCATION AND/OR REMOVAL OF EXISTING FACILITIES HAVE NOT BEEN SHOWN FOR REASONS OF CLARITY.
3. LOCATION OF TRACTION POWER SUBSTATIONS IS PRELIMINARY AND SUBJECT TO CHANGE.
4. STATIONING IS MEASURED ALONG THE CENTERLINE EASTBOUND LANES.

ABBREVIATIONS

AVE	AVENUE
BLVD	BOULEVARD
℄	CENTERLINE
DR	DRIVE
EB	EASTBOUND
FRWY	FREEWAY
MAKAI	(TOWARDS THE OCEAN)
MAUKA	(TOWARDS THE MOUNTAIN)
NB	NORTHBOUND
R	CURVE RADIUS
SB	SOUTHBOUND
ST	STREET
WB	WESTBOUND

SYMBOLS

CENTERLINE EXPRESS, HOV, ZIPPER, BUS OR BRT LANE (STATION TICK MARKS SHOWN ON EASTBOUND LANES)

BRT STOP

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

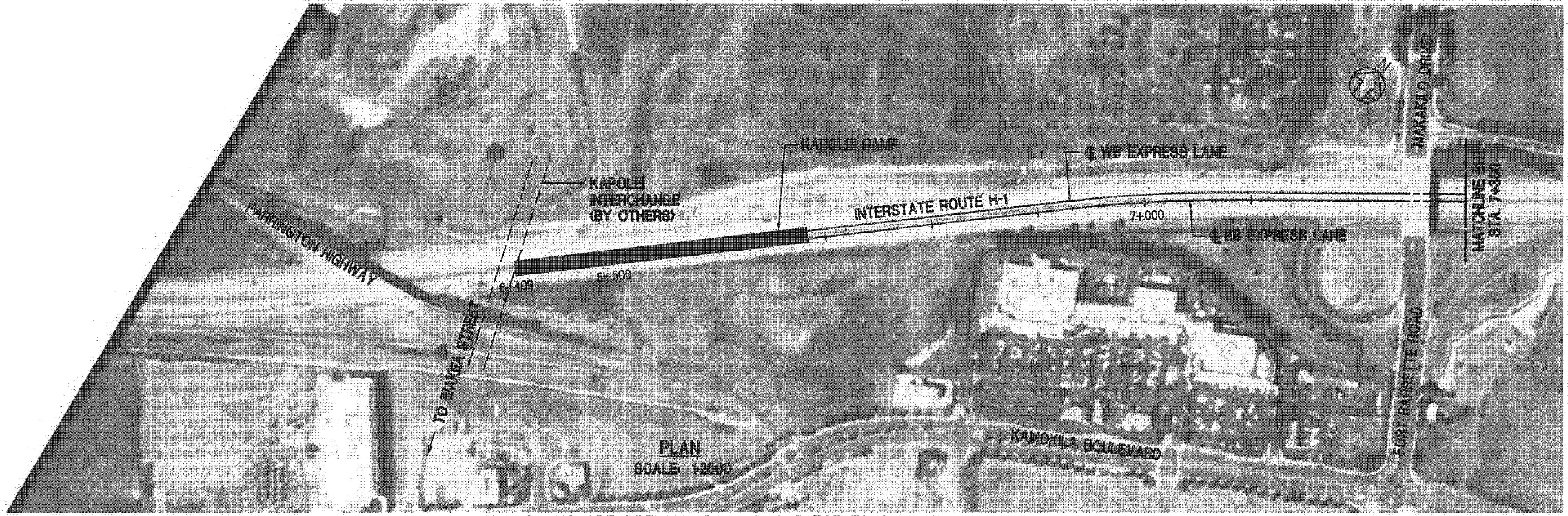
SCALE: NOT TO SCALE

GENERAL NOTES, SYMBOLS AND ABBREVIATIONS

DRAWING NO. G-2

DATE: 7-24-00 SHEET NO.

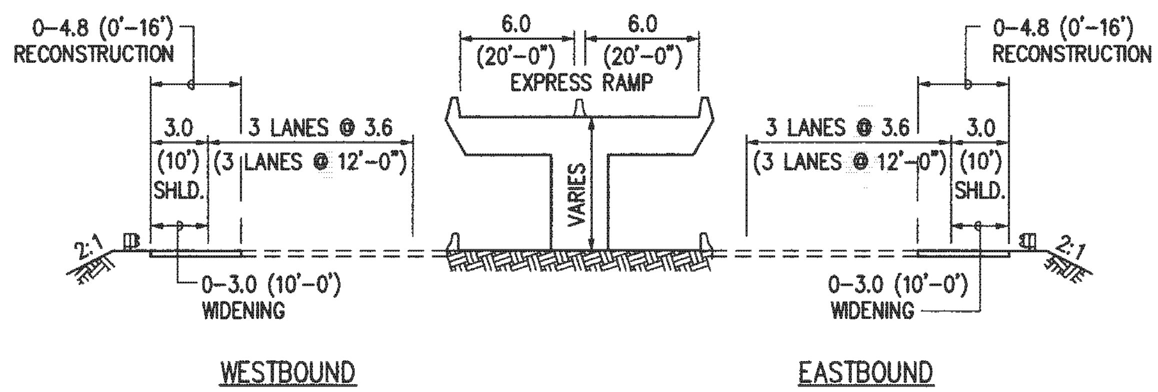
Last Saved: J:\PRIMCOR\misc\appendix-a3.dwg 07/20/00 at 15:09



PLAN

SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



KAPOLEI RAMP

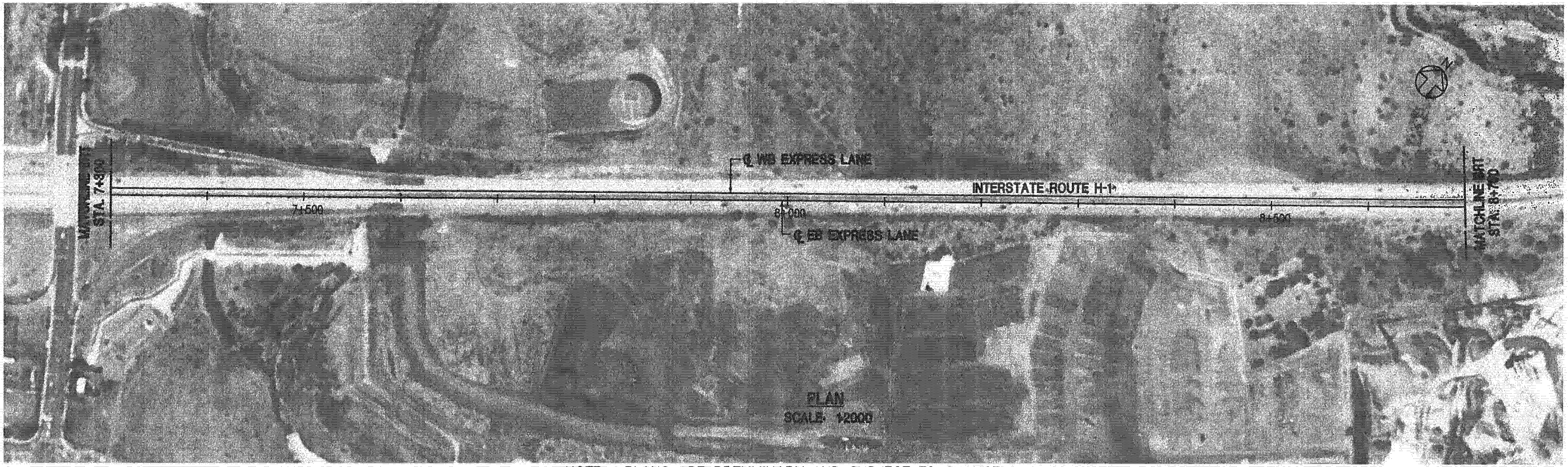
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

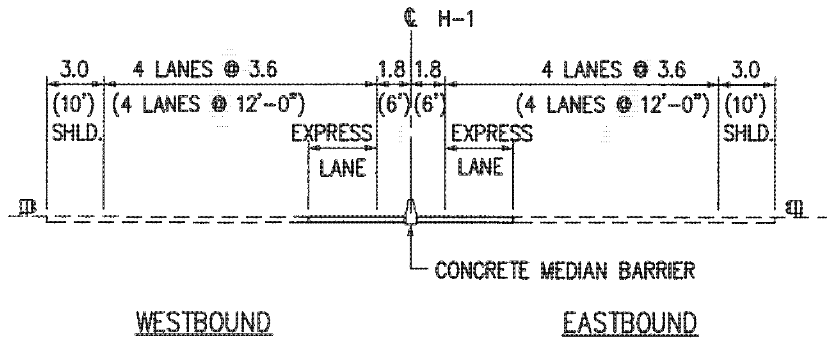
REV.	DATE	DESCRIPTION				
			PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS STA. 6+409 TO STA. 7+300	DRAWING NO. BRT–1 DATE: 7–24–00 | SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl01.dwg 07/19/00 at 15:32

AR00047886



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



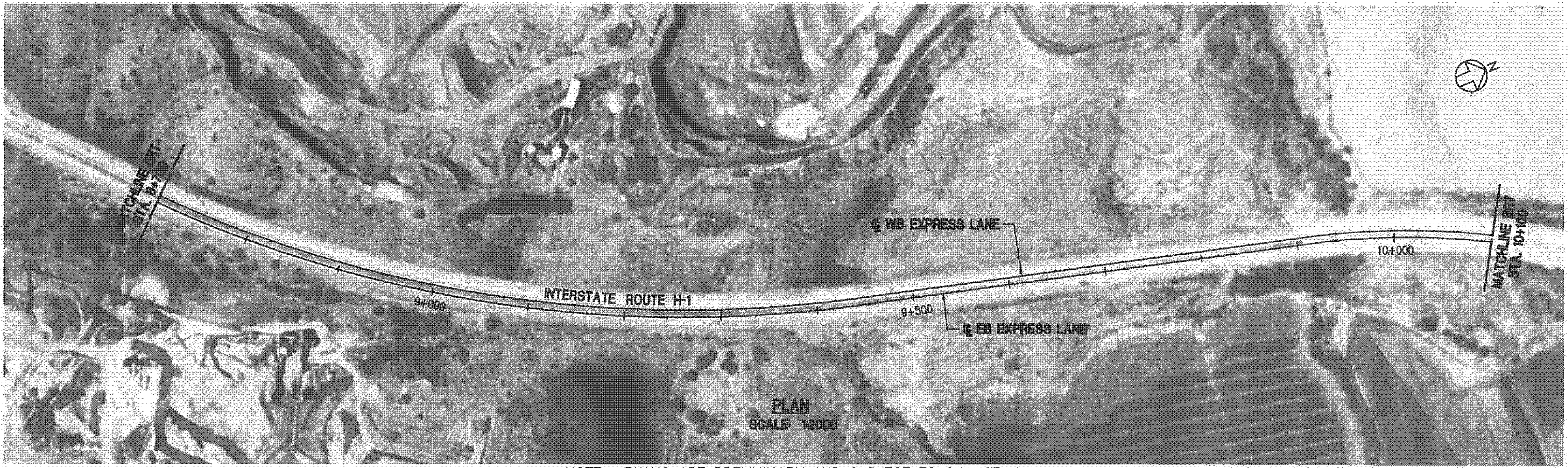
H-1 @ GRADE SECTION
KAPOLEI INTERCHANGE TO KUNIA ROAD
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

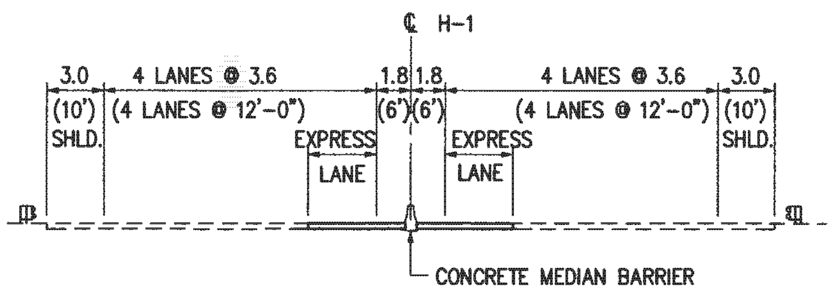
REV.	DATE	DESCRIPTION				
			PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS STA. 7+300 TO STA. 8+700	DRAWING NO. BRT-2 DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl02.dwg 07/19/00 at 15:35

AR00047887



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



H-1 @ GRADE SECTION
KAPOLEI INTERCHANGE TO KUNIA ROAD
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

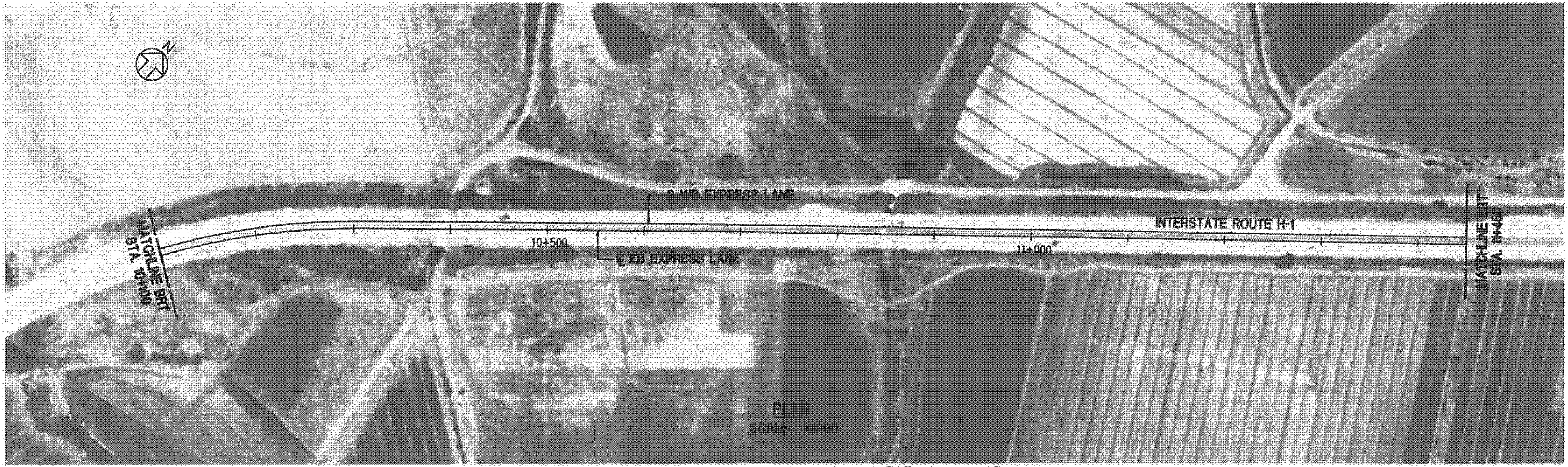
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 8+700 TO STA. 10+100

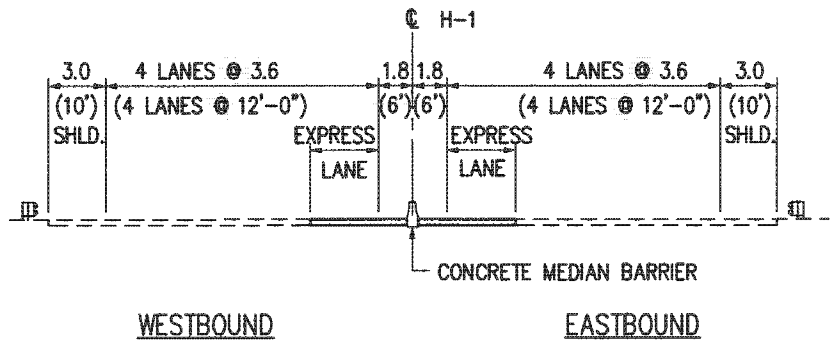
DRAWING NO. BRT-3
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl03_VOL1.dwg 07/19/00 at 15:42

AR00047888



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



TYPICAL H-1 @ GRADE SECTION
KAPOLEI INTERCHANGE TO KUNIA ROAD
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

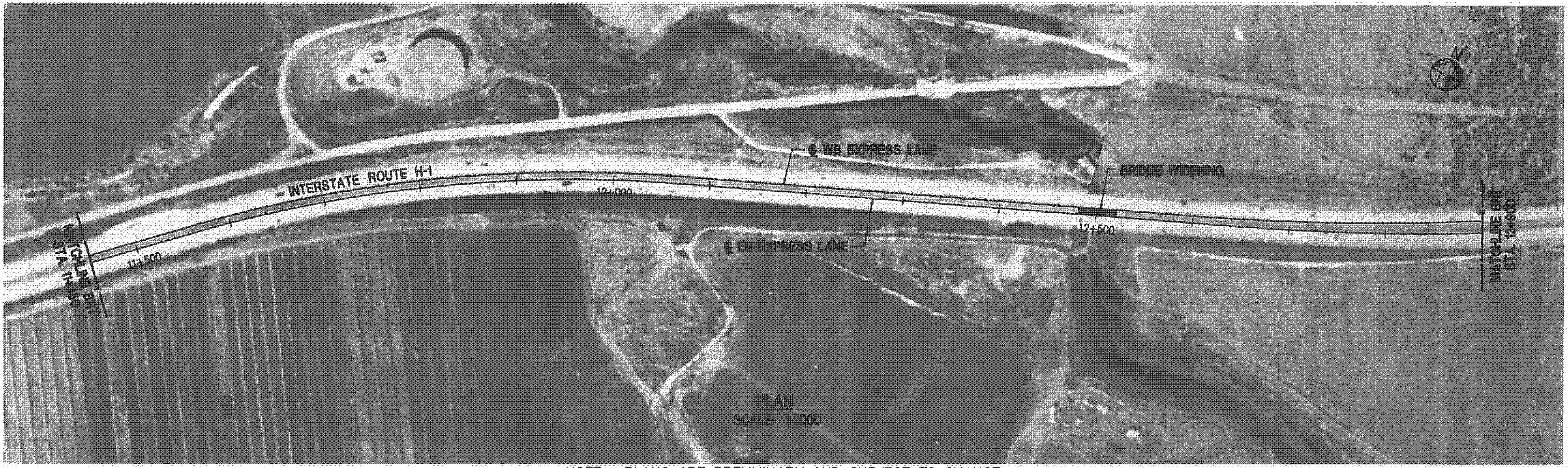
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 10+100 TO STA. 11+450

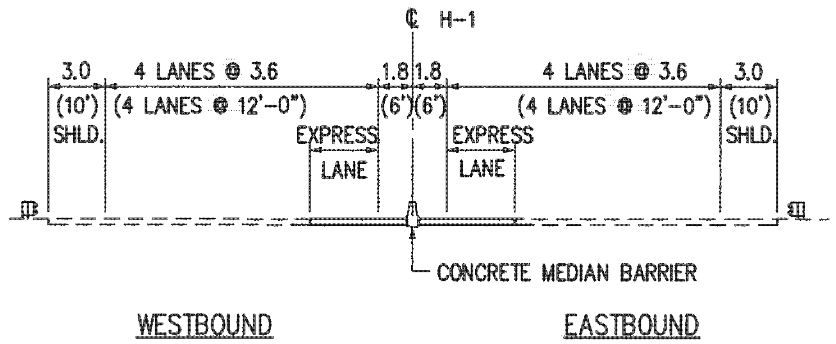
DRAWING NO.
BRT-4
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl04_VOL1.dwg 07/19/00 at 15:47

AR00047889



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



H-1 @ GRADE SECTION
KAPOLEI INTERCHANGE TO KUNIA ROAD
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

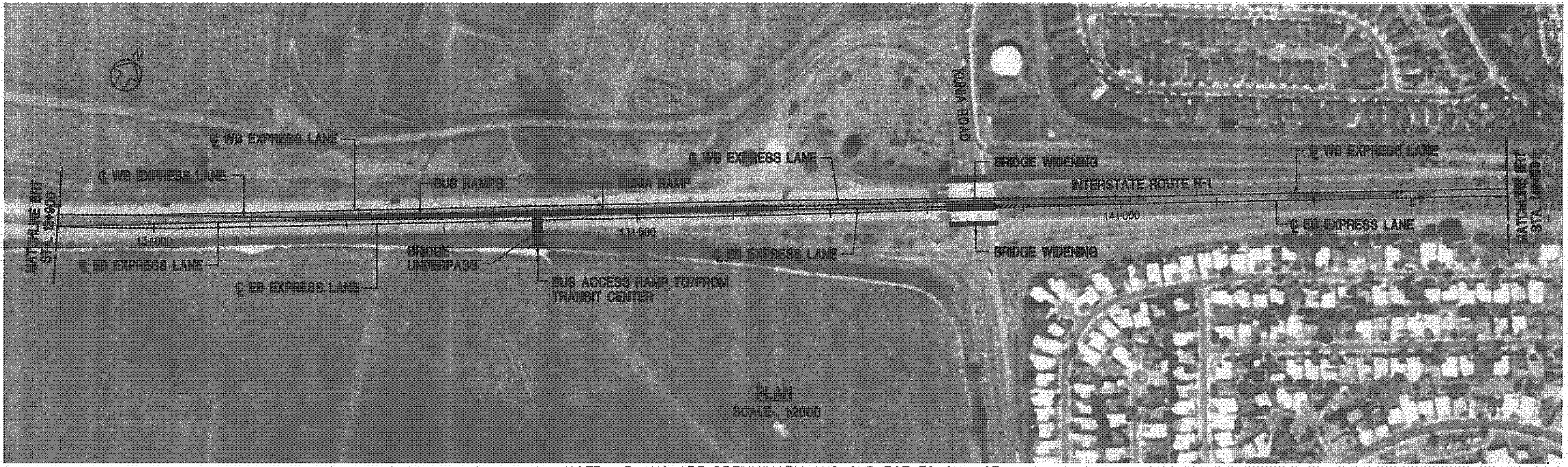
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 11+450 TO STA. 12+900

DRAWING NO. BRT-5
DATE: 7-24-00 SHEET NO.

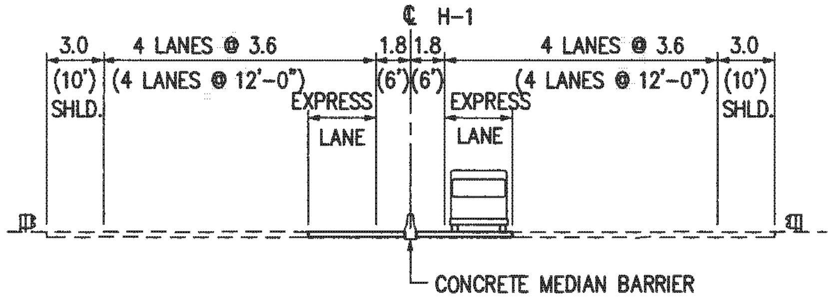
Last Saved: J:\PRIMCOR\BRT\Brt-pl05.dwg 07/19/00 at 15:54

AR00047890

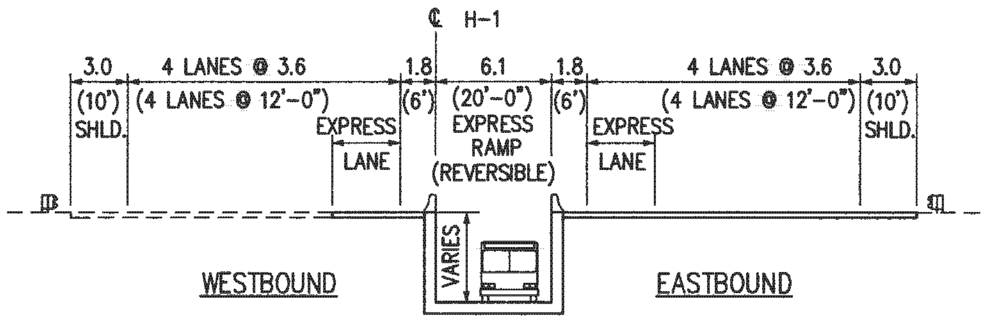


PLAN
SCALE: 1:2000

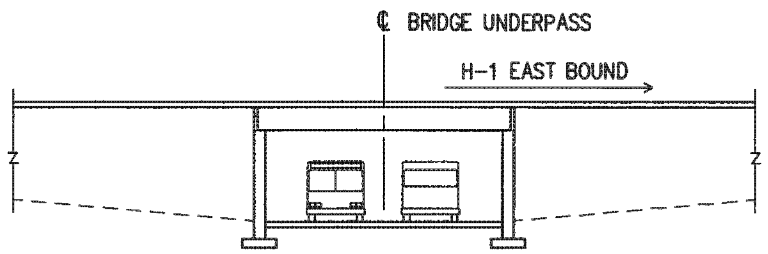
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



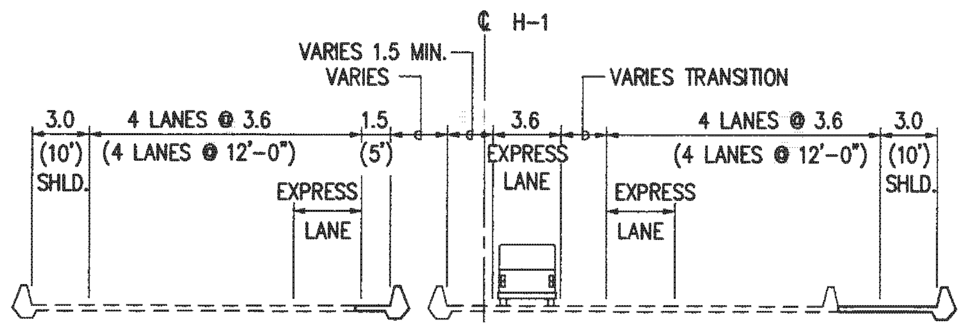
H-1 @ GRADE SECTION @ KUNIA ROAD
(BEFORE AND AFTER RAMP TRANSITION)
SCALE: 1:200



H-1 RAMP SECTION @ KUNIA ROAD
SCALE: 1:200



BRIDGE UNDERPASS @ H-1
SCALE: 1:200



H-1 @ BRIDGE SECTION
OVER KUNIA ROAD
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

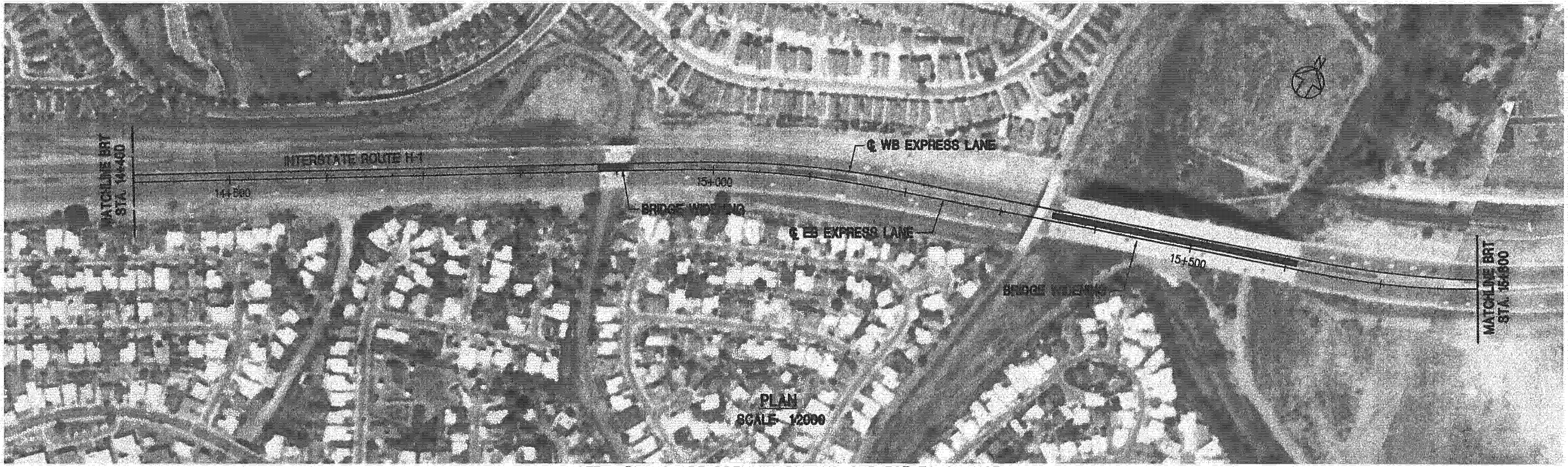
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 12+900 TO STA. 14+400

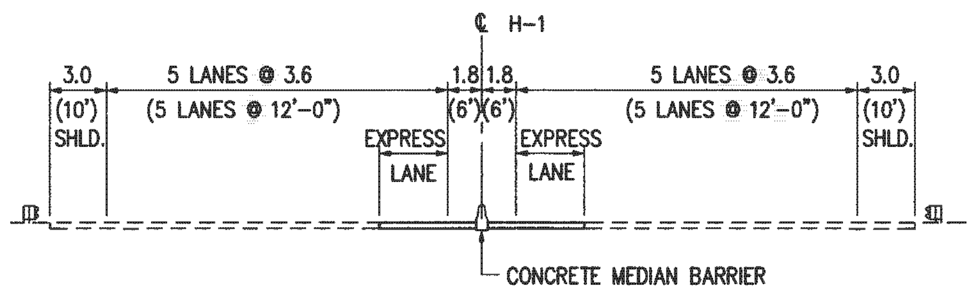
DRAWING NO. BRT-6
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl06.dwg 07/19/00 at 16:06

