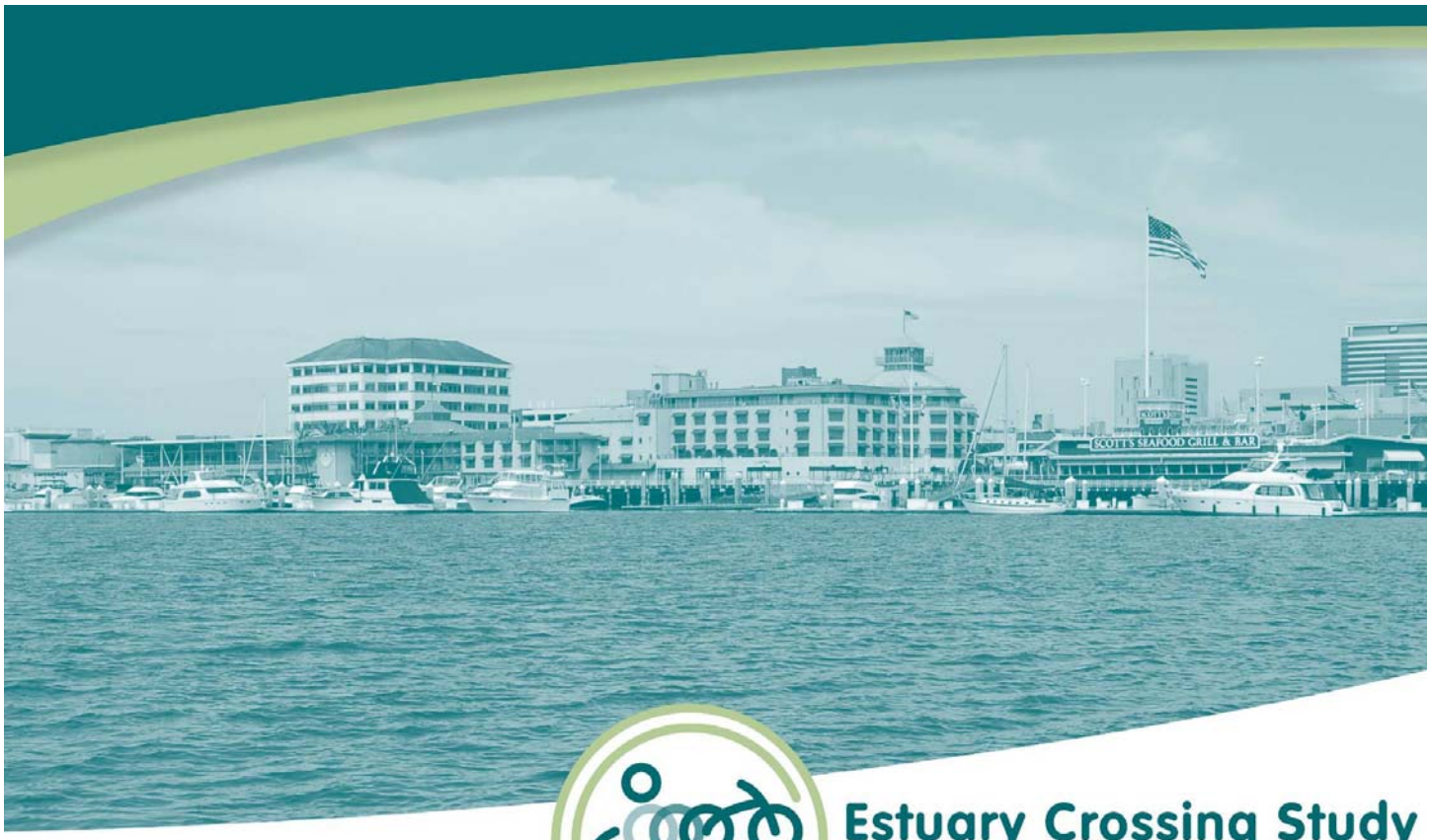
City of Alameda

Estuary Crossing Study

Final Feasibility Study Report

September 2009



Estuary Crossing Study

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City of Alameda Public Works Department
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Estuary Crossing Study

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September 2009

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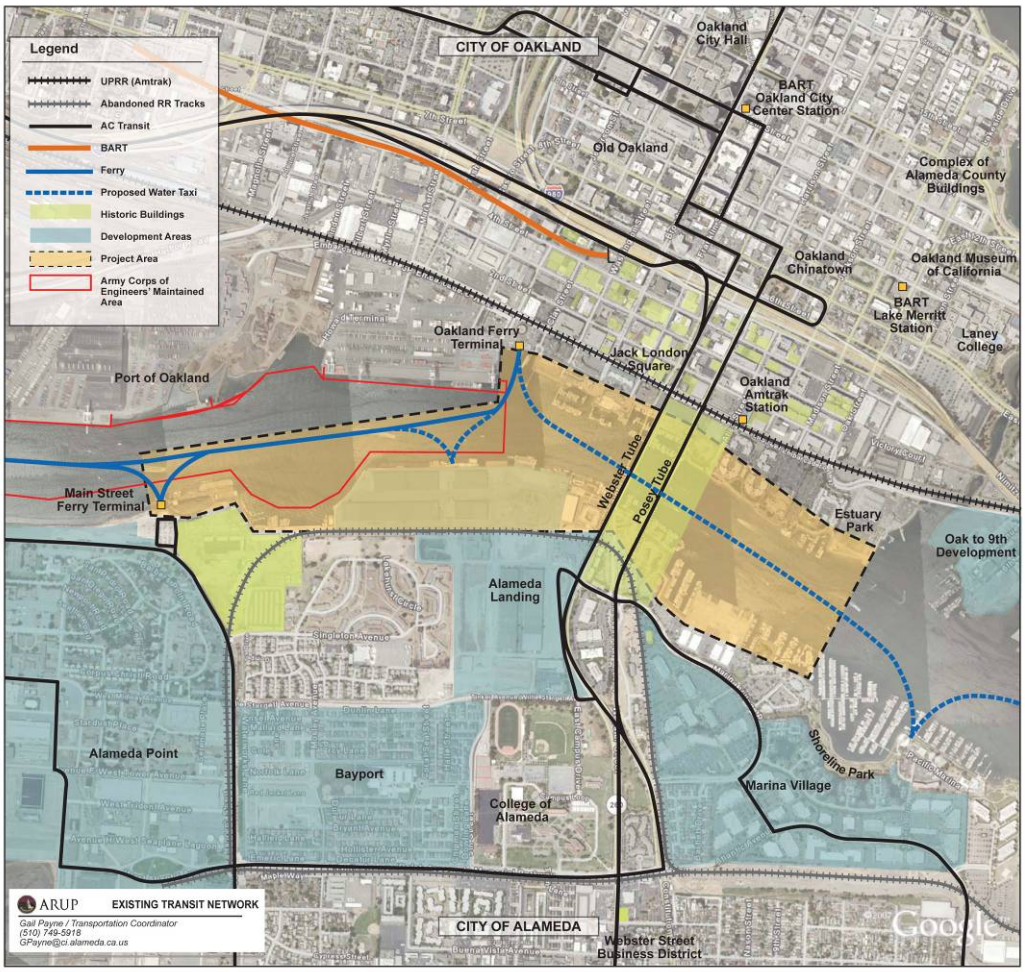
Executive Summary

Study Purpose

The overall vision for an improved estuary crossing is to create an easy-to-use, safe and enjoyable crossing to enhance the Bay Area's regional bicycle, pedestrian and transit networks. The goal of the feasibility study is to develop estuary crossing designs that appeal to the patron, adjacent communities, decision-makers, transit providers and funding authorities. In recent years, there have been numerous studies that have analyzed the possibility of developing additional capacity between Alameda's west end and downtown Oakland. These studies did not directly analyze potential alternatives, but rather raised various transportation alternatives as part of other feasibility, master plan and transportation strategy reports. This study is the first that directly analyzes the feasibility of new or improved estuary crossings between the two cities.

The boundaries of the study area are between the Marina Village and the Main Street Ferry Terminal on the Alameda side and the Estuary Park and the Oakland Ferry Terminal on the Oakland side (Figure 1).

Figure 1: Estuary Crossing Feasibility Study Area



Stakeholder and Public Involvement

A key aspect of this study was to establish a public involvement process at the early stages and to engage the public throughout the study. Caltrans District 4 Office of Community Planning provided on-call outreach support to develop and implement the public engagement action plan. The City also hired EnviroCom to provide outreach assistance as a facilitator at the public workshops and the stakeholder meetings.

The study was managed by the City of Alameda, with technical guidance and leadership provided by the Multi-Jurisdictional Task Force (Task Force) as well as policy guidance from the Policy Advisory Committee (PAC). The Task Force met four times – in March, April, August and December 2008. The PAC met three times – in May, August and December 2008.

In addition to Task Force and PAC meetings for this study, the City of Alameda hosted a series of community outreach workshops and spoke at key public meetings in both Alameda and Oakland. The Estuary Crossing Study Workshops were held in April, May and October 2008.

Existing Conditions

This chapter provides an overview of the existing baseline conditions in the study area, which informed the study team's understanding of the existing context, opportunities and constraints. Specifically, this chapter provides information on the below study area conditions:

- **Demographics**: Census data reveals a significant residential and employment population within a short distance of the proposed estuary crossing study limits. Within a one-mile radius of the study area, there are 19,644 residential units and 72,370 jobs according to the 2000 US Census.
- **Bikeways and Pedestrian Network**: There are two designated bikeways connecting Alameda and Oakland. One is through the Posey Tube and the other is via the Fruitvale (Miller Sweeney) Bridge. The Posey Tube path is approximately four feet in width, which is inadequate for passing cyclists and pedestrians. In addition, this link is unpleasant for users due to vehicle noise and emissions.
- **Transit Network**: The key transit services include BART, Amtrak, Alameda/Oakland Ferry and AC Transit.
- **Estimated Travel Demand**: A total of 72 cyclists and 22 pedestrians used the Posey Tube during the 13-hour survey period in 2006 according to a BikeAlameda survey. The number of one-way bus passengers traveling through the tubes on an average weekday totals over 7,000. About 55,000 vehicles per day travel through the Webster Street and Posey Tubes.
- **Potential Future Demand for Estuary Crossing**: The potential future demand for an improved estuary crossing will vary depending on future changes to land uses, the attractiveness of competing transport modes and the characteristics of the estuary crossing option chosen. When considering a crossing such as a bridge and the future expected land use developments, future demand is estimated to be 2,500 – 4,000 trips per day. This future trip demand scenario is estimated using the existing demand on the Park Street Bridge as a base and future expected land use developments in West Alameda. The demand estimate has been verified against alternate methods of trip estimation, including an analysis of potential mode shift from existing cross-estuary trips and analysis of Census data for work related trips between Oakland and Alameda.
- **Key Factors**: Key factors that guided the selection of the preferred alternatives include jurisdictional boundaries, historic buildings, emergency lifeline facility needs, policy regulations and government agency participation.

Relevant Policy Documents

Future development will alter the current landscape of Alameda and Oakland. Several master plans are either in development or being updated in and around the project area. The following relevant studies are summarized to provide an understanding of the project area:

- I-880/Broadway-Jackson Interchange Improvement Feasibility Study
- Alameda Countywide Bicycle Plan
- Alameda Countywide Pedestrian Plan
- Draft Alameda Point Station Area Plan Transit-Oriented Development Alternatives
- Alameda Point Transportation Strategy
- Alameda Seaport Access Assessment
- Alameda West End Feasibility Study - Shuttle Service and Operations Analysis
- Bayport / Alameda Landing Project Master Plan
- City of Alameda Bike Master Plan
- City of Alameda Internal Memos
- City of Oakland Bicycle Master Plan
- Cross Alameda Trail Feasibility Study
- Jack London BART Feasibility Study
- Oakland Estuary Policy Plan
- Oakland Waterfront Trail Plan
- Regional Bicycle Plan for the San Francisco Bay Area
- Regional Rail Plan for the San Francisco Bay Area

Evaluation Criteria

The project alternatives were evaluated against a set of assessment criteria to select the most appropriate alternative for further study. These criteria were developed based on project objectives, and input from the stakeholders and the community. The assessment criteria are:

- Safety
- Functionality
- Financial Impact – Short Term
- Financial Impact – Long Term
- Engineering
- Neighborhood Development
- Environmental Impact

Alternative Analysis

Project alternatives were developed based on a review of best practices and input from the City of Alameda, stakeholders and the community. Each of the project alternatives is described with an assessment of the key advantages, disadvantages and performance against the criteria. The list of project alternatives is as follows:

- Existing Service Improvement
    - Bike Shuttle Capacity Improvement
    - Ferry Service Improvement
    - Improved Traffic and Transit Management
    - Minor Modifications of Existing Tube
- Water Crossings
    - Amphibious Vehicles
    - Water Shuttles / Taxis
    - Bus and Bicycle Barges
    - User Propelled Boats / Amphibious Bikes
- Bridge, Tunnel or Elevated Structure
    - Bicycle-Pedestrian Bridge (Fixed, High Level Option)
    - Bicycle-Pedestrian Bridge (Moveable, Low Level Option)
    - Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Transit Lanes
    - Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Neighborhood Electric Vehicle Lanes
    - Transporter Bridge
    - Aerial Tramway
    - New Bicycle and Pedestrian Tube
    - Modification of Existing Tube
    - New Underground Extension to BART

Preferred Alternatives

The next step towards determining a preferred alternative was eliminating the under performing alternatives and carrying forward the remaining options for further analysis. Within each project category, the top feasible project alternatives were selected to be carried through to the next review stage (Table 1).

- Existing Service Improvements
    - Minor Modifications to Posey Tube – A short-term solution to better accommodate existing bicyclist and pedestrian demand. Potential improvements to the existing path include replacing existing plate covers, filling in grooves on the concrete path, and establishing a regular maintenance program.
- New Water Crossing
    - Water Shuttle/Taxi – An intermediate solution that will meet the project objectives with consideration of the planned developments on both sides of the estuary. The water shuttle/taxi was determined to be the high-priority alternative for bicyclist and pedestrian crossings.
- Bridge, Tunnel or Other Elevated Structure **(Potential Long-Term Alternative)**
    - Bicycle-Pedestrian Bridge (Moveable, Low Level Option) –***The bridge could be a long-term viable alternative if the following constraints are addressed***:

- The US Coast Guard allows the bridge to remain closed during peak times;
- The moveable span of the bridge, which is currently at 600 feet, is reduced to a more manageable horizontal clearance;
- The height of the bridge is reduced to a level that does not require significant closing and opening times; and
- The cost of construction could be justified for regional funding support.
- Potential inclusion of transit option

Table 1: Cost Estimates of the Preferred Alternatives

Alternative	Design	Admin	Environ-mental Review	Mitigation/ Utilities	Construc-tion	Operations / Maintenance (annual)
Short-term Alternative						
Modifications to Posey Tube	$250,000	$250,000	$35,000	None	$2.5 million	$50,000 (Caltrans)
Mid-term Alternative						
Water Shuttle / Taxi	$200,000	$200,000	$500,000 to $750,000	None	$3 million	$2.5 million (24/7 service); $1.25 million for 12 hour; $625,000 for 6 hour
Long-term Alternative (Potential)						
Bicycle/ Pedestrian Moveable Bridge	$8 million	$5 million	$500,000 to $750,000	$1 million / None expected based on preliminary analysis	$60 million	$1.5 million (assumes 24/7 operations)

Potential Project Environmental Impacts

The potential environmental constraints related to the various proposed alternatives are as follows:

- Moveable Bridge Location and Clearance
- Construction
- Earthwork
- Coastal and Flood Protection
- Water Quality
- Hazardous Materials
- Historic Buildings

The environmental review will serve as a basis for a complete environmental analysis that will occur in future phases of this project. The analysis provided here is based on the Appendix G Environmental Checklist Form from the California Environmental Quality Act (CEQA) guidelines for implementation. All determinations made in the following section are preliminary and should be noted as reference only. The final preferred alternatives will be analyzed further under a full environmental analysis as required by CEQA and the National Environmental Protection Act (NEPA).

Funding Opportunities

This section lists the funding sources that could help fund subsequent phases of the estuary crossing project. It should be noted that some funding sources have restrictions on how the monies may be spent. For example, construction and implementation only funding sources cannot be applied to planning and design.

Next Steps

The next step of the project development is the preparation of a project study report (PSR) equivalent document for the water taxi/shuttle. A PSR equivalent is an engineering report whose purpose is to document agreement on the scope, schedule and estimated cost of a project so that the project can be considered for inclusion in a future programming document such as the State Transportation Improvement Program (STIP). It is recommended that the water taxi/shuttle be carried forward in a PSR equivalent document. ***The long-term option – bicycle/pedestrian bridge – could be moved forward to a PSR equivalent document only if this option is deemed feasible.*** The City will work with stakeholders to determine if vessel restrictions during commute hours could be possible, vertical and horizontal clearances could be reduced and funding could be obtained. This follow up with stakeholders also would allow the possibility to accommodate a transit option with the bicycle/pedestrian bridge.

Staff recommends that operational characteristics of a crossing should also be studied as part of the PSR Equivalent document. In addition the PSR should also look at the user demand, destination choices, and user catchment area, so that the recommended alternative complements the existing transportation system and would allow users to make convenient intermodal transfers.

The City will coordinate with Caltrans on how to proceed with the Minor Modifications to the Posey Tube alternative. The City also will continue to work with AC Transit, Caltrans and the City of Oakland on other improvements such as the Webster Street SMART corridor project and improved bike racks on AC Transit buses.

1 Study Purpose

The overall vision for an improved estuary crossing is to create an easy-to-use, safe and enjoyable crossing to enhance the Bay Area's regional bicycle, pedestrian and transit networks. The goal of the feasibility study is to develop estuary crossing designs that appeal to the patron, adjacent communities, decision-makers, transit providers and funding authorities. In recent years, there have been numerous studies that have analyzed the possibility of developing additional capacity between Alameda's west end and downtown Oakland. These studies did not directly analyze potential alternatives, but rather raised various transportation alternatives as part of other feasibility, master plan and transportation strategy reports. This study is the first that directly analyzes the feasibility of new or improved estuary crossings between the two cities.

The boundaries of the study area are between the Marina Village and the Main Street Ferry Terminal on the Alameda side and the Estuary Park and the Oakland Ferry Terminal on the Oakland side.

Why do we need another crossing?

