8.6 Draft EIS Comments

The Draft EIS was placed on the Project's website on November 1, 2008. Comments received between this date and the issuance of the availability of the Draft EIS in the *Federal Register* on November 21, 2008, were included as Draft EIS comments. In total, 592 comment submissions were received via the following means:

- Project website—276
- Letter—181
- Public hearing testimony—73
- Public hearing comment form—20 (including two that were mailed in)
- E-mail—41
- Fax—1

The majority of the comments received were related to the following topics: alternatives considered, planned extensions, ridership and travel forecasting, parking, traffic analysis, visual, noise, cost and financing, construction phasing, construction effects, and acquisition and relocation (Table 8-2). A discussion of the comments received for each of these topics follows in the subsections below.

Postcards were mailed to everyone on the Project's mailing list, and advertisements were placed in local newspapers and City buses concerning the availability of the Draft EIS and how to comment. Individuals were able to provide comments through the Project's website at www.honolulutransit.org, attending a public hearings, or by mailing them to DTS or FTA. A copy of all comments received, as well as, copies of all response letters are included in Appendix A.

8.6.1 Alternatives Considered

Several individuals commented on various aspects of the alternatives considered. The most common comments were related to re-evaluating alternatives that were previously considered, specifically that the system be grade-separated; selection of steel wheel on steel rail technology; and selection of the Airport Alternative as the Project.

Re-evaluation of Alternatives

Bus-based transit and the Managed Lane Alternative were the topics of a number of comments. Both were evaluated during the Alternatives Analysis process as part of the Transportation System Management (TSM) Alternative and the Managed Lane Alternative. Additional information was added to Section 2.2.2 of this Final EIS to clarify why these alternatives performed poorly and were eliminated from further consideration.

The TSM Alternative, which was essentially the bus-based alternative, did not perform at a level comparable to the Fixed Guideway Alternative. This is because it would be subject to the same roadway congestion as automobiles and would not improve travel reliability. The analyses found that the TSM Alternative would have improved transit travel times somewhat by reducing the amount of time riders would have to wait for a bus to arrive at a bus stop; however, the TSM Alternative would have generated

fewer hours of transit-user benefits than the Managed Lane and Fixed Guideway Alternatives because most buses would still operate in mixed traffic.

The Managed Lane Alternative was fully evaluated in the *Honolulu High Capacity Transit Corridor Project Alternatives Analysis Report* (DTS 2006b) and demonstrated to be less effective than a Fixed Guideway Alternative. The Managed Lane facility would have cost $2.6 billion in 2006 dollars (higher now). Transit reliability would not have been improved except for express bus service operation in the managed lanes. While this alternative would have slightly reduced congestion on parallel highways, systemwide traffic congestion would have been similar to the No Build Alternative as a result of increased traffic on arterials trying to access the facility. As noted in Table 2-1 of Chapter 2, Alternatives Considered, of this Final EIS, total islandwide congestion as measured by vehicle hours of delay (VHD) would have increased with the Managed Lane Alternative as compared to the No Build Alternative. A more detailed response related to the Managed Lane Alternative is provided in Section 8.6.12.

Grade-separation Requirement

At-grade light-rail transit was suggested as an alternative to the Project in several comments. As explained in Section 2.2.2 of this Final EIS, at-grade light-rail transit was considered during the Alternatives Analysis process. An at-grade light-rail transit option did not meet the Project's Purpose and Need. Although, the at-grade light-rail system could have reduced the visual impact of the Project and, in some locations, could reduce the cost, it would also have reduced the reliability, speed, safety, and expandability of the system. It also would have increased the cost of right-of-way acquisition because more land would have been needed to maintain functioning roadways. An at-grade light-rail system also would have increased congestion by removing at least two lanes of traffic to place tracks at-grade and most likely would have had a broader effect on sensitive cultural resources and burial sites along the corridor. More detail in response to questions about at-grade operation is presented in Section 8.6.13.