AR00047891



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



WESTBOUND EASTBOUND

H-1 @ GRADE SECTION
KUNIA ROAD TO MANAGERS DRIVE
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

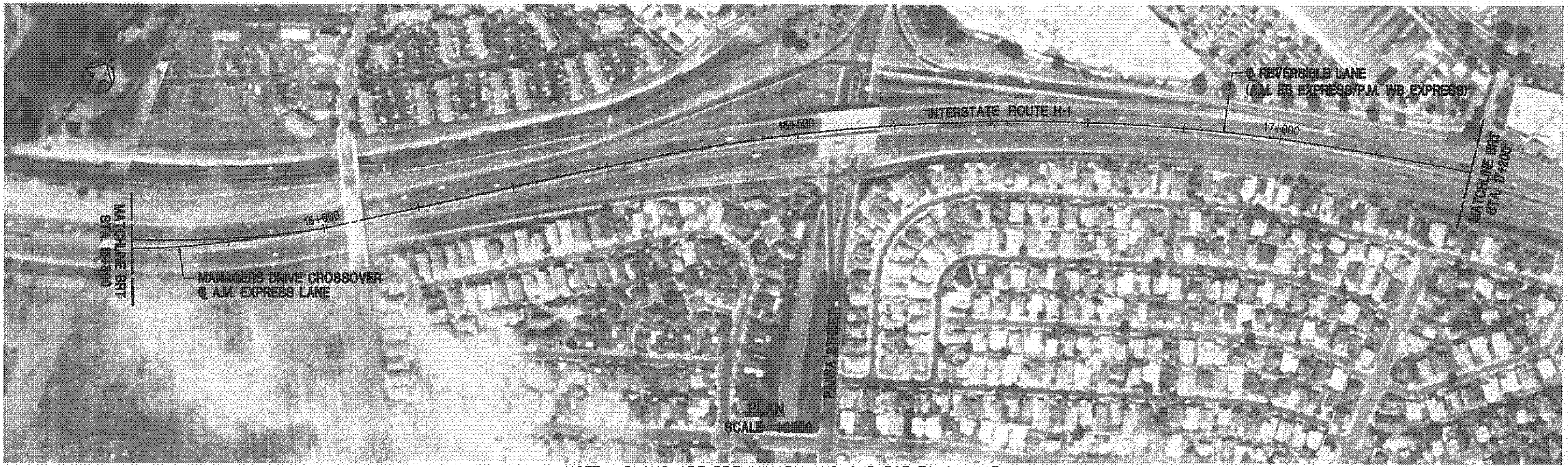
PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100
FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10
FULL SIZE SCALE: 1:200

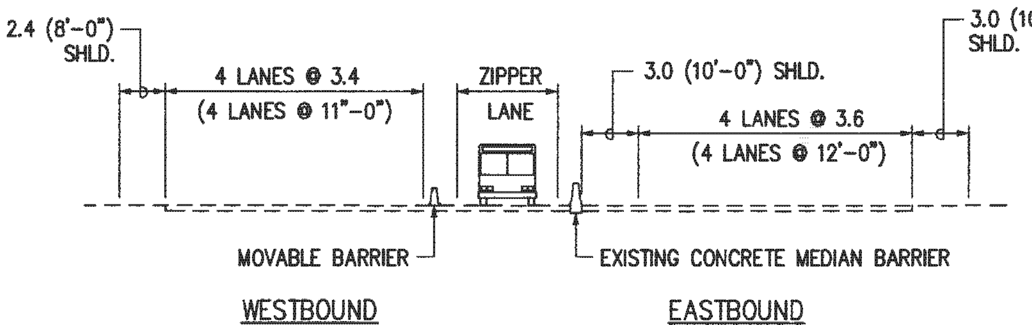
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 14+400 TO STA. 15+800

DRAWING NO.
BRT-7
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRMCOR\BRT\Brt-pl07.dwg 07/19/00 at 16:14



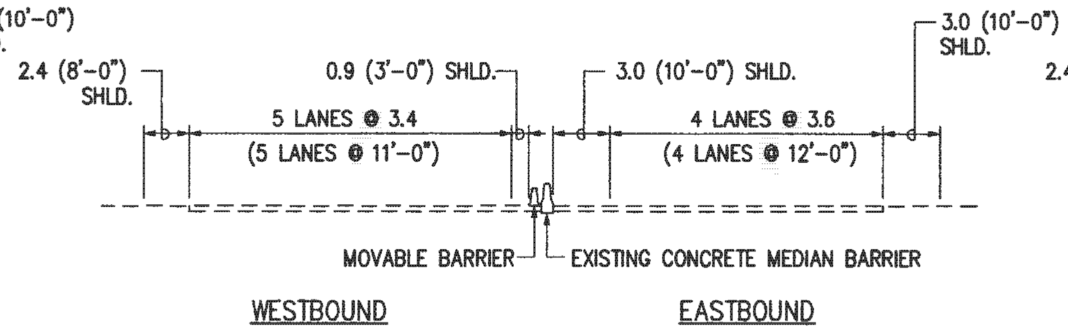
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR PAIWA STREET

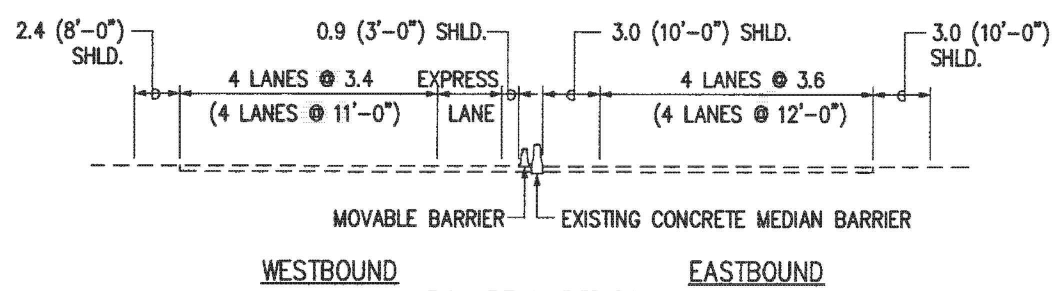
SCALE: 1:200



OFF PEAK PERIOD

H-1 @ GRADE SECTION NEAR PAIWA STREET

SCALE: 1:200



P.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR PAIWA STREET

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

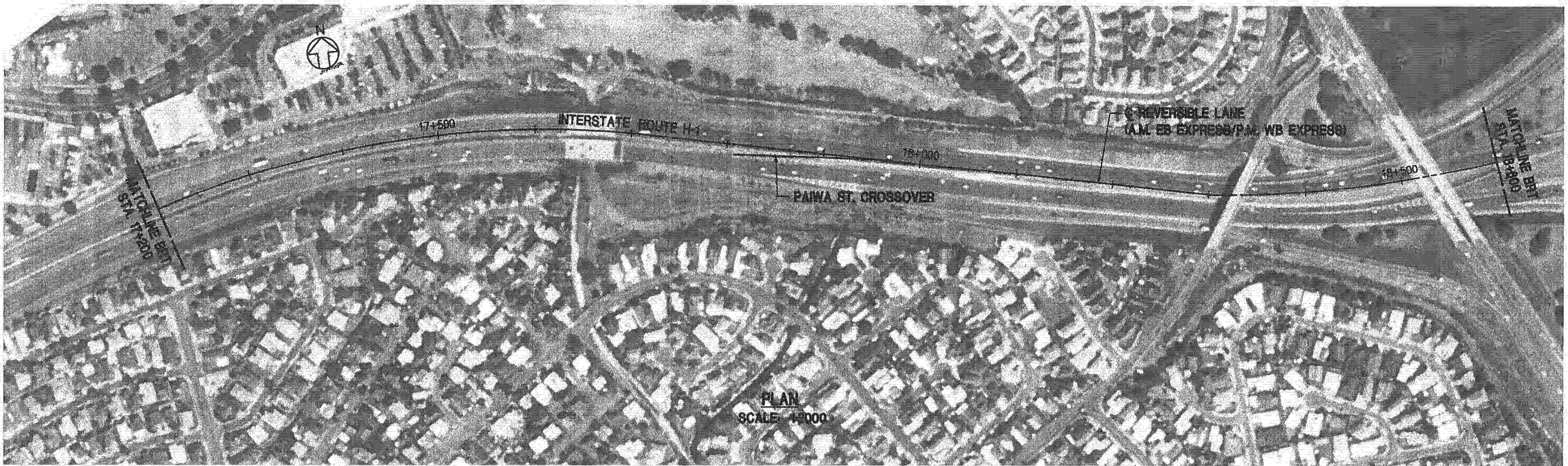
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 15+800 TO STA. 17+200

DRAWING NO. BRT-8

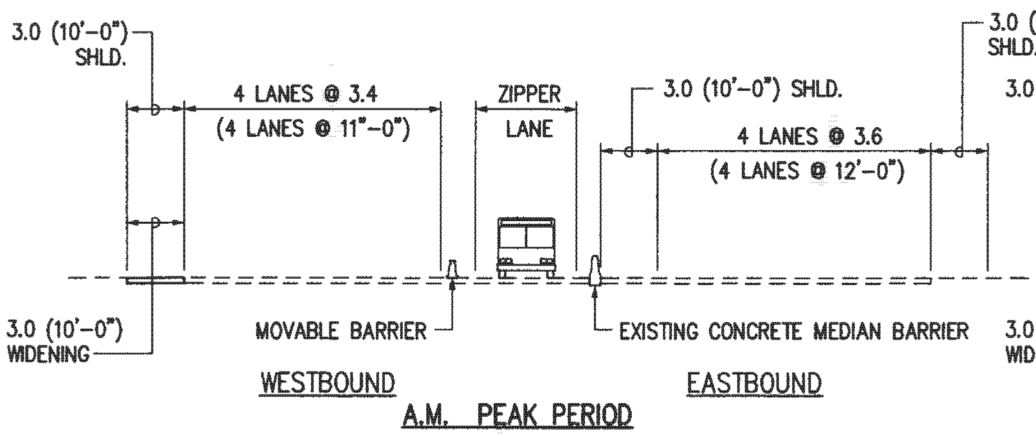
DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl08_VOL1.dwg 07/19/00 at 18:47

AR00047893

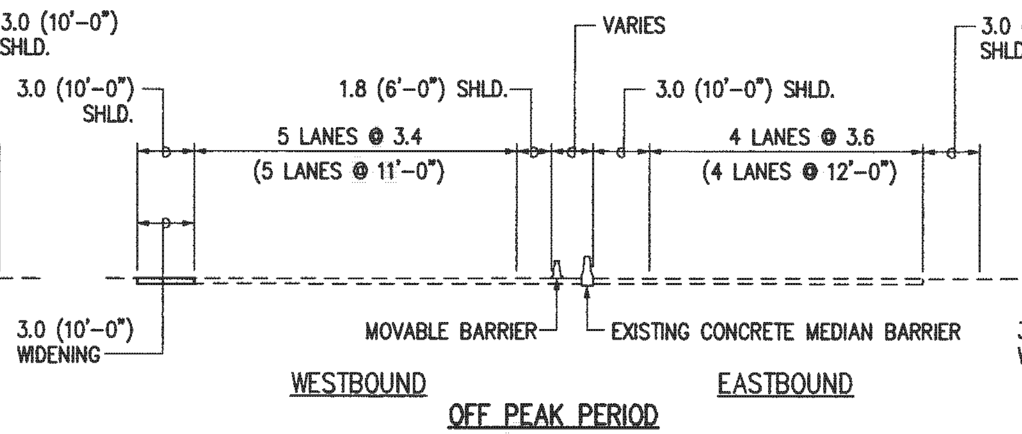


NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



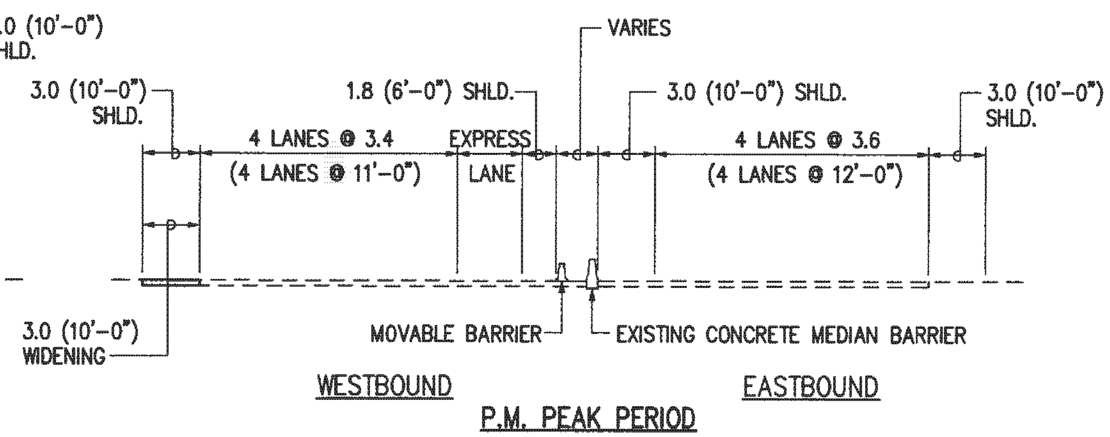
H-1 @ GRADE SECTION NEAR PAIWA STREET CROSSOVER

SCALE: 1:200



H-1 @ GRADE SECTION NEAR PAIWA STREET CROSSOVER

SCALE: 1:200



H-1 @ GRADE SECTION NEAR PAIWA STREET CROSSOVER

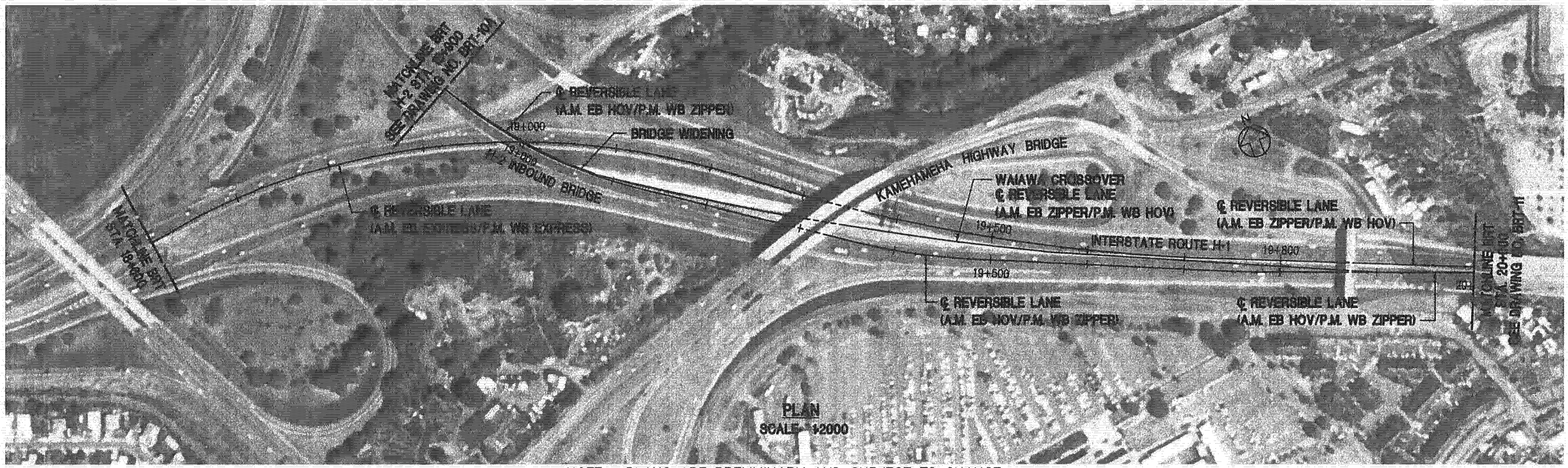
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

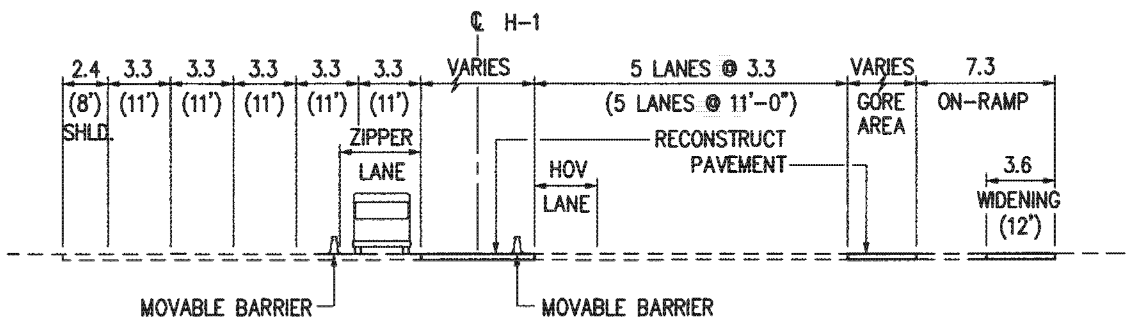
REV.	DATE	DESCRIPTION	PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS STA. 17+200 TO STA. 18+600	DRAWING NO. BRT-9 DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl09.dwg 07/19/00 at 18:52

AR00047894



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



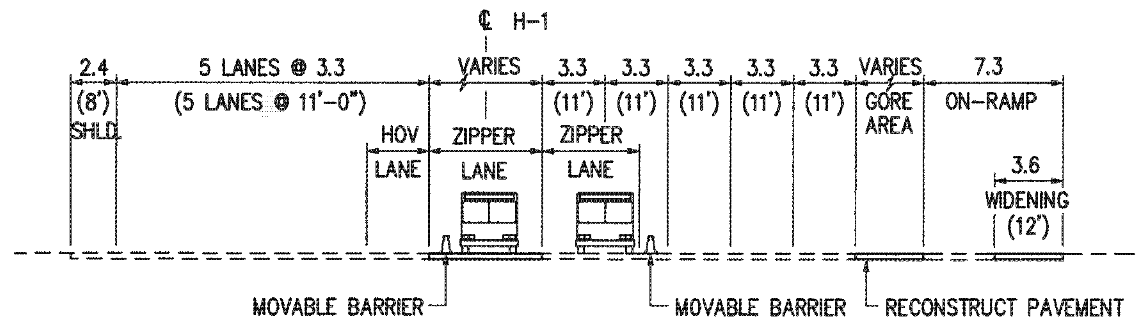
WESTBOUND

A.M. PEAK PERIOD

EASTBOUND

WAIAWA INTERCHANGE – H-1 SECTION
EAST OF KAMEHAMEHA HWY. BRIDGE

SCALE: 1:200



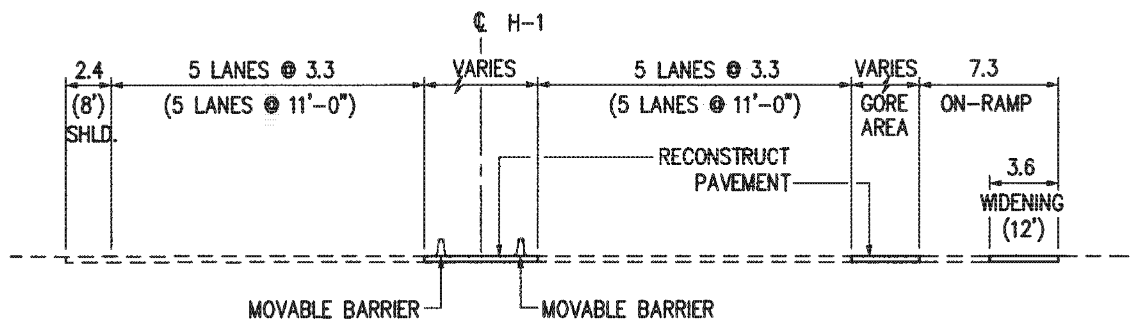
WESTBOUND

P.M. PEAK PERIOD

EASTBOUND

WAIAWA INTERCHANGE – H-1 SECTION
EAST OF KAMEHAMEHA HWY. BRIDGE

SCALE: 1:200



WESTBOUND

OFF PEAK PERIOD

EASTBOUND

WAIAWA INTERCHANGE – H-1 SECTION
EAST OF KAMEHAMEHA HWY. BRIDGE

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	10/29/99	REVISED PM CROSSOVER LAYOUT

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100
FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10
FULL SIZE SCALE: 1:200

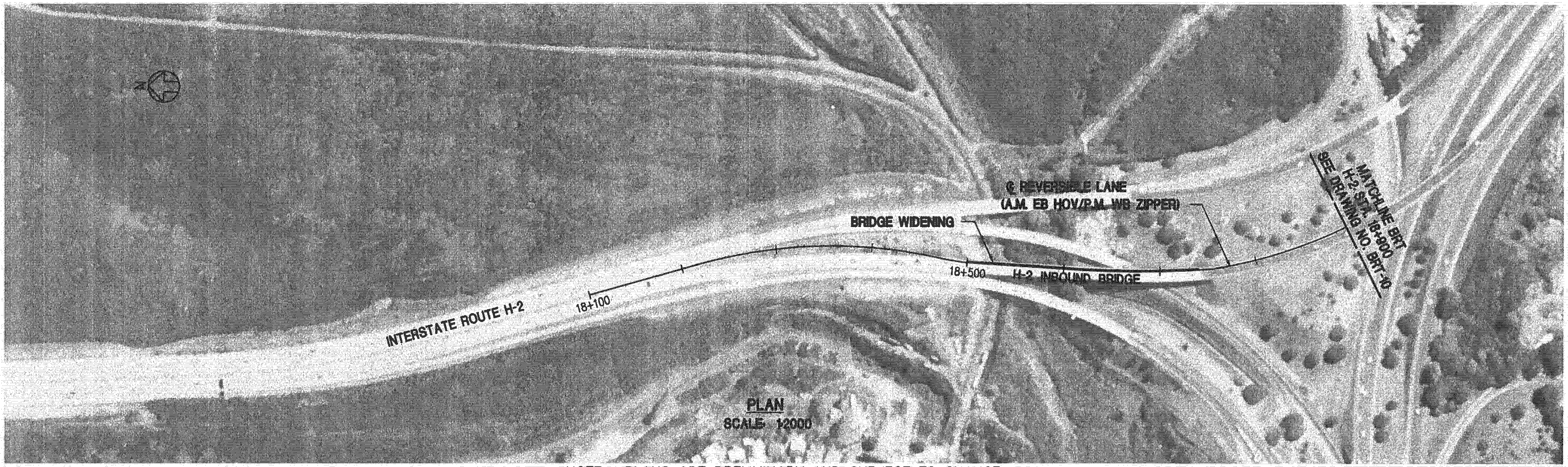
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 18+600 TO STA. 20+000

DRAWING NO.
BRT-10

DATE: 7-24-00
SHEET NO.

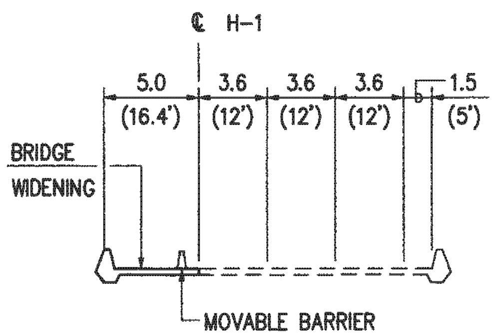
Last Saved: J:\PRIMCOR\BRT\Brt-pl10.dwg 07/18/00 at 15:44

AR00047895



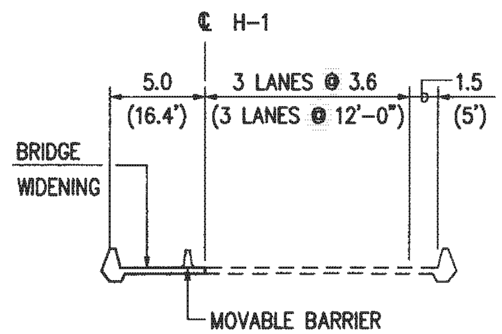
PLAN
SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



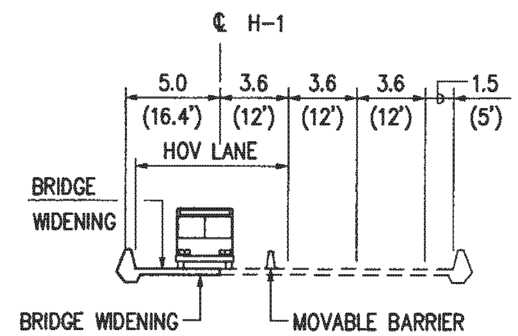
EASTBOUND
A.M. PEAK PERIOD

WAIAWA INTERCHANGE
H-2 INBOUND BRIDGE SECTION
SCALE: 1:200



EASTBOUND
OFF PEAK PERIOD

WAIAWA INTERCHANGE
H-2 INBOUND BRIDGE SECTION
SCALE: 1:200



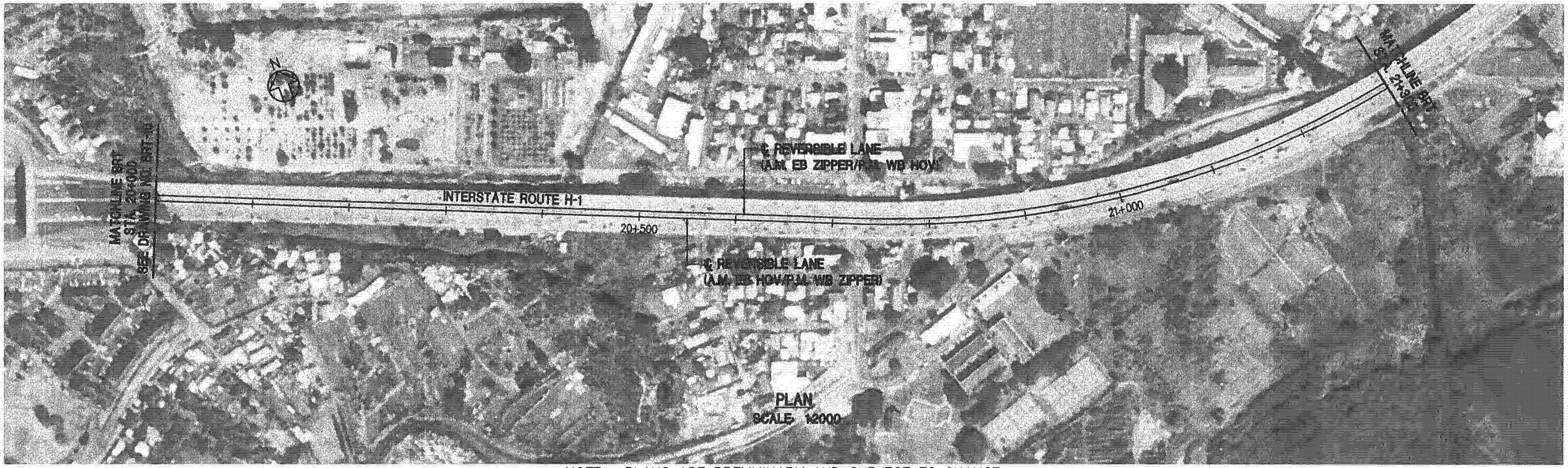
EASTBOUND
P.M. PEAK PERIOD

WAIAWA INTERCHANGE
H-2 INBOUND BRIDGE SECTION
SCALE: 1:200

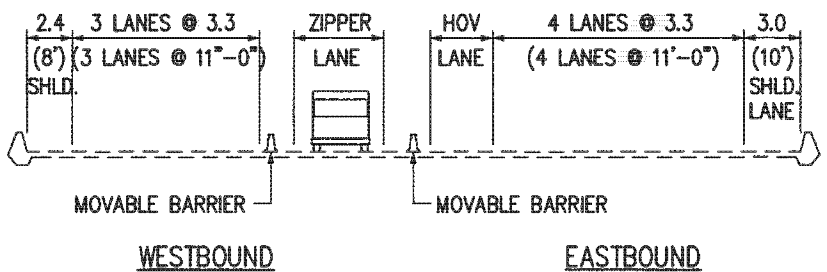
NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION				
			PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS H-2 STA. 18+100 TO H-2 STA. 18+900	DRAWING NO. BRT-10A DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl10a.dwg 07/19/00 at 15:44



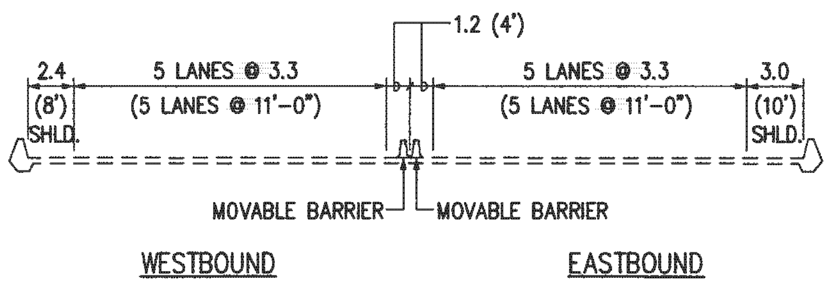
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

PEARL CITY VIADUCT

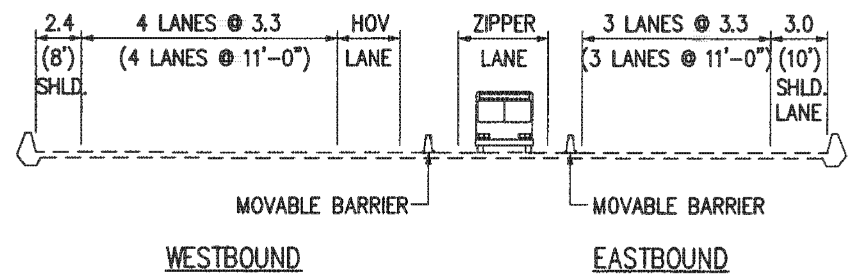
SCALE: 1:200



OFF PEAK PERIOD

PEARL CITY VIADUCT

SCALE: 1:200



P.M. PEAK PERIOD

PEARL CITY VIADUCT

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

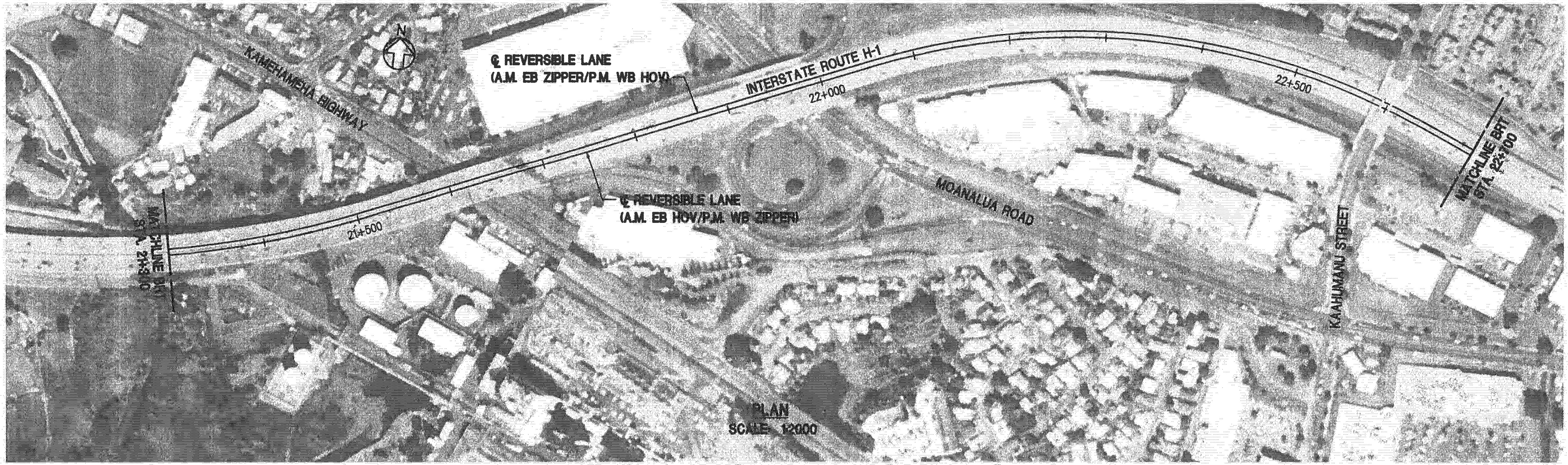
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 20+000 TO STA. 21+300

DRAWING NO. BRT-11

DATE: 7-24-00 | SHEET NO.