Today, bicyclists and pedestrians traveling between the west end of Alameda and Oakland's downtown must use either a bus or a narrow path in the Posey Tube with two-way pedestrian and bicycle traffic. Due to the limitations of this estuary crossing, pedestrians and bicyclists are reluctant to use it, which reduces the potential diversion from automobiles to walking and bicycling in this congested corridor. As the populations of west Alameda and Oakland grow, congestion and conditions in the Webster Street and Posey Tubes will degrade. A new crossing for bicyclists, pedestrians and perhaps for transit will help provide a convenient and efficient option for recreational riders, tourists and commuters. An additional crossing also could act as an emergency lifeline transportation corridor in the event of a disaster. The City of Alameda has limited resources on the island. A critical need would exist to transport tools, water, equipment and personnel to/from the island.

Who will use the new crossing?

As jobs, housing and tourism grow in the East Bay, more residents, workers, students and tourists will cross the estuary. Currently, more than 46,000 residents and 70,000 jobs are situated within one mile of the study area. Significant destinations on both sides of the estuary include the College of Alameda, the Webster Street Business District, Marina Village, Jack London Square, transit hubs such as BART, Amtrak and several bus stops, Oakland Chinatown, the new Alameda Landing project currently under development, the potential future redevelopment of Alameda Point and the Oak Street to 9th Street redevelopment in Oakland. After a major disaster, Alameda's access to water could be disrupted. Water could be transported using the new estuary crossing.

How will a new crossing benefit bicycle and pedestrian commuters?

For bicyclists from Alameda's west end who choose to use the next nearest crossing - Park Street Bridge - to reach downtown Oakland, a six-mile trip could be reduced to a one-mile trip. Improving connectivity across the estuary will encourage residents and workers to develop transportation modal habits that are less car-dependent, and will support multi-modal travel within the region. A new estuary crossing will provide improved multi-modal access to regional transit services provided by BART, Alameda/Oakland Ferry, AC Transit and Amtrak. The estuary crossing will extend the regional bikeway and trail networks in both cities, and will fill gaps in these bicycle networks. This major regional link will be a key feature of both the Bay Trail network and the Alameda Countywide pedestrian and bicycle networks.

What is the expected usage of a new crossing?

An inviting estuary crossing oriented toward non-motorized modes will encourage walking and biking on both sides of the estuary, and will capture a greater percent of crossings using sustainable transportation modes. With improved access, estimates of future pedestrian and bicycling demand range between 2,500-4,000 trips per day. About 62,000 daily weekday trips are made across the estuary using the Webster Street and Posey Tubes via all modes. Existing ridership for the bus routes that use the Posey and Webster Street Tubes totals 7,000 one-way passengers on an average weekday. The average daily traffic for the Webster Street and Posey Tubes is 27,000 and 28,000 vehicles per day, respectively. A proportion of existing transit and private automobile travelers could be expected to use an improved estuary crossing as pedestrians and bicyclists.

Who supports the new crossing?

The highest priority project in the City of Alameda's Bicycle Master Plan (2008) is to provide an alternate to the Posey Tube path by looking into the feasibility of a water taxi. The City of Alameda's Pedestrian Plan (2009) also lists the estuary crossing project as a high-priority project. The City of Oakland lists the estuary crossing project as a high priority project in its 2007 Bicycle Master Plan Update. The estuary crossing project is also on the San Francisco Bay Trail alignment and in Alameda County's Countywide Bicycle Plan. As indicated in Alameda's Bike Master Plan, the first step in providing for the bicycle/pedestrian estuary crossing is to conduct a feasibility study to identify and evaluate project alternatives.

What opportunities would be realized with a bicycle/pedestrian crossing?

An improved crossing will offer an exciting opportunity to support non-motorized and transit alternatives and in doing so will improve the environment and reduce vehicular traffic.

Bicycling, Walking and Transit Opportunities

- **Increased Bicycling/Walking**: Will capture a greater percent of crossings using sustainable modes of transportation between the two areas.
- **Extended Regional Bikeways and Trails**: Will be a key feature of both the Bay Trail and the Alameda countywide pedestrian and bicycle networks.
- **Improved Multi-modal Access**: Will provide improved multi-modal access to regional transit services provided by BART, Alameda/Oakland Ferry, AC Transit and Amtrak.
- **Congestion Relief**: Vehicular traffic congestion in the Webster Street and Posey Tubes can be relieved by shifting trips to a new estuary crossing for alternate modes.
- **Emergency Lifeline Connection**: Will allow for transportation of emergency supplies between Alameda and Oakland, and will provide an evacuation route to the mainland after a disaster.

Community Connectivity Opportunities

- **Neighborhood Connectivity**: Will benefit from increased community connectivity with increased access to retail, restaurants, parks, community colleges and other attractions.
- **People-oriented Transportation Network**: Will provide a more people-oriented and active transportation network to reach the region’s many destinations.
- **Decreased Car Dependence**: Will encourage existing and new residents to develop traveling habits that are less car-dependent.
- **Waterfront Community**: Will help link the two sides of the estuary creating a combined waterfront community.
- **Tourist and Recreation Destination**: Will help attract tourists and additional recreational activities.

Economic Opportunities

- **Increased Retail and Commercial Visibility**: Attracting more foot and cycle traffic to nearby businesses and neighborhoods, providing an opportunity for retail and commercial visibility.
- **Higher Property Values**: Adjacent businesses and residential areas are likely to enjoy higher property values from tenants and owners.
- **Increased Tourism**: Further enhance the tourist experience within adjacent areas of Jack London Square District, Oakland Chinatown and Alameda's shore, enlivening the district area throughout the week.

2 Stakeholder and Public Involvement

A key aspect of this study was to establish a public involvement process at the early stages and to engage the public throughout the study. Caltrans District 4 Office of Community Planning provided on-call outreach support to develop and implement the public engagement action plan. The outreach support is part of Caltrans' Planning Public Engagement Contract program (PPEC). The purpose of PPEC is to enhance Caltrans' ability to achieve a balanced representation of all stakeholders in the planning process including groups that have been traditionally underrepresented. This program provides support to Caltrans-related projects throughout the state. The City also hired EnviroCom to provide outreach assistance at the public workshops and the stakeholder meetings.

2.1 Stakeholder Involvement

The study was managed by the City of Alameda, with technical guidance and leadership provided by the Multi-Jurisdictional Task Force (Task Force) as well as policy guidance from the Policy Advisory Committee (PAC). The Task Force met four times – in March, April, August and December 2008. The PAC met three times – in May, August and December 2008.

Multi-Jurisdictional Task Force Members

- AC Transit
- Alameda County Congestion Management Agency (ACCMA)
- Alameda County Transportation Improvement Authority (ACTIA)
- Caltrans, District 4, Office of Transportation Planning
- Caltrans, District 4, Office of Community Planning
- City of Alameda Planning Department
- City of Alameda Public Works Department
- City of Oakland Strategic Planning Division
- City of Oakland Transportation Services Division
- Port of Oakland
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Francisco Bay Trail Project/Association of Bay Area Governments (ABAG)
- United States Coast Guard
- Water Emergency Transportation Authority (WETA)

Policy Advisory Committee Members

- AC Transit
- Alameda County Transportation Improvement Authority (ACTIA)
- Caltrans, District 4
- City of Alameda Planning Department
- City of Alameda Public Works Department
- City of Oakland Strategic Planning Division
- City of Oakland Transportation Services Division
- Port of Oakland
- San Francisco Bay Conservation and Development Commission (BCDC)
- United States Coast Guard

In lieu of being a member on an advisory committee, the U.S. Army Corps of Engineers staff requested the study team present the project at a U.S. Army Corps of Engineers Interagency meeting, which was done in April 2008.

The stakeholders requested that the estuary crossing fulfill the following criteria:

- Cost effectiveness
- Community consensus
- Aesthetically pleasing
- Minimize environmental impacts
- Minimize private property and neighborhood impact
- Minimize navigational impact
- Emergency evacuation
- Sustainable

2.2 Public Involvement

In addition to Task Force and PAC meetings for this study, the City of Alameda hosted a series of community outreach workshops in both Alameda and Oakland, and presented the study at key public meetings. The workshops were held on:

1. 1st Round on April 10 and 12, 2008
2. 2nd Round on May 17 and 21, 2008
3. 3rd Round on October 4, 2008 in Alameda with a presentation on October 16, 2008 to the Oakland Bicycle and Pedestrian Advisory Committee

The Outreach Reports for the three rounds of public workshops are shown in Appendix A and are summarized below. The study team used the following outreach methods to ensure a broad participation from both sides of the estuary:

- Bike-to-Work Day postcards and promotional items
- City's study web site (www.estuarycrossing.org)
- Email lists - Oakland, BikeAlameda, East Bay Bicycle Coalition and AC Transit
- Local festivals with brochure distribution – Webster Street Jam
- Local radio announcements (KALX, KPFA)
- Meetings
    - City of Alameda
        - Commission on Disability Issues
        - Economic Development Commission
        - Housing Authority
        - Planning Board
        - Recreation and Park Commission
        - Transportation Commission
    - Oakland Chinatown Chamber of Commerce
    - U.S. Army Corps of Engineers Interagency

  - Waterfront Action
  - West Alameda Business Association
- Online advertisements: Facebook, East Bay Express
- Postcards to residents and businesses within 1.25 miles of project area and to the residents and businesses on the main island of Alameda
- Posters in neighborhood stores, in Webster Street commercial district and on/near Tube entrances
- Print advertising and press releases - Alameda Sun, Alameda Journal, East Bay Express, Oakland Tribune and Alameda Times-Star

The public requested that the estuary crossing fulfill the following criteria:

- 24-hour passage
- Enhanced overall user experience
- Recreational and tourist opportunities
- Connectivity to other modes of transportation
- Connectivity to existing and proposed bicycle and pedestrian networks
- Multi-modal including cycling and walking
- Safety and security

2.2.1 Summary of First Round of Community Meetings

At the April meetings, community members had an opportunity to assess project opportunities and challenges and weigh in on some of the alternatives being considered. The meetings were held on Thursday, April 10 from 6 pm to 8 pm at the Oakland Asian Cultural Center in Oakland and on Saturday, April 12 from 10 am to 12 pm at Pasta Pelican Restaurant in west Alameda. Sixteen participants attended the Oakland meeting and 31 participants attended the Alameda meeting. The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings, and a Cantonese interpreter was available at the Oakland meeting.

Feedback Summary

- Include as suggested crossing alternatives: bridge, water shuttle, loaner boat fleet and improvements to existing Posey Tube path.
- Create a direct route to downtown Oakland.
- Minimize air pollution of new estuary crossing.
- Address all bicyclist/pedestrian types and trips and potential user conflicts.
- Have a low cost to user—there are many low-income bicyclists and pedestrians.
- Create a visually pleasing and pleasant crossing.
- Develop a quick, reliable, safe and convenient solution.

2.2.2 Summary of Second Round of Community Meetings

At the May meetings, community members had an opportunity to learn about and weigh in on each of the alternatives being considered. The meetings were held on Saturday, May 17, from 10 am to 12 pm at the Jack London Aquatic Center in Oakland and on Wednesday, May 21, from 7 pm to 9 pm at City Hall West in west Alameda. Nine participants attended the Oakland meeting and 21 participants attended the Alameda meeting. The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings.

Feedback Summary

- Consider all user groups and types of uses when evaluating crossing alternatives.
- Provide an alternative that contributes to its setting, takes environmental factors into account, and is safe and well maintained.
- Connect access points to transit and circulation systems for bicyclists and pedestrians.
- Frequency of service should match comparable transit systems and should be reliable.
- Potential funding options and partnerships will aid in the implementation of the crossing project.

2.2.3 Summary of Third Round of Community Meetings

The October community meeting provided an opportunity for community members from both sides of the estuary to come together to review and provide feedback on the winnowed list of estuary crossing options. A community meeting was held on Saturday, October 4, from 10 am to 12 pm at the Pasta Pelican Restaurant in Alameda. Community members also had the opportunity to learn about and comment on the study at a meeting of the Oakland Bicycle and Pedestrian Advisory Committee (BPAC) in Oakland from 5:30 pm to 7:30 pm on Thursday, October 16 at Oakland City Hall. Over 90 participants attended the two meetings. The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings.

Feedback Summary

- There is a need for both a short-term and a long-term solution.
- Residents prefer a moveable pedestrian/bicycle bridge or a water taxi service that could offer multiple stops along the estuary.
- The City should partner with AC Transit and the ferry operator to identify any interim actions that can improve the capacity and conditions of the existing estuary crossing options.
- There will continue to be a need for automobile crossings from Alameda's West End to Oakland.
- Cost is an important concern, and there may be merit to including options like transit on a fixed crossing to open up funding opportunities.

3 Existing Conditions

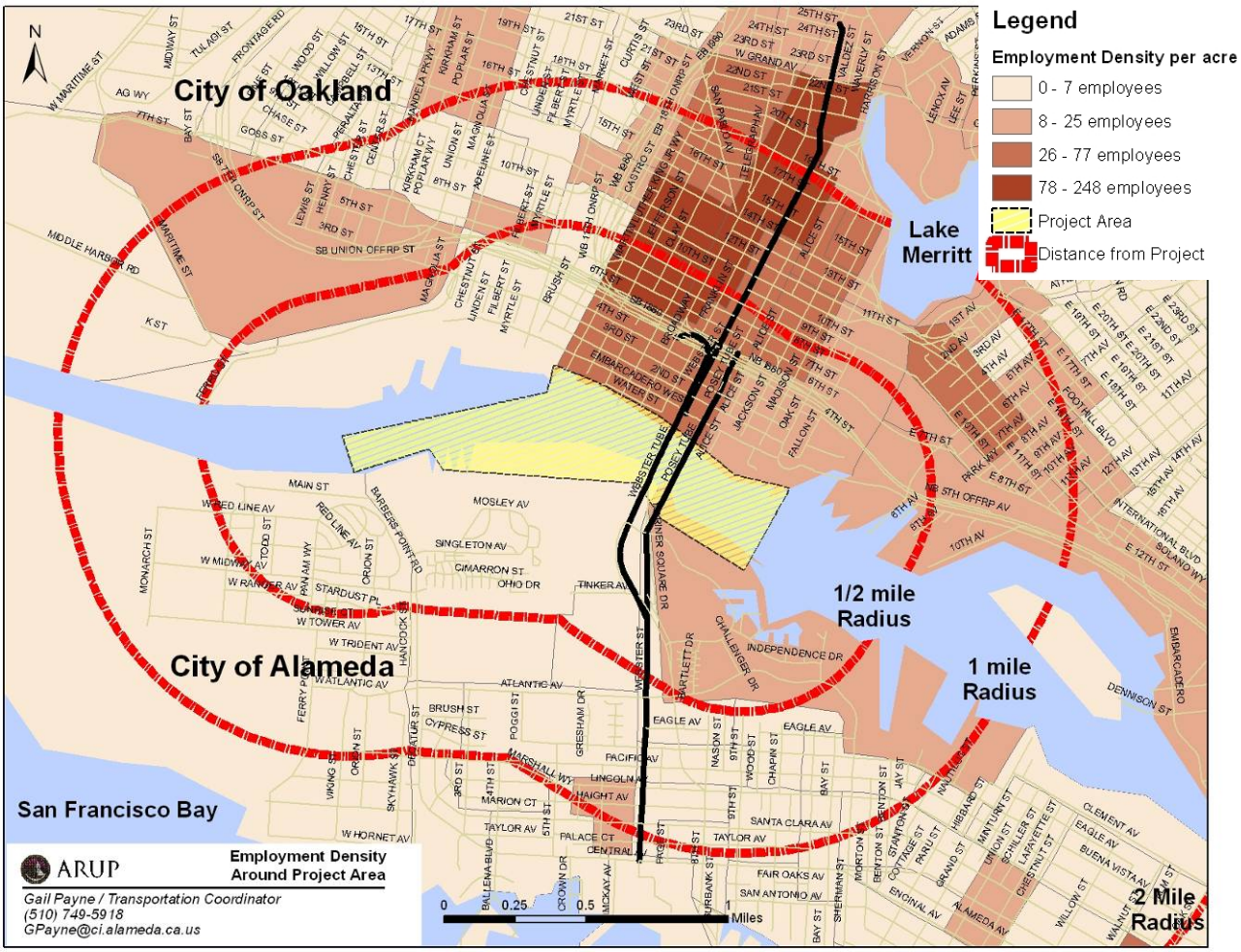
This chapter provides an overview of the existing baseline conditions in the study area, which informed the study team's understanding of the existing context, opportunities and constraints. Specifically, this chapter provides information on the study area demographics, the bicycle, pedestrian and transit networks, projected travel demand and key factors that guided the selection of the preferred alternatives such as historic buildings, emergency lifeline facility needs, related policies and jurisdictional boundaries.

3.1 Existing Demographics

3.1.1 Employment

The highest employment density within the project area is centered in downtown Oakland, with medium and low employment density surrounding downtown Oakland into Jack London Square (Figure 2). There is also a distinct employment district near the Alameda shore in Marina Village. Employment density may rise in the future from the Alameda Landing and Alameda Point projects.