Steel-wheel Technology

The selection of steel-wheel technology was questioned in several comments. The majority of individuals recommended magnetic levitation technology as an option. As explained in Section 2.2.3 of this Final EIS, technologies other than steel wheel were eliminated because they are proprietary technologies, meaning that selecting one of those technologies would have required all future purchases of vehicles or equipment to be from that same manufacturer. These were eliminated because none of the proprietary technologies offered substantial proven performance, cost, and reliability benefits compared to steel wheel operating on steel rail, which is a technology that has been in revenue operation around the world for many decades.

Commenters suggested that there are reduced noise, safety, and visual benefits of magnetic levitation relative to steel-wheel technology. However, High Speed Surface Transport, a Japanese magnetic levitation technology, is unproven in general use. There is only a single operating urban High Speed Surface Transport system in the world, with less than five years of operations, on record. The single operating system has a maximum speed of 100 kilometers per hour (62 miles per hour), which is similar to the maximum operating speeds of 50 to 60 miles per hour common for steel-wheel systems. While the system may be quieter, steel-wheel systems can be designed to match the noise level of magnetic levitation when in operation. There is no specific safety improvement from the traction design. The assumed visual

benefits for beam-track vehicles would not apply in the United States because of requirements to include an emergency egress walkway. Also, the smaller structures proposed in the comment result in shorter span-lengths, which increases the number of columns required and the number of views blocked by support structures. This would result in higher costs. More details about the elimination of magnetic levitation technologies as an option is presented in Section 2.2.3.

Selection of the Airport Alternative

Section 2.3, Alternatives Considered in the Draft Environmental Impact Statement, of this Final EIS summarizes the alternatives that were evaluated in the Draft EIS, and Section 2.4, Preferred Alternative Identification Process, describes the City's selection of the Airport Alternative as the Preferred Alternative for the Project. This selection was based on consideration of the benefits of each alternative, public input on the Draft EIS, and City Council Resolution 08-261 identifying the Airport Alternative. The Salt Lake Alternative is no longer being considered in this study.

8.6.2 Planned Extensions

Comments were received suggesting that the fixed guideway extensions, which are part of the Locally Preferred Alternative selected by the City Council, also should be examined in the EIS. There were also comments asking that the Project be extended to the University of Hawai'i at Mānoa.

The planned extensions are discussed as future foreseeable projects in the cumulative impacts sections of Chapter 3, Transportation, and Chapter 4, Environmental Analysis, Consequences, and Mitigation, of this Final EIS. The extensions are not part of the Project as evaluated in this Final EIS because no funding has been identified for these segments of the Locally Preferred Alternative. Because there is no identified funding, no engineering design or environmental evaluation could be completed at this time. The FTA will not be granting any New Starts approvals for the extensions of the elevated rail system under the current project.

As soon as funding is identified in the future, engineering design and environmental analysis of the extensions and the appropriate alternatives analysis will be undertaken at that time. The Project as evaluated in this EIS has logical termini and independent utility from any extensions that may be constructed in the future.

8.6.3 Ridership/Travel Forecasting

Various comments were received concerning the Project's travel forecasting model. Among the concerns was the uncertainty of the results given the nature of the modeling process, the type of model used in generating ridership information upon which the EIS information is based, and experience with modeling results on other projects around the country.

Modeling Process

In response to the comments, more information about the modeling process has been included in this Final EIS. Regarding the model used for the Project, it is important to note that the FTA determines the type of model, the modeling process, and the manner in which travel forecasting is conducted for large transit projects. The structure and process used in modeling were established by the FTA to ensure all projects

submitted for funding consideration under the Federal New Starts Program are presented on an equal footing. The FTA also defines the way travel forecasting is conducted to ensure ridership figures are realistic and to avoid past errors where, in some cases, forecasts exceeded actual ridership performance by a substantial margin in the early years of some systems' operations.

Ridership forecasting today is much better than it was just 10 years ago. Recent forecasts for new systems using the improved modeling techniques set forth by the FTA have been very accurate (e.g., Phoenix, Salt Lake City). Still, there is also recognition within FTA that forecasting by its nature contains an element of uncertainty. The acknowledgment of uncertainty is presented in Section 3.2, Methodology, of this Final EIS with a reference to the more detailed information available in the *Honolulu High Capacity Transit Corridor Project EIS Travel Forecasting Results Report* (RTD 2008t).