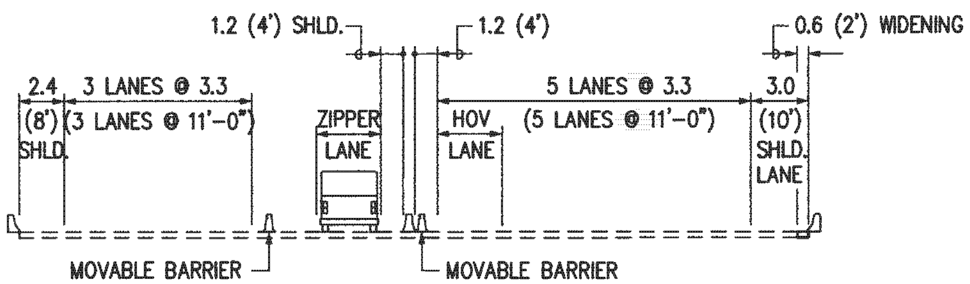
Last Saved: J:\PRIMCOR\BRT\Brt-pl11.dwg 07/19/00 at 15:45

AR00047897



PLAN
SCALE: 1:2000

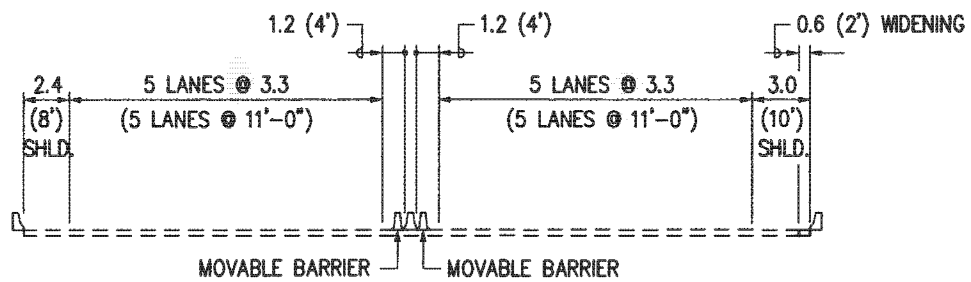
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR MOANALUA ROAD

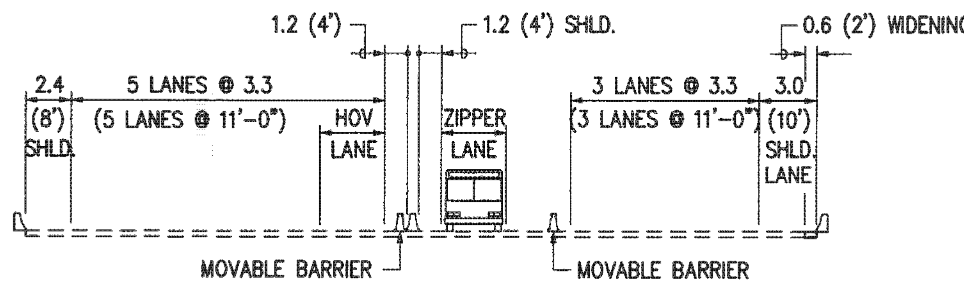
SCALE: 1:200



OFF PEAK PERIOD

H-1 @ GRADE SECTION NEAR MOANALUA ROAD

SCALE: 1:200



P.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR MOANALUA ROAD

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

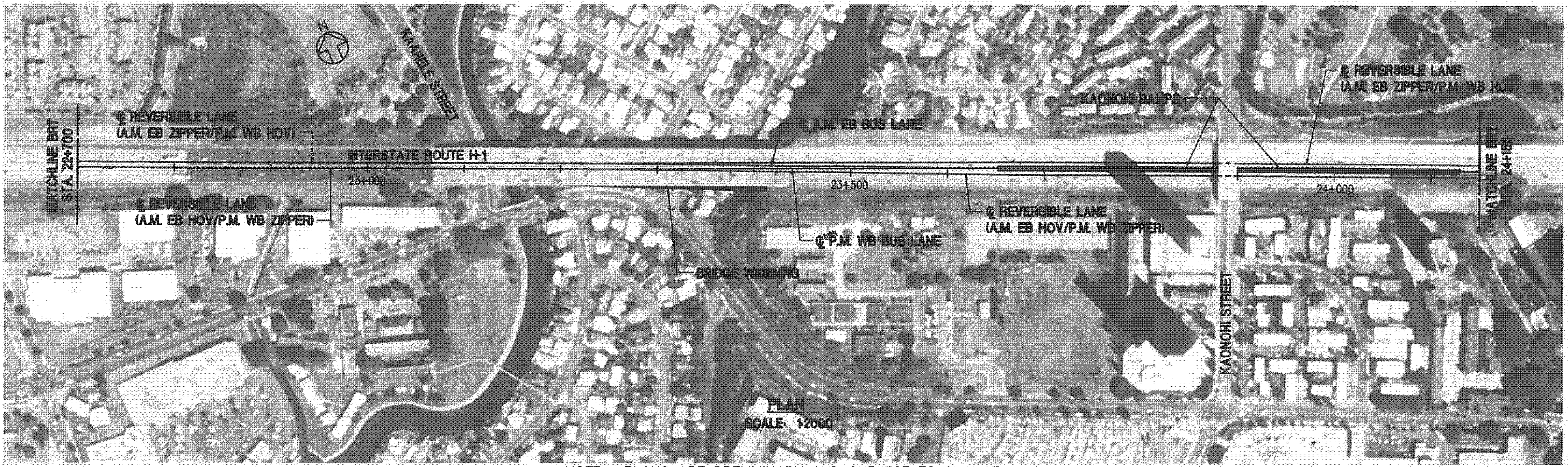
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 21+300 TO STA. 22+700

DRAWING NO. BRT-12

DATE: 7-24-00 | SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl12.dwg 07/19/00 at 15:46

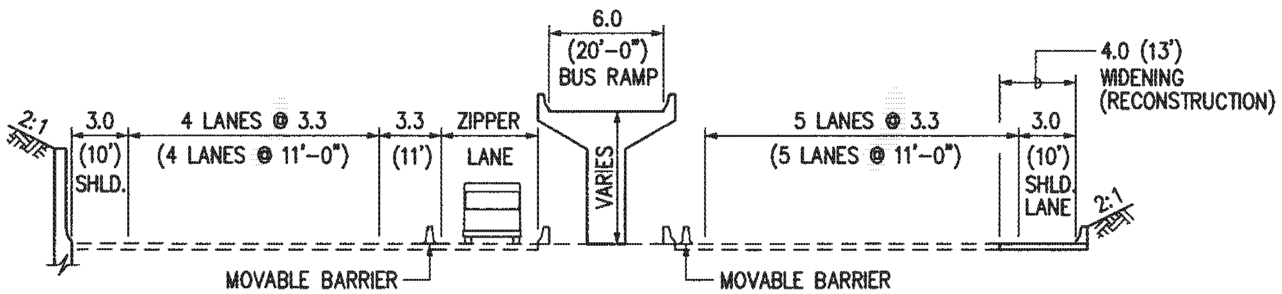
AR00047898



PLAN

SCALE: 1:2000

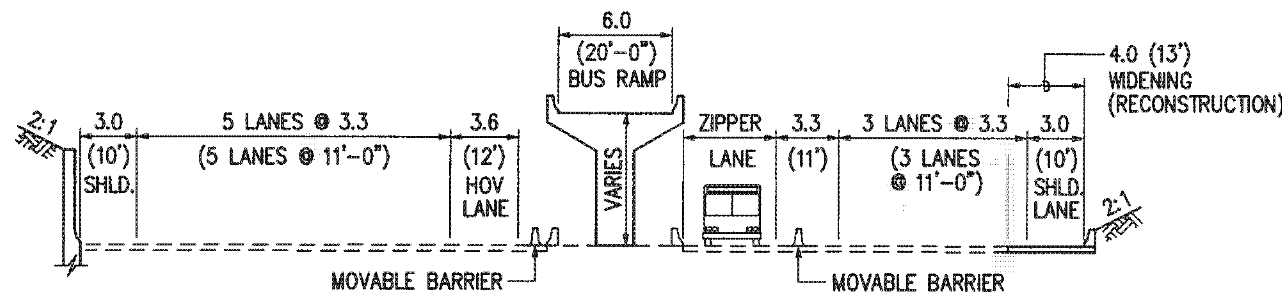
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

KAONOHI STREET RAMPS

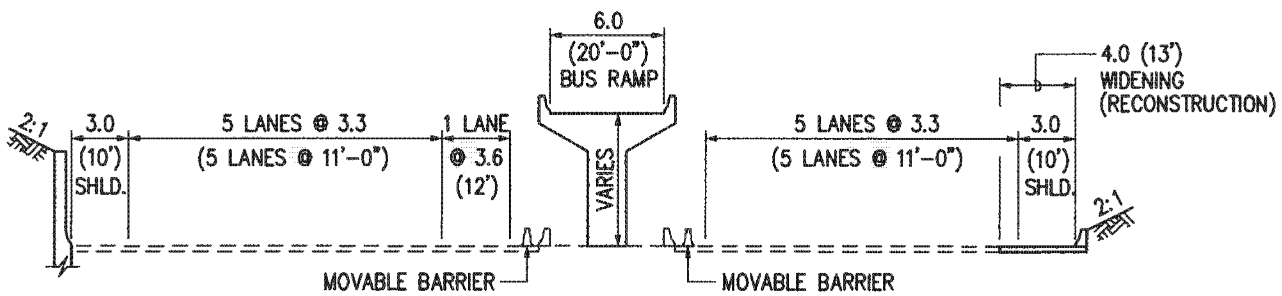
SCALE: 1:200



P.M. PEAK PERIOD

KAONOHI STREET RAMPS

SCALE: 1:200



OFF PEAK PERIOD

KAONOHI STREET RAMPS

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

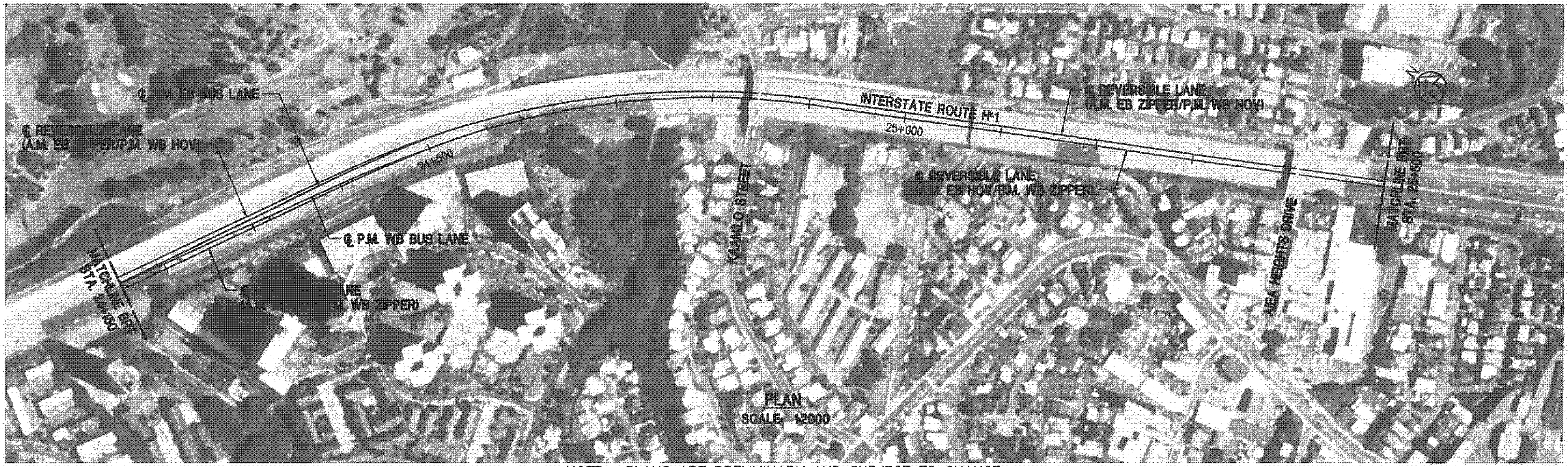
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 22+700 TO STA. 24+150

DRAWING NO. BRT-13

DATE: 7-24-00 | SHEET NO.

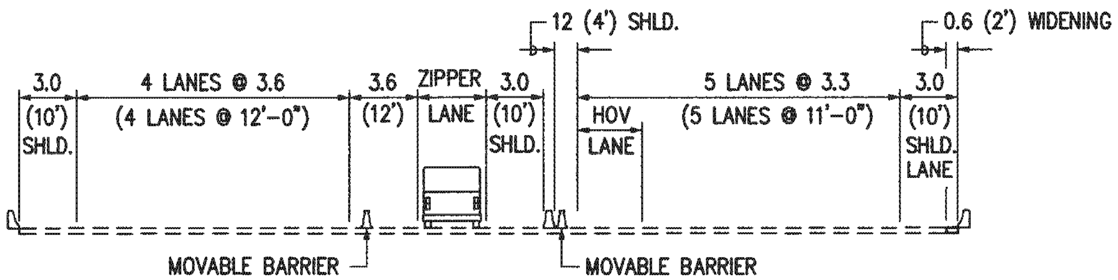
Last Saved: J:\PRIMCOR\BRT\Brt-pl13.dwg 07/19/00 at 15:47

AR00047899



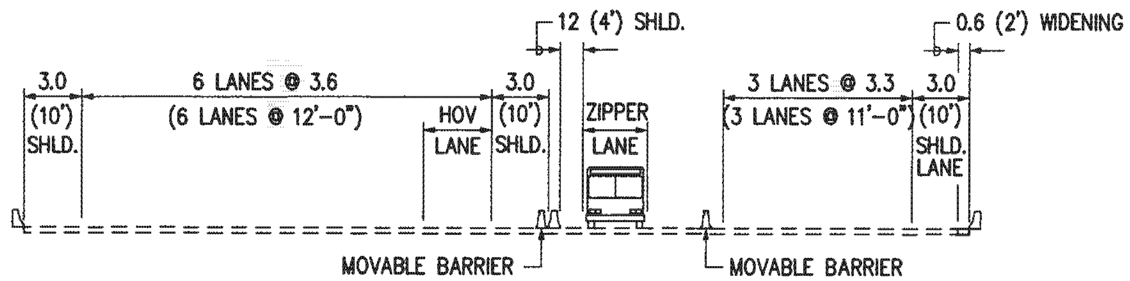
PLAN
SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



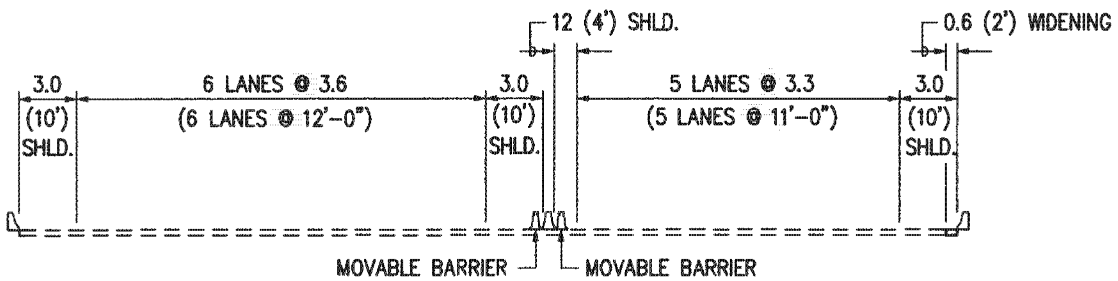
A.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR KAAMILO STREET
SCALE: 1:200



P.M. PEAK PERIOD

H-1 @ GRADE SECTION NEAR KAAMILO STREET
SCALE: 1:200



OFF PEAK PERIOD

H-1 @ GRADE SECTION NEAR KAAMILO STREET
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

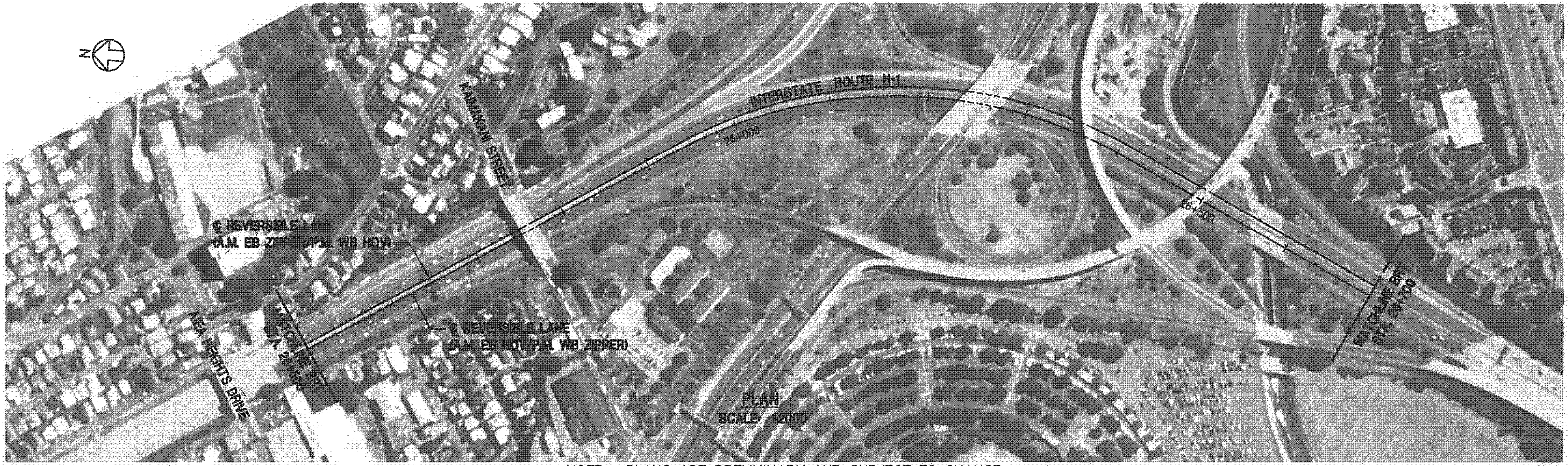
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 24+150 TO STA. 25+500

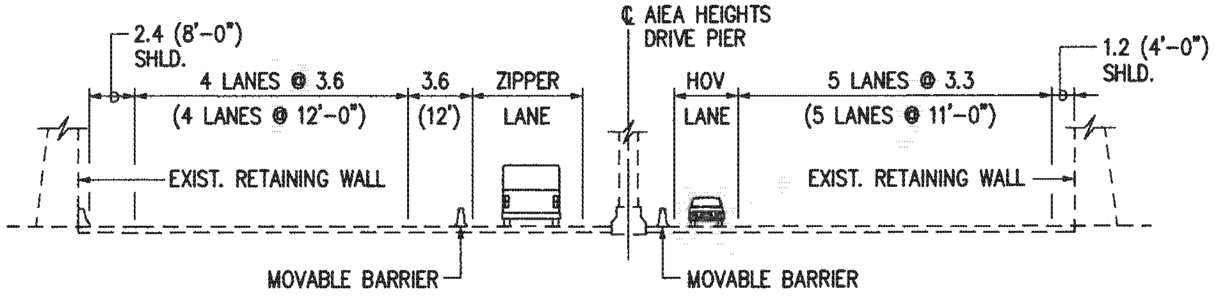
DRAWING NO. BRT-14
DATE: 7-24-00
SHEET NO.

Last Saved: z:\PRIMCOR\BRT\Brt-pl14.dwg 07/19/00 at 15:47

AR00047900



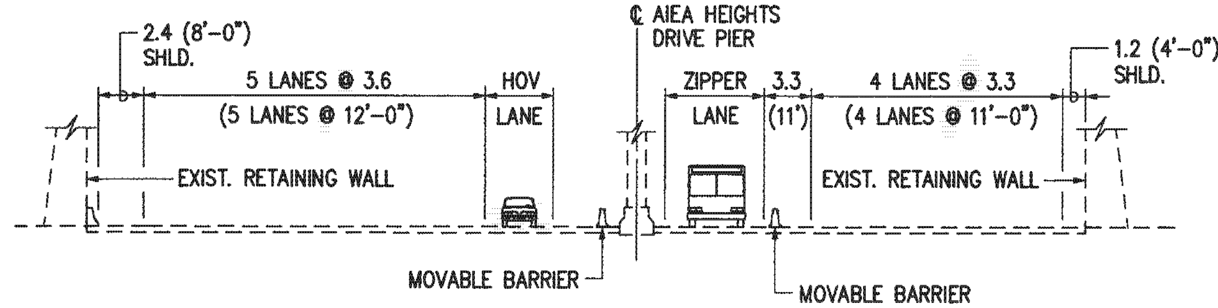
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

H-1 @ GRADE SECTION @ AIEA HEIGHTS DRIVE OVERPASS

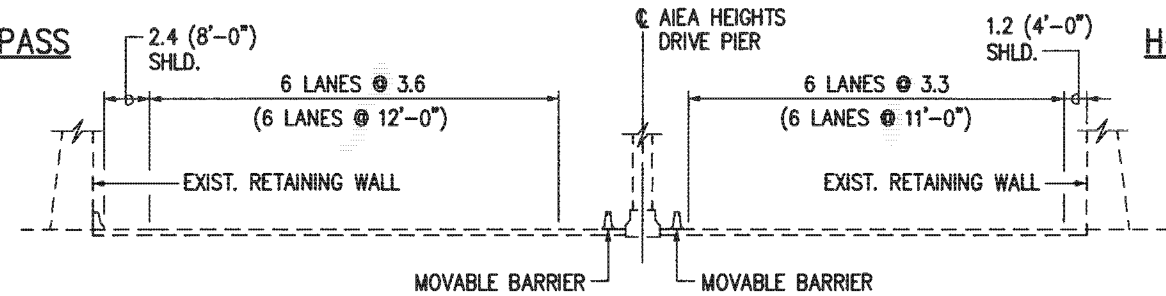
SCALE: 1:200



P.M. PEAK PERIOD

H-1 @ GRADE SECTION @ AIEA HEIGHTS DRIVE OVERPASS

SCALE: 1:200



OFF PEAK PERIOD

H-1 @ GRADE SECTION @ AIEA HEIGHTS DRIVE OVERPASS

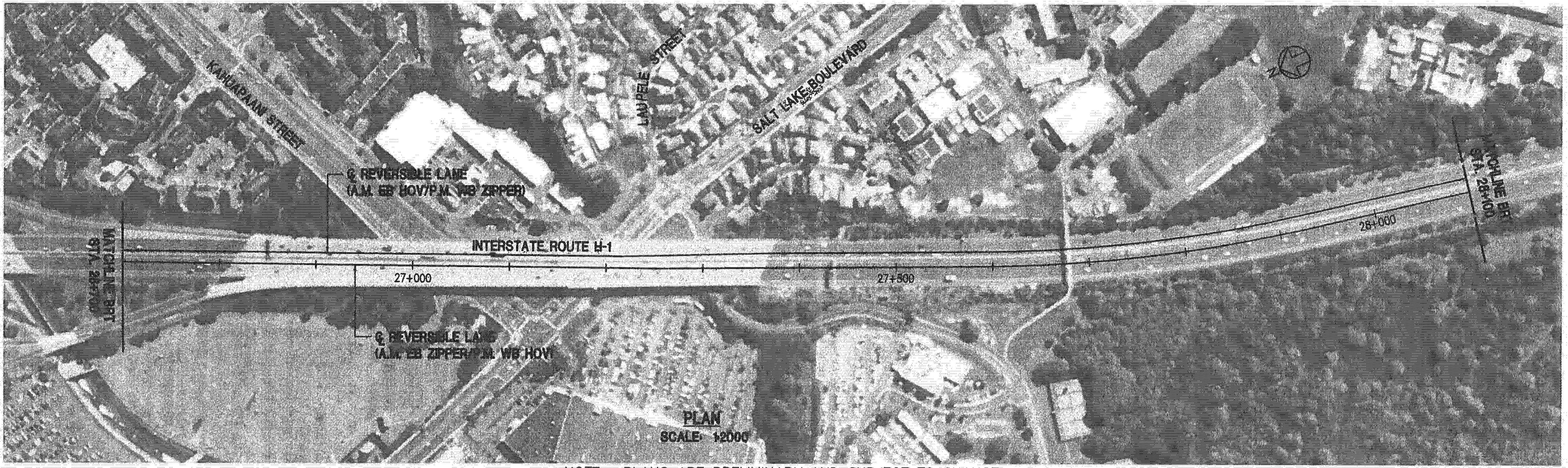
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

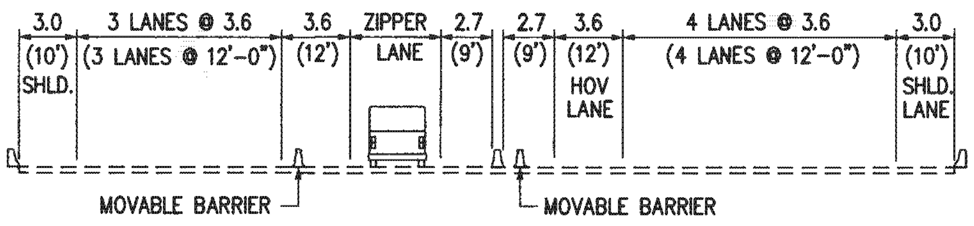
REV.	DATE	DESCRIPTION	PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS STA. 25+500 TO STA. 26+700	DRAWING NO. BRT-15 DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl15.dwg 07/19/00 at 15:47

AR00047901



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



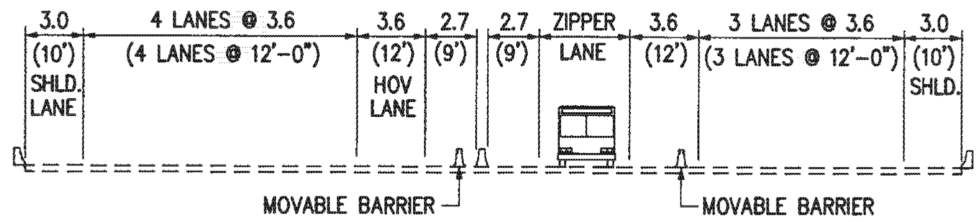
WESTBOUND

A.M. PEAK PERIOD

EASTBOUND

H-1 @ GRADE SECTION NEAR SALT LAKE BOULEVARD

SCALE: 1:200



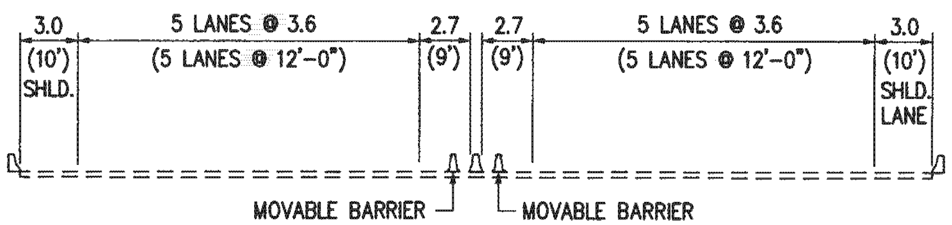
WESTBOUND

P.M. PEAK PERIOD

EASTBOUND

H-1 @ GRADE SECTION NEAR SALT LAKE BOULEVARD

SCALE: 1:200



WESTBOUND

OFF PEAK PERIOD

EASTBOUND

H-1 @ GRADE SECTION NEAR SALT LAKE BOULEVARD

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	10/29/99	DELETED ALOHA STADIUM RAMP