Figure 2: Employment Density within Project Area



Source: Arup (2008), US Census (2000)

3.1.2 Housing

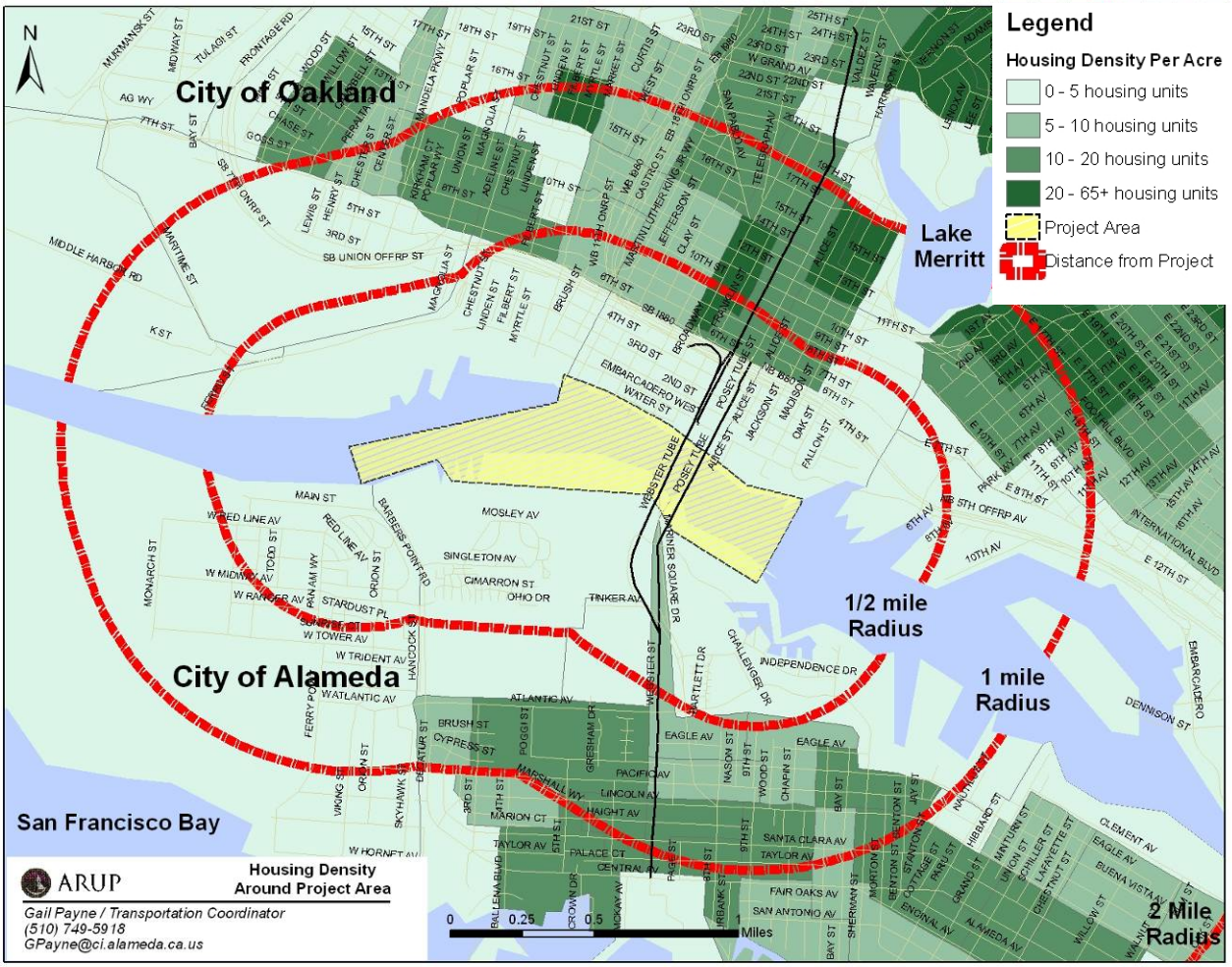
Within the study area, the City of Oakland shows a relatively high housing density; particularly around Lake Merritt and downtown Oakland with over 20 units per acre (Figure 3). Lower density housing exists in other areas of Oakland and in Alameda, in the range of 5-20 units per acre. Currently, much of the study area along the immediate shoreline in Alameda and Oakland shows low residential density, representing industrial, commercial and ex-naval land uses.

The current master plan efforts to redevelop Alameda Point, Alameda Landing and Alameda's northern waterfront (Marina Village to Grand Street) may bring over 4,000 new housing units to the area, representing an increase of 13 percent in housing units since the 2000 US Census.

In Oakland, the proposed Oak to 9th redevelopment would provide an additional 3,100 residential units and 200,000 square feet of ground-floor commercial space.

With these projects in the pipeline, it is increasingly important to consider alternative transportation options between Oakland and Alameda to address the expected increased demand in all modes of transportation.

Figure 3: Housing Density



Source: Arup (2008), US Census (2000)

3.1.3 Summary of Existing Employment and Housing

Census data reveals a significant residential and employment population within a short distance of the proposed estuary crossing study limits. Analysis of zones within a half-mile, one and two mile radius of the 1.5 mile long study area shows a significant catchment of residential and job density (Table 2). These numbers are likely to grow higher in the near future as major projects such as Alameda Landing and Alameda Point are realized.

Table 2: Residential Dwellings and Jobs within the Project Catchment

Distance	0.5 miles	1 mile	2 miles
Approximate residential population[1]	5,031	46,163	152,684
Residential dwelling units	2,141	19,644	64,972
Jobs	28,575	72,370	112,489

Notes: 1. Assumes average household occupancy of 2.35 residents per household, as reported for the City of Alameda in the 2000 US Census.

3.2 Existing and Planned Bicycle and Pedestrian Networks

There are two designated bikeways connecting Alameda and Oakland. One is through the Posey Tube and the other is via the Fruitvale (Miller Sweeney) Bridge. Although the Posey Tube is designated as a Class I facility, it currently provides a poor quality option for pedestrians and cyclists. The path, shown in Figure 4, is a bi-directional path within the Posey Tube on the east side of the northbound traffic lanes. The path is approximately four feet in width, which is inadequate for passing cyclists and pedestrians. In addition, this link is unpleasant for users due to vehicle noise and emissions.

Figure 4: Posey Tube Pedestrian and Bicycle Pathway

The Fruitvale Bridge is located approximately three miles southeast of the Posey Tube, and currently provides a physically separated, bi-directional path on each side of the vehicular bridge, which is also shared by pedestrians. This facility does not provide a convenient travel option for pedestrians and cyclists seeking to travel between west Alameda and downtown Oakland. Park Street and High Street provide alternate crossings for pedestrians and bicyclists near the Fruitvale

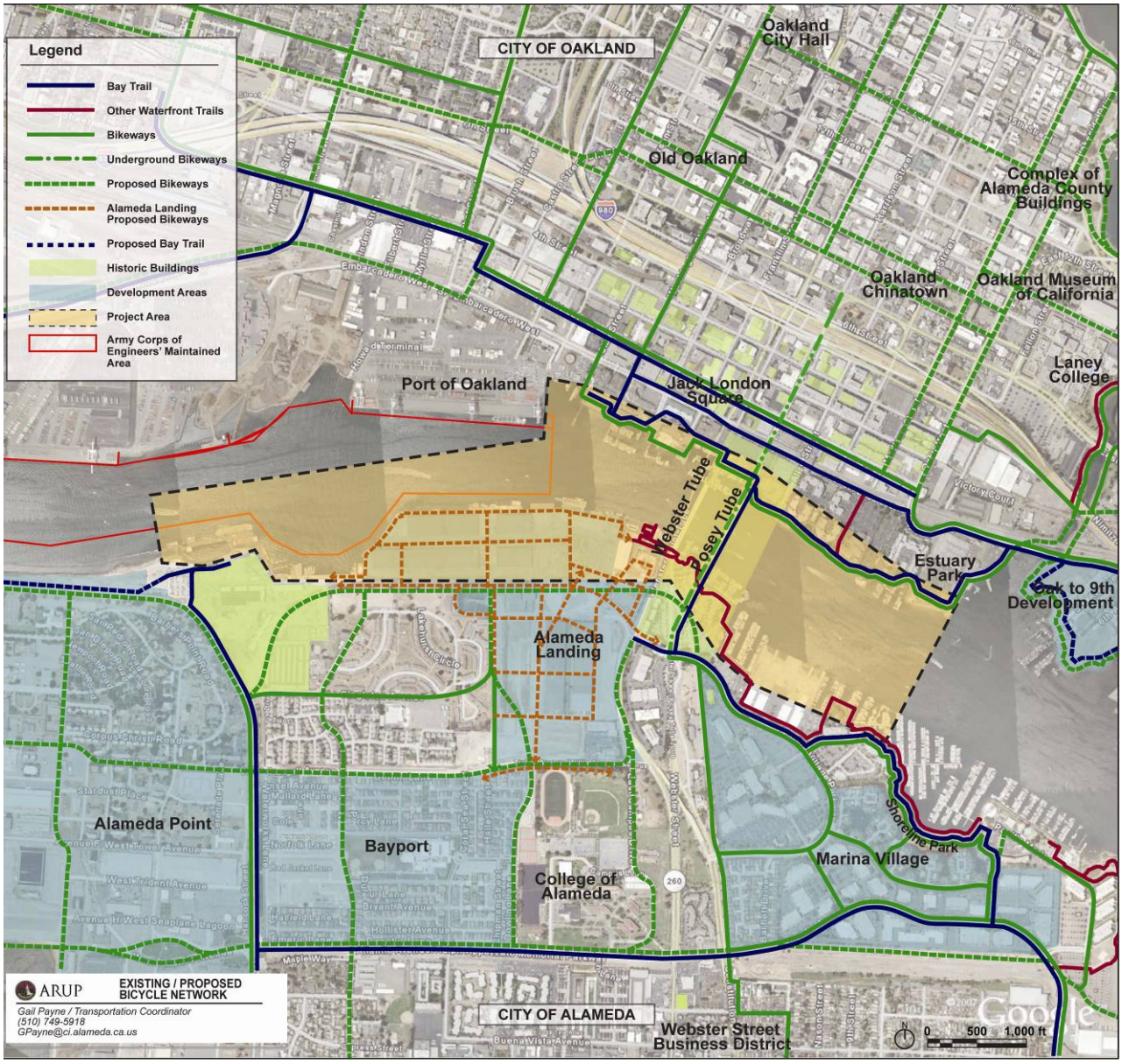
Bridge. Nevertheless, neither are designated bikeways. As a comparison, a bicyclist riding between the College of Alameda and Lake Merritt BART station would travel almost two miles using the Posey Tube and six miles using the Fruitvale Bridge corridor.

Many of the existing bike facilities in downtown Oakland and Jack London Square are Class III facilities. The 2007 Bicycle Master Plan proposes most facilities for upgrade to Class II striped bike lanes. Key facilities are a bike path along the Jack London Square shore, the Bay Trail along Second Street (Class III bike route) and north-south connections to downtown Oakland along proposed bike lanes on Martin Luther King Jr. Way, Washington Street, Madison Street and Oak Street.

In Alameda, there are existing Class II bike lanes in the Marina Village development in addition to the Posey Tube facility. Future bike lanes will be provided within the Alameda Landing development, which will extend the bicycle network along the immediate shoreline.

Key pedestrian and bicycle facilities are shown in Figure 5.

Figure 5: Key Pedestrian and Bicycle Networks



Sources: City of Alameda, City of Oakland (2007)

3.3 Existing and Planned Public Transit Facilities

The study area has several transit options available, as shown in Figure 6. The key services include:

- BART: Provides regional rail service within the Bay Area. Stations are available at downtown Oakland (12th Street Oakland City Center) and Lake Merritt (at 8th and Oak Streets).
- Amtrak: Provides service along the Capital Corridor (San Jose-Sacramento), Coast Starlight (Los Angeles – Seattle) and San Joaquin (Bakersfield – Oakland) lines. The station is located adjacent to the site on Second Street (at Alice Street).
- Alameda/Oakland Ferry: Provides service between Oakland (Jack London Square at Clay Street), Alameda (Main Street) and San Francisco (Embarcadero).
- AC Transit: Provides service within Alameda and Contra-Costa Counties and to San Francisco. Key local corridors include Broadway, 11th and 12th Streets in downtown Oakland, the Webster Street and Posey Tubes and Alameda's Webster Street.

There are also a number of concepts and proposals for transit improvements in the study area. These project proposals are outlined briefly below:

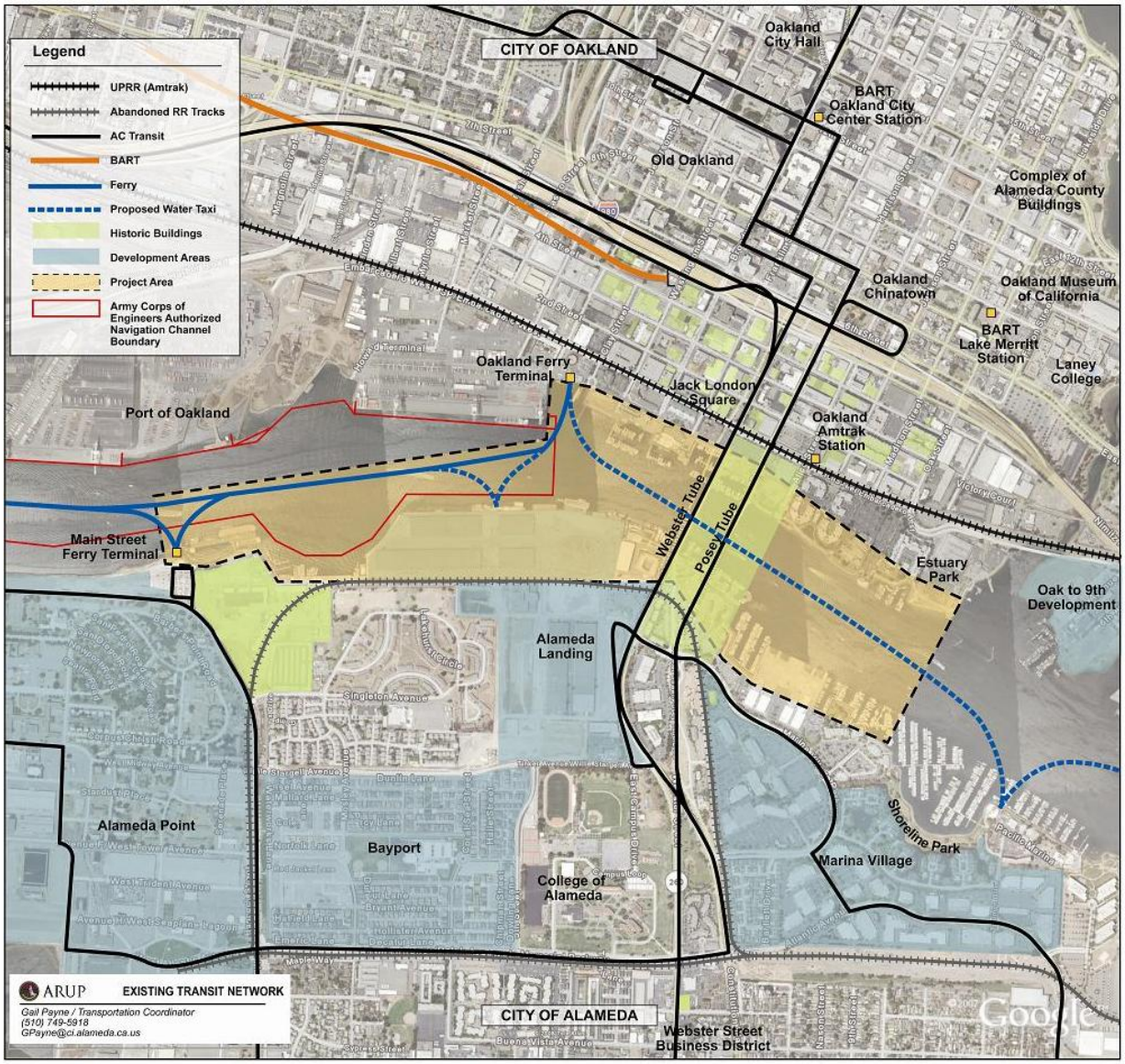
- BART: As outlined by the Regional Rail Plan (MTC, 2007), there may be potential to provide a BART station in Alameda as part of a new long-term Bay BART crossing.
- Ferry: The Alameda ferry terminal may move from the estuary to a bayside location in Alameda Point. Additionally, the Water Emergency Transportation Authority is planning a new ferry service between Oakland/Alameda and South San Francisco.
- Water Taxi/Shuttle: A water taxi or shuttle service has been proposed for the Alameda estuary as part of the Alameda Bike Plan and the Alameda Landing Transportation Systems Management / Transportation Demand Management (TSM / TDM Plan). The service would operate from multiple points along the Alameda shoreline to the existing ferry wharf at Jack London Square.
- Oakland Shuttle/Streetcar: Options have been studied by BART to better link Jack London Square with downtown Oakland. Initial planning has suggested that a streetcar or bus shuttle may be feasible options. More detailed studies are required and funding sources identified to confirm the future potential of this transit connection.
- West Alameda Shuttle: The City of Alameda has studied a potential shuttle for west Alameda with routes to serve Alameda Landing, Alameda Point and Marina Village.
- Webster Street as ITS/Smart Corridor: The City of Alameda has receive funding for an ITS/Smart Corridor Project for the Webster Street Corridor, which could reduce congestion and improve travel speed of transit and emergency services along this corridor.
- Exclusive Transit Right-of-Way Streets: The City of Alameda has identified exclusive transit right-of-way streets for a potential bus rapid transit system. Rights-of way were identified in the Transportation Element of the General Plan update along Clement Avenue and Lincoln Avenue from Ferry Point to the Fruitvale Bridge.
- Mariner Square Drive Transit Hub and Park & Ride Lot: The City of Alameda has proposed a realignment of Mariner Square Drive, which would allow provision of a transit hub with a park & ride lot with bus access only lanes to the Posey Tube.
- Queue Jump Lanes: The extension of Willie Stargell Avenue (formerly Tinker Avenue) to Webster Street in Alameda will provide a new queue jump lane for the northbound transit

buses. As part of Broadway/Jackson Street improvements, a current proposal could potentially introduce queue jump lanes for buses on reconfigured 6th Street in Oakland.

- ITS Bus Improvements: The City of Alameda also has proposed various ITS improvements for AC Transit routes using Webster Street and the Webster Street / and Posey Tubes, such as signal priority for buses and real-time bus arrival/departure electronic signs at bus stops for bus lines using Tubes.

While the surrounding area is rich in transit options, the estuary limits the number of transit connections between Alameda and Oakland. A key objective of the study is to enhance connectivity between Alameda and regional transit services in Oakland.

Figure 6: Key Transit Networks



Sources: City of Alameda, City of Oakland. Note: For AC Transit bus routes, only Alameda-Oakland bus routes via the Webster Street and Posey Tubes are shown on the map.

3.4 Existing and Projected Travel Demand

The existing travel demand for estuary crossings by the various modes of walking, cycling, bus and cars is summarized below.

3.4.1 Existing Bicyclist and Pedestrian Travel

BikeAlameda undertook a survey on October 24, 2006 to record the number of pedestrians and cyclists using the Posey Tube between the hours of 6am – 7pm. BikeAlameda also surveyed the usage at Park Street Bridge, which connects eastern Alameda and Oakland, and is located two and a half miles southeast of the project area. The results of the survey are:

- A total of 72 cyclists and 22 pedestrians used the Posey Tube during the 13-hour survey period.
- The peak demand was seven pedestrians and cyclists within a 15-minute period (5pm to 5:15pm), while typical demand was 1-3 users per 15-minute period.
- In addition, 39 cyclists used AC Transit services operating through the tube. There were nine instances of full racks (with two bikes loaded) throughout the day, meaning that any additional cyclists would have been precluded from using the service.
- On the Park Street Bridge, 282 cyclists, 239 pedestrians and 8 cyclists on buses crossed the estuary. This information is relevant as some cyclists and pedestrians may be diverting to the Park Street Bridge instead of using the Posey Tube.

3.4.2 Existing Bus Ridership

The number of one-way passengers traveling through the tubes on an average weekday totals over 7,000 (Table 3).