Regarding the modeling process for the Project, ridership projections for the forecast year of 2030 have been developed using a travel demand model that is calibrated and validated to current year conditions based on actual traffic counts and bus ridership. The model is based upon a set of realistic input assumptions regarding land use and demographic changes (City policy regarding where growth will be oriented over time and trends based on economic factors and population changes) between now and 2030. The model is also based on expected transportation levels-of-service on both the highway and public transit system (based on current conditions and how they are likely to change over time given plans for highway and transit improvement between now and 2030). Based upon the model and these key input assumptions, approximately 116,000 trips per day are expected to use the rapid transit system on an average weekday in 2030. Since the Draft EIS was published, the travel demand model has been refined by adding an updated air passenger model and, under the direction of the FTA, defining more realistic drive access modes to Project stations and including a more comprehensive off-peak non-home-based direct demand element based on travel surveys in Honolulu.

Ridership Forecast Uncertainty

Honolulu is the first project in the country to design and undertake such a detailed uncertainty analysis of this type of forecast. FTA has worked closely with the Project's travel forecasters and provided extensive guidance during this effort. A variety of factors were considered in the uncertainty analysis, including the following variables:

- Variations in assumptions regarding the magnitude and distribution patterns of future growth in the 'Ewa end of the corridor
- The impact of various levels of investment in highway infrastructure
- Expected frequency of service provided by the rapid transit system
- Park-and-ride behavior with the new system in place
- Implications on ridership of vehicle and passenger amenities provided by the new guideway vehicles

Although the analysis will continue to be refined, the anticipated range for rapid transit system ridership in 2030 is expected to be between 105,000 to 130,000 trips per day. Even at the low end, the cost-effectiveness of the Project is within New Starts funding thresholds requirements.

8.6.4 Parking

A number of comments addressed the Project's effects on parking, including the loss of existing on-street and off-street parking supply, removal of freight and/or passenger loading zones, and effects relating to spillover parking near stations.

Loss of Parking

Approximately 680 off-street and 105 on-street parking spaces will be removed to accommodate the Project. Off-street parking supply affected by the Project is scattered throughout the corridor and is exclusively on private property. These parking spaces will be acquired to provide additional rights-of-way needed to construct the guideway or stations. Compensation to the affected property owners will comply with the requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act. The City does not plan to generally replace all private, off-street parking removed for construction of the Project. However, the City will work with landowners to replace parking as appropriate.

On-street parking affected by the Project is concentrated in two areas: near the Iwilei Station and in Kaka'ako along Halekauwila Street. Based on the results of parking utilization surveys conducted in June 2008 and April 2009 for the Project, there is available parking nearby to accommodate motorists currently using the approximately 105 on-street parking spaces that will be removed by the Project. Therefore, these on-street parking spaces will generally not be replaced by the City. However, some new on-street parking spaces will be created by the Project in the same general locations as streets are rebuilt following project construction.

One freight loading zone and two passenger loading zones will be affected by the Project. The loading zones will be temporarily removed or relocated, and new loading zones will be installed once construction is complete.

Spillover Parking

Regarding the potential for spillover parking near stations, ridership forecasts indicate that a small number of passengers will park near stations without designated park-and-ride facilities. Analysis found that spillover parking will not affect traffic in the area. However the existing parking supply could be affected. To address the effects of spillover parking on supply, the City will conduct surveys prior to and again within six months after station opening to determine the extent of spillover parking and then implement mitigation strategies as needed. Mitigation strategies include, but are not limited to, addition of parking supply, implementation of parking restrictions, and development of shared parking arrangements. Follow-up surveys will be conducted by the City to determine if the mitigation strategies are effective, and additional mitigation measures will be implemented by the City as needed.