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

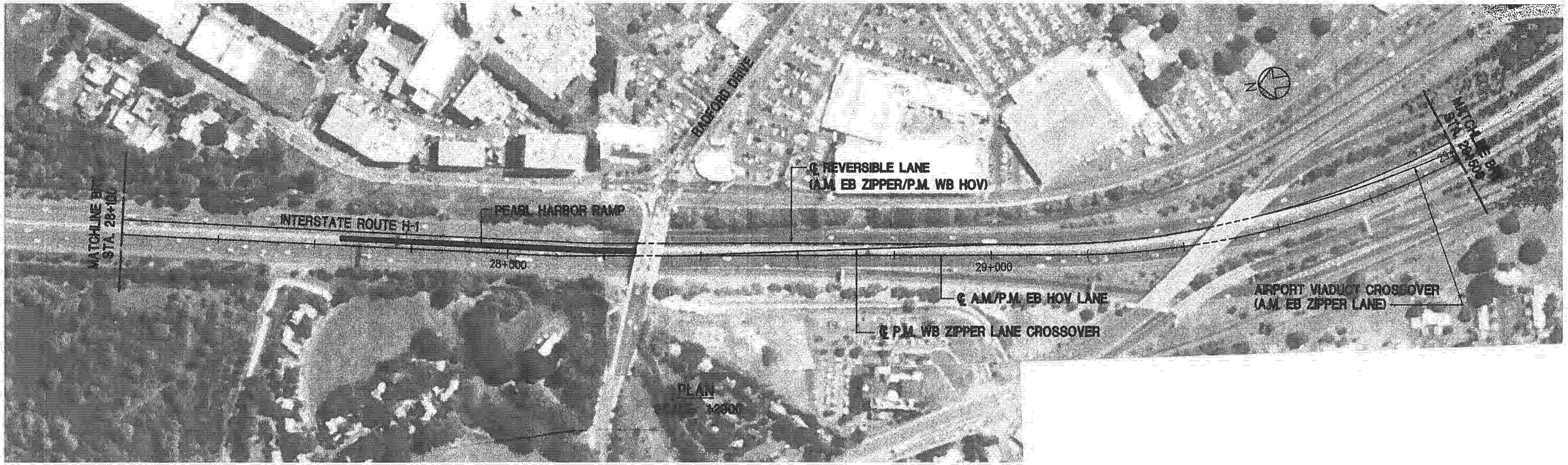
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 26+700 TO STA. 28+100

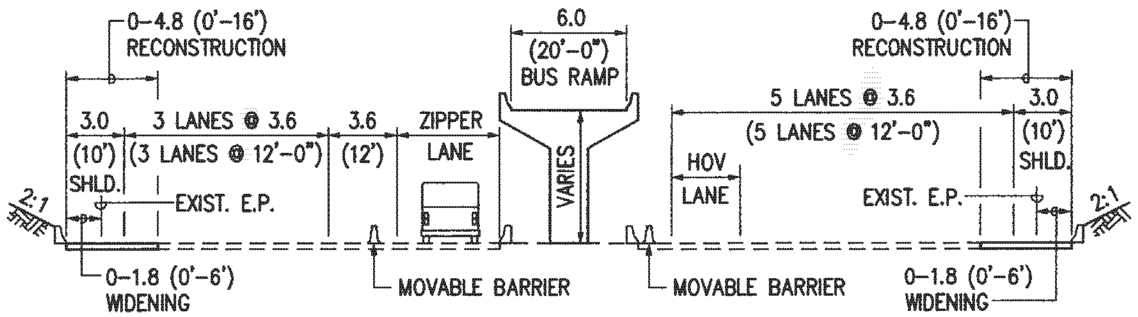
DRAWING NO. BRT-16

DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl16.dwg 07/19/00 at 15:54



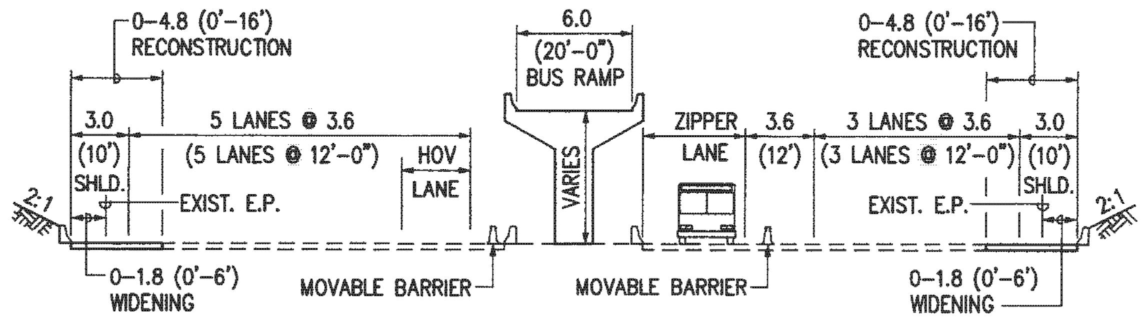
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



A.M. PEAK PERIOD

H-1 PEARL HARBOR RAMP @ RADFORD DRIVE

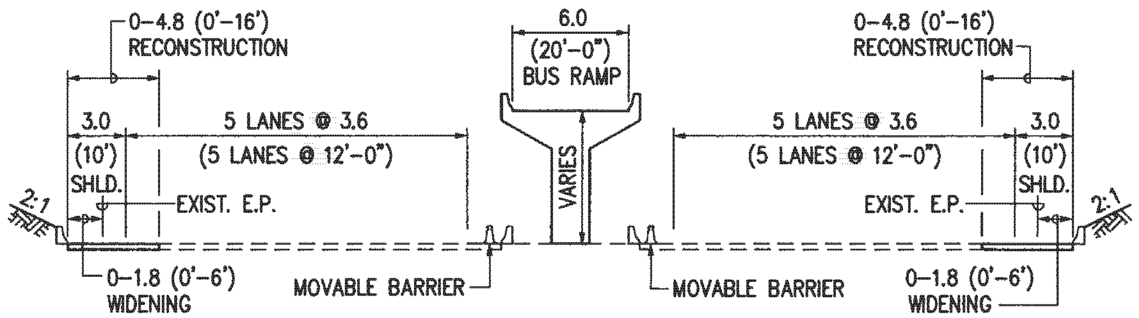
SCALE: 1:200



P.M. PEAK PERIOD

H-1 PEARL HARBOR RAMP @ RADFORD DRIVE

SCALE: 1:200



OFF PEAK PERIOD

H-1 PEARL HARBOR RAMP @ RADFORD DRIVE

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 — FULL SIZE SCALE: 1:2000

HORIZ. = 5 0 5 10 — FULL SIZE SCALE: 1:200

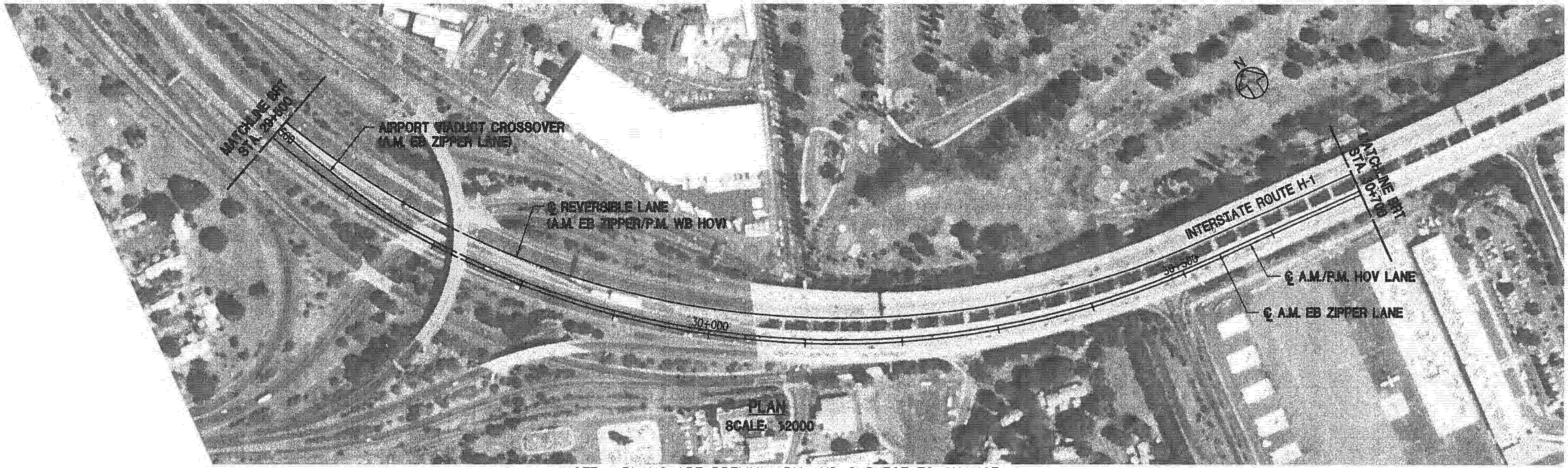
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 28+100 TO STA. 29+500

DRAWING NO. BRT-17

DATE: 7-24-00 SHEET NO.

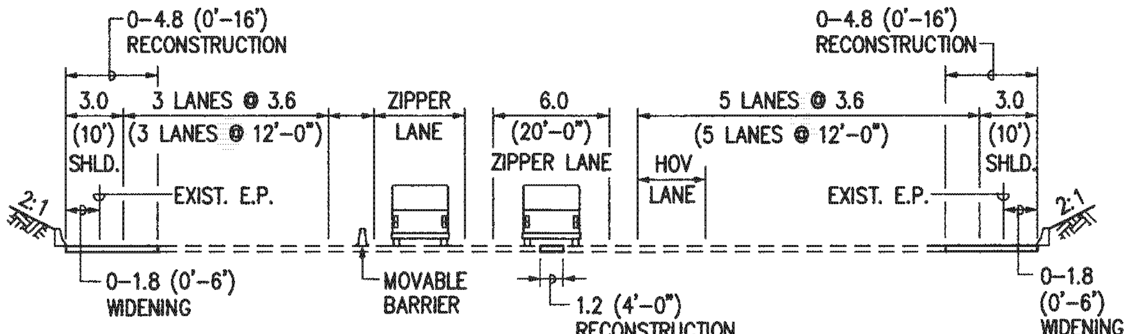
Last Saved: J:\PRIMCOR\BRT\Brt-pl17.dwg 07/19/00 at 15:54

AR00047903



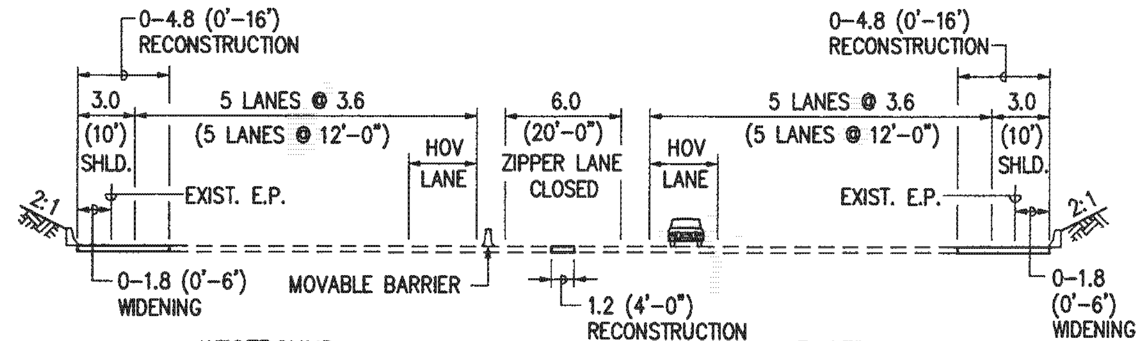
PLAN
SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



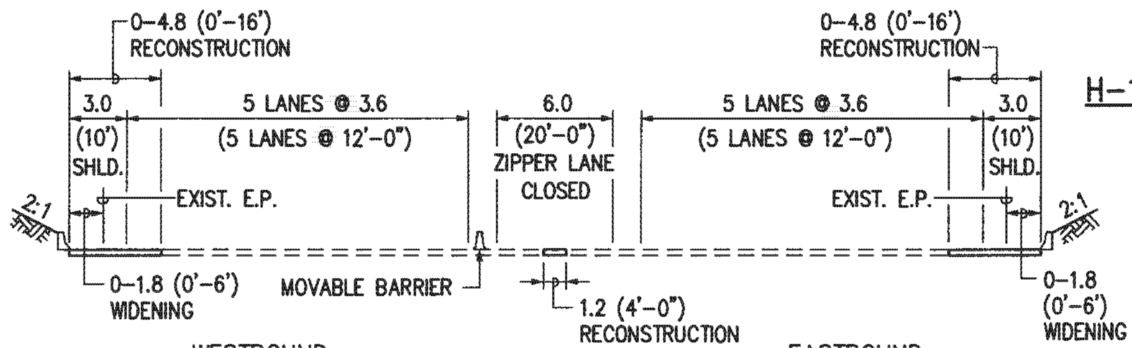
A.M. PEAK PERIOD

H-1 @ GRADE SECTION @ AIRPORT VIADUCT CROSSOVER
SCALE: 1:200



P.M. PEAK PERIOD

H-1 @ GRADE SECTION @ AIRPORT VIADUCT CROSSOVER
SCALE: 1:200



OFF PEAK PERIOD

H-1 @ GRADE SECTION @ AIRPORT VIADUCT CROSSOVER
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

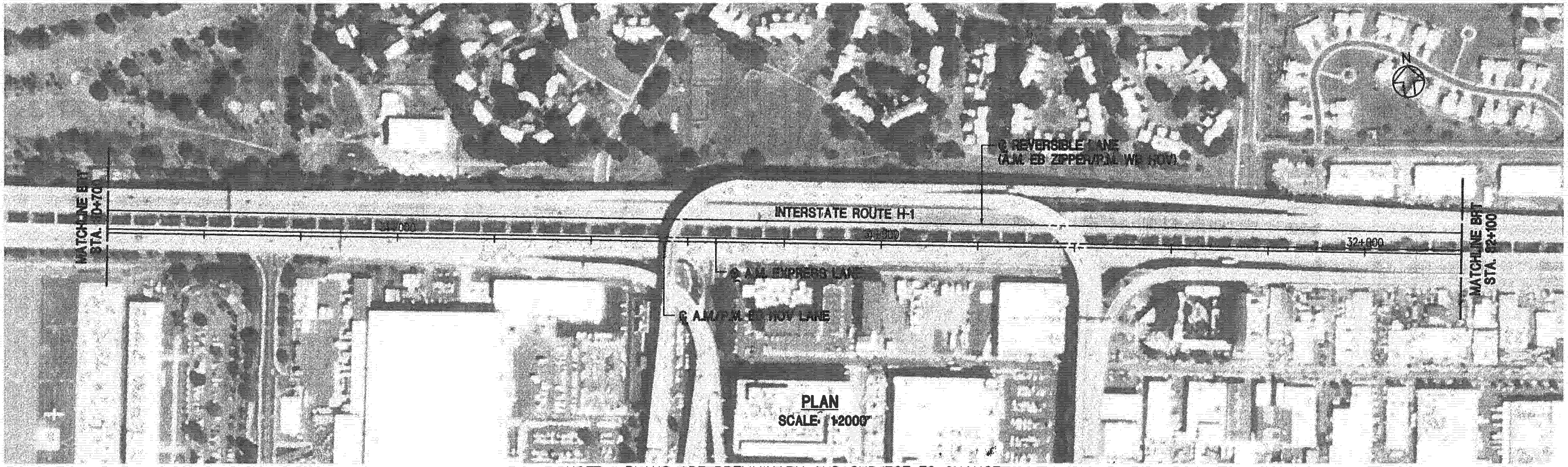
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 29+500 TO STA. 30+700

DRAWING NO. BRT-18
DATE: 7-24-00
SHEET NO.

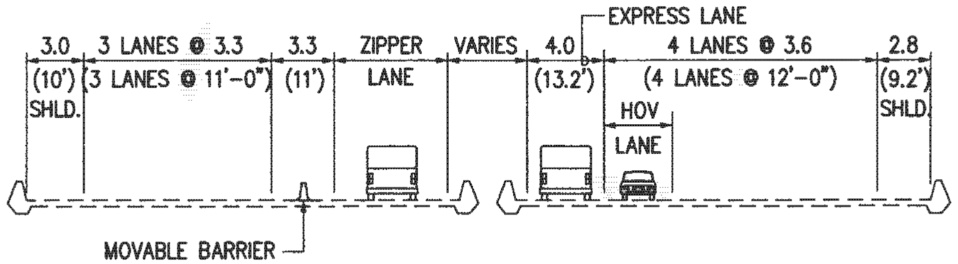
Last Saved: J:\PRIMCOR\BRT\Brt-pl18.dwg 07/19/00 at 15:55

AR00047904



PLAN
SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE

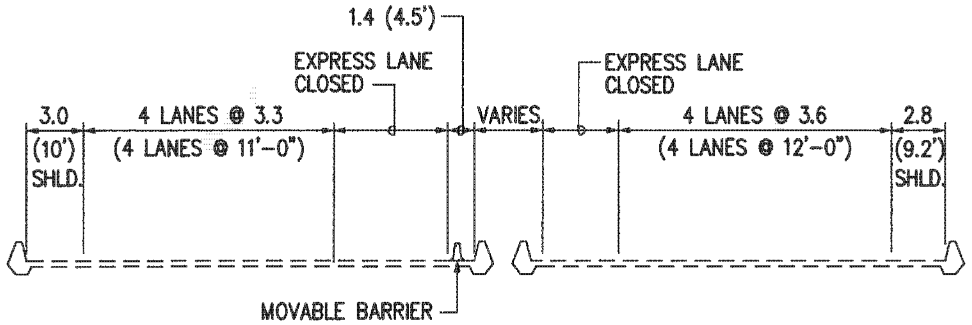


WESTBOUND EASTBOUND

A.M. PEAK PERIOD

H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200

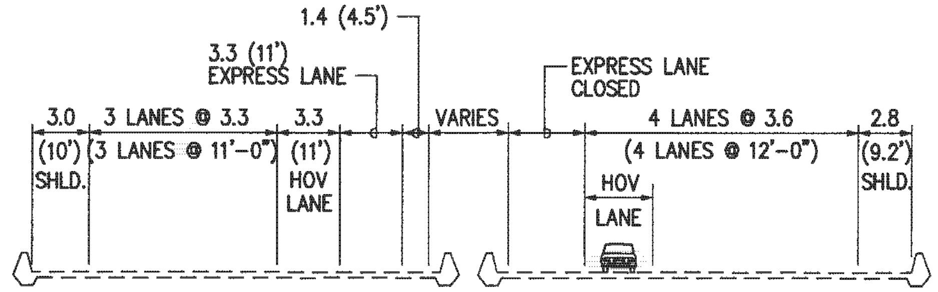


WESTBOUND EASTBOUND

OFF PEAK PERIOD

H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200



WESTBOUND EASTBOUND

P.M. PEAK PERIOD

H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

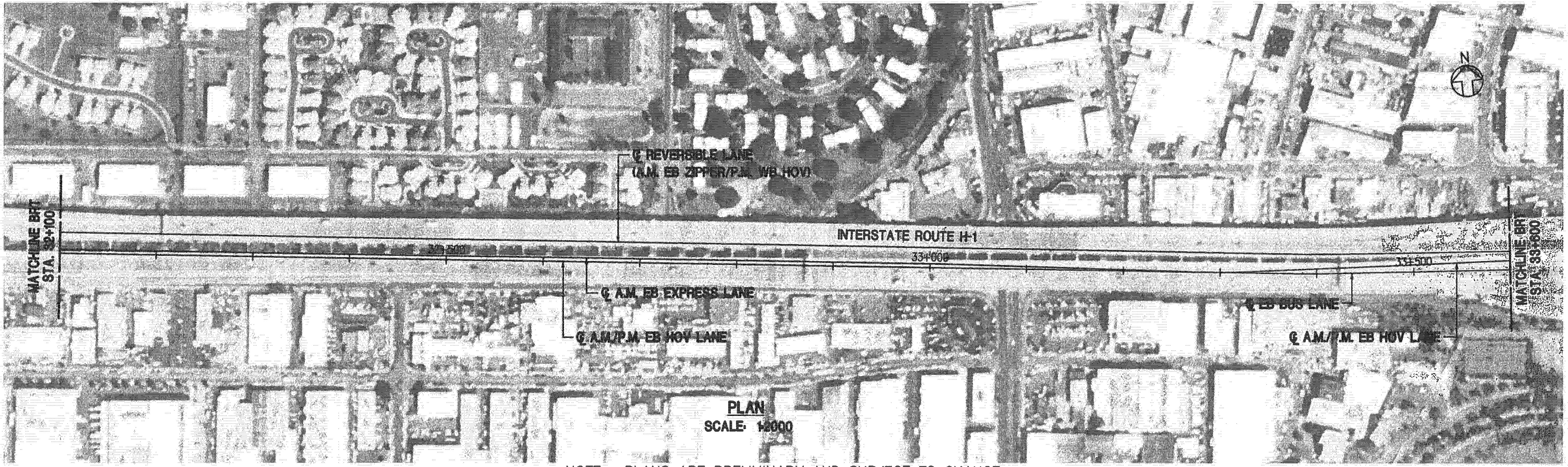
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 30+700 TO STA. 32+100

DRAWING NO. BRT-19

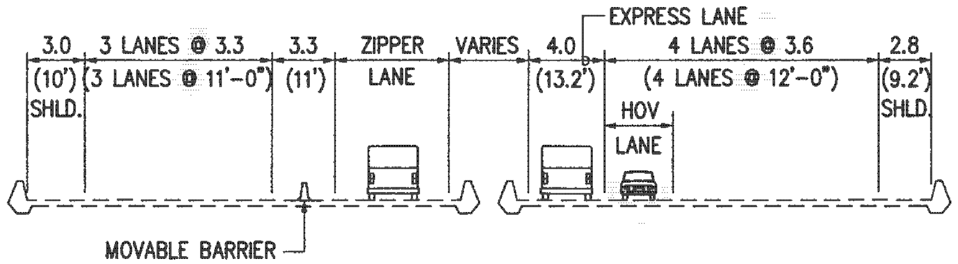
DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl19.dwg 07/19/00 at 15:55

AR00047905



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



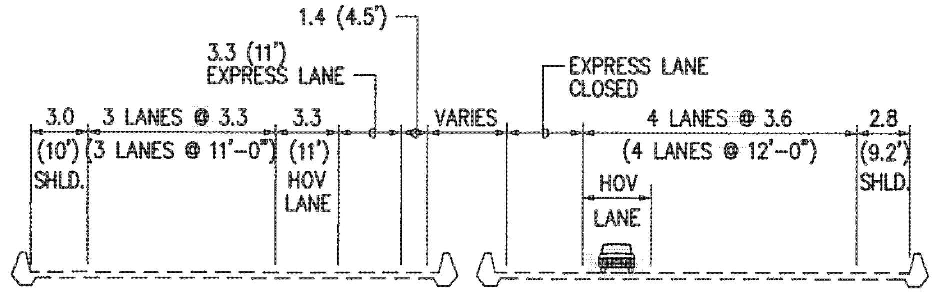
WESTBOUND

EASTBOUND

A.M. PEAK PERIOD

H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200



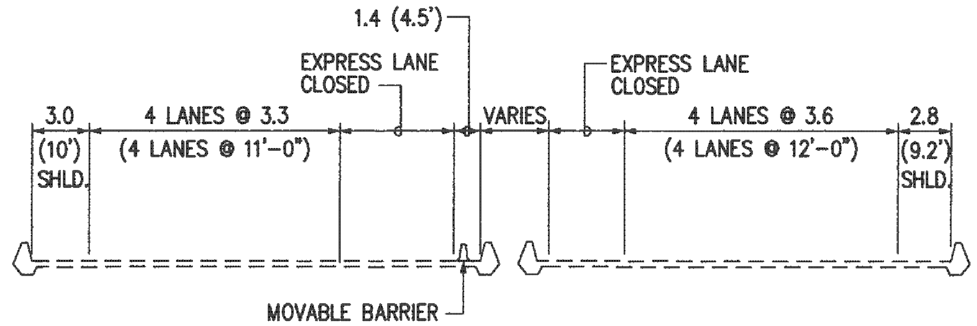
WESTBOUND

EASTBOUND

P.M. PEAK PERIOD

H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200



WESTBOUND

EASTBOUND

OFF PEAK PERIOD

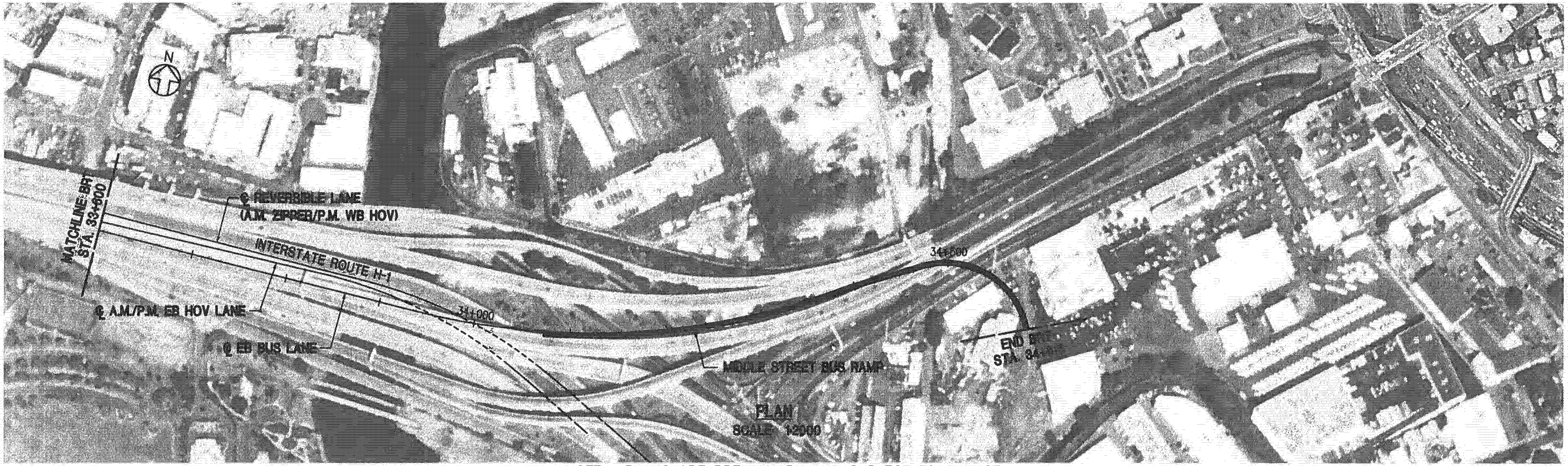
H-1 AIRPORT VIADUCT SECTION

SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

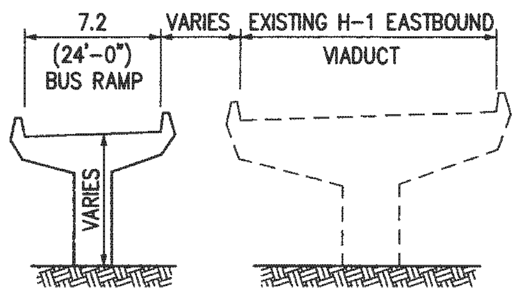
REV.	DATE	DESCRIPTION	PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200	REGIONAL BRT PLAN AND TYPICAL SECTIONS STA. 32+100 TO STA. 33+600	DRAWING NO. BRT-20 DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl20.dwg 07/19/00 at 15:56



PLAN
SCALE: 1:2000

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



MIDDLE STREET BUS RAMP
SCALE: 1:200

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	10/29/99	REVISED MIDDLE ST. RAMP LAYOUT

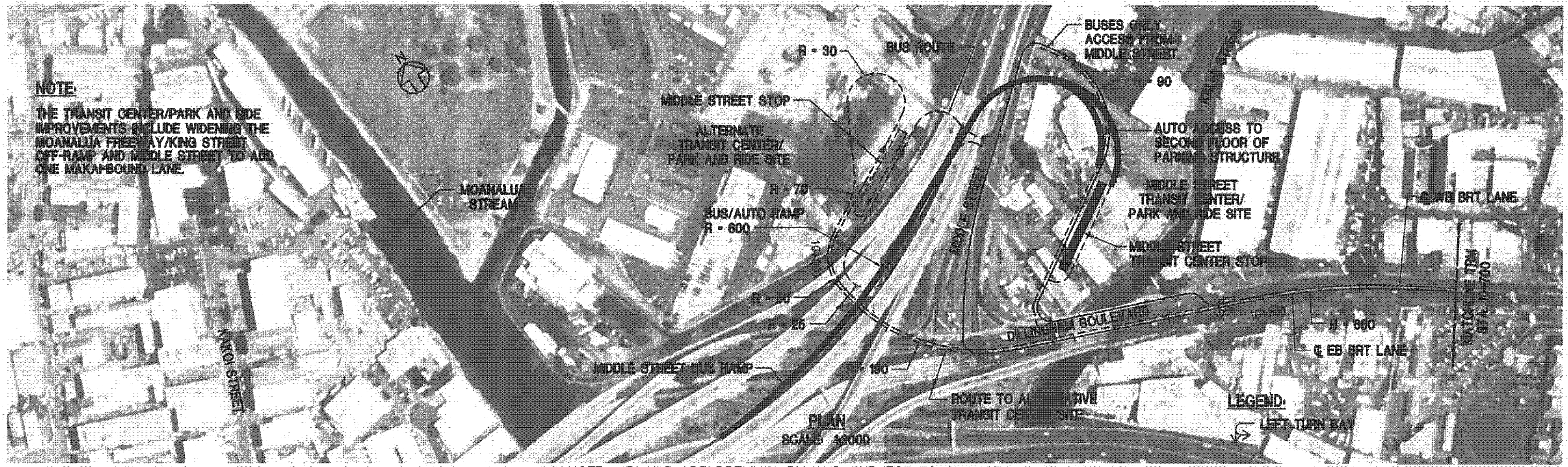
PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 5 0 5 10 FULL SIZE SCALE: 1:200