Table 3: Existing AC Transit Daily Ridership through the Webster Street/Posey Tubes

Bus Line	Direction	Location before Tubes	City	Riders thru Tube	Ave. no. of riders	Max. no. of riders
19	EB	7th Street and Franklin Street	Oakland	255	8.1	19
19	WB	Marina Village Pkwy and Mariner Square Drive	Alameda	241	7.7	17
51	SB	7th Street and Franklin Street	Oakland	1,989	23.2	71
51	NB	Webster Street and Atlantic Street	Alameda	2,092	20.8	49
63	SB	7th Street and Franklin Street	Oakland	260	8.2	21
63	NB	Constitution Way and Marina Village Pkwy	Alameda	209	6.5	21
O-OX	EB	5th Street and Washington Street	Oakland	904	18.3	48
O-OX	WB	Webster Street and Atlantic Street	Alameda	756	13.7	45
W	EB	5th Street and Washington Street	Oakland	218	19.9	35
W	WB	Webster Street and Atlantic Street	Alameda	160	22.8	38
Total One-Way Passengers Traveling Thru Tubes on an Avg. Weekday				7,084		

Source: Automatic Passenger Counters, AC Transit, Summer 2006

3.4.3 Existing Auto Traffic Volumes

Preliminary information from the Broadway/Jackson Street Access Improvements for I-880 Project Study Report indicates that about 55,000 vehicles per day travel through the Webster Street and Posey Tubes as shown below:

- Webster Street Tube Average Daily Traffic (ADT) = 27,000 vehicles per day (approximate)
- Posey Tube Average Daily Traffic (ADT)= 28,000 vehicles per day (approximate)
- Webster Street Tube existing peak hour vehicular volumes = 2,085 vehicles per hour (AM) and 3,044 vehicles per hour (PM)
- Posey Tube existing peak hour vehicular volumes = 2,485 vehicles per hour (AM) and 2,175 vehicles per hour (PM)

3.4.4 Existing Boat Traffic Volumes and Bridge Openings in Estuary

Three bridges – Park Street, Miller-Sweeney and High Street – exist in the Oakland-Alameda Estuary to the east of the study area. According to 2007 Alameda County data, these bridges were required to open on average between 72 and 83 times per month, which averages almost three times per day (Table 4). Bay Farm Island Bridge is on San Leandro Channel, which is near the southeast part of the island, and opened on average 12 times per month in 2007.

The boat traffic, as shown in the rows titled “Craft” and “Barge,” and the bridge openings are expected to be greater in the study area of a proposed bridge. Alaska Basin, Pacific Marina and Alameda Marina are all to the west of these existing bridges. Not all the “Craft” and “Barge” movements require or would require a bridge opening because many vessels can pass through under the bridges.

Table 4: Existing Boat Traffic Volumes and Bridge Openings in Estuary

	Average/month	Peak Month
Park Street Bridge		
Required Bridge to Open	83	104
Craft	92	123
Barge	35	58
Miller-Sweeney Bridge		
Required Bridge to Open	80	108
Craft	89	115
Barge	34	55
High Street Bridge		
Required Bridge to Open	72	96
Craft	80	105
Barge	35	56
Bay Farm Island Bridge		
Required Bridge to Open	12	24
Craft	17	38
Barge	1	9

Source: Alameda County Public Works Agency, 2007.

The amount of time needed to open and close a drawbridge varies depending on the weather conditions, height to raise the bridge, and the type of vessel that needs to pass under the bridge. On average, to open and close a drawbridge, such as Park Street or Miller Sweeney, from start to finish for pleasure craft such as sailboats takes between 4 and 6 minutes and for tugboats/barges takes between 8 and 12 minutes. The aerial lifts move at approximately one foot per second. Most of the time is needed to clear traffic and to move the vessel. To clear pedestrians or bicycles from a

wider bridge takes a bit longer than the vehicles. A proposed bridge in the study area is expected to be bigger than the existing estuary bridges so is expected to take longer to open and close than the existing bridges. Examples of other bridges, which would be similar to a proposed bridge in the study area, take between 6 and 20 minutes to open and close. It is estimated that some additional time (2 to 4 minutes) will be required for pedestrians. More information on these bridges is as follows:

- **Burlington-Bristol Bridge**, which crosses the Delaware River, takes up to 20 minutes to open and close. This bridge has a vertical clearance of 135 feet, and is at 61 feet in the closed position.
- **Duluth Aerial Lift Bridge** is a significant landmark and tourist attraction for the Duluth area. This bridge, which had an overhaul in 2000, takes between 7 and 8 minutes for pleasure craft and US Coast Guard cutters that are stationed at the US Coast Guard Station in Duluth and between 12 and 15 minutes for ore boats. This bridge has a vertical clearance of 135 feet, and is at 15 feet in the closed position.
- **Hawthorne Bridge** in Portland has 200 openings per month, and takes between 6 and 12 minutes to open and close. This bridge has a vertical clearance of 165 feet, and is at 49 feet in the closed position.
- **Interstate Bridge** between Oregon and Washington states takes about 8 minutes for pleasure craft and about 20 minutes for tugboats/barges to open and close. This bridge has a vertical clearance of 160 feet, and is at 25 feet in the closed position.

During commute hours, the existing bridges in the Oakland-Alameda Estuary are not required to open for the passage of vessels except for reasons of safety and for emergency vessels. These restrictions were initiated to reduce congestion back-ups on I-880. Congestion back-up concerns for a bike/pedestrian or bike/pedestrian/transit bridge would not be as great as for the existing motor vehicle bridges, although allowing the bridge to open during peak commute hours could be a significant deterrent to bicycle commuters in this corridor. The existing bridge regulation, which is Code of Federal Regulations Title 33, Subpart B – Specific Requirements for the Oakland Inner Harbor Tidal Canal (§117.181), states as follows:

> "The draws of the Alameda County highway bridges at Park Street, mile 5.2; Fruitvale Avenue, mile 5.6; and High Street, mile 6.0; and the U.S. Army Corps of Engineers railroad bridge, mile 5.6 at Fruitvale Avenue, shall open on signal; except that, from 8:00 a.m. to 9:00 a.m. and 4:30 p.m. to 6:30 p.m. Monday through Friday except Federal Holidays, the draws need not be opened for the passage of vessels. However, the draws shall be open during the above closed periods for vessels which must, for reasons of safety, move onto a tide or slack water, if at least two hours notice is given. The draws shall open as soon as possible for vessels in distress and emergency vessels, including commercial vessels engaged in rescue or emergency salvage operations."

3.4.5 Potential Future Demand for Estuary Crossing

The potential future demand for an improved estuary crossing will vary depending on future changes to land uses, the attractiveness of competing transport modes and the characteristics of the estuary crossing option chosen (Table 5).

Existing Bicyclists and Pedestrians

The existing pedestrian and bicycle demand recorded by BikeAlameda would likely represent a small fraction of the potential demand, due to the conditions in the Posey Tube. It is assumed that most, if not all, of these 92 daily travelers would divert to an improved estuary crossing option. A further proportion of users of the Park Street Bridge (521 daily trips) could be expected to divert to the new estuary crossing as a result of a more direct or otherwise more convenient route.

Diverted Trips to Bicycling and Walking

In addition, a proportion of existing travelers using buses and private vehicles could be expected to use an improved estuary crossing, depending on the relative attractiveness and convenience of the option selected. The extent of this diversion depends on the origins and destinations of the trips, with shorter trips being more likely to divert to walk and bike modes. The usage of the estuary crossing will depend on future land use intensification, which includes significant redevelopment at Alameda Landing and Alameda Point. When considering all travel modes, approximately 62,000 daily trips are made across the estuary via the Webster Street and Posey Tubes.

Induced Trips – New Bicycling and Walking Trips

A third category of potential trips is new users. This 'induced demand' would arise as a result of improved transport choices, which would allow new trips to be taken that are not being satisfied by existing transport options. A large proportion of these trips would be recreational or tourism based, including visits to Jack London Square or users of the Bay Trail. This user group is likely to be highly influenced by the attractiveness and visibility of the estuary crossing option. Another potential user group could include residents of Oakland who could access shopping and services in Alameda rather than Oakland, Emeryville or Berkeley with estuary crossing improvements.

Future Trip Demand Estimate

A future trip demand scenario can be estimated using the existing demand on the Park Street Bridge as a base. This nearby precedent allows for unimpeded bicycle and pedestrian flow across the bridge, at no cost to the user, surrounded by a fully built out urban environment at relatively low density residential and employment land uses. There are also two adjacent bridges at Fruitvale Avenue and High Street, which provide comparable alternate routes. The total pedestrian and bicycle volume in the eastern Alameda-Oakland corridor is likely to be in the order of 1,000 - 1,500 trips per day.

The surrounding urban environment near the eastern estuary crossings has significantly lower residential and employment densities than exhibited adjacent to the project area. Analysis of GIS data has revealed that there are approximately 170 percent more jobs and housing units within a 1-mile radius of the Webster Street and Posey Tube Crossings than in the vicinity of the Park Street Bridge. Broadly, trip demand would be expected to change in proportion with this factor. Based on this approach, existing demand is estimated to be in the order of 2,000 – 3,000 trips per day, or approximately 150-250 trips per hour if distributed evenly over a 12-hour day.

Future Trip Demand Estimate with Land Use Changes

Significant development associated with projects such as Alameda Landing and Alameda Point may increase this demand. Applying this methodology to future increases in population and employment for future projects would increase the demand by approximately 500 – 1,000 trips per day, or 40 – 80 additional trips per hour. When considering a crossing such as a bridge and the future expected land use developments, future demand is estimated to be 2,500 – 4,000 trips per day, or approximately 190-330 trips per hour if distributed evenly over a 12-hour day.

Table 5: Summary of Potential Pedestrian and Bicyclist Demand

Scenario	Demand per day	Typical demand per hour
Estimated Existing Demand	1000 – 1500	80 – 125
Estimated Future Demand with Improved Crossing	2000 – 3000	150 – 250
Estimated Future Demand with Improved Crossing and Identified Land Use Changes	2500 – 4000	190 – 330

This estimate will be greatly affected by the total delay and cost to users, and the above estimates assume a crossing such as a bridge with minimal delays especially during the peak commute times. Therefore, having an opening restriction during the commute hours would be critical to attract the estimated users. A conveniently located bridge option with no cost to use would attract a higher number of users than an infrequent shuttle option with a required user fee. Delay and cost to users are taken into consideration in the options evaluation phase of the study.

Validation of Pedestrian and Bicyclist Demand

The demand estimate has been verified against alternate methods of trip estimation, including an analysis of potential mode shift from existing cross-estuary trips and analysis of Census data for work related trips between Oakland and Alameda. For example, the bicycling and walking commute mode share for the City of Alameda is 4.4 percent according to the 2000 Census. Using this mode share and the existing 62,000 daily trips across the estuary via the tubes, the expected number of bicyclists and pedestrians totals 2,728. This estimate is within the above estimated trips per day for an estuary crossing like a bridge that would have minimal delays at all times of the day. Another way to validate the estimate is by comparing the potential crossing with similar improvements made to bridges in the City of Portland. Portland's population of 500,000 is over five times the population of the City of Alameda. The Portland bridge improvements have led to over 15,000 daily trips by bicyclists. When scaled down to the City of Alameda, 3,000 daily trips by bicyclists could occur, which is within the above estimated trips per day for the proposed estuary crossing.

3.5 3.5 Key Guiding Factors

Key factors that guided the selection of the preferred alternatives include jurisdictional boundaries, historic buildings, emergency lifeline facility needs, policy regulations and government agency participation.

3.5.1 Jurisdictional Boundaries

The City of Alameda and the City of Oakland are separated by the estuary, which provides a natural boundary between the two cities. The Port of Oakland controls a significant portion of the waterfront, as shown in Figure 7. Each city retains control within their respective city limits and the United States Coast Guard monitors the waterways.

Figure 7: Jurisdictional Boundaries

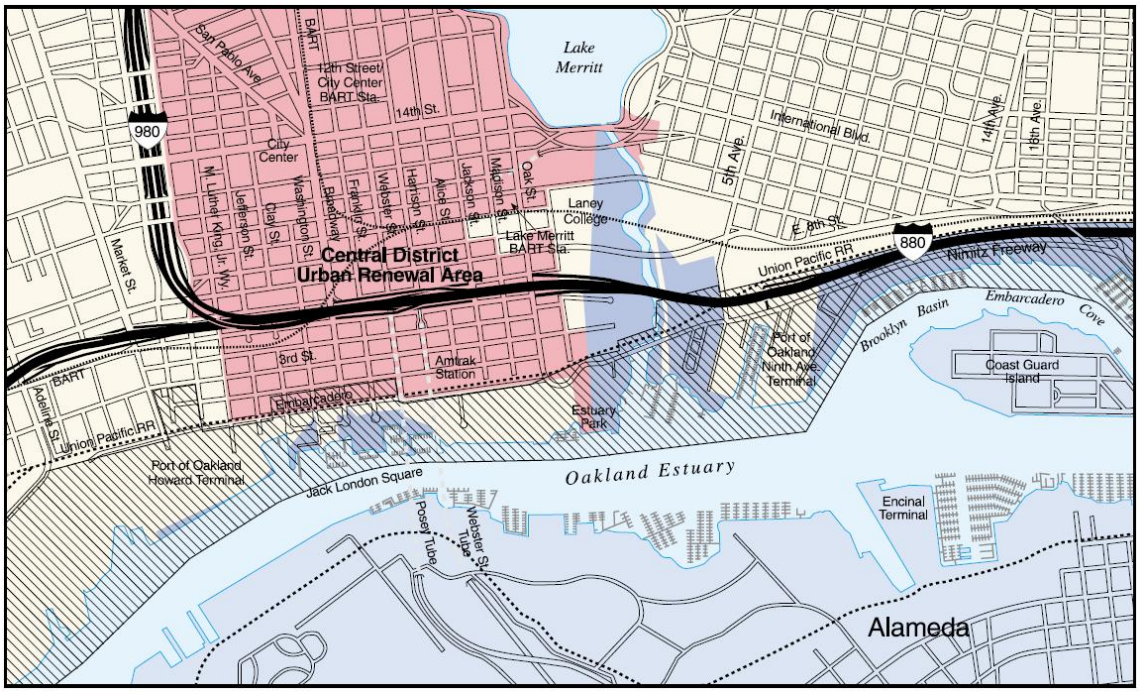


FIGURE I-5: **Jurisdictions**

City of Oakland Redevelopment Areas
City of Oakland
Tidelands Trust Land
Port of Oakland Jurisdiction
City of Alameda

Source: Estuary Policy Plan, Oakland California (City of Oakland, 1999)

3.5.2 Historic Buildings

The majority of historic buildings listed on the National Register are found in the City of Oakland, mainly in the downtown core and in nearby Jack London Square. The Posey Tube and its entrance portals are considered historic structures. There are a few historic buildings listed within the project area in the City of Alameda, mainly due to the historic nature of the area previously being developed as military-related installations.

3.5.3 Emergency Lifeline Facility

The City of Alameda lacks a lifeline transportation facility, which would connect the island to the regional lifeline transportation and water systems including the adjacent Oakland International Airport and the Port of Oakland for emergency response, mutual aid and evacuation purposes. A lifeline facility in the City of Alameda also would ensure an uninterrupted flow of goods and people via the City of Alameda in case I-880 were disrupted.

The City of Alameda could be vulnerable after a major earthquake or act of terrorism. The City of Alameda is an island City with limited resources for addressing a major disaster without bringing outside assistance. A regional distribution center for Red Cross is at Alameda Point in the City of Alameda. Furthermore, the regionally significant port and airport may need to have alternative routes via the City of Alameda to access their facilities, especially since I-880 is not a lifeline facility.

3.5.4 United States Coast Guard Regulations

A proposed bridge would be subject to bridge law (United States Code Title 33 section 494), which is administered by the United States Coast Guard.

> "No Bridge erected or maintained under the provisions of sections 491 to 498 of this title, shall at any time unreasonably obstruct the free navigation of the waters over which it is constructed. If the bridge shall be constructed with a draw, then the draw shall be opened promptly by the persons owning or operating such bridge upon reasonable signal for the passage of boats and other watercraft.

In the event that a drawbridge is unable to operate for any reason, the bridge is to remain open to vessel traffic until the bridge is again operational or is removed.

Owners of drawbridges shall ensure that the necessary draw tenders are provided for the safe and prompt opening of the draw. They shall ensure that all operating machinery of the draw is maintained in a serviceable condition and that the draws are operated at sufficient intervals to assure their satisfactory operation.

Enforcement of these regulations is the responsibility of the United States Coast Guard reporting to the United States Department of Transportation."

3.5.5 Policy Regulations and Government Agency Participation

Further analysis of the study will take into consideration existing regulations and adopted policies in guiding the development of project alternatives. The study team will need to engage in ongoing discussions with relevant government agencies to comply with state or federal regulations. A brief description of regulations and government agencies the project stakeholders will refer to include:

- Americans with Disability Act (ADA): The ADA provides guidelines for designing and implementing pedestrian infrastructure related to individuals with disabilities.
- Army Corps of Engineers (ACOE): The ACOE is responsible for investigating, developing and maintaining the nation's water and related environmental resources, and will have a stake in any project over the waterway.
- California Department of Transportation (Caltrans) – Caltrans is the State agency responsible for California's state highways and freeways. Caltrans also provides rail services in partnership with Amtrak, provides technical assistance to airports and administers funding grants for cities, counties and transit operators. Locally, Caltrans manages the I-880 and I-980 freeways, SR-260 (Webster Street, the Webster Street Tube and the Posey Tube) linking Oakland and Alameda and SR-61 (Central Avenue, Encinal Avenue, Broadway and Otis Drive) linking Alameda and Oakland International Airport.
- California Environmental Quality Act (CEQA): CEQA is California's guiding environmental policy that informs policy makers and the public about the potential significant environmental effects of proposed activities. Project impacts are required to be reported in an Environmental Impact Report (EIR).
- National Environmental Policy Act (NEPA): NEPA is the federal environmental policy that requires environmental reporting associated with federal projects, including projects undertaken by others that receive federal funding. An Environmental Impact Statement (EIS) is required to provide detailed information on the proposed project, alternatives considered and strategies to be employed to mitigate any environmental impacts. The Environmental Protection Agency overseas and reviews EIS documents to ensure quality and consistency of reporting.
- US Coast Guard: The Coast Guard is responsible for approval of the locations and plans of bridges constructed across navigable waters of United States. The Coast Guard also regulates drawbridge operations and bridge lighting, inspects merchant vessels and certifies their masters and crews. For the pertinent bridge law, refer to the above section (Section 3.5.4.).
- San Francisco Bay Conservation and Development Commission (SFBCDC): The San Francisco Bay Conservation and Development Commission is responsible for approval of any filling, dredging, new construction, major remodeling and substantial change in use in the Bay, along the shoreline or other managed wetlands adjacent to the Bay.
- San Francisco Bay Trail: The Bay Trail Plan, adopted by the Association of Bay Area Governments (ABAG) in July 1989, includes a proposed alignment, a set of policies to guide the future selection, design and implementation of routes, and strategies for implementation and financing.