8.6.5 Traffic Analysis

Comments were received questioning the use of the *Highway Capacity Manual* (HCM) methodology in evaluating traffic conditions under the No Build Alternative or the Project. The concern was that the HCM technique does not perform well under saturated conditions. There were also multiple comments about traffic conditions becoming worse in the future, even with the Project.

Calculations

In response to these comments, the information provided regarding the use of the HCM methodology was expanded and more comprehensively explained. Despite the cited limitations of the HCM methodology, it works well under the conditions present in the Honolulu corridor. The HCM methodology is used as a basic measure of the quality of service on the highway system and as a gauge for where additional analysis is needed. There are few traffic impacts from the Project itself because traffic conditions are already difficult in some areas. For those locations that presented an identifiable effect based on the Project's implementation, further analysis was completed using more sophisticated modeling tools such as VISSIM to develop micro-simulation models of these critical areas. The application of this modeling effort provided insight into a broader area of impact and allowed testing of mitigation options.

Future Conditions

The *Honolulu High Capacity Transit Corridor Project Alternatives Analysis Report* (DTS 2006b) concludes that traffic conditions will worsen in 2030 as a result of planned growth in the future no matter which alternative is built. On the other hand, based on the Alternatives Analysis, the only alternative that improves future traffic conditions to a measurable degree compared to the No Build Alternative is the Fixed Guideway Alternative. It clearly shows superior results in terms of congestion reduction in comparison with other touted alternatives analyzed in the Alternatives Analysis.

The information about the alternatives is presented in more detail in Section 2.2, Alternatives Screening and Selection Process. More information about the performance of the Draft EIS alternatives is presented in Section 2.3 and in Chapter 3.

8.6.6 Visual

Comments received expressed concern that the elevated fixed guideway transit system would adversely affect O'ahu's unique visual character by creating visual blight and degrading views. Commenters requested more information on how the Project elements would be integrated visually with their surroundings.

Visual Character

The island's unique visual character and scenic beauty are essential components of the visual and aesthetic assessment presented in the Draft EIS. This Final EIS includes more details on protected views and vistas, as well as potential visual effects. The assessment acknowledges that the Project will substantially change the visual setting and views in some areas. Although the guideway and stations will obstruct mauka-makai views in certain places, view changes are not likely to be obtrusive in wider vistas or regional panoramic views where the project elements are small features of the larger landscape. For some views, the Project's elements will not be the dominant feature.

Visual Integration

A viewer's response to changes in view may vary with exposure and sensitivity, and depend on the alignment orientation and the height of the guideway, stations, surrounding trees, and buildings. Overall, the Project will be set in an urban context where visual change is expected and differences in scales of structures are typical. It should also be noted that the Project will provide users with expansive views from

several portions of the corridor by elevating riders above highway traffic, street trees, and low structures adjacent to the alignment.

Mitigation measures will focus on preserving visual resources and enhancing project design to comply with applicable policies. As part of the Final Design process, RTD has developed specifications and Design Criteria to address the City's requirements for the Project. Guideway materials and surface textures will be selected in accordance with generally accepted architectural principles and local community insights to achieve effective integration between the guideway and its surrounding environment. Landscaping and streetscape improvements will mitigate some potential visual impacts. Other measures to address visual impacts of the Project are being developed through the station design and planning process.

8.6.7 Noise

Operational noise from the Project was a concern to several commenters. The most common concern was operating noise from the rail vehicles. To place the noise generated by the Project in context, the system will generates less noise than a bus at the same distance.

Section 4.10, Noise, of this Final EIS provides a detailed noise analysis for the Project, including additional evaluation completed in response to comments on the Draft EIS and implementation of recommended mitigation measures in portions of the corridor that would experience noise impacts in the absence of such mitigation.

The noise analysis follows current FTA guidance to use Ldn or Leq to evaluate noise impacts. Figure 4-51 in Chapter 4 of this Final EIS, however, does generally compare the Lmax noise levels. The Project design includes a parapet wall and wheel skirts to reduce noise along the guideway. No noise impacts are predicted for any schools along the study corridor. In three locations in the corridor, sound-absorptive material will be placed in the track bed to reduce noise levels at nearby high-rise buildings.