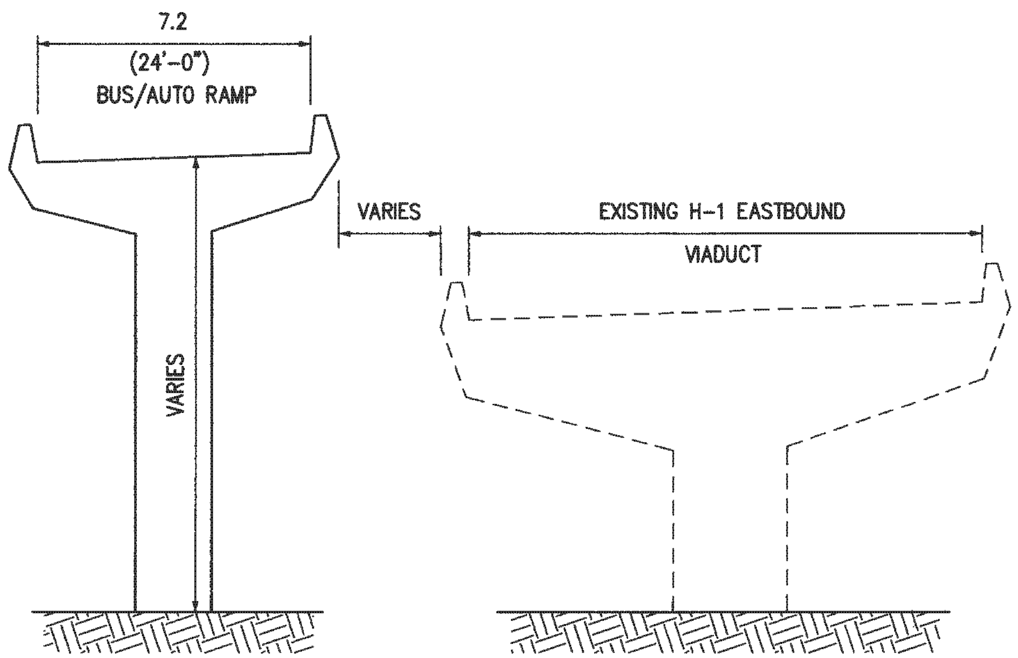
REGIONAL BRT
PLAN AND TYPICAL SECTIONS
STA. 33+600 TO STA. 34+616

DRAWING NO. BRT-21
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\BRT\Brt-pl21_VOL1.dwg 07/19/00 at 15:56

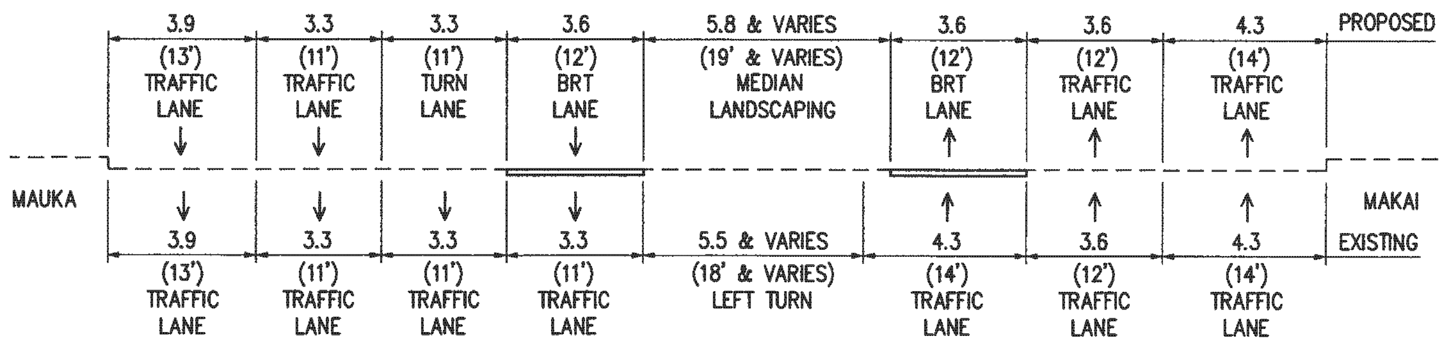


NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



MIDDLE STREET BUS RAMP

SCALE: 1:100



KAMEHAMEHA HIGHWAY (DILLINGHAM BLVD.)

(MIDDLE ST. TO LAUMAKA ST.)

SCALE: 1:100

NOTES: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
PROPOSED IMPROVEMENTS ARE FOR BRT ALT. & BRT W/ SISP ALT. UNLESS INDICATED OTHERWISE.

REV.	DATE	DESCRIPTION
1	3/7/00	REVISED TRANSIT CENTER LAYOUT

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 10+000 TO STA. 10+700

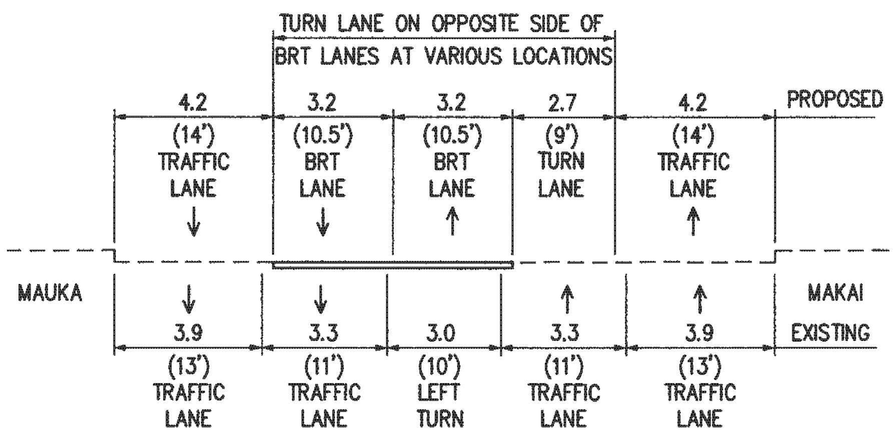
DRAWING NO. TRM-1

DATE: 7-24-00 SHEET NO.

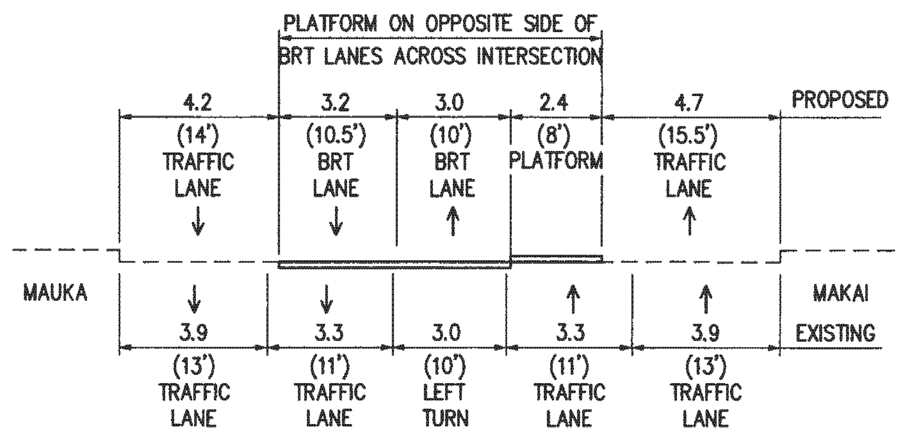
Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-01.dwg 07/18/00 at 16:39

AR00047908

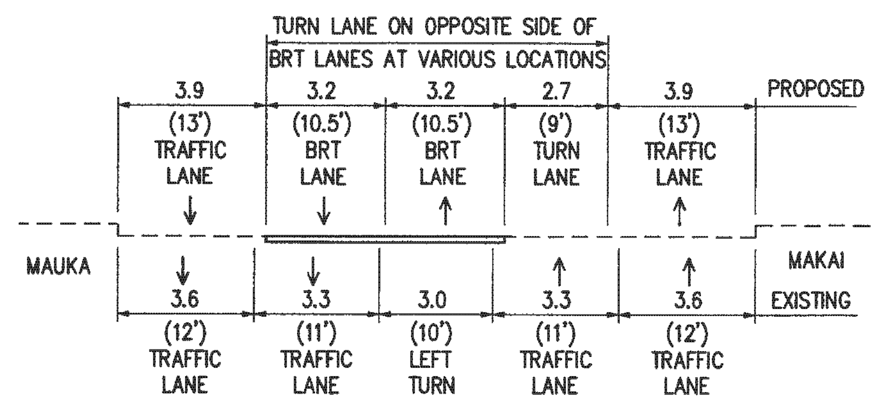
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



DILLINGHAM BOULEVARD
(LAUMAKA ST. TO WAIAKAMILO ST.)
SCALE: 1:100



KALIHI STOP
SCALE: 1:100



DILLINGHAM BOULEVARD
(WAIAKAMILO RD. TO KOHOU ST.)
(KOKEA ST. TO KAAAHI ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	7/24/00	WIDENED CURBSIDE LANES

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

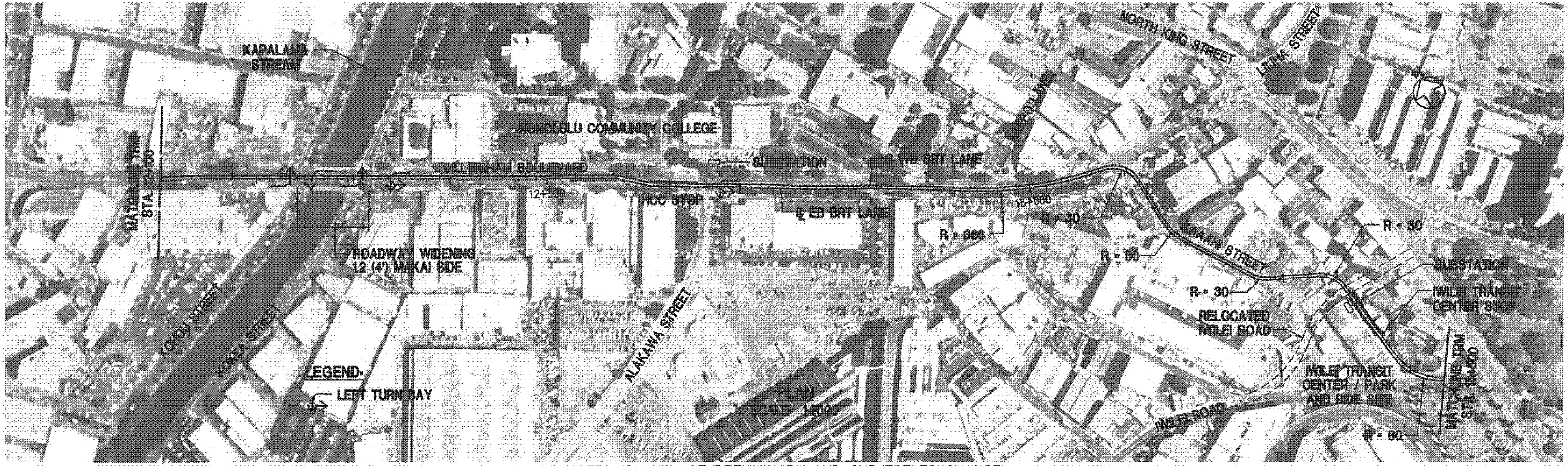
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 10+700 TO STA. 12+100

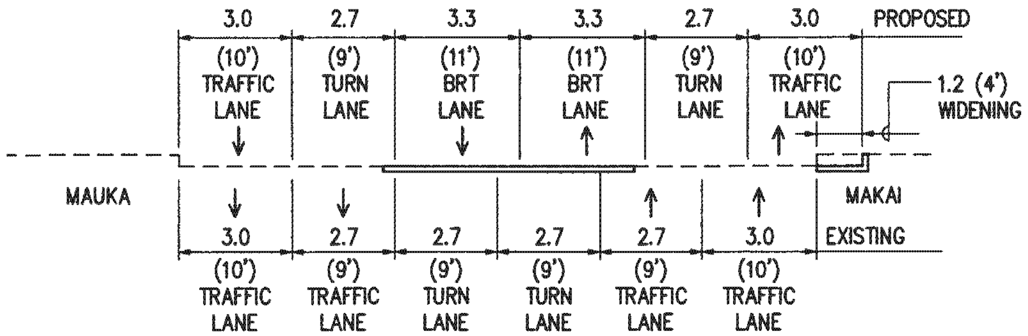
DRAWING NO. TRM-2
DATE: 7-24-00 | SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-02.dwg 07/24/00 at 09:19

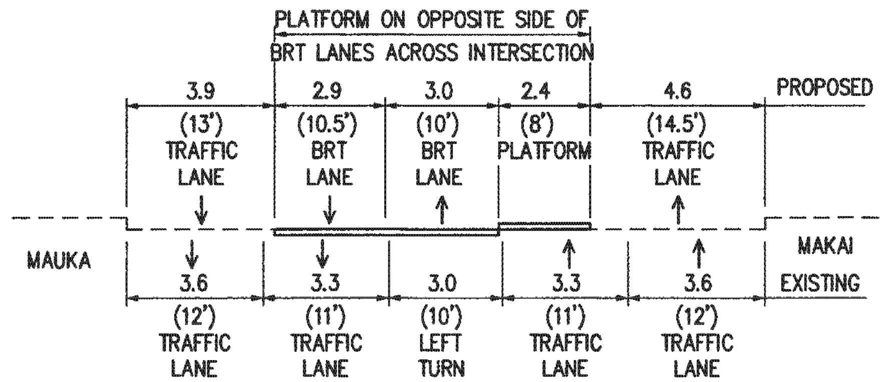
AR00047909



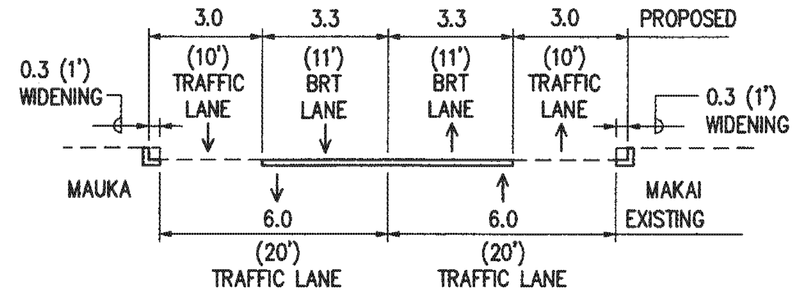
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



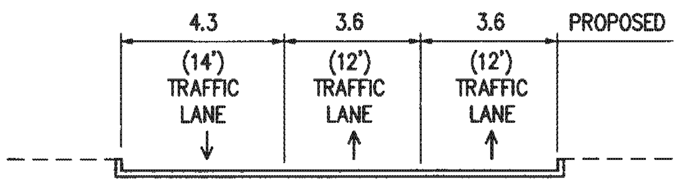
DILLINGHAM BOULEVARD
(KOHOU ST. TO KOKEA ST.)
SCALE: 1:100



HCC STOP
SCALE: 1:100



KAAAHI STREET
(DILLINGHAM BLVD. TO RELOCATED IWILEI RD.)
SCALE: 1:100



RELOCATED IWILEI ROAD
(IWILEI RD. TO N. KING ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	7/24/00	WIDENED CURBSIDE LANES
1	10/29/99	REVISED IWILEI TRANSIT CENTER LAYOUT

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

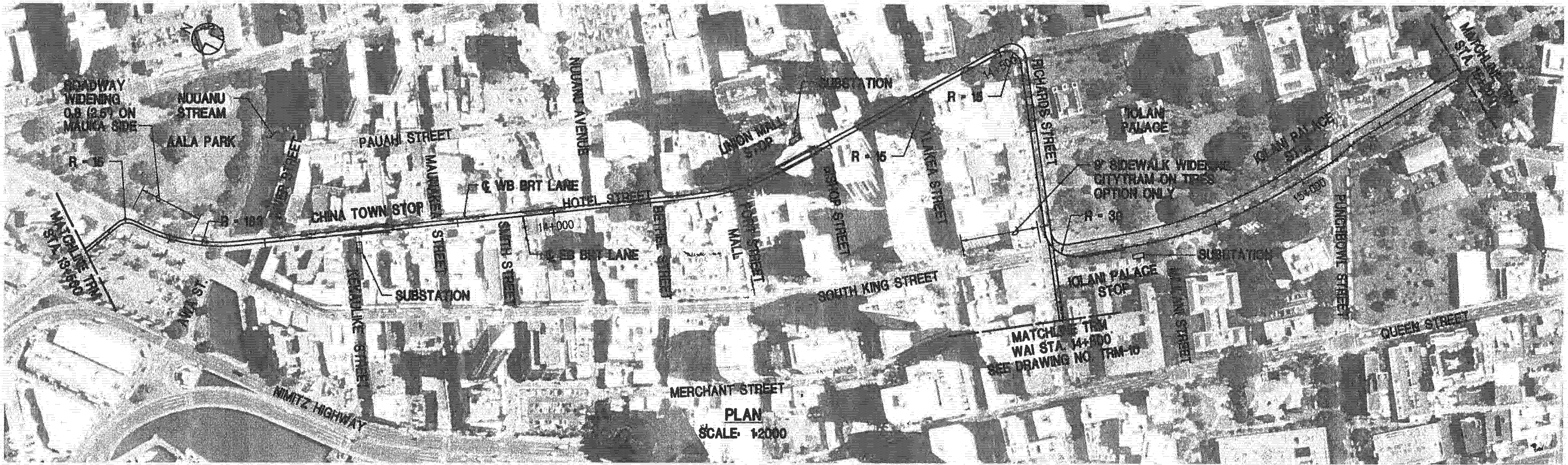
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTION
STA. 12+100 TO STA. 13+500

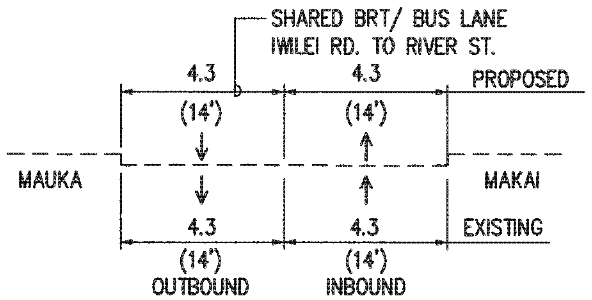
DRAWING NO. TRM-3
DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-03.dwg 07/24/00 at 09:32

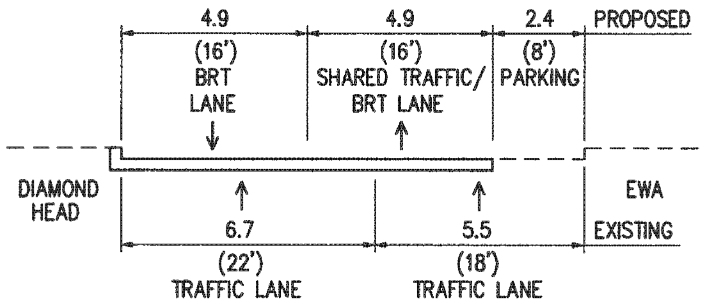
AR00047910



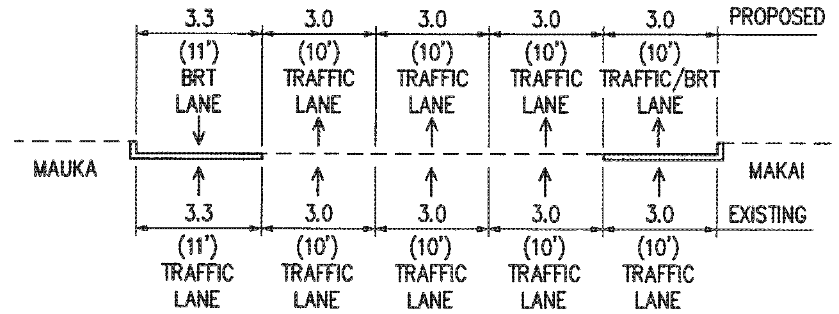
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



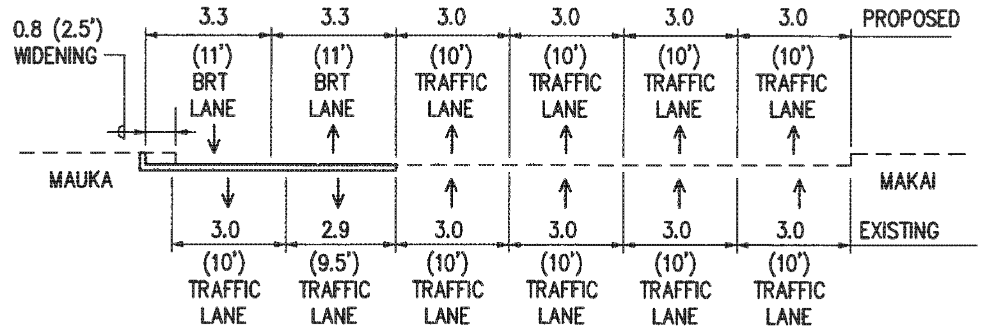
HOTEL STREET
(N. KING ST. TO RICHARDS ST.)
SCALE: 1:100



RICHARDS STREET
(HOTEL ST. TO S. KING ST.)
SCALE: 1:100



SOUTH KING STREET
(RICHARDS ST. TO MILILANI ST.)
SCALE: 1:100



NORTH KING STREET
(IWILEI RD. TO HOTEL ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

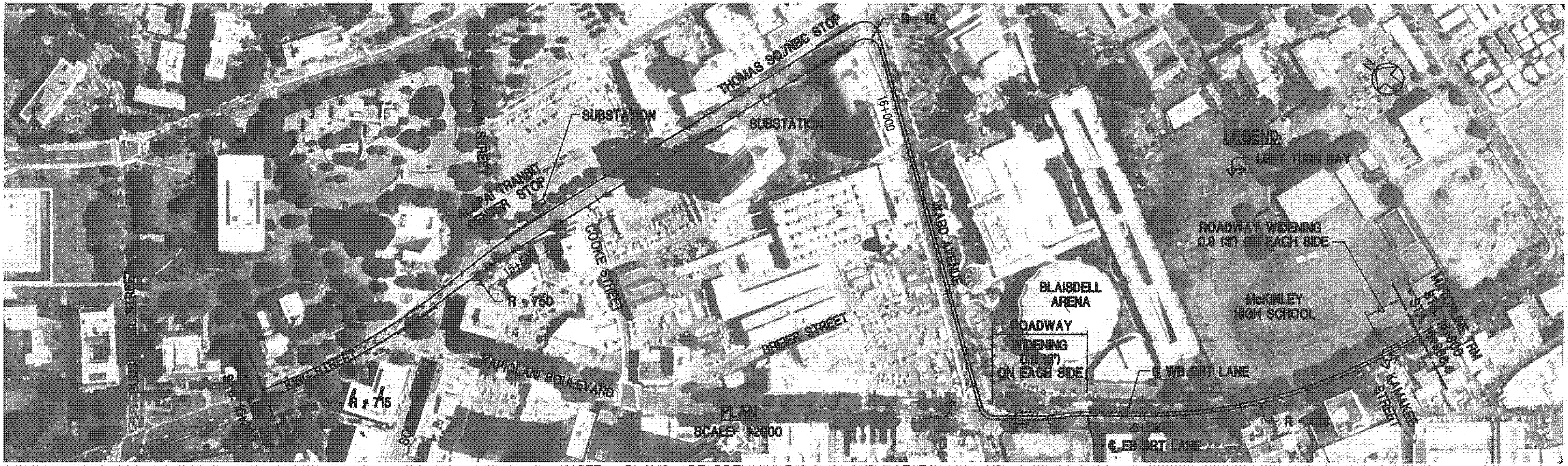
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 13+500 TO STA. 15+200

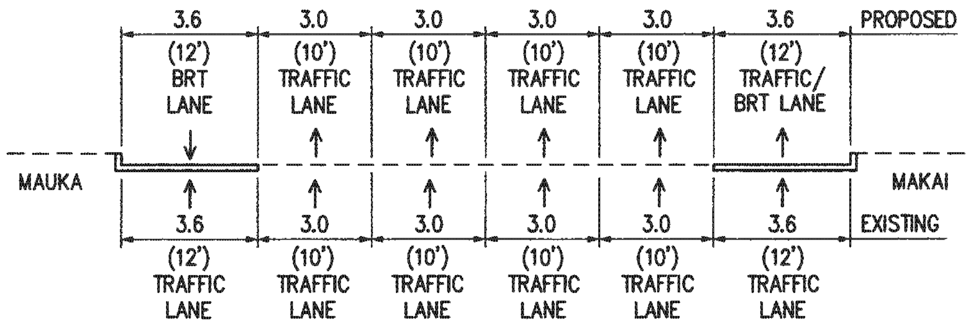
DRAWING NO. TRM-4
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-04.dwg 07/19/00 at 16:35

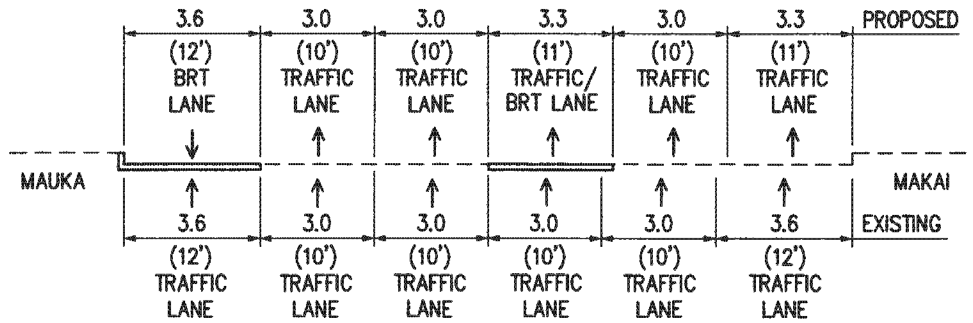
AR00047911



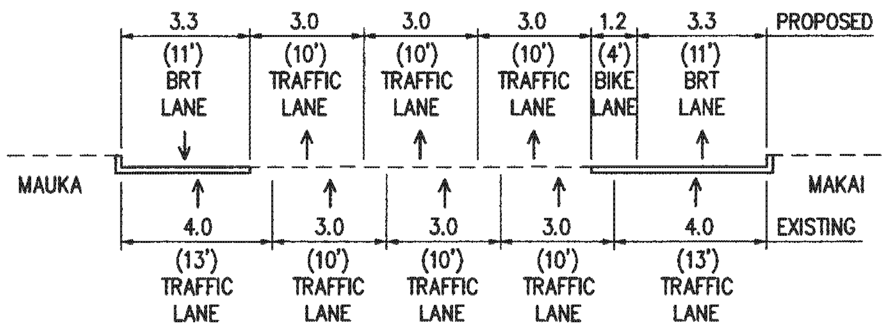
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



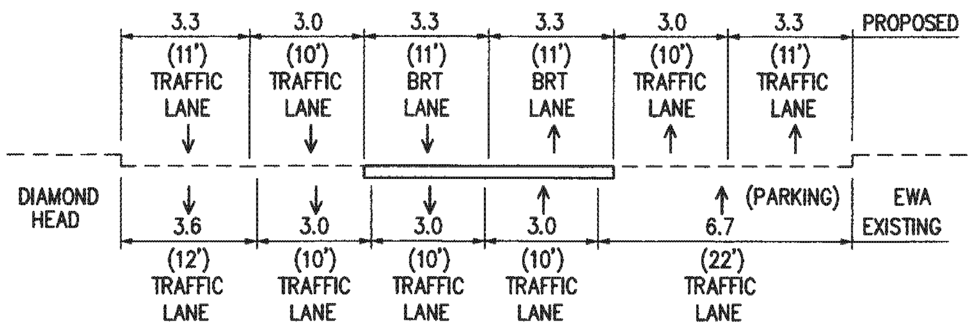
SOUTH KING STREET
(MILILANI ST. TO PUNCHBOWL ST.)
SCALE: 1:100



SOUTH KING STREET
(PUNCHBOWL ST. TO ALAPAI ST.)
SCALE: 1:100



SOUTH KING STREET
(ALAPAI ST. TO WARD AVE.)
SCALE: 1:100



WARD AVENUE
(S. KING ST. TO KAPIOLANI BLVD.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
2	7/24/00	ADDED BIKE LANE ON SOUTH KING STREET
1	10/29/99	REVISED NBC STOP LOCATION