4 Relevant Policy Documents

Future development will alter the current landscape of Alameda and Oakland. Several master plans are either in development or being updated in and around the project area. Relevant studies are summarized below to provide an understanding of the project area.

4.1 I-880/Broadway-Jackson Interchange Improvement Feasibility Study[1]

Completed in 2006, the I-880/Broadway-Jackson Interchange Improvement Feasibility Study focuses on alternatives for improving vehicle connectivity between the north I-880 corridor from Oak Street to Union Street in the City of Oakland and the Webster Street and Posey Tubes. The report also documents the various concept alternatives developed, the alternatives screening, and the final recommendations and next steps. The alternatives developed in this report highlight different variations of off-ramps and interchange connections that would directly affect either the Webster Street or Posey Tubes. Three alternatives are recommended to take forward to a Project Study Report. The preferred option ultimately selected has the potential to affect pedestrian and bicycle access between downtown Oakland and Jack London Square, and therefore should be monitored to ensure coordination.

4.2 Alameda Countywide Bicycle Plan[2]

In 2006, Alameda County Congestion Management Authority published an update of the original 2001 Countywide Bicycle Plan. The plan outlines a vision of a countywide bicycle network that is proposed for construction over a 25 year period. It also provides strategies that would better integrate bicycles with other modes and use education and promotion to increase the incidence of bicycling. This plan shows a potential future link across the Alameda Estuary, but its type is yet to be determined and the project is unfunded. A key design criteria recommendation is that Class I facilities should be at least 12-16 feet in width, and provide for separate pedestrian and bicycle paths if possible.

4.3 Alameda Countywide Pedestrian Plan[3]

The Alameda Countywide Strategic Pedestrian Plan was published with the aim of raising pedestrian issues in Alameda County and of developing a coordinated framework to address them. The plan allocates countywide pedestrian funds through 2030. Key actions undertaken during the development of plans included:

- Describing the existing pedestrian environment and plans for improving the walking and cycling environment throughout the County;
- Isolating institutional obstacles and proposing solutions;
- Crafting a vision with specific goals to further pedestrian improvements;
- Identifying and prioritizing projects, programs and plans of countywide significance;
- Estimating the cost of and revenue available to deliver these efforts; and
- Laying out a course of action to fund and implement these countywide priorities.

The focus areas for investment were identified as routes that provided access to transit, inter-jurisdictional trails and areas that are activity centers such as downtowns. The plan identified areas of significance at a high level, but did not identify specific improvements.

[1] Feasibility Study I-880/Broadway-Jackson Interchange Improvement, Caltrans 2006
[2] *Countywide Bicycle Plan*, Alameda County Congestion Management Agency, October 2006.
[3] *Alameda Countywide Strategic Pedestrian Plan*, Alameda County Transportation Improvement Authority and Alameda County Congestion Management Agency, October 2006.

In addition to the Plan, a Toolkit for Improving Walkability was developed. The Toolkit is designed to help Alameda County jurisdictions and others enhance walkability through policy, planning, design standards, education and programs to encourage walking.

4.4 Draft Alameda Point Station Area Plan Transit-Oriented Development Alternatives[4]

The purpose of the Alameda Point Station Area Plan is to promote discussion within the community on the development options available for the Alameda Point site. In particular, the plan provides information and development typologies that can help achieve a walkable, transit supportive neighborhood. The study notes the key constraint to traffic growth is the Webster Street and Posey Tubes, and responds by summarizing various transportation measures that will work to reduce vehicle trips by 10 percent from residences and 30 percent from commercial development.

Three development alternatives are outlined: the Preliminary Development Concept (PDC) (1,800 housing units and 9,000 jobs), Transit Enhanced PDC (1,800 housing units and 9,000 jobs), and Transit Plus (4,000 housing units, 1,000 affordable housing units and 9,000 jobs). No recommendation is made on the preferred alternative, however it is noted that the Transit Enhanced PDC and the Transit Plus scenarios would provide higher levels of transit ridership, walking and cycling than the base Preliminary Development Concept.

4.5 Alameda Point Transportation Strategy[5]

The Alameda Point Transportation Strategy is a report guiding the growth and redevelopment of the Alameda Point site. The site is located approximately one mile west of the existing Webster Street and Posey Tubes, and is a proposed infill project.

The report develops a number of transportation strategies with the goal to reduce vehicle trips. These strategies include:

- Transit pass program
- Transit center
- Improved bus and shuttle services
- Zero or low emission vehicles
- Expanded ferry service
- Bicycle facilities
- Car sharing
- Parking strategies
- Guaranteed ride home

The report analyzes various transit options to move residents and employees between Alameda Point, Oakland and the greater Bay Area along three specific alignments. One of the three alignments uses the existing tubes for travel between Alameda's west end and downtown Oakland. The transit option alternatives considered for this alignment include:

- Shuttle service
- Expanded ferry service
- AC Transit rapid bus
- Streetcar or light rail
- Aerial tram
- New bridge/tube
- Amphibious crossing

The report also provides traffic analysis of the existing roadway network as well as future traffic demand generated by the Master Plan.

[4] Draft Alameda Point Station Area Plan Transit-Oriented Development Alternatives, prepared for City of Alameda, April 2008
[5] Alameda Point Transportation Strategy, prepared for City of Alameda, November 2005

4.6 Alameda Seaport Access Assessment[6]

The Alameda Seaport Access Assessment provides a preliminary assessment of truck/vehicle and rail access for seaport facilities at the former Alameda Naval Air Station facility. While the naval air station facility is no longer in operation, the analysis conducted for this study is comparable, in terms of traffic, to potential project alternatives.

The report recognized existing physical constraints including:

- Southern Pacific Railroad
- Union Pacific Railroad
- BART
- EBMUD Utility Mains
- Local Streets
- Constraints in improved connections to 1-880
- Alignment and elevation of Interstate 980
- Future alignment of the Cypress Freeway and its interchanges

Design considerations included:

- Future turning basin for ships
- Future channel depth
- Existing container and intermodal terminals
- Wharf pilings
- Container crane's height and travel
- Planned Joint Intermodal Terminal
- Planned expansion of port container facilities

Key design criteria are a navigable channel of 500 feet width, 45 feet vertical clearance for lift bridge options and 135 feet vertical clearance for high level (fixed) bridge options.

Based on a review of the area's opportunities and constraints, the report documented five bridge and tunnel alignments for preliminary analysis. The preliminary alignments were evaluated against a variety of indicators such as capital costs, benefits to Oakland and Alameda residents, and Port and Maritime activities. These alignments were scored against the indicators to determine how each alignment ranked. The five alignments considered in this report were:

- Option A High Level Bridge: Vehicular Bridge from Middle Harbor Road to Main Street
- Option B High Level Bridge: Vehicular Bridge from Adeline St. to Main St.
- Option C Deep Tunnel: Vehicular Tunnel from I-980 to Main Street
- Option D Shallow Tunnel: Vehicular Tunnel from Mitchell Avenue to I-880
- Option E Low Level Lift Bridge: Vehicle and rail bridge from east of Posey Tube in Alameda to I-/880 at 5th Avenue in Oakland.
- Option F Lift Rail Bridge: Rail only Bridge from Mitchell Avenue in Alameda to the Embarcadero near Oak Street in Oakland.

Options B, C, D and E were recommended to take forward for further analysis.

[6] Alameda Seaport Access Assessment, Final Report August 1994. Korve Engineering to The East Bay Conversion and Reinvestment Commission

4.7 Alameda West End Feasibility Study - Shuttle Service and Operations Analysis Draft Report[7]

The Shuttle Service and Operations Analysis Draft Report gives and overview of factors to be considered in the planning for improved transit accessibility to Alameda's west end. The report notes the significant development occurring in Alameda, and the potential to introduce new shuttle services to reduce single occupant vehicle use, particularly at peak hours.

Issues raised by the report include service parameters, vehicle fuel options, operating structure, funding and likely costs. Three conceptual routes serving Alameda Point, Alameda Landing and Marina Village are documented. All options assumed that the shuttle would travel to Oakland's 12th Street BART Station via the Webster Street and Posey Tubes.

No definitive recommendations are made; however, the advantages and disadvantages of various options are explained. From this analysis, it was suggested that:

- Any future service would be most efficiently operated by a third party such as AC Transit or a shuttle operator;
- The vehicle fuel type should be selected based on an understanding of fuel availability, capital and operating costs, maintenance requirements and environmental benefits;
- The route(s) should complement the existing transit network and not duplicate existing services; and
- Long-term financial sustainability would be most likely through a private-public partnership using a Transportation Management Association.

4.8 Bayport / Alameda Landing Project Master Plan[8]

The Alameda Landing Project Master Plan looks at mid-and-long range build out scenarios and alternatives on the decommissioned Alameda Naval Air Station and Fleet Industrial Supply Center. The site is west of the Webster Street and Posey Tubes. The Master Plan proposes a number of new roadways, bikeways and pedestrian linkages that support the new Master Plan program and that connect to the existing primary circulation system in Alameda. The plan also proposes a new water shuttle landing site approximately 700 feet west of the Webster Street Tube. A portion of the proposed program focuses on development along the water's edge, west of the proposed water shuttle landing site. If a new estuary crossing were proposed in this area, close coordination would be required to provide an integrated land use and transportation development outcome.

4.9 City of Alameda Bike Master Plan[9]

There are two designated bikeways connecting Alameda and Oakland: through the Posey Tube and the Fruitvale Bridge connector. In the immediate proximity of the Posey Tube, there are some existing Class II bike lanes near the Marina Village development, while the Posey Tube facility is designated as a Class I bike path. There is also a relatively well developed network of bike lanes in east Alameda.

Much of the network development will occur with the redevelopment of industrial and naval land uses in the western sections of Alameda. Of key significance are the Class II bike lanes proposed to connect Alameda Landing along the shoreline. Other priorities will include further development of the off-street shoreline (or Bay Trail) trail network around Alameda, and a proposal to link Alameda to Oakland via water taxi routes.

[7] 2.15 Alameda West End Feasibility Study - Shuttle Service and Operations Analysis Draft Report, City of Alameda, April 2007.
[8] Bayport/Alameda Landing Project Master Plan, Alameda City Council, December 2006
[9] City of Alameda Bicycle Master Plan, Final Report, July 1999

4.10 City of Alameda Internal Memos

The City of Alameda produced several internal memorandums detailing various topics related to the estuary crossing. The topics discussed ranged from water borne vehicle comparison analyses to bridge feasibility studies. The various memos are discussed below.

Amphibious Vehicles for Estuary Crossing (September 2007)

This memo summarizes three amphibious vehicle options for the estuary crossing and makes a preliminary recommendation on the preferred option for use in Alameda. The options considered include:

- Hydra-Terra (a 49 capacity vehicle, used by Vancouver Duck Tours)
- Lighter Amphibious Resupply Cargo (LARC) (a 32 capacity vehicle developed for the Vietnam War, currently used by SeaQuest in Victoria, BC)
- DUKW (a 38 capacity vehicle developed for World War II, currently used by Ride The Ducks in Baltimore, Philadelphia, Seattle and other US locations)

The memo recommends the Hydra-Terra option. Primary reasons for this recommendation are that these modern vehicles are wheelchair accessible, and also satisfy US Coast Guard, US Department of Transportation and California emission requirements. The LARC vehicle option was considered but rejected, in part due to its wide body and environmental concerns with the visible emissions of the vehicle. The DUKW vehicles were considered but rejected due to their age, safety concerns and maintenance requirements.

Estuary Pedestrian and Bicyclist Bridge (September 2007)

This memo is a brief description of some of the existing conditions and requirements for a future bridge in discussions with the U.S. Coast Guard. Key notes from the memo included:

- Vertical and horizontal clearance requirements for a fixed bridge, which would be prohibitive due to ADA requirements
- Drawbridge considerations included:
    - Need to make the clearance wide enough and large enough for maritime and Coast Guard operations
    - Need to operate the bridge which will most likely be in the closed navigable position
    - If open in the navigable position, an operator is not required during evening hours
    - Difficult to justify since the span has to be wide - horizontal clearance - thus need to design a wide movable span
    - Length and width requirements preclude a small/light weight bridge like Bay Farm Island Bicycle/Pedestrian Bridge
- Need to design for 35 mph winds
- Big vessels use the channel

Neighborhood Electric Vehicles (August 2007)

This memo provides a brief description of neighborhood electric vehicles (NEVs) as a potential option for alternative transportation between Alameda and Oakland. The memo provides an explanation of the benefits and constraints associated with NEVs, as well as real world examples. The benefits include:

- An attractive alternative for short trips, which tend to be the most polluting and inefficient in gasoline powered automobiles
- Zero tailpipe emissions or evaporative emissions that contribute to air pollution and global warming
- Small vehicles take up less space on the road and so help reduce traffic congestion
- Compact, one- to four-passenger vehicles powered by rechargeable batteries and electric motors
- Comparably inexpensive fuel cost
- Reduces the nation's dependence on imported oil

4.11 City of Oakland Bicycle Master Plan[10]

The focus of the City of Oakland Bicycle Master Plan includes upgrades to the bicycle network in downtown Oakland from predominantly Class III bicycle routes to Class II bicycle lanes. These projects will improve the existing bicycle connections between downtown Oakland and Jack London Square with new bike lanes on Martin Luther King Jr. Way, Washington Street, Madison Street and Oak Street. These bike lanes will replace Class III bike routes on Martin Luther King Jr. Way, Washington Street and Broadway. The existing bicycle path in the Posey Tube between Oakland and Alameda is classified as a Class I bicycle path, and the boardwalk along the shore of Jack London Square is also a Class I facility.

4.12 Cross Alameda Trail Feasibility Study[11]

The proposed "Cross Alameda Trail" is intended to enhance the City of Alameda's transportation infrastructure and to provide enhanced bicycle and pedestrian access to the City's major commercial districts and redevelopment sites as well as along the northern waterfront of the City. The purpose of the feasibility study was to understand the existing bicycle and pedestrian infrastructure, identify potential opportunities and constraints, and develop a trail corridor map that identifies potential new infrastructure for future development and cost estimating exercises. The feasibility study identifies five alignment sections for the Cross Alameda Trail. These alignments were analyzed for opportunities and constraints regarding each individual section, including design detail, property acquisitions and cost estimates. These alignments will be analyzed further in future studies.

4.13 Jack London BART Feasibility Study[12]

At the request of the City of Oakland, BART and the City of Oakland undertook a study to determine the feasibility of a new BART station in the vicinity of Jack London Square. The study also considered other transit alternatives that could better link downtown Oakland to Jack London Square. Two options and two alignments were highlighted as the most promising options. The two modes were a distinctive shuttle bus and a streetcar. The streetcar was identified as a longer term option. The two alignments were Broadway and a loop option that would use Washington Street, Franklin Street and Webster Street. The study also noted a City of Alameda study to introduce an underground shuttle between Alameda and the 12th Street BART station.

[10] City of Oakland Bicycle Master Plan, part of the Land Use and Transportation Element of the Oakland General Plan, December 2007
[11] Cross Alameda Trail Feasibility Study, City of Alameda Department of Public Works, July 2005
[12] *Jack London BART Feasibility Study*, Oakland City Council and BART, 2004.

4.14 Oakland Estuary Policy Plan[13]

The Estuary Policy Plan provides objectives and policies to enhance the future of the area of Oakland between Adeline Street, the Nimitz Freeway, 66th Avenue and the Estuary shoreline. The plan was a response to the efforts by the League of Women Voters to enhance and strengthen Oakland's waterfront shoreline district, which borders major city areas such as Jack London Square, downtown Oakland and Chinatown.

The plan calls for a number of improvements for open space and recreational activities along the shoreline such as bikeways, trails and visual amenities. Within Jack London Square, a new retail and commercial core is proposed that attracts visitors to the waterfront. The existing light industrial areas will be preserved to maintain and expand the manufacturing industry.

Significant content within the plan focuses on improving the existing circulation system on the City of Oakland side of the project area. The plan recommends creating new and improved access for pedestrians, bicyclists, vehicles and transit along the entire five-and-a-half-mile length of waterfront. The plan also emphasizes the need to connect waterfront uses and inland areas.

4.15 Oakland Waterfront Trail Plan[14]

The City of Oakland undertook a study to provide public access and other open space opportunities on the Oakland Waterfront. The width of the trail is proposed to be a minimum of 12 feet and vary along its length. The trail will accommodate pedestrians and bicyclists on separated paths in some areas and shared path in other areas. The trail currently exists in the Jack London Square to Oakland Estuary section, which is within the study area of the Estuary Crossing Study. In this section, the trail is shared between pedestrians and cyclists, and was determined as urban in character. Some improvements of signage, lighting and furniture are proposed to provide improved facilities and achieve a unified character. These projects are scheduled to be completed by 2010.

4.16 Regional Bicycle Plan for the San Francisco Bay Area[15]

The Regional Bicycle Plan forms part of the MTC's 2001 Regional Transportation Plan for the San Francisco Bay Area. The plan provides a regional framework completion of a regional bike network. It discusses existing bike infrastructure, identifies a primary bikeway network and provides a plan for funding and implementing the network. The regional network is over 1,600 miles in length, including the 400 mile Bay Trail. In Alameda, the regional bikeways are predominantly existing facilities, comprised of the Bay Trail and the Broadway and Fernside Boulevard bikeways.

4.17 Regional Rail Plan for the San Francisco Bay Area[16]

The Metropolitan Transportation Commission, the Peninsula Corridor Joint Powers Board (Caltrain), the Bay Area Rapid Transit District (BART), and the California High-Speed Rail Authority (CHSRA) recently developed a draft long-range vision for improving the Bay Area's passenger rail system. This long-range plan, documented in the *Regional Rail Plan for the San Francisco Bay Area (Revised Draft Report),* highlights the potential need for a new Transbay rail crossing. This new link would be required some time during 2030 to 2050. The Regional Rail Plan outlines a range of options to provide new infill stations along the new Transbay line. Two potential station options have been identified: at a new Alameda Ferry Wharf on the southern side of Alameda, and at Atlantic Avenue near Webster Street.