8.6.8 Project Cost and Financing

Many comments questioned the cost of the Project (both capital and operating costs) and the City's ability to fund the Project and obtain the anticipated Federal share of the funding. There were concerns about the economy and the drop in the $0.05 GET surcharge collections that are dedicated to fund the Project.

The funding of the Project relies on a combination of Federal and Local funds. Costs have held relatively steady over the past year as the economy has slowed the rate of inflation of some of the key cost drivers, such as steel and cement. The overall cost of the Project has not changed substantially in year-of-expenditure (inflation-adjusted) dollars since the Draft EIS was published.

While there has been a reduction in the rate of GET surcharge collections, the financial plan continues to be balanced despite the reduction in revenues. This has been accomplished using a higher Section 5309 New Starts allocation than shown in the Draft EIS (from $1.4 billion to $1.55 billion) and allocating to the Project some of the anticipated increases in Section 5307 formula funds that will come to the City as a result of the Project. Section 6.3, Capital Plan, addresses the way capital costs have been covered in the Project's financial analysis.

The responses also reference how the financial analysis addresses the uncertainties of the funding forecast and provides for alternative funding options should they be needed to offset any additional shortfall in the primary revenue sources. These uncertainties and alternative funding options are presented in more detail in Section 6.6, Risks and Uncertainties.

Regarding operating and maintenance costs, the daily operation of the rapid transit system will come from the same City sources currently used to pay for TheBus and other elements of the public transportation system. The rapid transit system will represent about 25 percent of the total transit system's annual cost and will add between 2 percent and 3 percent to the City's annual operating budget. This amount is within annual variability in budgeting and will not, by itself, cause a need to increase property taxes or other fees.

8.6.9 Construction Phasing

Many comments were received that questioned the phasing plan to begin construction toward the 'Ewa end of the line when most of the ridership is likely to be closer to Downtown. There was also a concern that if the Project began in Kapolei and funding was insufficient, the Project would never realize the anticipated benefit or would require an increase in local funding to reach Downtown. Downtown is the primary activity center in the study corridor and getting to Downtown is of great interest among those who commented.

There are a number of reasons for starting construction at the 'Ewa end of the line even though it is acknowledged that ridership will not achieve its full potential until the Project reaches Downtown. The Project starts at the 'Ewa end for the following key reasons: access to the maintenance and storage facility, the ability to start the Project sooner saving on costs, and improved ability to obtain the needed rights-of-way.

As described in Chapter 2, the Project will be constructed in four segments over a nine-year period. To support phased openings, the first construction segment must have access to the maintenance and storage facility, which requires more than 40 acres of dedicated space. In addition to maintenance and storage of vehicles, the facility will serve as the location of the main operations center for the entire system. No location has been identified closer to Downtown with sufficient available space to construct a maintenance and storage facility.

The Project is not a series of individual projects, but a single project that consists of a series of construction segments that will accomplish the following:

- Match the anticipated schedule for right-of-way acquisition and utility relocations
- Reduce the time that each area will experience traffic and community disturbances
- Allow for multiple construction contracts with smaller contract size to promote more competitive bidding
- Match the rate of construction to what can be maintained with the local workforce and available financial resources
- Balance expenditure of funds to minimize borrowing

The portion of the corridor in the 'Ewa direction of Pearl Highlands is less developed than the areas in the Koko Head direction. Right-of-way can be obtained more quickly at the 'Ewa end of the Project; therefore,

overall project construction can begin earlier, resulting in lower total construction costs. Construction is planned to continue uninterrupted in the Koko Head direction from Pearl Highlands to Aloha Stadium, Kalihi, and finally to Ala Moana Center.

8.6.10 Construction

A number of comments addressed the effects of construction on traffic and access to businesses.