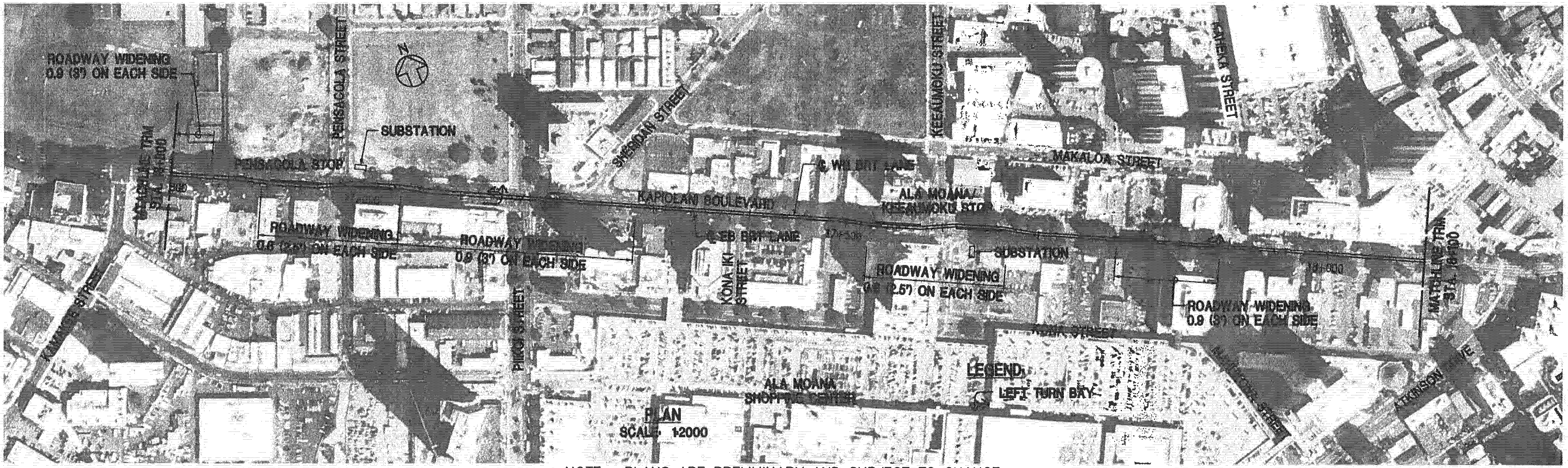
PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

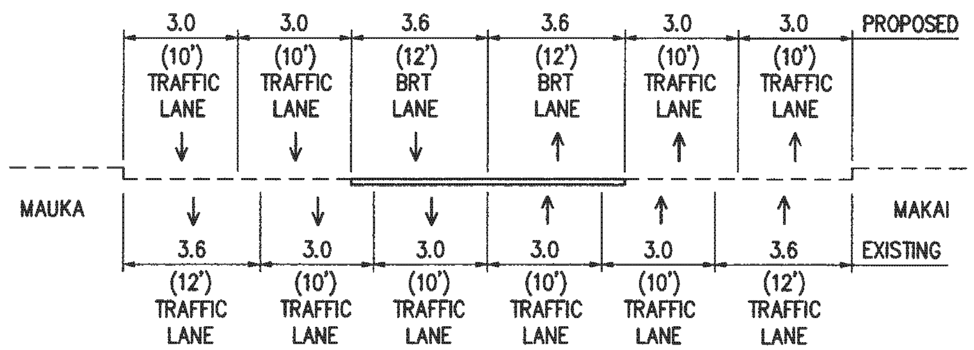
IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 15+200 TO STA. 16+800

DRAWING NO. TRM-5
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-05.dwg 07/24/00 at 09:34



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE

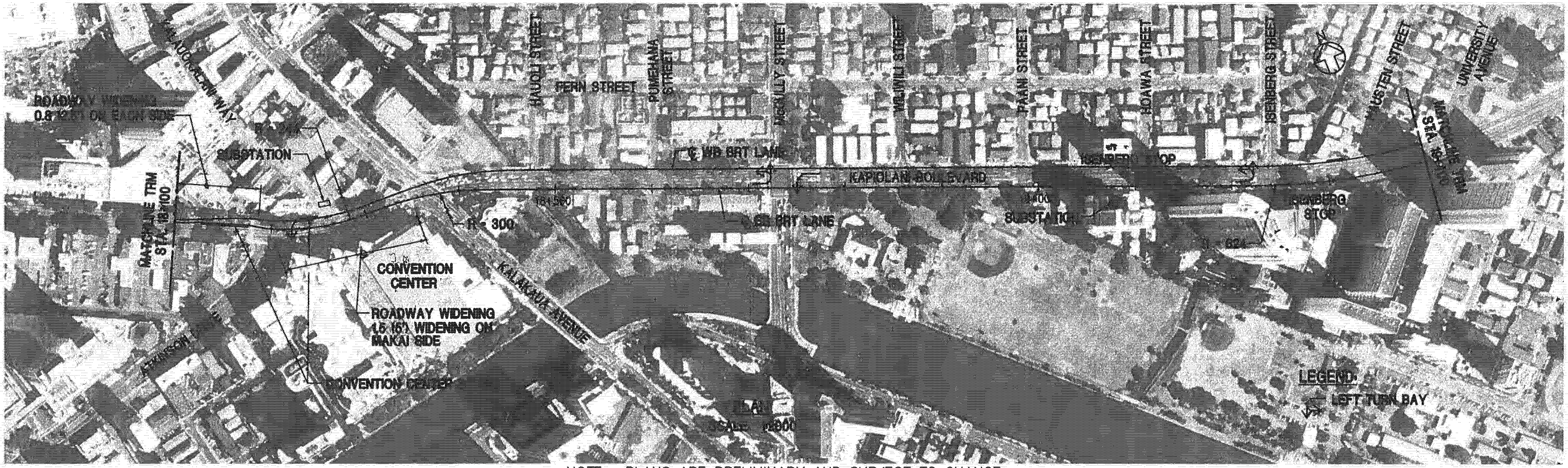


KAPIOLANI BOULEVARD
(WARD AVE. TO ATKINSON DR.)
SCALE: 1:100

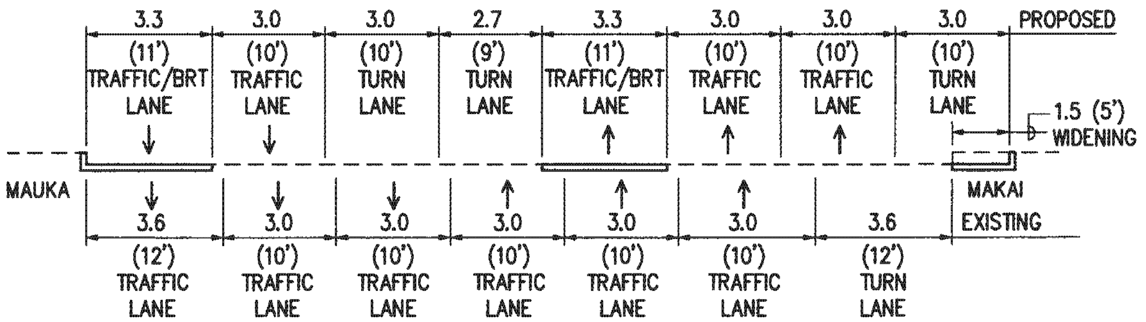
NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION				
			PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000 HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100	IN-TOWN BRT PLAN AND TYPICAL SECTIONS STA. 16+800 TO STA. 18+100	DRAWING NO. TRM-6 DATE: 7-24-00 SHEET NO.

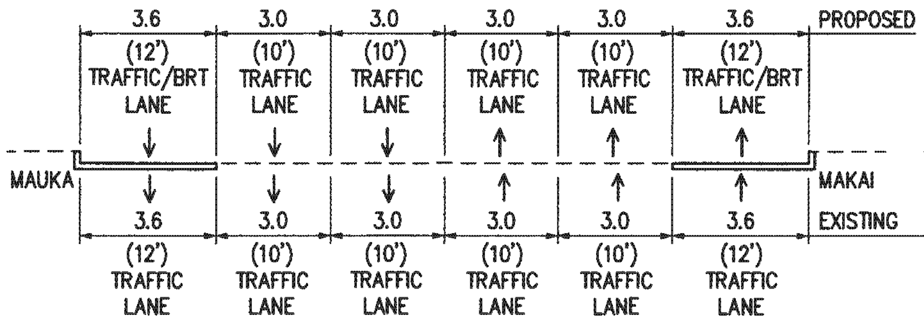
Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-06.dwg 07/19/00 at 17:30



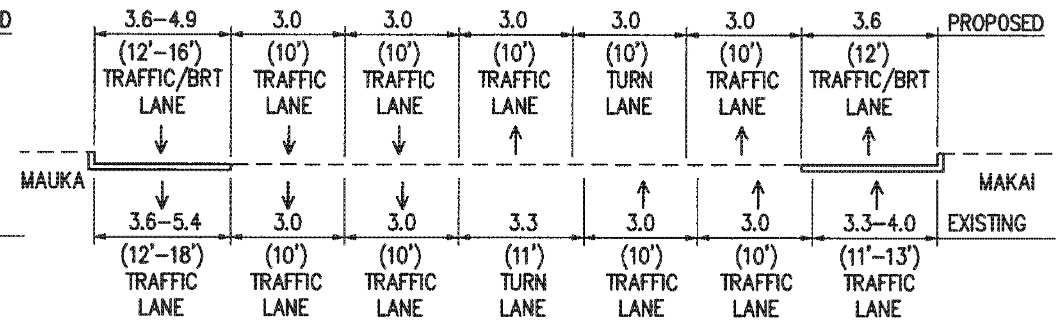
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



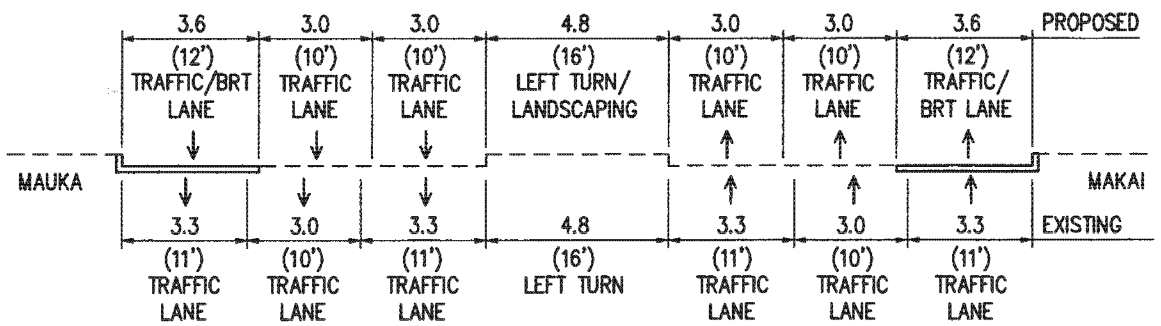
KAPIOLANI BOULEVARD
(ATKINSON DR. TO KALAKAUA AVE.)
SCALE: 1:100



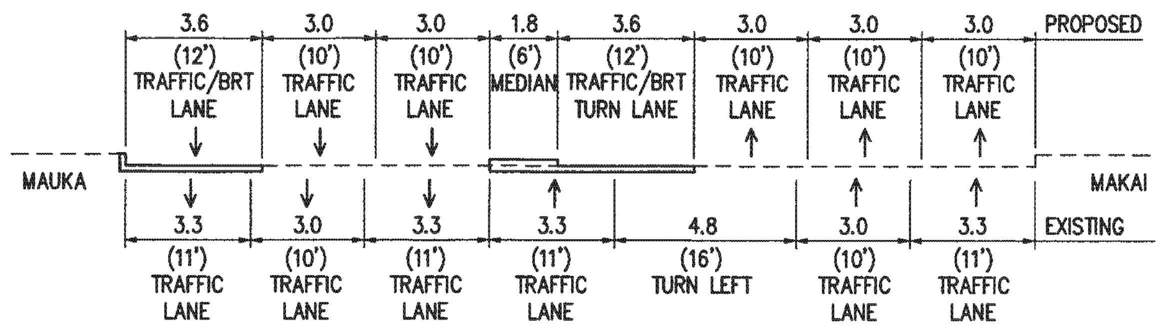
KAPIOLANI BOULEVARD
(KALAKAUA AVE. TO PUMEHANA ST.)
SCALE: 1:100



KAPIOLANI BOULEVARD
(PUMEHANA ST. TO WILIWILI ST.)
SCALE: 1:100



KAPIOLANI BOULEVARD
(WILIWILI ST. TO ISENBERG ST.)
SCALE: 1:100



KAPIOLANI BOULEVARD
(ISENBERG ST. TO UNIVERSITY AVE.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	3/11/00	REVISED KAPIOLANI BLVD. TYPICAL SECTIONS

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

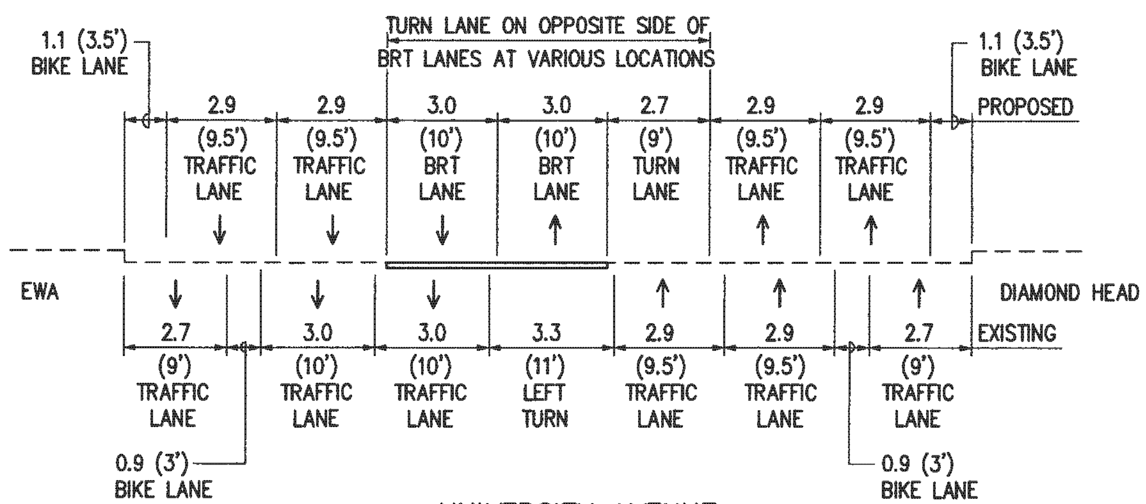
IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 18+100 TO STA. 19+400

DRAWING NO. TRM-7
DATE: 7-24-00
SHEET NO.

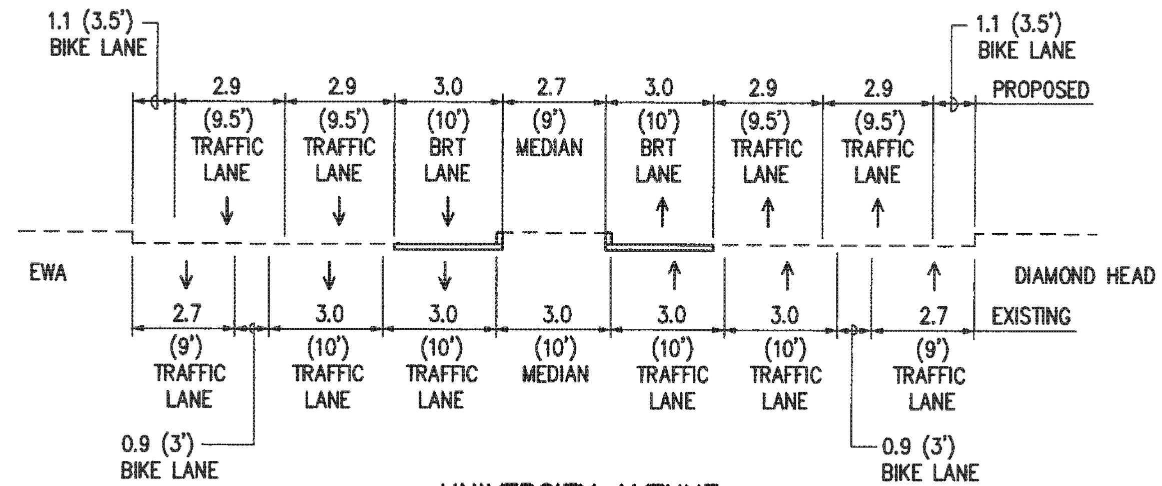
Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-07.dwg 07/19/00 at 18:21

AR00047914

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



UNIVERSITY AVENUE
(KAPIOLANI BLVD. TO DOLE ST.)
SCALE: 1:100



UNIVERSITY AVENUE
(KAPIOLANI BLVD. TO DOLE ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
1	7/27/00	ADDED BIKE LANE

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

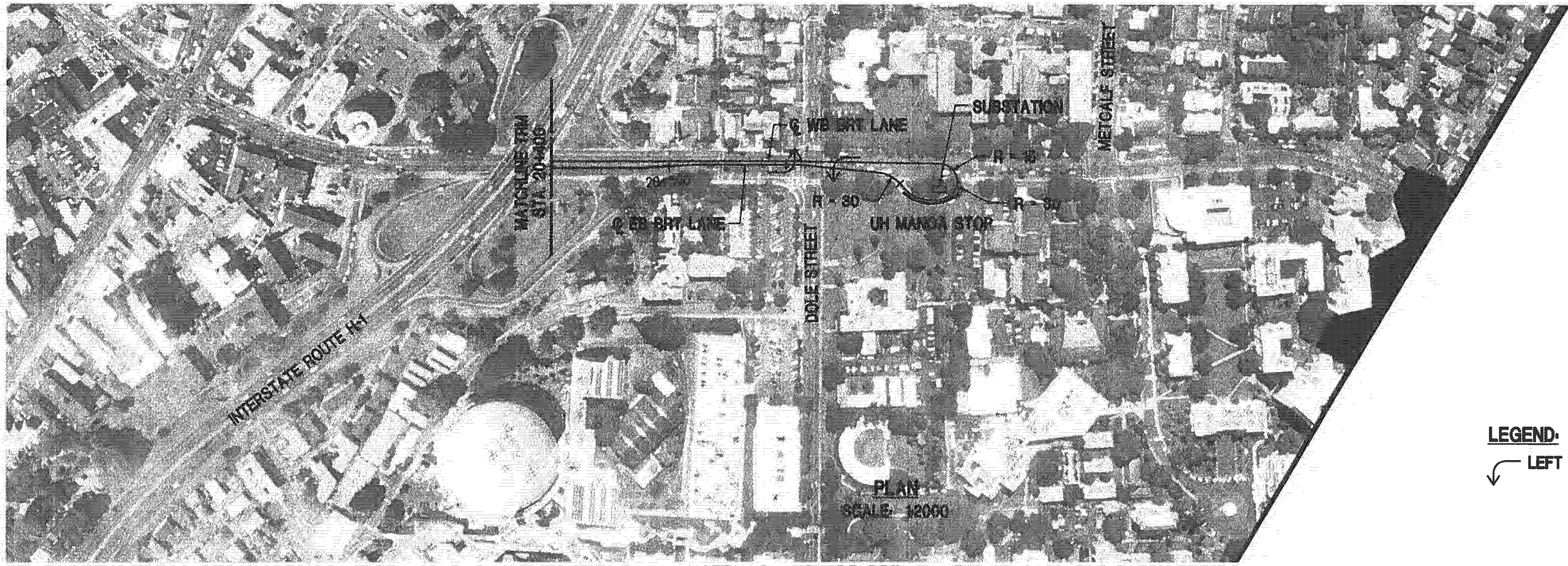
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 19+400 TO STA. 20+400

DRAWING NO. TRM-8
DATE: 7-24-00
SHEET NO.

Last Saved: Z:\PRIMCOR\TRM\TRM_WFL\TWFL-08.dwg 07/24/00 at 09:42

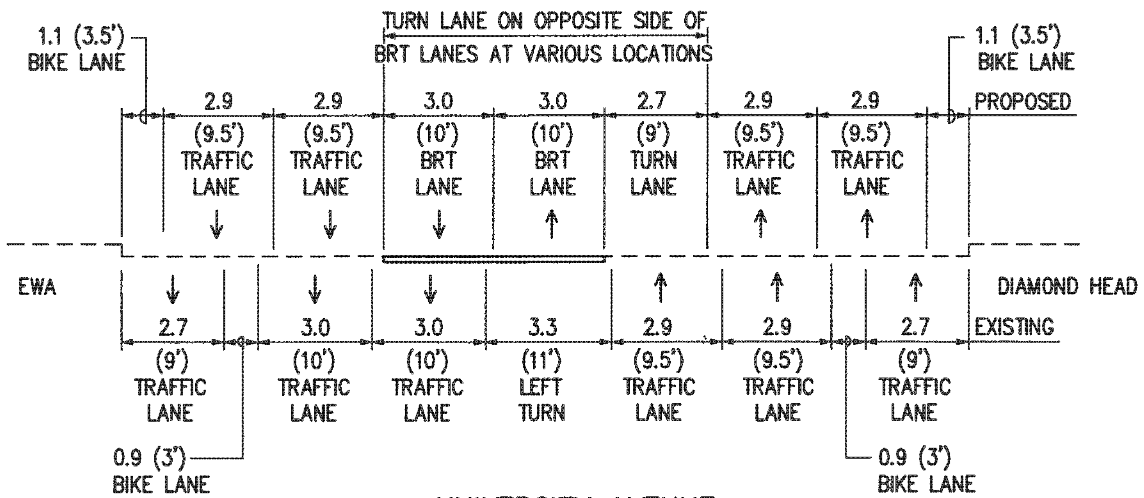
AR00047915



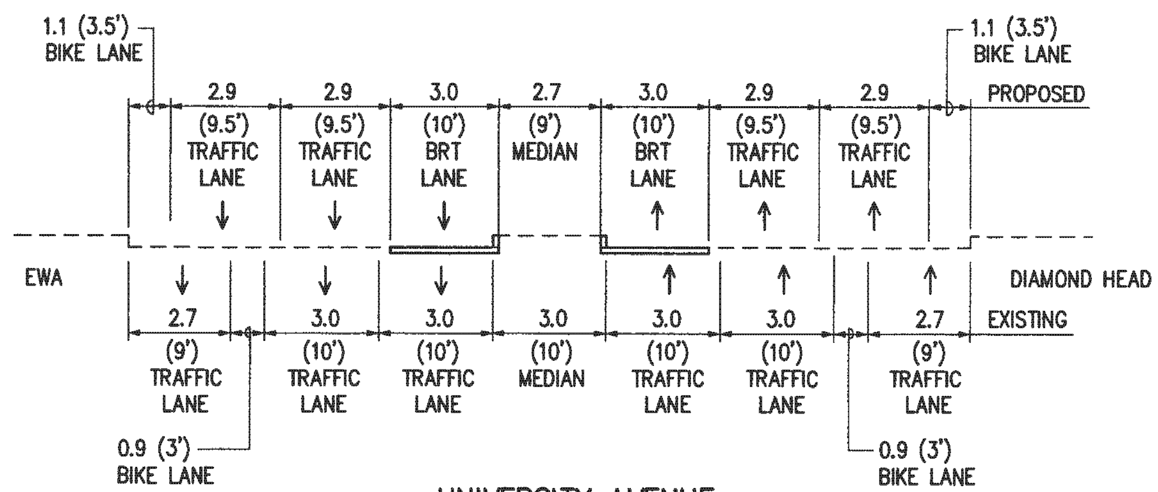
LEGEND:

LEFT TURN BAY

NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



UNIVERSITY AVENUE
(KAPIOLANI BLVD. TO DOLE ST.)
SCALE: 1:100



UNIVERSITY AVENUE
(KAPIOLANI BLVD. TO DOLE ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
2	7/27/00	ADDED BIKE LANE
1	3/11/00	DELETED VARNEY CIRCLE ALTERNATIVE STOP

PRIMARY CORRIDOR TRANSPORTATION PROJECT

CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000

HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

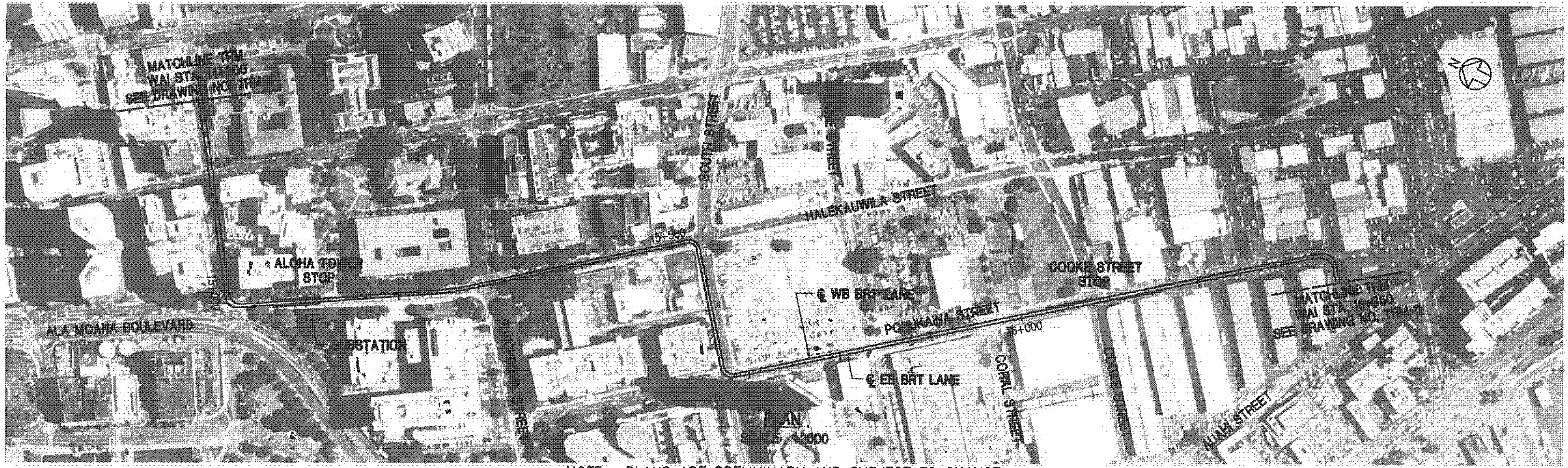
IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
STA. 20+400 TO STA. 20+700

DRAWING NO. TRM-9

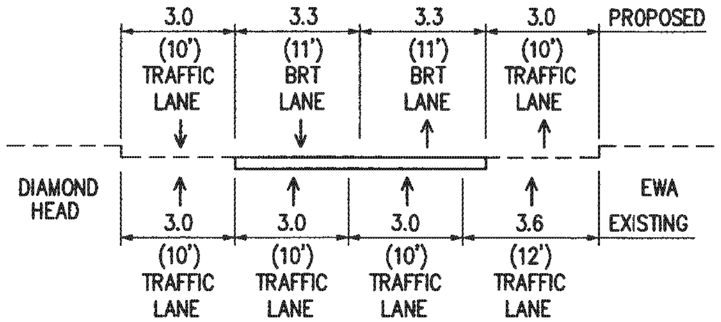
DATE: 7-24-00 | SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-09.dwg 07/24/00 at 09:44

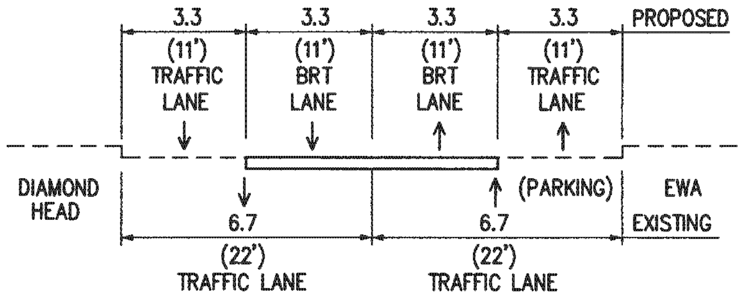
AR00047916



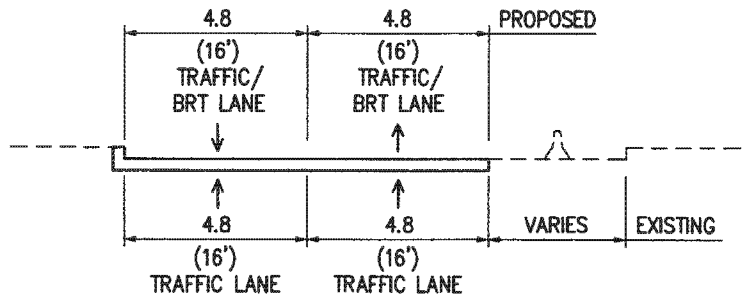
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



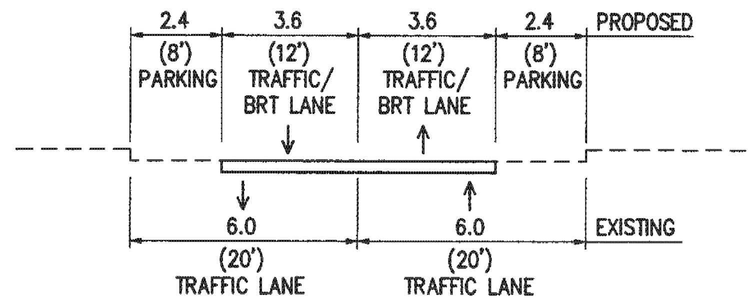
RICHARDS STREET
(S. KING ST. TO QUEEN ST.)
SCALE: 1:100



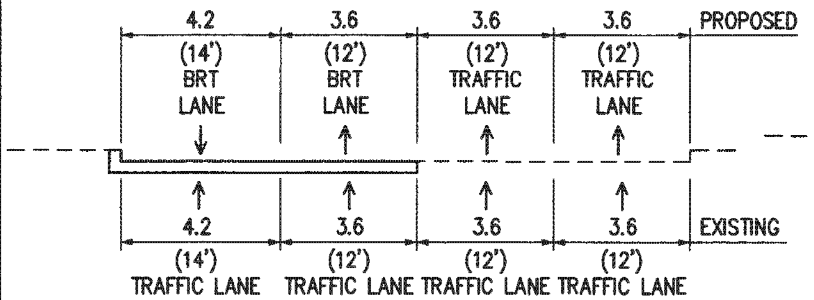
RICHARDS STREET
(QUEEN ST. TO ALA MOANA BLVD.)
SCALE: 1:100



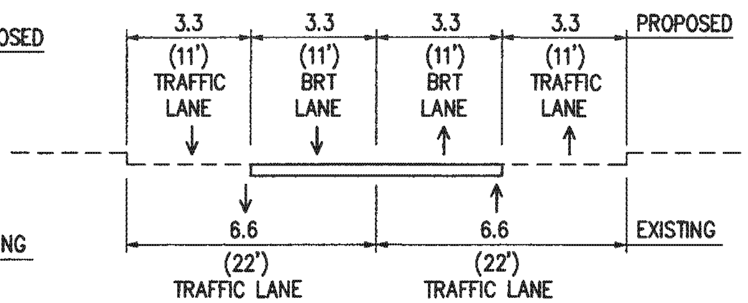
HALEKAUWILA STREET
(RICHARDS ST. TO PUNCHBOWL ST.)