[13] Oakland Estuary Policy Plan, June 1999, City of Oakland and Port of Oakland
[14] *Oakland Waterfront Trail – Bay Trail Feasibility and Design Guidelines*, City of Oakland, October 2003
[15] 2001 Regional Bicycle Plan for the San Francisco Bay Area, MTC, December 2001
[16] *Regional Rail Plan for the San Francisco Bay Area - Revised Draft Report*, Metropolitan Transportation Commission, September 2007

5 Evaluation Criteria

The project alternatives were evaluated against a set of assessment criteria to select the most appropriate one for further study. These criteria were developed based on input from the project objectives, stakeholders and the community.

The assessment criteria are:

1. **Safety**: Provision for safe and secure operations based on:
    a. Daily transit service; and
    b. Potential to assist emergency response such as emergency evacuation and lifeline requirements.
2. **Functionality**: Ability to serve and stimulate user demand while allowing maritime access and potential for transit integration. The following are considered:
    a. Minimizing navigational impacts;
    b. Connectivity to other modes;
    c. 24 hour passage capability; and
    d. Connectivity to existing and proposed bicycle and pedestrian networks.
3. **Financial Impact – Short Term**: Assessment of likely capital costs to establish service.
4. **Financial Impact – Long Term**: Assessment of likely annual operation and maintenance costs.
5. **Engineering**: Ability to deliver the alternative in terms of technical complexity, constructability and freedom from physical constraints. Alternatives also are measured against visual aesthetics, including design, view corridors and community appropriateness.
6. **Neighborhood Development**: Potential to stimulate and support recreational and commercial opportunities and to form part of the tourist and recreational experience in the Alameda-Oakland Estuary district while considering potential impacts on private property and neighborhood.
7. **Environmental Impact**: Minimize negative impacts on existing communities, businesses and the natural environment and considering sustainable measures.

All of the alternatives will comply with the requirements and objectives of stakeholders including: Federal Aviation Administration, the U.S. Coast Guard, the U.S. Army Corps of Engineers, the San Francisco Bay Conservation and Development Commission, the Regional Water Quality Control Board, the California Department of Fish and Wildlife Service, the California Harbors and Navigation Code, the California Department of Transportation and Union Pacific Railroad (if required).

Each project alternative has been qualitatively assessed against each criterion according to the rating scale shown in Table 6.

Table 6: Alternative Rating Scale

Symbols	○	O	⊙	◉	●
Assessments	**Very good**	**Good**	**Neutral**	**Poor**	**Very poor**
Safety, Functionality, Engineering, Neighborhood Development and Environmental Impact	Highly positive impact or strong correlation with objective	Positive impact or positive correlation with objective	Moderate impact or neutral correlation with objective	Negative impact or poor correlation with objective	Highly negative impact or very poor correlation with objective
Financial Impact – Short Term	≤ $500,000	$501,000 - $5 million	$6 million - $25 million	$26 million - $50 million	$51 million +
Financial Impact – Long Term	≤ $150,000	$151,000 - $500,000	$501,000 - $2.5 million	$2.6 million - $5 million	$5 million +

Where possible, order of magnitude quantitative information has informed the assessment, particularly with respect to operating speed, capacity, operating costs and capital costs.

6 Alternative Analysis

Project alternatives were developed based on a review of best practices and input from the City of Alameda, stakeholders and the community. Each of the project alternatives is described below, with an assessment of the key advantages, disadvantages and performance against the criteria. Section 6.4 summarizes the qualitative ratings of the preliminary project alternatives.

6.1 Existing Service Improvements

6.1.1 Bike Shuttle Capacity Improvements

Description	Introduction of a new shuttle service between downtown Oakland and Alameda's west end. The service is anticipated to have 15-minute headways. The service can be one of the following options: a) Ultra low floor buses where bicycles can be wheeled directly onto the vehicle. b) Shuttles with higher bike carrying capacity.		
Advantages	Low capital costs Easy to implement	**Disadvantages**	Does not provide a greatly enhanced user experience thus unlikely to stimulate significant demand or land use changes.

Description of performance against preliminary assessment criteria		
Safety	◉	a) Daily transit service safety is comparable to existing transit service in the area. b) Additional capacity to aid in emergency services is limited.
Functionality	⊙	The shuttle service option uses shuttles, with a bicycle trailer attached. Modifications for an ultra low floor bus service will accommodate hanging 25-30 bicycles side by side. The shuttle will be subject to delays from congestion during peak periods. The shuttle service will be timed for increased frequencies during peak commute times. Late night service can be implemented if it is required. The service can connect to other modes, such as BART. It does not interfere with water navigation.
Financial Impact – Short Term	○	The estimated capital cost is $300,000, which does not include a maintenance facility, either using existing space or a new garage. The service will be provided for by an existing bus operator.
Financial Impact – Long Term	◉	The shuttle is expected to have operating costs more than $2 million annually based on 15-minute service headways and two vehicles operating on the route.
Engineering	○	Uses existing roads with new bus stops. New bus stops with accompanying signage will help inform the public about the new service(s) and amenities.
Neighborhood Development	⊙	Unlikely to lead to a large increase in additional cross-estuary pedestrian and bicycle trips and unlikely to stimulate significant land use change. The service will have minimum impact on existing private property and neighborhoods.
Environmental Impact	○	Minimal increases in noise or emissions as the shuttle uses existing road network. Very little infrastructure or construction is needed, unless a maintenance garage or facility is required.

6.1.2 Ferry Service Improvements

Description	An expanded ferry service will provide improved services between Alameda and Oakland with 15-minute service headways. The ferry service will complement the existing Oakland-Alameda-San Francisco service by providing a more regular shuttle along the estuary. This option assumes the purchase of an additional ferry with a capacity of approximately 149-300 passengers, and uses the existing ferry docks at Jack London District and Alameda's Main Street terminal.		
Advantages	High capacity for users Easy to implement	**Disadvantages**	Requires purchase of additional ferry or ferries

Description of performance against preliminary assessment criteria		
Safety	◉	a) Daily ferry transit service safety is comparable to existing ferry service safety levels. b) The alternative is not included in the Water Emergency Transportation Agency's (WETA) future service plan and emergency response procedures.
Functionality	◉	Provides an improvement of an existing service linking the relatively remote Main Street ferry terminal in Alameda to Jack London District. This route does not serve existing demand to and from the established areas of Alameda, but will serve the emerging Alameda Point development. It is likely to be most valuable to commuters and of less value for tourism and recreation. The terminals connect to bikeways or trails. In the longer term, there are plans to move the Alameda ferry terminal to the end of Atlantic Avenue /Ralph Appezzato Parkway, which will make the ferry connection between Alameda-Oakland more difficult.
Financial Impact – Short Term	◉	A new ferry will be required with a significant capital cost of approximately $8 million. Additional terminal and expansion of the existing terminals is likely to be required because of the limited capacity. Seismic retrofits of the existing terminals will be required if the route is designated to be a lifeline. The estimated cost will be approximately $20 million for a new terminal. Expansion, seismic retrofit and ADA enhancements to the existing docks will be additional costs.
Financial Impact – Long Term	◉	The ferry improvement is expected to have operating costs of $4 million annually, which is based on current Oakland-Alameda ferry operating costs.
Engineering	○	The preferred option is to use existing terminals wherever possible. There is little anticipated change to the visual impacts of the alternative, given that existing ferry terminals will be used.
Neighborhood Development	◉	As it is similar to the existing service but with increased frequency, it is unlikely to noticeably change the existing community, although neighborhoods near the station may experience increased traffic congestion related to ferry patrons. Parking requirements will have to be investigated, which may affect surrounding land uses.
Environmental Impact	○	No disruption to the estuary shore; however, there will be some increases in noise and engine emissions.

6.1.3 Bus Service Improvements - Improved Traffic and Transit Management

Description	Improved traffic management of the Webster Street and Posey Tubes can lead to improved travel times for users including bus passengers. Typical treatments include transit priority measures, queue jump lanes, revised signal timing, automated bus routing, real time bus arrival information and changeable message signs on bus and ferry schedules. Specific pedestrian or cyclist improvements are not part of this alternative. 24-hour service is assumed.		
Advantages	Low capital cost Easy to implement Potential for travel time savings for existing Tube users	**Disadvantages**	Does not significantly improve conditions for pedestrians and cyclists over existing environment Will not influence land uses

Description of performance against preliminary assessment criteria		
Safety	◎	a) Road safety levels are comparable to existing roadway safety criteria b) Facilitates emergency information flow to the public via usage of message signs and signals.
Functionality	●	Does not directly serve the needs of pedestrians and cyclists. Does not address the lack of pedestrian and bicycle infrastructure. Does not provide for additional connections to new and future bicycle and pedestrian networks. Improvements can be set for 24-hour service. Does not interfere with water navigation.
Financial Impact – Short Term	○	Depending on the upgrades necessary for implementing improvements such as signal timing and transit priority measures, capital costs are estimated at $1.3 million.
Financial Impact – Long Term	○	The traffic improvements have annual operating costs estimated at $30,000.
Engineering	◯	Uses common traffic engineering practices that are relatively simple to implement. Improvements will cause slight delays in existing traffic flows during upgrade. Visual changes will be limited to signage and lane markings on existing roads.
Neighborhood Development	●	Is unlikely to benefit local businesses or to stimulate increased pedestrian and bicycle trips in the area. Queue jump lanes can shift automobile traffic modes to transit trips since buses will be given priority in the queue jump lane. Overall there is minor impact on existing land use. Improvements are not expected to greatly stimulate and support recreational and commercial opportunities.
Environmental Impact	○	Some reduction in congestion can lead to minor improvements in air quality. This improvement directly addresses vehicular movement in the area with minor improvements to bus transit travel.

6.1.4 Minor Modifications to Posey Tube

Description	Potential improvements will include: installing face-mounted railing, replacing existing plate covers, filling in grooves on the concrete path, establishing a regular maintenance program, and converting the maintenance path on the west side into a pedestrian/bicycle path. Auto traffic is not permanently affected by the modifications. If the Posey Tube is to be modified, the design is subject to review by the State Office of Historic Preservation since the Posey Tube is listed on the register for historic structures in California. The design also will need to be reviewed and approved by Caltrans. The study team considered but rejected a barrier between the path and the travel lanes. A barrier would inhibit motorists from accessing the pathway in an emergency and would prevent the ventilation from working properly.		
Advantages	Unimpeded access for tube users and maritime traffic Low visual impact	**Disadvantages**	Short term solution; long term modifications are not addressed. Users are still exposed to high noise levels and air emissions from vehicles.

Description of performance against preliminary assessment criteria		
Safety	◉	a) Users to remain in an environment away from passive surveillance. Will require monitoring to provide personal security for users. b) Path width is only improved by inches and will not facilitate the passing of other bicycles and pedestrians without dismounting. c) As the tubes are not designated lifeline routes, the potential to assist in an emergency is not assured.
Functionality	◉	Users are still exposed to high noise levels and air emissions from vehicles so there would be low potential to attract new users. There is no impact on waterborne traffic. 24-hour service is available.
Financial Impact – Short Term	◉	Capital cost is estimated at $7 million.
Financial Impact – Long Term	○	The structure is maintained by Caltrans. The annual cost for cleaning the modified pathways is estimated to be $50,000. Security and monitoring costs will have to be agreed upon between the City of Alameda, Caltrans and the California Highway Patrol.
Engineering	○	Minor modifications to the tube are anticipated. The modifications will not affect the integrity of the existing structure.
Neighborhood Development	◉	Upgraded tube will require greater visibility and wayfinding to increase bicycle and pedestrian traffic. Improvements will facilitate better connectivity to paths and bicycle lanes on either end of Posey Tube.
Environmental Impact	○	Modifications will not impact the existing community or natural environment.

6.2 Water Crossings

6.2.1 Amphibious Vehicles

Description	A bus that has the ability to drive on public roads and travel across water bodies. Often used for tourist transportation. Requires maritime licenses. Potential 15-minute service frequencies.		
Advantages	Novel service that will be popular with tourists Able to access key inland destinations for commuters	**Disadvantages**	Lack of transit implementation history May be difficult to find ramps at appropriate locations Slow travel time when in water (5 to 7 miles per hour speeds)

Description of performance against preliminary assessment criteria		
Safety	◉	a) While the modernized vehicles meet all Department of Transportation, Federal and US Coast Guard regulations for passenger vessels, the vehicles have not yet been implemented under the rigors of typical daily transit usage. b) The vehicles have limited capacity to aid in emergency services.
Functionality	◉	All vehicles should be ADA compliant. Modifications may be necessary for bicycles. Pick-up locations can connect to existing bike, pedestrian routes, as well as use existing bus routes and stops. The service also provides greater permeability to Alameda and Oakland than typical shore-to-shore operations. This alternative requires specialized drivers to operate both in water and on the roadways, which limits the available pool of drivers. There is minimum impact on other waterborne traffic. 24-hour service is not assumed.
Financial Impact – Short Term	○	Requires investment in stops, vehicles and estuary access ramps totaling an estimated $2 million. Vehicles cost about $700,000 each, with one vehicle required to maintain the 15-minute headways.
Financial Impact – Long Term	◉	The amphibious vehicle has operating costs approximately $2.5 million annually.
Engineering	◉	Further analysis for reuse of existing access ramps. If infeasible, the concept will require construction of a new estuary access ramps and suitable road access. The vehicles are highly visible and distinctive, which will create a presence within the route about the existence of the service. The vehicles themselves can become unintentional advertising.
Neighborhood Development	○	Novel estuary crossing option is likely to be well known and used by tourists, potentially strengthening retail uses adjacent to stops, with moderate impact on private property and neighborhood.
Environmental Impact	○	The buses will have some impact on the estuary due to increases in noise and engine emissions and minor impacts at estuary access ramps and shoreline. Oil or petroleum drippings are contained within the boat. The modernized vehicles satisfy California emission requirements.

6.2.2 Water Shuttles / Taxis

Description	A water shuttle between a new or modified dock in Alameda and the Jack London District, with potential for additional stops on either shore. Service headways estimated at 15 minutes. Can operate as a scheduled or on-call service. A previous service between Alameda and Oakland closed in 2005 due to a combination of reasons including expiration of dock agreement (at Jack London Square), safety concerns from developers and lack of ridership.		
Advantages	Frequent and fast service is attractive to both commuters and tourists	**Disadvantages**	Limited passenger catchment

Description of performance against preliminary assessment criteria		
Safety	◉	a) Service safety is regulated by the U.S. Coast Guard. b) Limited capacity to aid in emergency services.
Functionality	○	Offers fast and frequent service balanced against lower capacity compared to ferries. There is also flexibility in employing set schedules or picking up passengers as needed. Pick-up locations can connect to bike and pedestrian routes. There is minimum impact on other waterborne traffic. 24-hour service is assumed along with 12-hour and 6-hour service options.
Financial Impact – Short Term	○	Requires some investment in new wharves and small ferries, with an estimated capital cost of approximately $350,000 per vehicle. One water taxi will be required to maintain the 15-minute service headway. The City also will need to determine if existing docks can be used for shuttle launches, or if new docks are required.
Financial Impact – Long Term	○	The water taxi has operating and maintenance costs approximately $2.5 million annually, which assumes 24 hour, 7 days per week service; $1.25 million annually for 12 hour, 7 days per week service; $625,000 annually, which assumes 6 hour, 7 days per week service.
Engineering	◉	Requires some construction of small-scale wharves on Alameda's shore and possible new or existing docks on Oakland's shore. A water taxi on the estuary will be a visual presence for residents and travelers in the area. The vehicle, combined with several wharves along the shoreline, will act as small ferry stations that are highly recognizable.
Neighborhood Development	○	Convenient and attractive option for tourists and commuters can help stimulate the waterfront on both shores, and can provide visibility towards the shoreline for future redevelopment opportunities. There is minimum impact on private property and neighborhood.
Environmental Impact	◉	Some impact expected on the estuary due to increases in noise and engine emissions and construction of wharves. Use of small and potentially alternative fuel vessels will reduce these impacts.

6.2.3 Bus and Bicycle Barges

Description	A bus/bicycle/passenger ferry service to transport pedestrians, bicyclists and buses between Alameda and Oakland. This service will be limited to operating from one location on each shore on 15-minute service headway.		
Advantages	Easily accessible Potential to convey transit or emergency vehicles	**Disadvantages**	Significant infrastructure requirements Requires a loading/offloading area for vehicles

Description of performance against preliminary assessment criteria		
Safety	◎	a) Transit service safety is regulated by the U.S. Coast Guard. b) Potential capacity to aid emergency response efforts.
Functionality	◎	Provides a service that is easily accessible to all users, with potential for use by transit vehicles. Slow boarding and offloading times can hamper efforts to use as a short haul commuter service. Stations can connect to bike and pedestrian routes. There is minimum impact on other waterborne traffic. 24-hour service is not assumed.
Financial Impact –Short Term	○	The barge has estimated infrastructure costs of $5 million to provide ferry and ramp facilities as well as potentially adding workers to direct and manage landside operations. Only one vehicle is required to maintain the 15-minute service headways.
Financial Impact – Long Term	◎	The barge has estimated operating costs of $2.5 million annually, which assumes a 12 hour per day, 7 day per week operation. Operating a barge will require boat captains and landside crews to manage the boarding and offloading of vehicles and the ships docking and pulling away from the shore.
Engineering	◎	Requires construction of new estuary access ramps on both shores and suitable road access and queuing space. New ramps or docks will need to be able to carry loads or have flexibility for other water launches. Similar to the ferry and taxi service alternatives, the barge creates the same visual awareness, especially with the size and height of the barge.
Neighborhood Development	◎	The barge is geared exclusively towards transit vehicles and bicycles, and will not greatly benefit the surrounding community and future neighborhood development. Moderate impacts on neighborhood and private properties.
Environmental Impact	◎	Some impacts on the estuary due to increases in noise and engine emissions, and minor impacts at estuary access ramps.