Construction-phase Traffic

Construction of the Project will affect traffic with temporary lane closures occurring throughout the day, including peak periods and at night. Both through lanes and turning lanes will be affected by these closures. In some cases, up to two travel lanes will be closed at a time. Construction-related effects on transportation will be mitigated through the implementation of a Maintenance of Traffic (MOT) Plan and a Transit Mitigation Program to be prepared prior to construction. The construction contractor will develop the MOT Plan using parameters developed by, and with approval of, the City. The MOT Plan will address all phases of construction, and the construction contractor will submit any proposed changes to the MOT Plan to the City for approval.

Access to Businesses

Access to businesses in the Project area will be maintained throughout construction, although there could be temporary changes to access and movement during construction. In some locations, left-turn lanes will be closed during construction, restricting access to right-turns only. Other streets may temporarily become one-way movements or eliminate parking altogether during construction. Existing passenger or freight loading zones could be relocated for the duration of construction.

The MOT Plan will address temporary effects on access to businesses during construction. Mitigation to reduce adverse economic hardships for existing businesses may include, but is not limited to, the following:

- Coordination with nearby property owners and businesses
- Development of a public involvement plan prior to construction
- Provide public information to inform customers that businesses are open during construction
- Minimize extent and duration of effects to business access
- Provide signage, lighting, and information to indicate businesses are open
- Provide public information on construction activity using print, television, and radio media
- Phase construction to minimize traffic disruption and maintain access to businesses
- Provide advance notice of utility relocation

8.6.11 Acquisitions and Relocations

Various commenters inquired about acquisition of individual property or the acquisition and relocation process in general. Appendix C, Conceptual Right-of-Way Plan, of the Final EIS includes a map and tables of all parcels from which the Project would acquire property.

The City has been coordinating with potentially affected property owners since October 2008. The City will continue to work with individual property owners to provide relocation services. As stated in Section 4.4.3 of this Final EIS, relocation services will be provided to all affected business and residential property

owners and tenants without discrimination; and persons, businesses, or organizations that are displaced as part of the Project will be treated fairly and equitably.

Those from whom property is to be acquired will be treated according to the requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act. It provides for purchase at fair market value and includes relocation assistance to those affected. The Act requires that those in need of relocation must be placed in comparable quarters.

8.6.12 Managed Lane Alternative

A number of commenters stated that the alternatives studied did not properly address other options for the corridor. In particular, there was a concern that the Managed Lane Alternative was not evaluated in the Draft EIS.

The process of alternatives screening and selection is discussed in Section 8.6.1. As discussed, alternatives were developed during three general phases: (1) the FTA Alternatives Analysis process; (2) the selection of a Locally Preferred Alternative; and (3) the NEPA scoping and Draft EIS process. The initial screening of alternatives is documented in the *Honolulu High-Capacity Transit Corridor Project Alternatives Screening Memorandum* (DTS 2006a) (Screening Memorandum). The subsequent FTA Alternatives Analysis process is provided in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Report* (DTS 2006b).

The initial screening process considered a wide range of alternatives, including "construction of a 'managed' two-lane elevated structure for transit vehicles and potentially carpools, as well as single occupant vehicles willing to pay a congestion-based toll," as described on page S-2 of the Screening Memorandum. The screening results for the Managed Lane Alternative are discussed on pages C-4 through C-5 of this report. The analysis found that the transit mode share under the Managed Lane Alternative would hold constant with the No Build Alternative; the automobile mode share would increase; and the bike and walk mode share would decrease. Vehicle hours traveled would decrease, while vehicle miles traveled would increase slightly.

This initial screening process identified four alternatives that were presented at scoping meetings held to obtain public input. As described on page 5-2 of the Screening Memorandum, one of the alternatives recommended for further evaluation was the Managed Lane Alternative.

The scoping process resulted in two operational options under the Managed Lane Alternative. The first option proposed a two-lane grade-separated facility between Waiawa Interchange and Iwilei which would operate as one lane in each direction at all times of the day. The second option proposed similar infrastructure, but it would operate as a reversible facility with two lanes traveling Koko Head during the morning peak period, and then reversing to travel 'Ewa in the PM peak period. Intermediate access points would be provided in the vicinity of Aloha Stadium and the Ke'ehi Interchange.