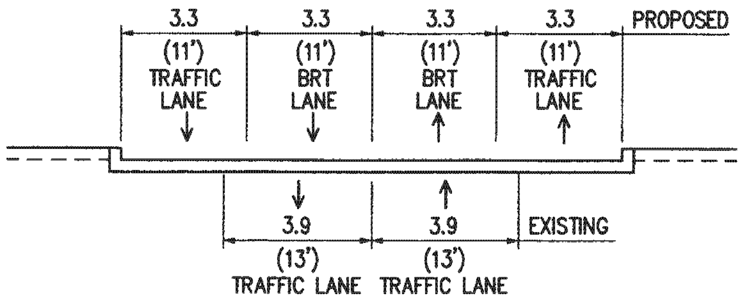
HALEKAUWILA STREET
(PUNCHBOWL ST. TO SOUTH ST.)



SOUTH STREET
(HALEKAUWILA ST. TO POHUKAINA ST.)

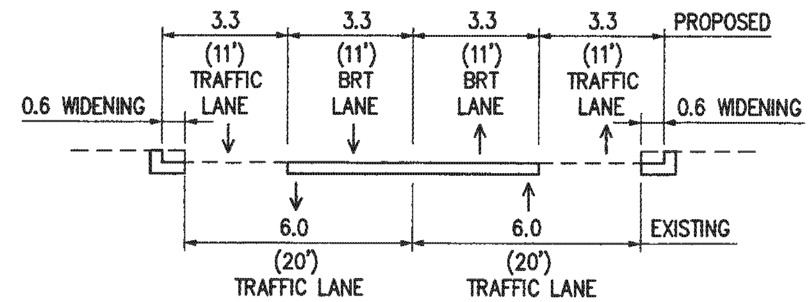


POHUKAINA STREET
(SOUTH ST. TO COOKE ST.)
SCALE: 1:100



POHUKAINA STREET
(COOKE ST. TO KOULA ST.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE



POHUKAINA STREET
(KOULA ST. TO KAMANI ST.)
SCALE: 1:100

REV.	DATE	DESCRIPTION
3	7/27/00	REALIGNED BRT ONTO HALEKAUWILA STREET
2	7/27/00	DELETED ILALO ST. OPTIONAL ALIGNMENT
1	3/11/00	NEW SHEET

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100
FULL SIZE SCALE: 1:2000

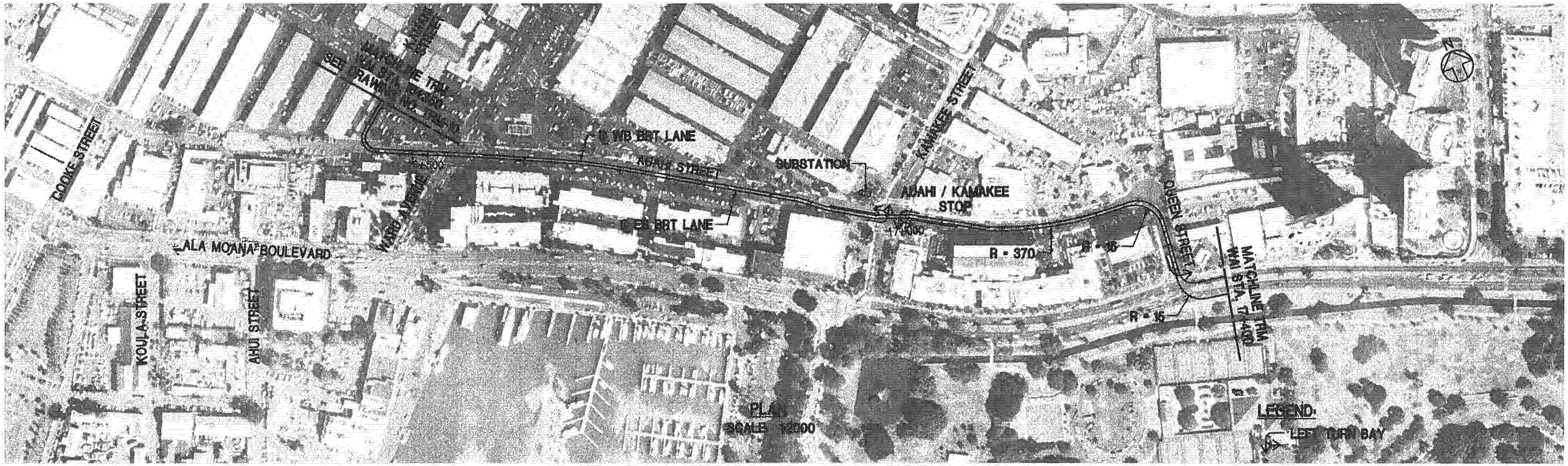
HORIZ. = 2.5 0 2.5 5
FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
WAI STA. 14+800 TO WAI STA. 16+350

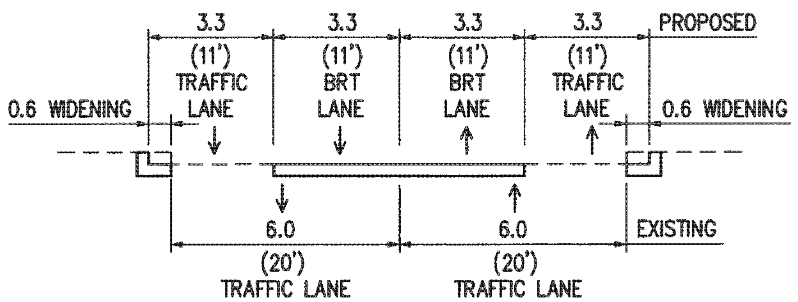
DRAWING NO. TRM-10
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-10A.dwg 07/24/00 at 09:49

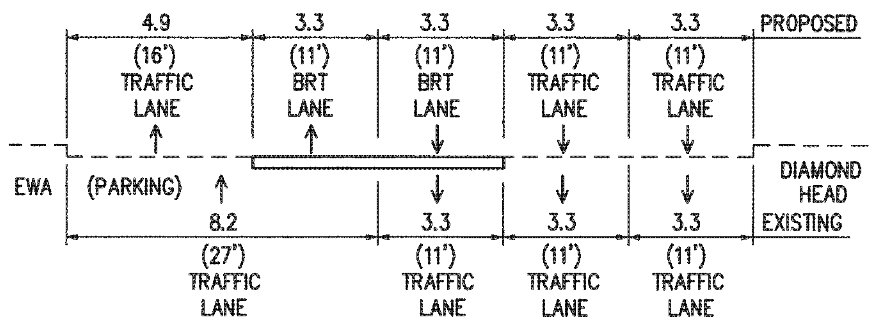
AR00047917



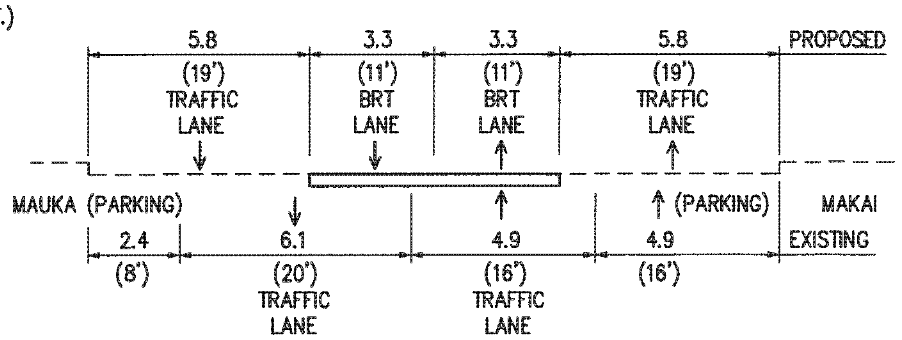
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



KAMANI STREET
(POHUKAINA ST. TO AUAHI ST.)
SCALE: 1:100

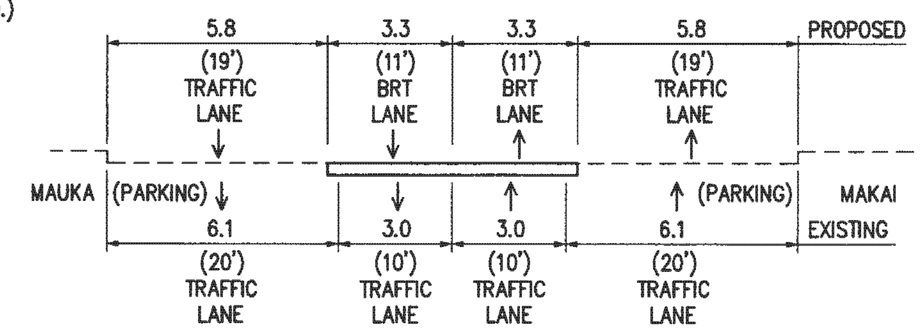


QUEEN STREET
(AUAHI ST. TO ALA MOANA BLVD.)
SCALE: 1:100



AUAHI STREET
(KAMANI ST. TO WARD AVE.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE



AUAHI STREET
(WARD AVE. TO QUEEN ST.)
SCALE: 1:100

REV.	DATE	DESCRIPTION
1	7/13/00	DELETED ILALO ST. OPTIONAL ALIGNMENT

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

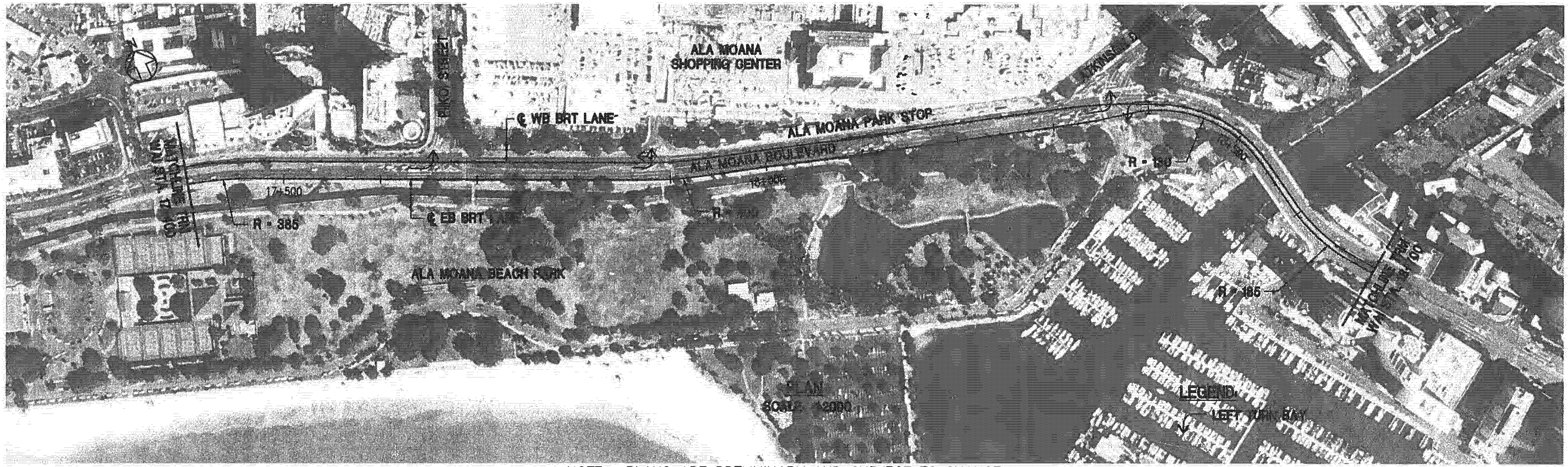
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
WAI STA. 16+350 TO WAI STA. 17+400

DRAWING NO. TRM-11
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-11.dwg 07/24/00 at 10:01

AR00047918



NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE

ALA MOANA BOULEVARD
(QUEEN ST. TO PIIKOI ST.)
SCALE: 1:100

MAUKA → MAKAI

PROPOSED	3.3 (11') TRAFFIC LANE ↓	3.0 (10') TRAFFIC LANE ↓	3.3 (11') BRT LANE ↓	6.1 (20') MEDIAN	3.0 (10') TRAFFIC LANE ↑	3.0 (10') TRAFFIC LANE ↑	3.6 (12') BRT LANE ↑
EXISTING	3.6 (12') TRAFFIC LANE ↓	3.0 (10') TRAFFIC LANE ↓	3.0 (10') TRAFFIC LANE ↓	6.1 (20') MEDIAN	3.0 (10') TRAFFIC LANE ↑	3.0 (10') TRAFFIC LANE ↑	3.6 (12') TRAFFIC LANE ↑

ALA MOANA BOULEVARD
(PIIKOI ST. TO ATKINSON DRIVE)
SCALE: 1:100

MAUKA → MAKAI

PROPOSED	4.3 (14') TRAFFIC LANE ↓	3.6 (12') TRAFFIC LANE ↓	3.6 (12') BRT LANE ↓	6.1 (20') MEDIAN	3.6 (12') TRAFFIC LANE ↑	3.6 (12') TRAFFIC LANE ↑	4.3 (14') BRT LANE ↑
EXISTING	4.3 (14') TRAFFIC LANE ↓	3.6 (12') TRAFFIC LANE ↓	3.6 (12') TRAFFIC LANE ↓	6.1 (20') MEDIAN	3.6 (12') TRAFFIC LANE ↑	3.6 (12') TRAFFIC LANE ↑	4.3 (14') TRAFFIC LANE ↑

ALA MOANA BOULEVARD
(AT ALA WAI CANAL BRIDGE)
SCALE: 1:100

MAUKA → MAKAI

PROPOSED	4.6 (15') TRAFFIC LANE ↓	3.3 (11') TRAFFIC LANE ↓	3.3 (11') BRT LANE ↓	3.6 (12') MEDIAN	3.3 (11') BRT LANE ↑	3.3 (11') TRAFFIC LANE ↑	4.6 (15') TRAFFIC LANE ↑
EXISTING	4.6 (15') TRAFFIC LANE ↓	3.3 (11') TRAFFIC LANE ↓	3.3 (11') TRAFFIC LANE ↓	3.6 (12') MEDIAN	3.3 (11') TRAFFIC LANE ↑	3.3 (11') TRAFFIC LANE ↑	4.6 (15') TRAFFIC LANE ↑

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

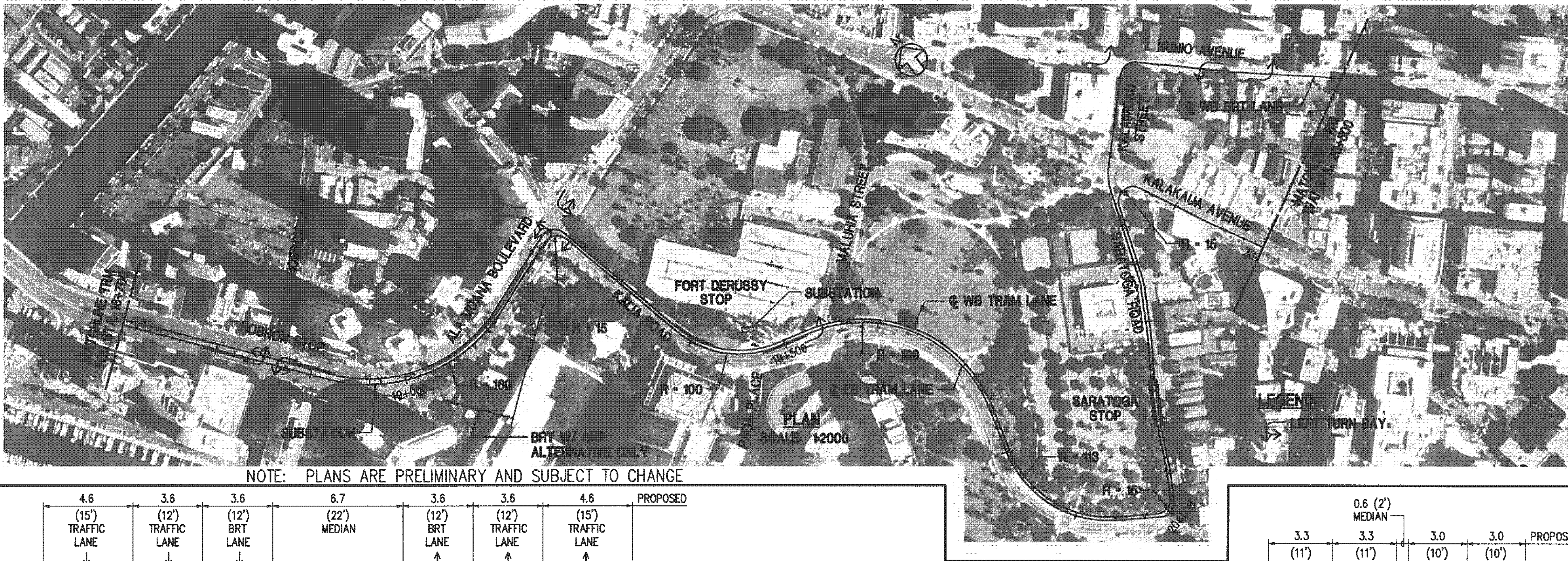
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
WAI STA. 17+400 TO WAI STA. 18+700

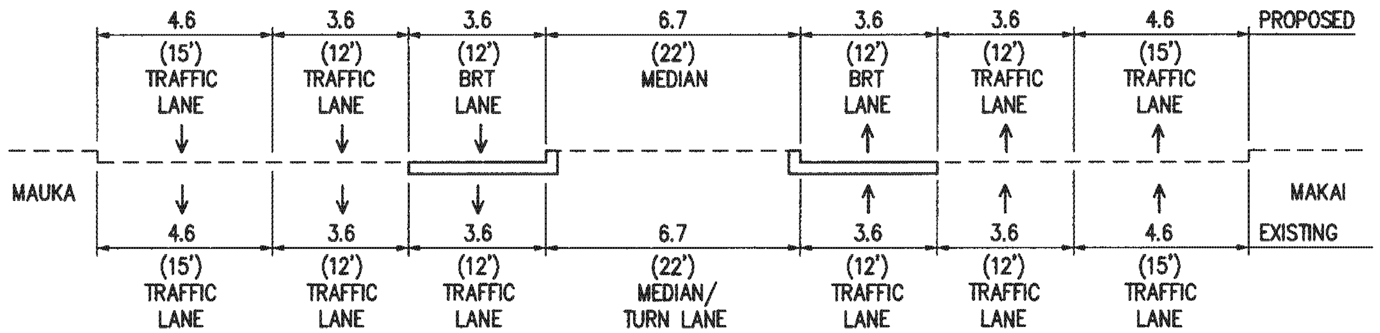
DRAWING NO. TRM-12
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-12.dwg 07/24/00 at 10:01

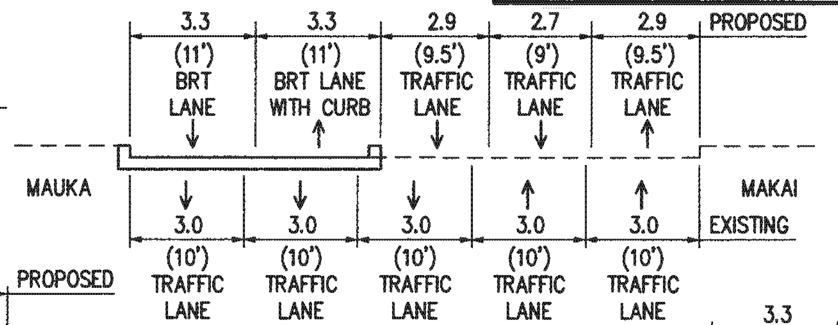
AR00047919



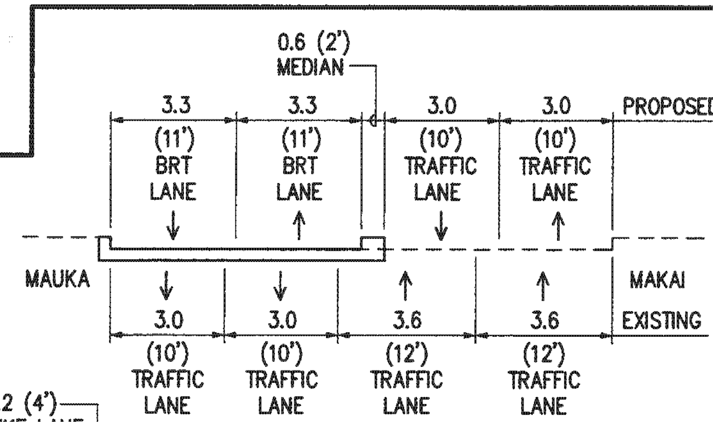
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



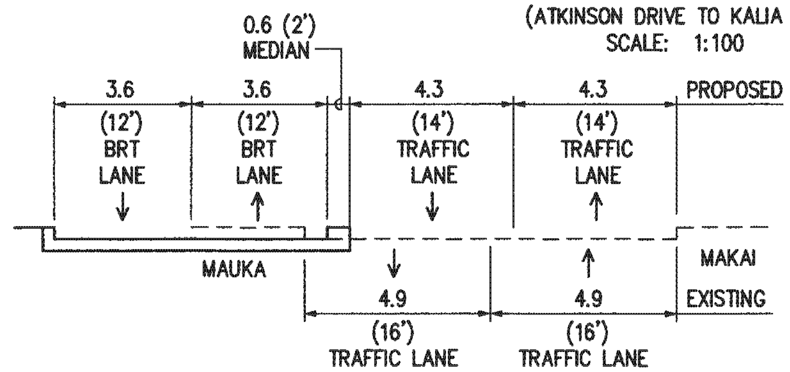
ALA MOANA BOULEVARD
(ATKINSON DRIVE TO KALIA RD.)
SCALE: 1:100



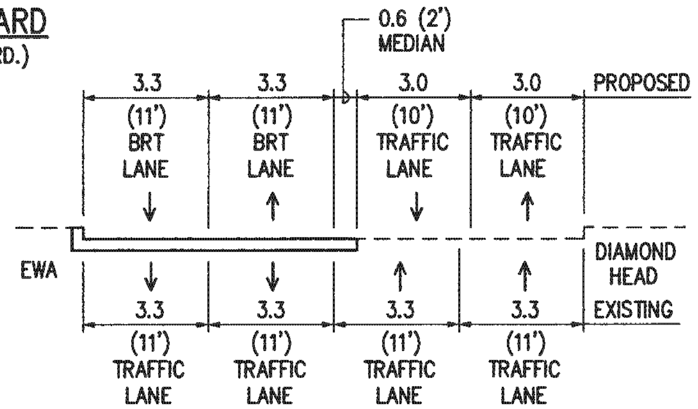
KALIA ROAD
(ALA MOANA BLVD. TO PAOA PLACE)
SCALE: 1:100



KALIA ROAD
(PAOA PLACE TO MALUHIA ST.)
SCALE: 1:100

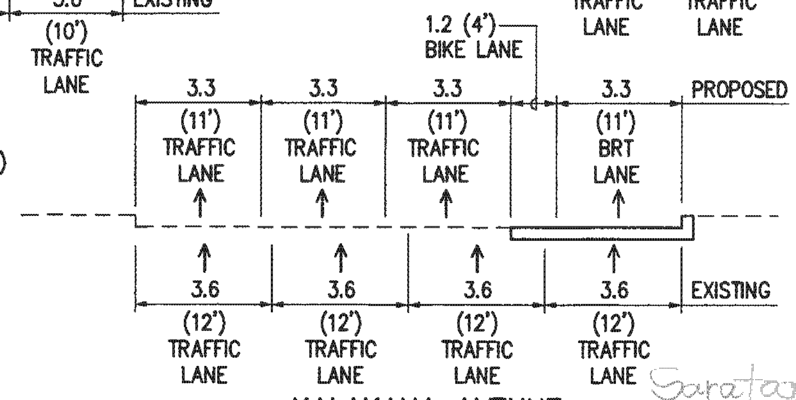


KALIA ROAD
(MALUHIA ST. TO FORT DERUSSY STOP) Saratoga Rd.
SCALE: 1:100



SARATOGA ROAD
(KALIA ROAD TO KALAKAUA AVE.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS
UNLESS NOTED OTHERWISE



Saratoga to Kapal Hawai -
Seaside to Kaiulani

KALAKAUA AVENUE
(SARATOGA AVE. TO KAIULANI AVE.)
SCALE: 1:100

REV.	DATE	DESCRIPTION
2	7/24/00	ADDED BIKE LANE ON KALAKAUA AVENUE
1	1/11/00	REVISED KALIA ROAD ALIGNMENT

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

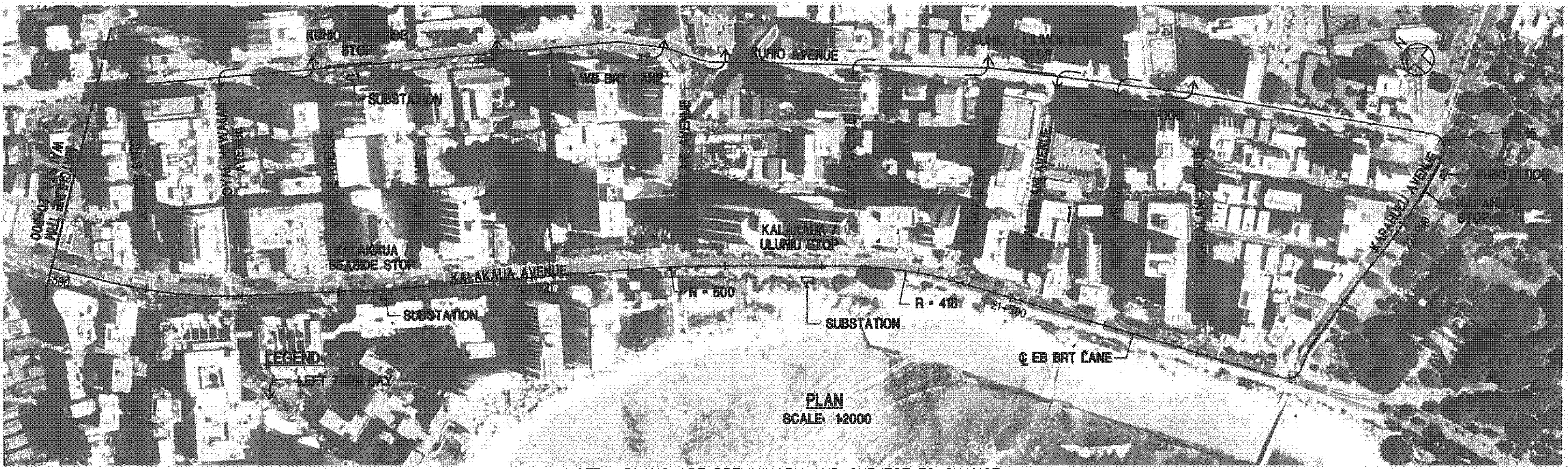
HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
WAI STA. 18+700 TO WAI STA. 20+500

DRAWING NO. TRM-13
DATE: 7-24-00 SHEET NO.