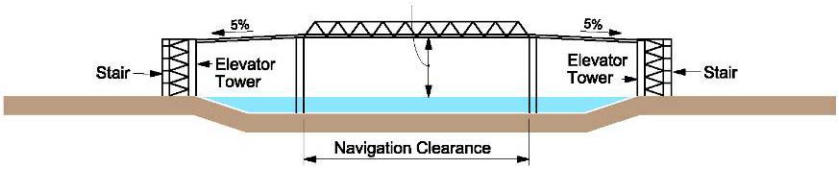
6.2.4 User Propelled Boats / Amphibious Bikes

Description	A small fleet of user propelled paddle boats will be used by pedestrians and cyclists to cross the estuary. A large fleet of perhaps 40 boats will be required to provide an equivalent capacity to other alternatives. Other variations of the user propelled boat include the amphibious bicycle, which uses standard bicycles with floatation devices. Vehicles will be launched on a first come, first serve basis. Travel time is linked to the individual user. Staff will monitor boat supply on both ends.		
Advantages	Potential for recreational use Low environmental impact	**Disadvantages**	Poor access for wheelchair and bicycles Requires user to power and operate Slow

Description of performance against preliminary assessment criteria		
Safety	●	a) Transit service safety is unregulated by the U.S. Coast Guard. Unskilled users can capsize or become caught in estuary currents, or cause collisions with boats along the waterway. Users also will be required to wear lifejackets, and may be required to sign safety waivers and sit for instructional safety videos. b) This alternative offers limited capacity to aid emergency response efforts.
Functionality	●	A large fleet of low capacity boats is required. Likely to be used by a small proportion of users, predominantly for recreation. Slow travel times, especially for users unable to pedal for long periods of time. Requires a certain level of fitness for use, and users may get wet from wake currents. Difficult to achieve ADA accessibility, and there may be weight restrictions necessary. Users do not require specific docks, and can launch from an outfitted dock. There also are potential conflicts between users and navigational ships.
Financial Impact – Short Term	○	Approximate capital cost of $200,000 for vehicles, including additional costs for facilities for an office, boat storage, maintenance area and a power boat to retrieve wandering boaters or pulling boats from one side to the other. Some investment on developing safety measures are needed, such as certified lifeguards or additional Coast Guard attention.
Financial Impact – Long Term	○	This alternative has an estimated $400,000 annual operating cost.
Engineering	○	Requires simple wharves on each shore and administrative /storage buildings. The small nature of the boat gears it more towards recreational use. The design of the launching facilities should consider the appropriate locations so as to not interfere with other navigational operations.
Neighborhood Development	●	Usage from this alternative is not expected to affect or alter the existing community. There will be minimum impact on private property and neighborhood.
Environmental Impact	○	No noise or emissions from operations.

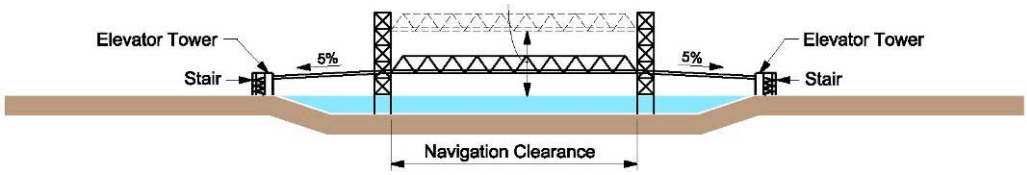
6.3 Bridge, Tunnel or Elevated Structure

6.3.1 Bicycle-Pedestrian Bridge (Fixed, High Level Option)

Description	A bridge designed for pedestrian and bicycle use will provide a link across the estuary. Due to the fixed nature of this alternative, a 175 foot (vertical) by 600 foot (horizontal) navigational opening is required to allow for unimpeded passage of boats on the estuary. This constraint will require users to access the bridge deck via elevators or stairs. Due to the height and ramp requirements, it is not practical to allow for dual use with transit or neighborhood electric vehicles. 24/7 passage will be provided.		
			
Advantages	Provides 24-hour unimpeded passage for both bridge users and maritime traffic A significant landmark	**Disadvantages**	Environmental and visual impacts Long travel time due to elevation

Description of performance against preliminary assessment criteria		
Safety	○	a) Provides a safe option for users and maritime traffic without potential conflict. May require monitoring to provide personal security for users. b) The option has limited capacity to aid in emergency services since the high level structure can only be accessed through stairs and elevators.
Functionality	◉	Provides a high capacity option for users to cross the estuary, while complying with ADA and maritime access requirements. The high level bridge deck will increase travel time for users. 24-hour service will be possible.
Financial Impact – Short Term	◉	An estimated capital cost of $40 million.
Financial Impact – Long Term	◉	Operating costs are estimated at $70,000 annually and maintenance costs are estimated at $400,000 annually.
Engineering	◉	A significant structure will require property acquisition for the structure and access ramps. Heavy construction equipments and temporary works in the water channel are required. Special construction techniques will be required for construction of a 600 foot main span.
Land Use Impact	○	The bridge will be a landmark for the estuary district with proper aesthetic design and can invigorate local businesses. There is significant and potentially positive impact on private property and the neighborhood.
Environmental Impact	◉	The bridge structure will likely have a significant impact on the local area, requiring environmental clearance for new structures in the water. The bridge design also must be approved by all the related stakeholder agencies such as the US Coast Guard.

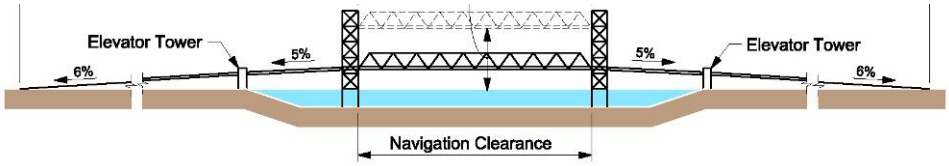
6.3.2 Bicycle-Pedestrian Bridge (Moveable, Low Level Option)

Description	A bridge designed for pedestrian and bicycle use will provide a link across the estuary. This alternative has a 600-foot moveable center span that will be raised to allow passage by tall maritime traffic. This bridge will allow a lower clearance to the bridge deck during normal operation. Users will need to ascend to the bridge deck via a ramp or elevator. Land traffic delay is assumed to be less than 15 minutes for each water vessel passage. Trains using the Union Pacific railroad tracks on the Oakland side also are expected to delay bridge users.		
			
Advantages	Provides shared access for bridge users and maritime traffic Will be a significant landmark for the Alameda estuary	**Disadvantages**	Environmental and visual impacts Moderate travel time due to elevation Temporary closures and railroad use on Oakland side will delay users

Description of performance against preliminary assessment criteria

Safety	○	a) Will provide a safe option for users and maritime traffic with minor potential conflict. May require monitoring to provide personal security for users. b) The option has limited capacity to aid in emergency services since the structure can only be accessed through stairs and elevators.
Functionality	◯	Provides a high capacity and attractive option for users to cross the estuary, while complying with ADA and maritime access requirements. Delays will occur when the bridge periodically opens for tall maritime traffic and when trains use the railroad tracks on the Oakland side. There will be minimum impact on waterborne traffic. 24-hour service will be possible.
Financial Impact – Short Term	●	High capital cost in the order of $60 million. This cost estimate is using the same cost estimate assumptions as provided for the bicycle/pedestrian/transit bridge in Appendix B. This estimate is $12 million more than what was reported in the City's Pedestrian Plan because previous estimates were only preliminary order-of-magnitude cost estimates.
Financial Impact – Long Term	●	Operating and maintenance costs are estimated at $1.5 million annually for 24/7 service. The existing bridges in the estuary have operating and maintenance costs between $500,000 and $750,000 annually. The proposed bridge is expected to be bigger and have more usage so will be more expensive to maintain.
Engineering	●	A significant structure will be constructed, which will require property acquisition for the structure and access ramps. Heavy construction equipments and temporary works in the water channel will be required. Significant technically challenging as it will be one of the longest moveable bridges in the world.
Land Use Impact	○	The bridge will be a landmark for the estuary district with proper aesthetic design, and can invigorate local businesses. There is significant and potentially positive impact on private property and neighborhood.
Environmental Impact	●	The bridge structure will likely have a significant impact on the local area, requiring environmental clearance for new structures in the water. The bridge design also must be approved by all related stakeholder agencies such as the US Coast Guard.

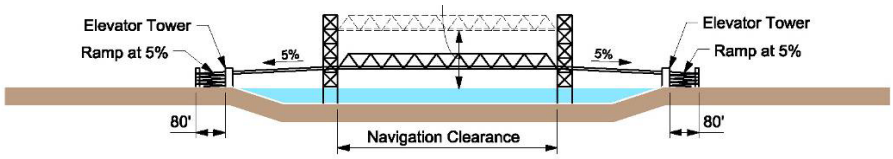
6.3.3 Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Transit Lanes

Description	A bridge designed for pedestrian and bicycle use with adjacent transit lanes will provide a link across the estuary. This alternative will have a 600-foot moveable center span that will be raised to allow passage by tall maritime traffic. This bridge will allow a lower clearance to the bridge deck during normal operation. Users will need to ascend to the bridge deck via a ramp or elevator. Land traffic delay is assumed to be less than 15 minutes for each water vessel passage. Trains using the Union Pacific railroad tracks on the Oakland side also are expected to delay bridge users.		
			
Advantages	Provides shared access for bridge users and maritime traffic Will be a significant landmark for the Alameda estuary Potential for use by transit vehicles	**Disadvantages**	High construction cost Environmental and visual impacts Moderate travel time due to elevation Temporary closures and railroad use on Oakland side will delay users

Description of performance against preliminary assessment criteria		
Safety	◯	a) Will provide a safe option for users and maritime traffic with minor potential conflict. May require monitoring to provide personal security for users. b) Good potential to be used for emergency relief.
Functionality	◯	Will provide a high capacity and attractive option for users to cross the estuary, while complying with ADA and maritime access requirements. Potential to use as part of a local circulator transit service. Delays will occur when the bridge opens for tall maritime traffic and when trains use the railroad tracks on the Oakland side. There will be minimum impacts on waterborne traffic. 24-hour service will be possible.
Financial Impact – Short Term	●	Capital costs are expected to be $125 million.
Financial Impact – Long Term	◉	Operating and maintenance costs are estimated at $2 million annually for 24/7 service. The existing bridges in the estuary have operating and maintenance costs between $500,000 and $750,000 annually. The proposed bridge is expected to be bigger and have more usage so will be more expensive to maintain.
Engineering	◉	A significant structure will be constructed, which will require property acquisition for the structure and access ramps. Heavy construction equipments and temporary works in the water channel are required. Significant technically challenging as it will be one of the longest moveable bridges in the world.
Land Use Impact	○	The bridge will be a landmark for the estuary district with proper aesthetic design and can invigorate local businesses. There will be significant and potentially positive impact on private property and neighborhood. This alternative has the most potential to benefit adjacent land uses by increasing alternate access to the land uses in this area, increasing the potential for multiuse development, and enhancing access to the region by connecting to the proposed future Altamont Pass High Speed Commuter Rail in Oakland; however, the footprint of the transit bridge may have some initial impacts to the land uses in the area which need to be assessed and addressed through the environmental analysis.

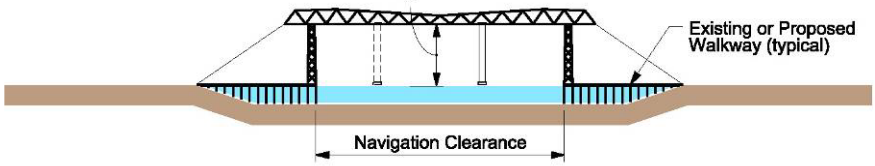
Environmental Impact	●	The bridge structure will likely have a significant impact on the local area, requiring environmental clearance for new structures in the water. The bridge design also must be approved from all related stakeholder agencies such as the US Coast Guard.

6.3.4 Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Neighborhood Electric Vehicle Lanes

Description	A bridge with pedestrian sidewalks and two bike lanes shared with neighborhood electric vehicles (NEVs) will provide a link across the estuary. This alternative will have a 600-foot moveable center span that will be raised to allow passage by tall maritime traffic. This bridge will allow a lower clearance to the bridge deck during normal operation. Users will need to ascend to the bridge deck via a ramp or elevator. Land traffic delay is assumed to be less than 15 minutes for each water vessel passage. Trains using the Union Pacific railroad tracks on the Oakland side also are expected to delay bridge users. This alternative does not consider accommodating full-sized motor vehicles because it is not supported by the community at this time.		
			
Advantages	Provides shared access for bridge users and maritime traffic Will be a significant landmark for the Alameda estuary Potential for use by NEVs	**Disadvantages**	High construction cost Environmental and visual impacts Moderate travel time due to elevation Temporary closures and railroad use on the Oakland side will delay users
Description of performance against preliminary assessment criteria			
Safety	○	a) Will provide a safe option for users and maritime traffic with minor potential conflict. May require monitoring to provide personal security for users. b) Good potential to be used for emergency relief.	
Functionality	○	Will provide a high capacity and attractive option for users to cross the estuary, while complying with ADA and maritime access requirements. Potential to allow use by NEVs, which will encourage the use of this low impact transport mode. Delays will occur when the bridge opens for tall maritime traffic and when trains use the railroad tracks. There will be a minimum impact on waterborne traffic. 24-hour service will be possible.	
Short Term	●	An estimated capital cost of $125 million.	
Financial Impact – Long Term	◉	Operating and maintenance costs are estimated at $2 million annually for 24/7 service. The cost of maintaining the NEV systems on the structure are assumed to be borne by the NEV provider. The existing bridges in the estuary have operating and maintenance costs between $500,000 and $750,000 annually. The proposed bridge is expected to be bigger and have more usage so will be more expensive to maintain.	
Engineering	◉	A significant structure will be constructed, which will require property acquisition for the structure and access ramps. Heavy construction equipments and temporary works in the water channel will be required. Significant technically challenging as it will be one of the longest moveable bridges in the world.	
Land Use Impact	○	The bridge will be a landmark for the estuary district with proper aesthetic design and can invigorate local businesses. There will be significant and potentially positive impact on private property and neighborhood.	
Environmental	◉	The bridge structure will likely have a significant impact on the local area, requiring	

Impact		environmental clearance for new structures in the water. The bridge design also must be approved from all related stakeholder agencies such as the Coast Guard.

6.3.5 Transporter Bridge

Description	A bridge designed for pedestrian and bicycle use will provide a link across the estuary. This alternative will have one moveable cabinets that will shuttle horizontally over the center span during normal operation, allowing passage by tall maritime traffic. A lower clearance is allowed for the bridge deck at the approaches. The service is anticipated to have 15-minute headways.		
 			
Advantages	Provide shared access for bridge users and maritime traffic A significant landmark for the Alameda estuary	**Disadvantages**	High construction cost Environmental and visual impacts Temporary closures and railroad use on the Oakland side will delay users
Description of performance against preliminary assessment criteria			
Safety	○	a) Will provide a safe option for users and maritime traffic with minimum conflict. May require monitoring to provide personal security for users. b) Some potential to use for emergency relief.	
Functionality	○	Provides a high capacity and attractive option for users to cross the estuary, while complying with ADA and maritime access requirements. Delays will occur when the bridge opens for tall maritime traffic and when trains use the railroad tracks. Adhering to schedules may lessen the delay frustrations. There is minimal impact on waterborne traffic. 24-hour service is available.	
Financial Impact – Short Term	●	Capital cost is estimated at $100 million.	
Financial Impact – Long Term	◎	Operating and maintenance costs are estimated at $1.5 million annually. The existing bridges in the estuary have operating and maintenance costs between $500,000 and $750,000 annually. The proposed bridge is expected to be bigger and have more usage so will be more expensive to maintain.	
Engineering	◉	A significant structure will be constructed for the structure and access ramps. Heavy construction equipments and temporary works in the water channel will be required. Some technically challenging engineering due to the complexity of the machinery.	
Neighborhood Development	○	The bridge will be a landmark for the estuary district and can invigorate local businesses. The construction of a transporter bridge will require some property acquisition in the surrounding neighborhood.	

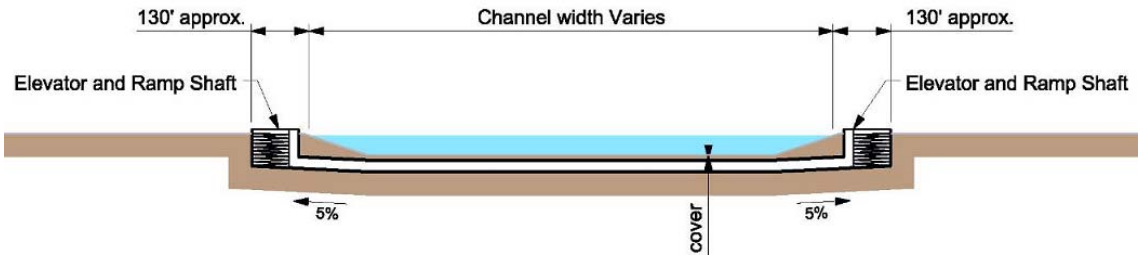
Environmental Impact	⊙	The bridge structure will require environmental clearance for new structures in the water. The bridge design also must be approved by all related stakeholder agencies such as the US Coast Guard.

6.3.6 Aerial Tramway

Description	An elevated aerial tram designed for pedestrian and bicycle use will provide a link across the estuary. This system will collect passengers near ground level and ascend to a high level guideway, above the clearance requirement for the channel to allow passage by tall maritime traffic. Stops will be provided at four locations: Alameda Point, Alameda Estuary, Jack London Square and 12th Street BART Station. The service is anticipated to have 15-minute headways.		
Advantages	Provide shared access for tram users and maritime traffic A significant landmark for the Alameda estuary	**Disadvantages**	High construction cost Potential environmental and visual impacts Any closures will shut down access along this route

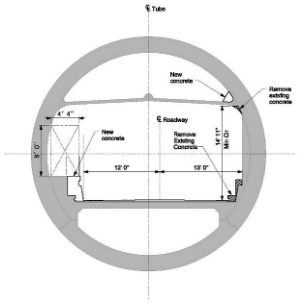
Description of performance against preliminary assessment criteria		
Safety	⊙	a) Will provide a safe option for users and maritime traffic without potential conflict. May require monitoring to provide personal security for users. b) Some potential to use for emergency relief.
Functionality	⊙	Offers fast and frequent service for users to cross the estuary, while complying with ADA and maritime access requirements. Reversible ropeway with two cabins or carriers can be used to reduce waiting time. The system can carry up to 200 people traveling at up to 26 miles per hour. Stations will connect to bike, pedestrian and other routes. There is no impact on waterborne traffic. 24-hour service is not available.
Financial Impact – Short Term	⊙	Capital cost estimated at $50 million.
Financial Impact – Long Term	⊙	Operating costs are estimated at $1.5 million annually and maintenance costs of $500,000 annually.
Engineering	⊙	A facility will be constructed for the structure and access ramps. The height of the trams will need to sufficiently clear the minimum heights required from the tallest ships. Temporary works in the water channel are not required. Tramways are a mature technology.
Neighborhood Development	○	The tram will be a landmark for the estuary district and can invigorate local businesses from increased local and tourist traffic. The construction of an aerial tramway will require property acquisition and easement agreement.
Environmental Impact	⊙	The tram guideway structure will affect the local area, including new stations, structural posts and new visual barriers.