This alternative was further developed in the Alternatives Analysis Report, with additional features added to maximize the performance of the alternative. The Two-direction Option would serve express buses

operating in both directions during the entire day. The Reversible Option would serve peak-direction bus service, while reverse-direction service would use the H-1 Freeway.

A toll structure was developed that ensured that the managed lane facility would operate to maintain free-flow speeds for buses. To maintain free-flow speeds in the Two-direction Option, it would have been necessary to charge tolls to manage the number of vehicles using the facility. For the Reversible Option, three-person vehicles would be allowed to use the facility for free, while single-occupant and two-person vehicles would have to pay a toll.

The Alternatives Analysis Report estimated total capital and operating costs for the Managed Lane Alternative. Capital costs for the Managed Lane Alternative were estimated to range between $3.6 and $4.7 billion, of which $2.6 to $3.8 billion would be for construction of the managed lanes. Transit operating costs for the Managed Lane Alternative would range between approximately $251 and $261 million as a result of additional buses that would be put in service under that alternative. These costs do not include the cost of maintaining the managed lane facility. These cost factors were considered in conjunction with other project goals in evaluating the alternatives.

With respect to transit travel time benefit, the Managed Lane Alternative options would produce improvements for some trips that were particularly well-served by the managed lanes. In general, however, the Managed Lane Alternative would increase transit travel times by increasing traffic on the overall roadway system and creating more delay for buses. The H-1 Freeway leading up to the managed lanes would become more congested because cars accessing the managed lanes would increase traffic volumes. Significant congestion would occur where the managed lanes connect to Nimitz Highway at Pacific Street near Downtown. Much of the time saved in the managed lane itself would be negated by the time spent in congestion leading up to the managed lane, as well as exiting the lanes at their downtown terminus. Furthermore, areas that are not directly served by the managed lane would not experience much positive change from the No Build Alternative. The Alternatives Analysis Report found that "although the Managed Lane Alternative would provide some travel-time improvement for certain areas, it has significant limitations with regard to improving travel times or transit service for a broader customer base."

Transit ridership would increase only 5.3 to 6.4 per cent over the No Build Alternative, a small increase compared to both the cost of the Managed Lane Alternative and the increase that would result from the Fixed Guideway Alternative, which would increase transit ridership by 21 percent for the 20-mile alignment.

The volume of peak hour vehicles in key areas would actually increase under the Managed Lane Alternative compared to the No Build Alternative. The Fixed Guideway Alternative would reduce the number of vehicles by 3 to 12 percent.

With respect to the goal of providing equitable transportation solutions that meet the needs of lower-income transit-dependent communities, the Alternatives Analysis Report stated that the Managed Lane Alternative "would not substantially improve service or access to transit for transit-dependent communities, as buses that use existing HOV facilities would be routed to the managed lane facility but

would continue to be affected by congestion in other parts of their routes. Arterial congestion would increase in the study corridor with the Managed Lane Alternative, making bus access to the managed lanes less reliable."

The Alternatives Analysis Report also documented consistency with existing land use planning and regional transportation planning. It concluded that the Fixed Guideway Alternative "best serves the areas of O'ahu that are designated for future growth and development. It is also the only alternative that is consistent with regional transportation system planning defined in the *2030 O'ahu Regional Transportation Plan* (OMPO 2006a)."

The evaluation of alternatives inevitably involves tradeoffs. As stated in the Alternatives Analysis Report, the "greatest trade-off among the alternatives is between the transportation benefit provided and the cost to implement alternatives....The Managed Lane Alternative provides slightly more benefit [than the Transportation System Management (TSM) Alternative, which had little effect on traffic], but at a substantial cost. While the Fixed Guideway Alternative would have the highest cost, it is also the only alternative that would provide a substantial transportation benefit, measured both by the benefit to transit users and in the reduction in congestion compared to the No Build Alternative."