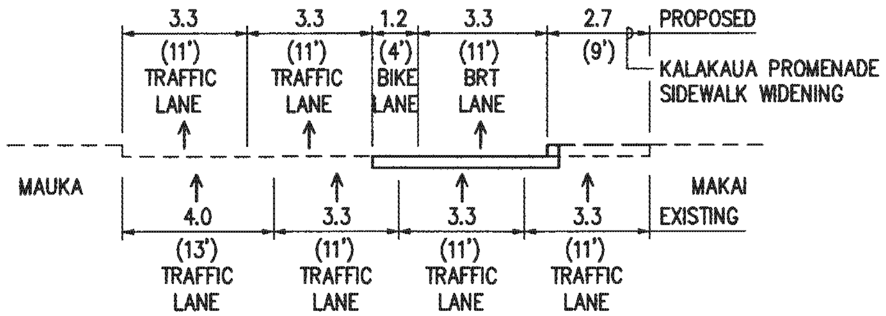
Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-13.dwg 07/24/00 at 10:01

AR00047920

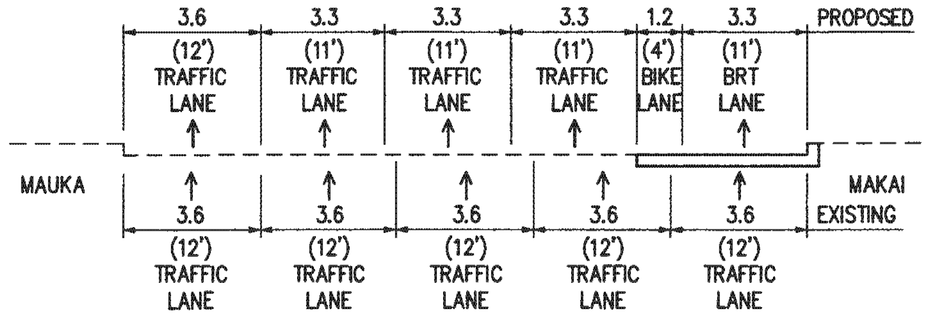


PLAN
SCALE: 1:2000

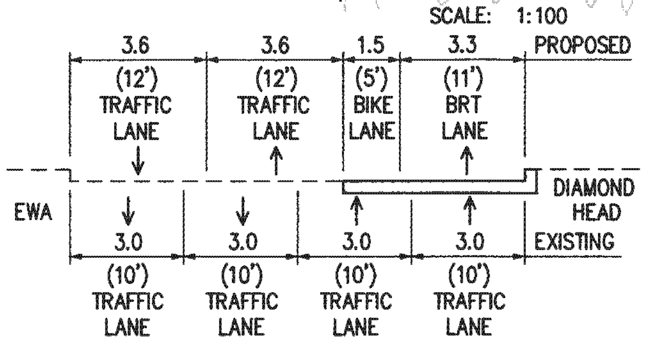
NOTE: PLANS ARE PRELIMINARY AND SUBJECT TO CHANGE



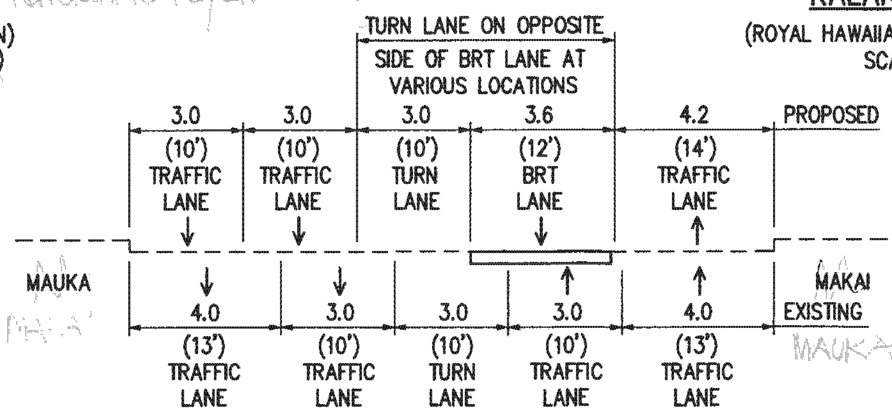
KALAKAUA AVENUE Kaiulani to Kapahulu
(KAIULANI AVE. TO ROYAL HAWAIIAN)
(SEASIDE AVE. TO KAPAHULU AVE.)
SCALE: 1:100



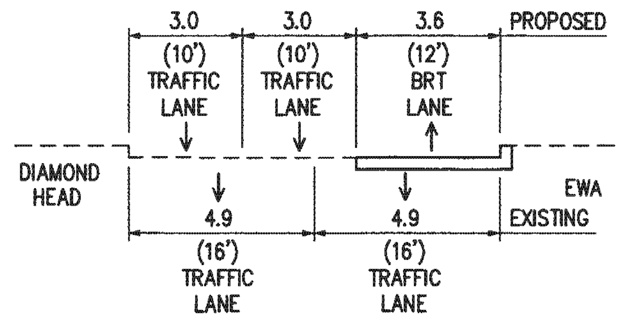
KALAKAUA AVENUE
(ROYAL HAWAIIAN AVE. TO SEASIDE AVE.)
SCALE: 1:100



KAPAHULU AVENUE
(KALAKAUA AVE. TO KUHIO AVE.)
SCALE: 1:100



KUHIO AVENUE
(KAPAHULU AVE. TO KALAIMOKU ST.)
SCALE: 1:100



KALAIMOKU STREET
(KUHIO AVE. TO KALAKAUA AVE.)
SCALE: 1:100

NOTE: ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION
2	7/24/00	ADDED BIKE LANES ON KALAKAUA AND KAPAHULU AVENUES
1	3/11/00	DELETED EWA BOUND BRT KALAKAUA AVE. OPTION

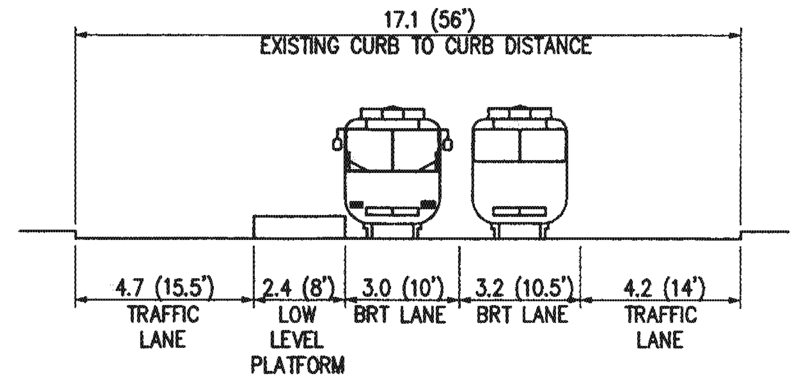
PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

HORIZ. = 50 0 50 100 FULL SIZE SCALE: 1:2000
HORIZ. = 2.5 0 2.5 5 FULL SIZE SCALE: 1:100

IN-TOWN BRT
PLAN AND TYPICAL SECTIONS
WAI STA.20+500 TO WAI STA. 22+100

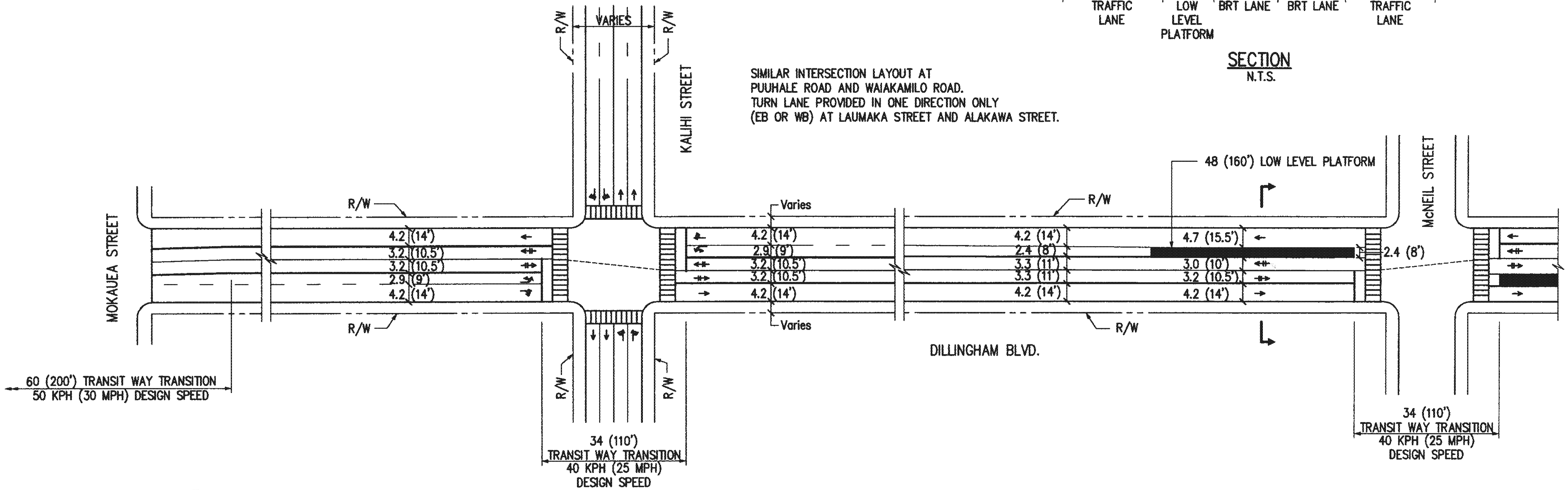
DRAWING NO. TRM-14
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TWFL-14.dwg 07/24/00 at 10:02



SECTION
N.T.S.

SIMILAR INTERSECTION LAYOUT AT
PUUHALE ROAD AND WAIAKAMILO ROAD.
TURN LANE PROVIDED IN ONE DIRECTION ONLY
(EB OR WB) AT LAUMAKA STREET AND ALAKAWA STREET.



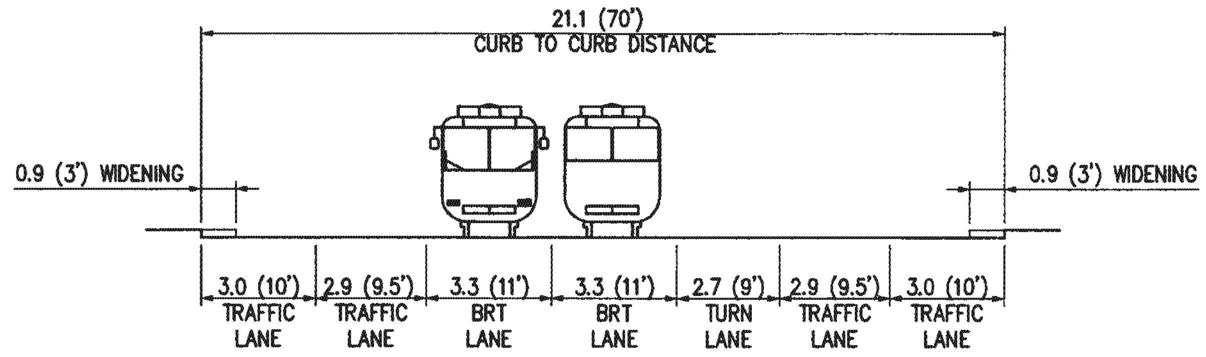
LEGEND

→ TRAFFIC LANE
⇉ BRT LANE

TYPICAL INTERSECTION & STATION LAYOUT
DILLINGHAM BLVD. – 17.7 (58') EXISTING CURB TO CURB DISTANCE

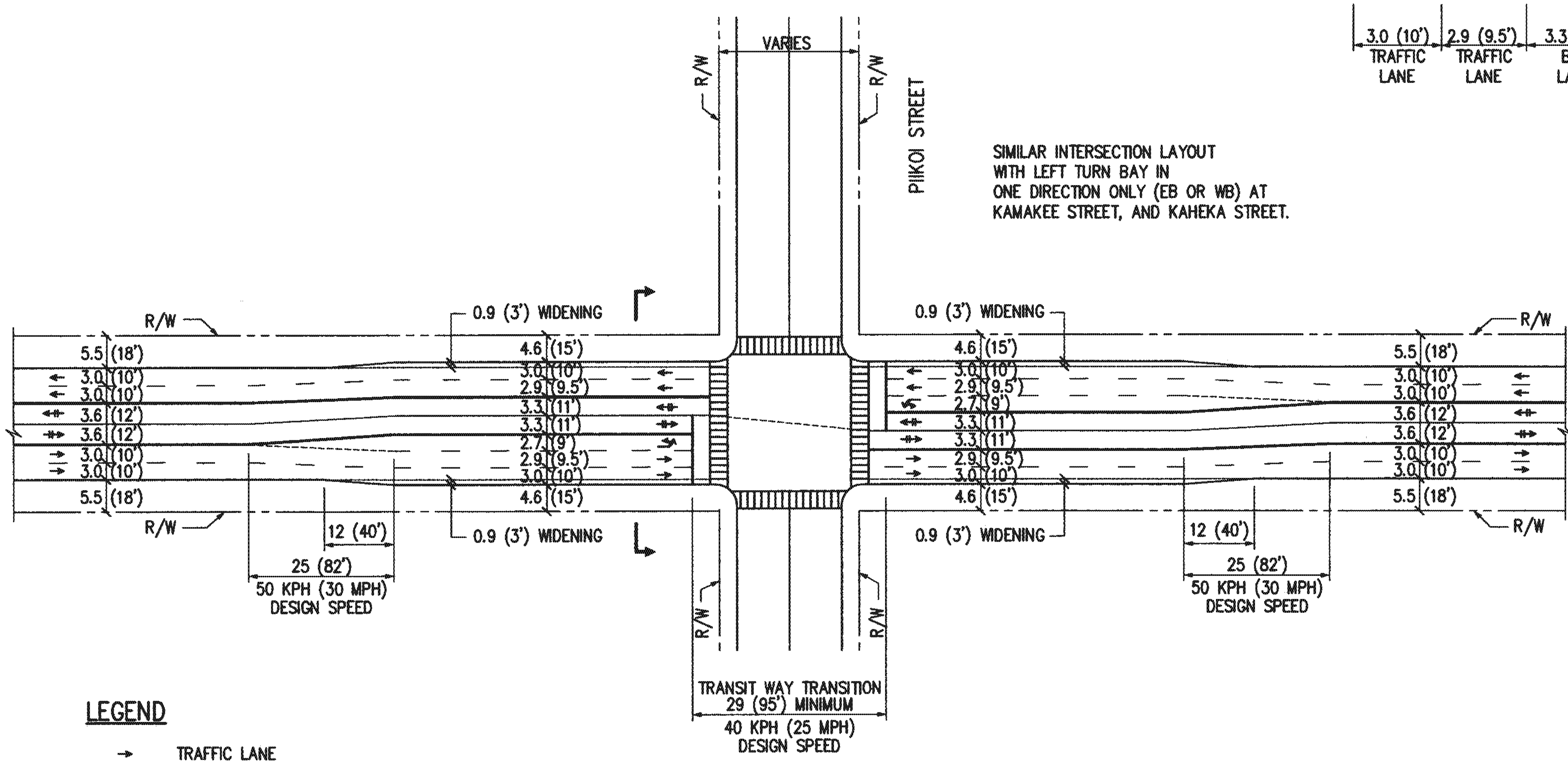
REV.	DATE	DESCRIPTION				
2	7/24/00	WIDENED CURBSIDE LANES	PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	SCALE: NOT TO SCALE	IN-TOWN BRT TYPICAL INTERSECTION & STOP LAYOUT DILLINGHAM BOULEVARD	DRAWING NO. TRM-15
1	3/11/00	REVISED SECTION AT PLATFORMS				DATE: 7-24-00 SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TRM-15.dwg 07/24/00 at 07:54



SECTION
N.T.S.

SIMILAR INTERSECTION LAYOUT
WITH LEFT TURN BAY IN
ONE DIRECTION ONLY (EB OR WB) AT
KAMAKEE STREET, AND KAHEKA STREET.



LEGEND

→ TRAFFIC LANE
⇸ BRT LANE

TYPICAL INTERSECTION LAYOUT
KAPIOLANI BLVD. – 19.5 (64') EXISTING CURB TO CURB DISTANCE

NOTE:
THE WIDTH OF WIDENING MAY VARY DEPENDENT UPON ITS IMPACT ON EXISTING MONKEY POD TREES.

REV.	DATE	DESCRIPTION

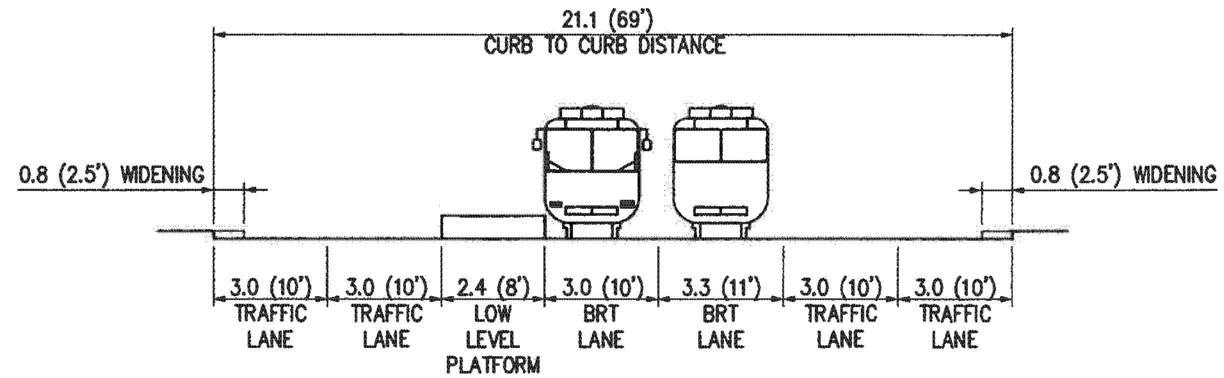
PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

SCALE: NOT TO SCALE

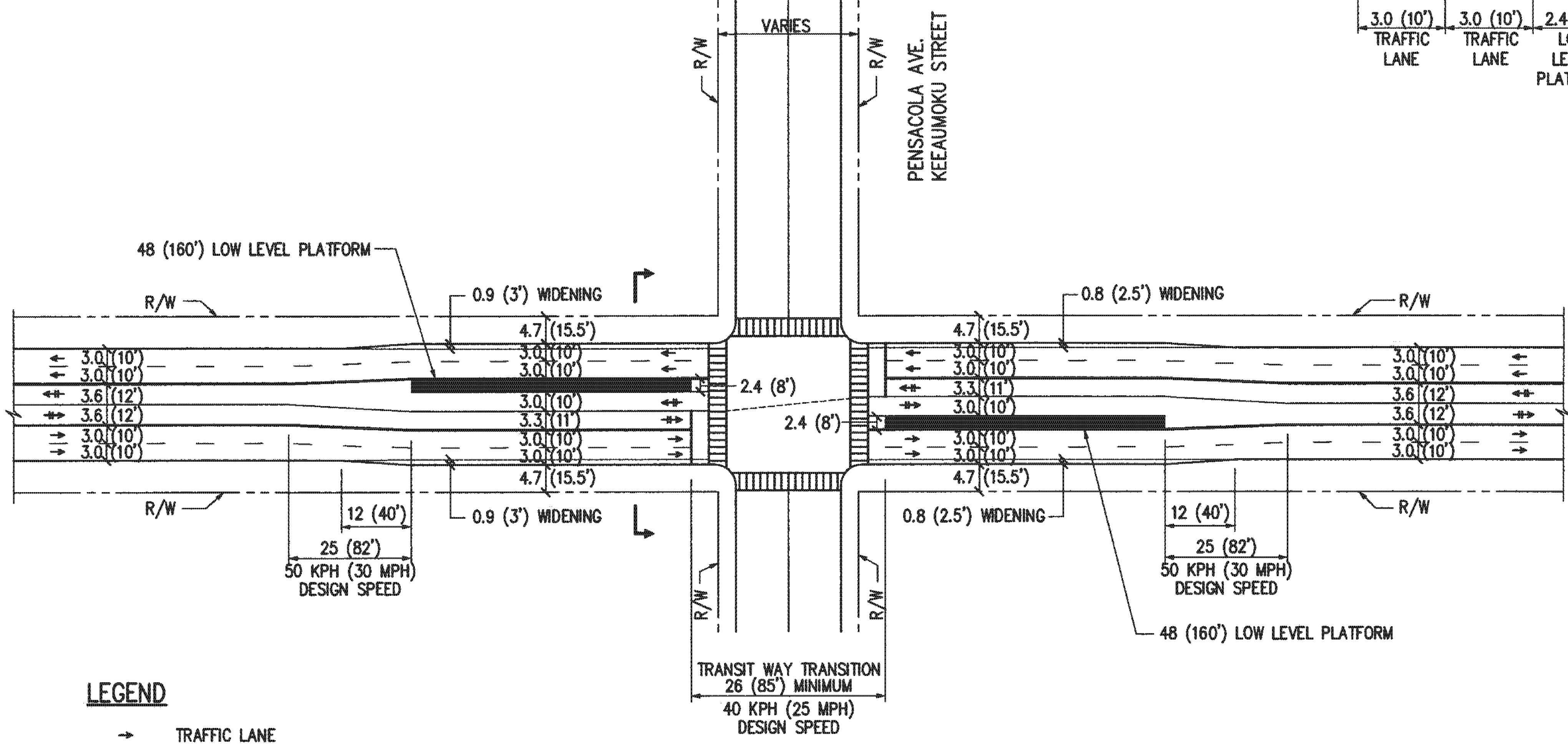
IN-TOWN BRT
TYPICAL INTERSECTION LAYOUT
KAPIOLANI BOULEVARD

DRAWING NO.
TRM-16
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TRM-16.dwg 07/20/00 at 15:43



SECTION
N.T.S.



LEGEND

→ TRAFFIC LANE

↠ BRT LANE

TYPICAL STATION LAYOUT

KAPIOLANI BLVD. – 19.5 (64') EXISTING CURB TO CURB DISTANCE

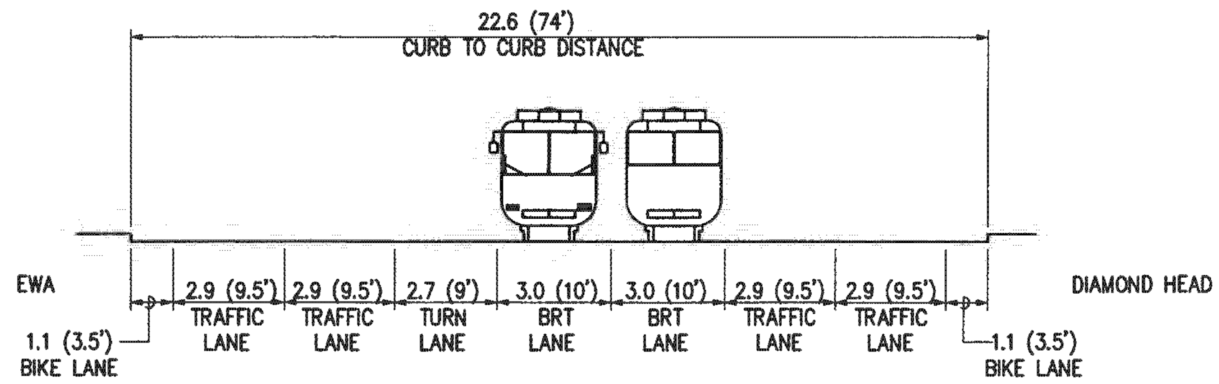
NOTE:

THE WIDTH OF WIDENING MAY VARY DEPENDENT UPON ITS IMPACT ON EXISTING MONKEY POD TREES.

REV.	DATE	DESCRIPTION	PRIMARY CORRIDOR TRANSPORTATION PROJECT CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	SCALE: NOT TO SCALE	IN-TOWN BRT TYPICAL STOP LAYOUT KAPIOLANI BOULEVARD	DRAWING NO. TRM-17 DATE: 7-24-00 SHEET NO.

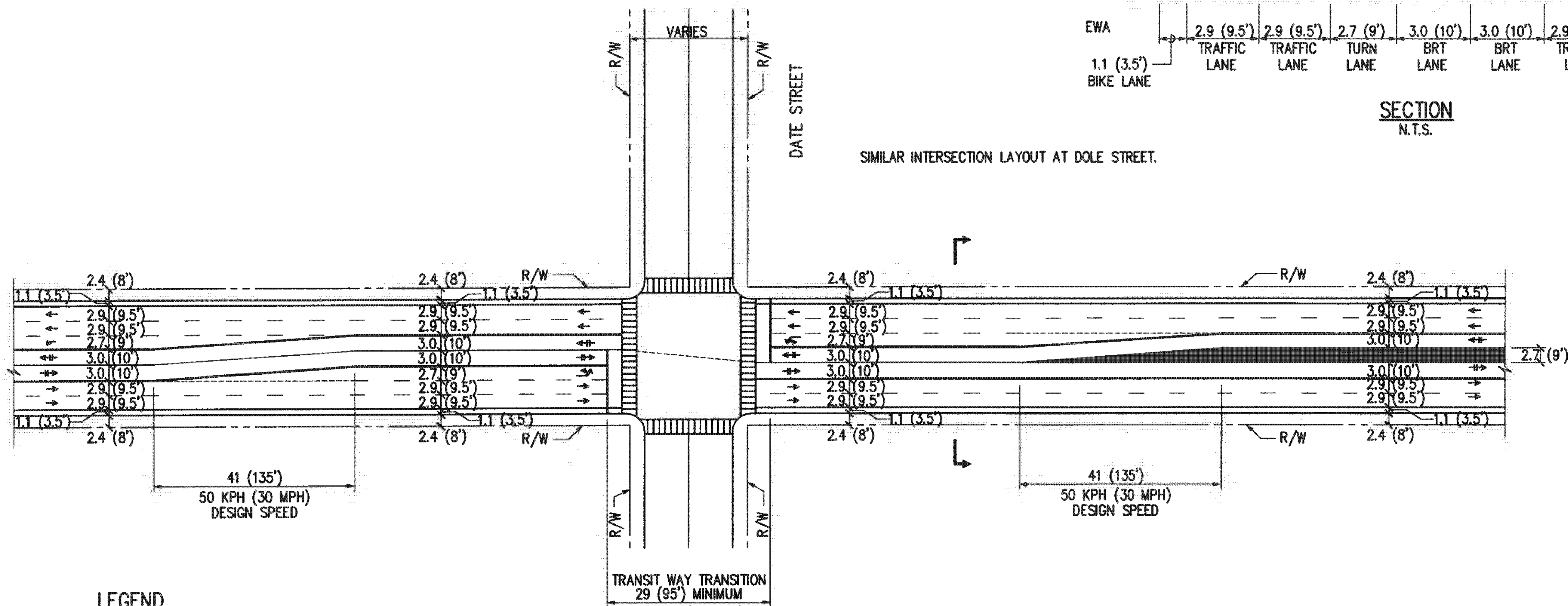
Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TRM-17.dwg 07/20/00 at 15:46

AR00047924



SECTION
N.T.S.

SIMILAR INTERSECTION LAYOUT AT DOLE STREET.



LEGEND

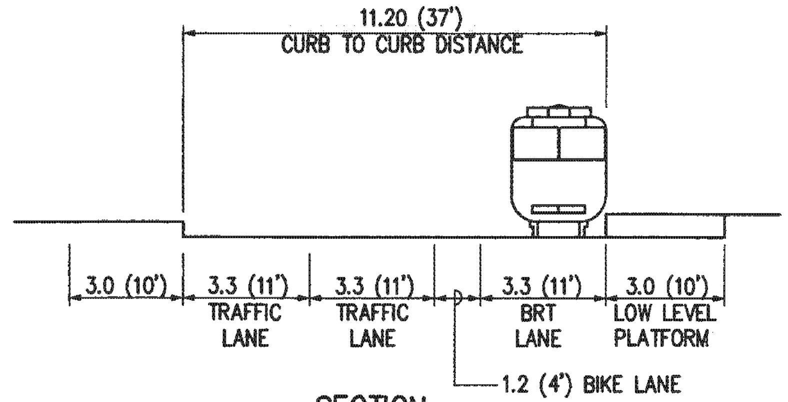
→ TRAFFIC LANE
⇸ BRT LANE

TYPICAL STATION LAYOUT
UNIVERSITY AVE. – 22.6 (74') EXISTING CURB TO CURB DISTANCE

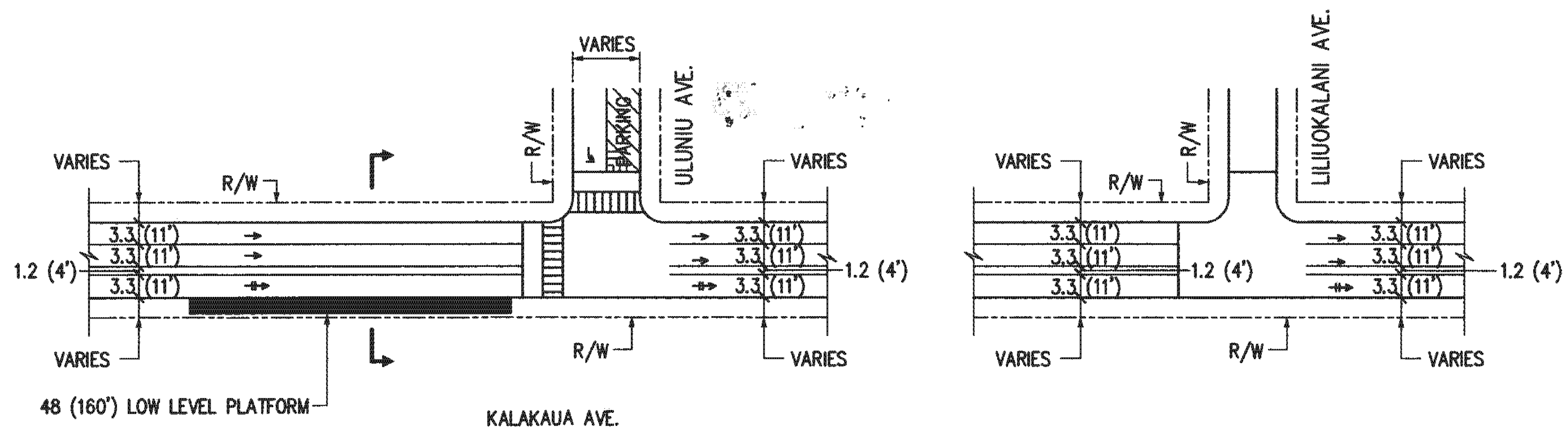
REV.	DATE	DESCRIPTION				
1	7/24/00	ADDED BIKE LANE	**PRIMARY CORRIDOR TRANSPORTATION PROJECT** CITY & COUNTY OF HONOLULU DEPARTMENT OF TRANSPORTATION SERVICES	SCALE: NOT TO SCALE	IN–TOWN BRT TYPICAL INTERSECTION LAYOUT UNIVERSITY AVENUE	DRAWING NO. TRM–18 DATE: 7–24–00 SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TRM-18.dwg 07/24/00 at 10:19

AR00047925



SECTION
N.T.S.



LEGEND

→ TRAFFIC LANE
⇸ BRT LANE

TYPICAL INTERSECTION & STOP LAYOUT
KALAKAUA AVENUE – 11.20 (37') EXISTING CURB TO CURB DISTANCE

REV.	DATE	DESCRIPTION
1	7/27/00	ADDED BIKE LANE

PRIMARY CORRIDOR TRANSPORTATION PROJECT
CITY & COUNTY OF HONOLULU
DEPARTMENT OF TRANSPORTATION SERVICES

SCALE: NOT TO SCALE

IN-TOWN BRT
TYPICAL INTERSECTION & STOP LAYOUT
KALAKAUA AVENUE

DRAWING NO. TRM-19
DATE: 7-24-00
SHEET NO.

Last Saved: J:\PRIMCOR\TRM\TRM_WFL\TRM-19.dwg 07/20/00 at 18:35