The Alternatives Analysis findings are summarized in Table 2-1 in Chapter 2 of this Final EIS. The Managed Lane Alternative is discussed in Section 2.2.2 of the Final EIS. As stated in this Final EIS and supported by the lengthy analysis that preceded the preparation of the Draft EIS, the Managed Lane Alternative was not pursued because it would not have achieved project goals and objectives, would not result in substantially fewer environmental impacts, and would not be financially feasible. For all of these reasons, it was not advanced to consideration in the EIS.

8.6.13 At-Grade Alternatives

Several comments have suggested that an at-grade alternative could reduce visual impacts, particularly Downtown. This response addresses the reasons why an at-grade alternative was not included in the EIS. It may also be helpful to refer to Section 2.2 of this Final EIS.

The Screening Memorandum recognized the visually sensitive areas in Kaka'ako and Downtown, including the Chinatown, Hawai'i Capital, and the Thomas Square/Academy of Arts Special Design Districts. To minimize impacts on historic resources, visual aesthetics, and surface traffic, the screening process considered 15 different combinations of tunnel, at-grade, and elevated alignments between Iwilei and Ward Avenue. As identified on pages 4-23 and 4-24 of the Screening Memorandum, four different alignments through Downtown were advanced for further analysis, including an at-grade portion along Hotel Street, a tunnel under King Street, and elevated guideways along Nimitz Highway and Queen Street.

The Alternatives Analysis Report evaluated the alignment alternatives based on transportation benefits, environmental and social impacts, and overall benefits and cost considerations. The report found that an at-grade alignment along Hotel Street would require the acquisition of more parcels and affect more burials than any of the other alternatives. The alignment with a tunnel under King Street through Downtown, in addition to the environmental effects such as impacts to cultural resources, reduction of street capacity, and

property acquisition requirements of the at-grade section, would cost more than $500 million more than the least expensive alternative. Of the remaining elevated alignments that were studied, the Alternatives Analysis concluded that an elevated alignment along Nimitz Highway would have less visual impacts than one along Queen Street because of its much wider right-of-way and location along the edge of the Hawai'i Capital District.

The Project's purpose is "to provide high-capacity rapid transit" in the congested east-west travel corridor. The need for the Project includes improving corridor mobility and reliability. The at-grade alignment would not meet the Project's Purpose and Need because it could not satisfy the mobility and reliability objectives of the Project. Some of the technical considerations associated with an at-grade versus elevated alignment through Downtown include the following:

- **System Capacity and Speed**–the short 200-foot blocks Downtown would permanently limit the system to two-car trains so that stopped trains do not block vehicular traffic on cross-streets. Even with transit signal priority, the at-grade speeds would be slower and less-reliable than an elevated guideway. Under ideal circumstances, the capacity of an at-grade system could reach 6,000 passengers per hour per direction as it does in places like Calgary, Alberta. Based on travel forecasts, the Project will need to carry over 9,000 by the early 2020s. Moreover, the system can be readily expanded to carry over 25,000 in each direction by reducing the interval between trains (headway) to 90 seconds during the peak period. To preserve the system speed and reliability, an at-grade alignment would require a fenced, segregated right-of-way with no crossings throughout Downtown.
- **Mixed-Traffic Conflicts**–with the planned three-minute intervals between trains in each direction (headways), the short cycle of traffic lights would affect traffic flows and capacity on cross-streets. Furthermore, there would be no option to increase the capacity of the system by reducing the headway to 90 seconds.
- **Construction Impacts and Cost**–an at-grade system would also consume two or more lanes of existing roadways, resulting in increased congestion or requiring that additional businesses or homes be taken to widen the roadway through Downtown. This would also result in greater construction impacts and potentially affect cultural practices and burials to a greater extent than the placement of discrete column foundations for an elevated structure.

Because it is not feasible for an at-grade system through Downtown to move passengers rapidly and reliably without a significant detrimental effect on other elements of the transportation system (e.g., highway and pedestrian systems, safety, reliability, etc.), an at-grade system would have a negative system-wide impact that would reduce ridership throughout the system. The at-grade system would not meet the Project's Purpose and Need and does not, therefore, require additional analysis.