6.3.7 New Bicycle-Pedestrian Tube

Description	A new tube or tunnel designed for pedestrian and bicycle use will provide a link under the estuary. This 0.3 mile tube will be located approximately 60 feet below the water surface, allowing unimpeded passage by all current maritime traffic. 24/7 passage will be provided.		
			
Advantages	Unimpeded access for tube users and maritime traffic Low visual impact	**Disadvantages**	High construction cost Potentially unpleasant / unsafe environment for users

Description of performance against preliminary assessment criteria		
Safety	⊙	a) Will remove potential for conflict between maritime and pedestrian or bicycle traffic, but will place users in a potentially unsafe environment away from passive surveillance. Will require monitoring to provide personal security for users. b) Good potential for use during emergencies.
Functionality	○	Will provide a high capacity option for users to cross the estuary, while complying with ADA and maritime access requirements. It will not be highly visible to visitors, and security concerns may discourage use. There will be no impact on waterborne traffic. 24-hour service will be available.
Financial Impact – Short Term	●	Capital cost is estimated at $200 million.
Financial Impact – Long Term	○	Operating costs are estimated at $250,000 and maintenance at $2 million annually.
Engineering	⊙	A new tube or tunnel under the estuary is a complex structure that will require a lengthy design, environmental and approval process. Heavy construction equipments are required. A Large construction staging area will be required. Some technical engineering challenges.
Neighborhood Development	⊙	Tube portal locations will determine the level of development activity resulting from pedestrian and bicycle travel. The surrounding community will be affected during construction staging and phasing.
Environmental Impact	○	The alternative requires environmental clearance for a new tube. However, operational impacts on the local community and natural environment will be low. Does not require US Coast Guard approval.

6.3.8 Modifications of Existing Tube

Description	A modification to the existing Webster Street and Posey Tubes can allow improved conditions for pedestrians and cyclists. Potential improvements will include: separated one way paths to avoid conflicts within the existing narrow path; and new barriers, lighting, security and ventilation to provide an improved environment for users. Traffic will be unaffected by the changes. 24/7 passage will be provided. The Posey Tube is listed on the register for historic structures in California. Design to be reviewed and approved by the State Historic Preservation Officer. The study team did not consider converting the ventilation shaft, which is the upper part of the tube, into a bike/pedestrian path because it is needed for ventilation.		
Advantages	Unimpeded access for tube users and maritime traffic Low visual impact	**Disadvantages**	Marginal improvement for users One-way tubes – too difficult to enforce and regulate

Description of performance against preliminary assessment criteria		
Safety	◉	d) Users to remain in a potentially unsafe environment away from passive surveillance. Will require monitoring to provide personal security for users. e) As the tubes are not designated lifeline routes, potential to assist in an emergency is not assured.
Functionality	◉	Will provide a marginal improvement over the existing tube access that is unlikely to attract new users. There is no impact on waterborne traffic. 24-hour service will be available.
Financial Impact – Short Term	◉	Capital cost is estimated at $40 million.
Financial Impact – Long Term	○	Operation and maintenance cost will be negligible as the structure is being maintained by Caltrans.
Engineering	●	A modification to the constrained existing tubes will be difficult, and will likely require relocation of services and temporary closures of the tubes during construction. Structural vulnerability assessment is required before any tunnel modification.
Neighborhood Development	◉	Upgraded tubes will be of limited use as a result of the poor environment and lack of visibility. The construction and staging phases of the modification will affect the surrounding neighborhood.
Environmental Impact	○	Modifications will not impact the existing community or natural environment above existing levels.

6.3.9 New Underground Extension to BART

Description	A new underground rail connection from Oakland's 12th Street Station will travel via Alameda's west end to San Francisco via a new transbay tube. This alternative was documented in MTC's Regional Rail Plan. Initial operating segments can provide service between Oakland and Alameda as the tube is constructed. Service headways will be determined by BART.		
Advantages	High quality and capacity urban transit improvement will benefit a wide range of users High potential for land use benefits	**Disadvantages**	Very high capital and operating costs Not likely within the planning horizon of this study (30 years)

Description of performance against preliminary assessment criteria		
Safety	○	a) Rail transit safety will be comparable to existing BART service. b) Capacity to provide aid for emergency services.
Functionality	○	Likely to attract a high number of new trips and will provide greatly enhanced connectivity to other cities within the Bay Area region. Stations will connect to bike, pedestrian and other modes. There will be no impact on waterborne traffic. 24-hour service could be provided.
Financial Impact – Short Term	●	Capital cost is estimated at $1.2 billion for the Alameda segment of the entire extension plan (per the Regional Rail Plan).
Financial Impact – Long Term	●	Operating costs are estimated at $3 million and maintenance costs at $10 million annually.
Engineering	●	This project is a complex design with significant engineering challenges.
Neighborhood Development	○	Rail transit will provide an attractive opportunity for transit-oriented redevelopment in Alameda. A new extension may require property and easement acquisition for the rail alignment, station and parking.
Environmental Impact	◎	While construction will be underground, construction impacts on surface level traffic will be an issue. Operationally, the rail service will provide a highly efficient mode of transportation.

6.4 Summary of Preliminary Assessment

	Typical Capacity (pax per hour)	Safety	Function-ality	Financial Impact Short Term (1-5 years)	Financial Impact Long Term (20-30 years)	Engineer-ing Feasibility	Neighborhood Development	Environ-mental Impact	Overall
Existing Service improvement:									
1. Bus service improvement	120	◎	◉	○	◎	○	◉	○	◎
2. Ferry service improvement	600	◎	◎	◎	◎	◎	◉	◎	◎
3. Improved traffic & transit management	n/a	◎	●	◎	◎	○	●	◎	◎
4. Minor modifications to Posey Tube	n/a	◉	◉	◎	○	○	◎	○	◎
New Water Crossing:									
5. Amphibious vehicles	160	◎	◎	◎	◎	◎	◎	◎	◎
6. Water shuttles / taxis	80	◎	◎	◎	◎	◎	◎	◎	◎
7. Bus & bicycle barges	400	◎	◎	◎	◎	◎	◎	◎	◎
8. User propelled boats	40	●	●	○	◎	◎	●	○	◉
Bridge, Tunnel or Elevated Structure:									
9. Bicycle-pedestrian bridge (fixed, high level option)	8000	◎	◉	◉	◎	◉	◎	◉	◉
10. Bicycle-pedestrian bridge (moveable, low level option)	8000	◎	○	◉	◎	◉	◎	◉	◎
11. Bicycle-pedestrian bridge (moveable, low level option) with transit lanes	8000	○	○	●	◎	◉	◎	◉	◎
12. Bicycle-pedestrian bridge (moveable, low level option) with neighborhood electric vehicle lanes	8000	○	○	●	◎	◉	◎	◉	◎
13. Transporter bridge	400	◎	◎	●	◎	◉	◎	◉	◉

	Typical Capacity (pax per hour)	Safety	Function-ality	Financial Impact Short Term (1-5 years)	Financial Impact Long Term (20-30 years)	Engineer-ing Feasibility	Neighborhood Development	Environ-mental Impact	Overall
14. Aerial tramway	160	◎	◎	◉	◉	◉	○	◉	◉
15. New bicycle-pedestrian tube	8000	◉	◎	●	◎	◉	◉	◎	◉
16. Modification of existing tube	4000	◉	◉	◉	○	●	◎	○	◉
17. New underground BART connection	1200	○	○	●	●	●	○	◎	◉

Explanation of ratings:

○	◎	◉	◉	●
Very good	Good	Neutral	Poor	Very poor

7 Preferred Alternatives

The preliminary list of alternatives under review was divided into three main project categories:

- Existing Service Improvements
- New Water Crossing
- Bridge, Tunnel or Other Elevated Structure

Seventeen potential project alternatives were considered in the preliminary assessment. As the summary of the assessment demonstrates in Section 6.4, some alternatives performed better than others under analysis. The next step towards determining a preferred alternative is eliminating the under performing alternatives and carrying forward the remaining options for further analysis. Within each project category, the top feasible project alternative was selected to be carried through to the next review stage.

Existing Service Improvements

- Minor Modifications to Posey Tube – Modification to the existing tube pathway can allow improved conditions for pedestrians and cyclists as a short-term solution. Potential improvements to the existing path include replacing existing plate covers, filling in grooves on the concrete path, and establishing a regular maintenance program. Converting the maintenance path on the west side into a pedestrian/bicycle path and installing face-mounted railing on the existing path are ***not*** recommended due to the high cost.

New Water Crossing

- Water Shuttle/Taxi – An intermediate solution that will meet the project objectives with consideration of the planned developments on both sides of the estuary. The water shuttle/taxi was determined to be the high-priority alternative for bicyclist and pedestrian crossings.

Bridge, Tunnel or Other Elevated Structure **(Potential Long-Term Alternative)**

- Bicycle-Pedestrian Bridge (Moveable, Low Level Option) – ***The bridge could be a long-term viable alternative if the following constraints are addressed***:
    - The US Coast Guard allows the bridge to remain closed during peak times;
    - The moveable span of the bridge, which is currently at 600 feet, is reduced to a more manageable horizontal clearance;
    - The height of the bridge is reduced to a level that does not require significant closing and opening times; and
    - The cost of construction could be justified for regional funding support.
    - Potential inclusion of transit option.

The Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Transit Lanes was recommended to move forward by the City of Alameda City Council if stakeholders' support could be ascertained. Nevertheless, the City of Oakland and AC Transit do not favor pursuing it at this time and, therefore, the study team does not list it as a preferred alternative. There are significant unknowns with this alternative because it was not studied at a level of detail that is comparable to its complexity. At this time, it is unknown if such a bridge would provide transit operations with run-time or reliability advantages over the Posey and Webster Street Tubes. A moveable bridge plus the railroad crossing at Embarcadero pose significant challenges to transit operations. It is also unknown how this alternative would spatially and visually affect Jack London Square. Appendix B shows the bicycle-pedestrian bridge with transit lane option analysis. Note that the Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Neighborhood Electric Vehicle Lanes is a variation of the bicycle/pedestrian bridge with transit lanes.

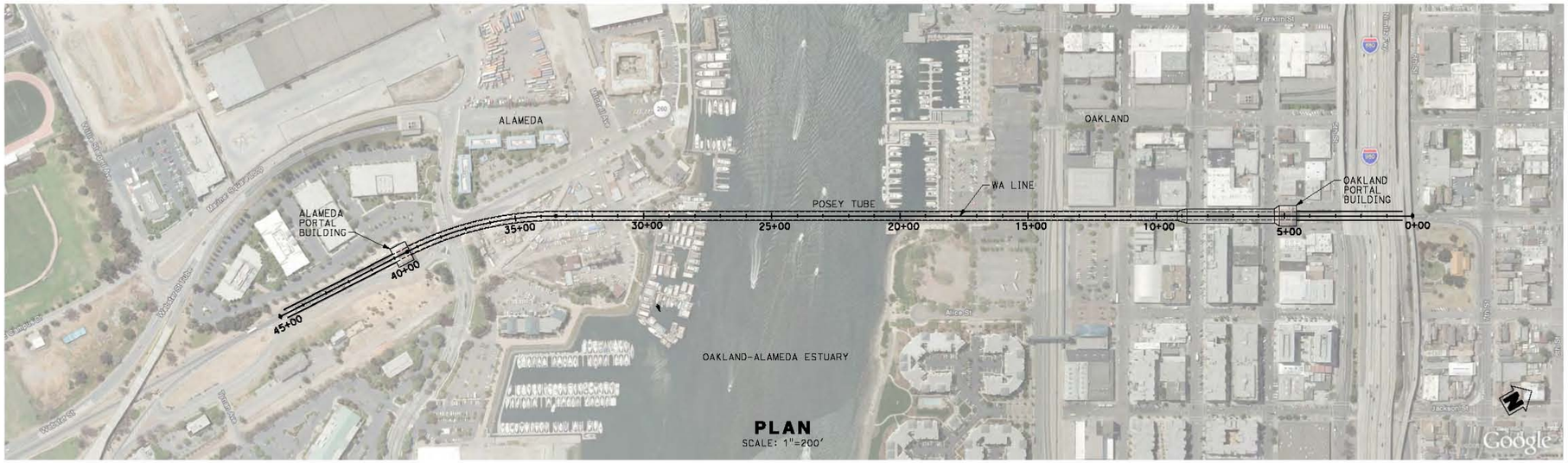
7.1 Minor Modifications to Posey Tube

Modifications to the existing Posey Tube can allow for improved conditions for pedestrians and cyclists. Potential improvements to the existing path include replacing existing plate covers, filling in grooves on the concrete path, and establishing a regular maintenance program (Figure 15).

The study team considered but rejected a barrier between the path and the motor vehicle travel lanes. A barrier would inhibit motorists from accessing the path in an emergency, and would prevent the ventilation from working properly. The study team also considered but rejected opening the Posey Tube maintenance path on the west side and installing face-mounted railings on the existing path. These alternatives were rejected because they only provided minimal improvements at what was considered an excessive cost. Appendix C shows the analysis that includes opening the maintenance path on the west side and installing face-mounted railing on the existing path.

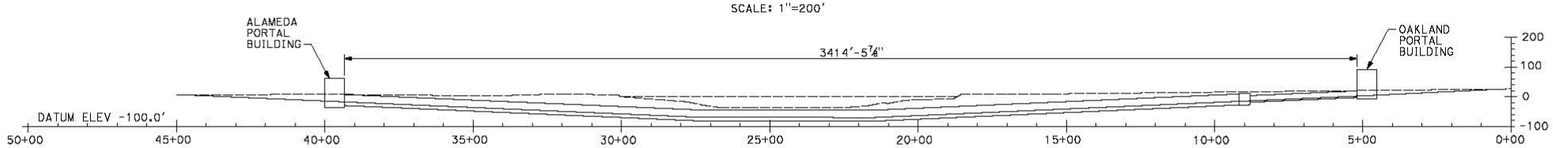
Auto traffic will not permanently be affected by the modifications. Modifications to Posey Tube are subject to review by the State Office of Historic Preservation since the Posey Tube is listed on the register for historic structures in California.

Figure 15: Conceptual Plan for Posey Tube Modifications



PROFILE GRADE
SCALE: 1"=200'

NOTE:
ELEVATIONS ARE PER DESIGN DRAWINGS PREPARED FOR CALTRANS SEISMIC RETROFIT PROJECT NO. 722



ELEVATION
SCALE: 1"=200'

CONCEPTUAL DRAWING
NOT FOR CONSTRUCTION

BENCH MARK	REFERENCES

NO.	REVISED	BY	APP.
DESIGNED	Q. LIU		
DRAWN	B. MASON		
CHECKED	J. EDDY		
DATE	11/3/08	SCALE	AS SHOWN

CITY OF ALAMEDA
CALIFORNIA
ENGINEERING DEPARTMENT

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

POSEY TUBE (MOD)

APPROVED BY
CITY ENGINEER
DATE

1 OF 2
SHEET
DATE

7.1.1 Cost Estimates for Minor Modifications to Posey Tube

Order of magnitude costs are given for various items with brief explanations on the basis of the estimates.

- **Right-of-way**: None. Right-of-way acquisition is not anticipated as no construction is required outside of the tube.
- **Design**: The cost of the design is about $250,000.
- **Administration**: $250,000 is anticipated for the administrative task performed by the government agencies.
- **Contingencies**: Contingencies are 25 percent of the construction cost and have been included as part of the construction cost.
- **Environmental Review**: $35,000 based on the assumption that a negative declaration is anticipated.
- **Mitigation**: None.
- **Utility**: None.
- **Public Outreach**: None.
- **Construction**: $2.5 million including direct construction cost, time related overhead, mobilization and contingencies (refer to Table 11 for details).
- **Operation and Maintenance**: $50,000. Posey Tube will be maintained by Caltrans as it is within Caltrans right-of-way (refer to Table 12 for details).

Table 11: Construction Costs for Posey Tube Modifications

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	POSEY TUBE (MOD)	**RTE:**	LOCAL
TYPE:	IMMERSED CONCRETE TUNNEL	**CO:**	ALA

LENGTH: 4,439.00 **WIDTH:** 22.00 **AREA (SF)=** 97,658

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	QL	**COST INDEX:**	
PRICES CHECKED BY :	BM	**DATE:**	10/23/2008
QUANTITIES BY:	QL	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	SEAL CONCRETE SURFACE		SF	17,756	$65.00	$1,154,140.00
2	MISCELLANEOUS METAL (BRIDGE)		LB	4,795	$10.00	$47,950.00
3	DRILL AND EPOXY ANCHOR		EA	400	$300.00	$120,000.00
4	TRAFFIC HANDLING		LS	1	$10,000.00	$10,000.00
		SUBTOTAL				$1,332,090
		TIME RELATED OVERHEAD				$133,209
		MOBILIZATION (@ 10 %)				$162,811
		SUBTOTAL BRIDGE ITEMS				$1,628,110
		CONTINGENCIES (@ 25%)				$407,028
		BRIDGE TOTAL COST				$2,035,138
		COST PER SQ. FOOT				$20.84
		BRIDGE REMOVAL (CONTINGENCIES INCL.)				
		WORK BY RAILROAD OR UTILITY FORCES				
		GRAND TOTAL				$2,035,138
COMMENTS:		BUDGET ESTIMATE AS OF				**$2,500,000**

Table 12: Annual Operation and Maintenance Costs for Posey Tube Modifications

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	POSEY TUBE (MOD)	**RTE:**	LOCAL
TYPE:	IMMERSED CONCRETE TUNNEL	**CO:**	ALA

LENGTH: 4,465.00 **WIDTH:** 22.00 **AREA (SF)=** 98,230

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	Q. LIU	**COST INDEX:**	
PRICES CHECKED BY :	B. MADDEX	**DATE:**	10/23/2008
QUANTITIES BY:	Q. LIU	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	CLEANING		HR	576	$50.00	$28,800.00
2	MACHINE RENTAL & FUEL		LS	1	$3,000.00	$3,000.00
8						
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SUBTOTAL	$31,800
TIME RELATED OVERHEAD	
MOBILIZATION (@ 10 %)	
SUBTOTAL BRIDGE ITEMS	$31,800
CONTINGENCIES (@ 25%)	$7,950
TOTAL COST	$39,750
COST PER SQ. FOOT	$0.40
GRAND TOTAL	$39,750
BUDGET ESTIMATE AS OF	**$40,000**
USE	**$50,000**

COMMENTS:

7.2 Water Shuttle/Taxi

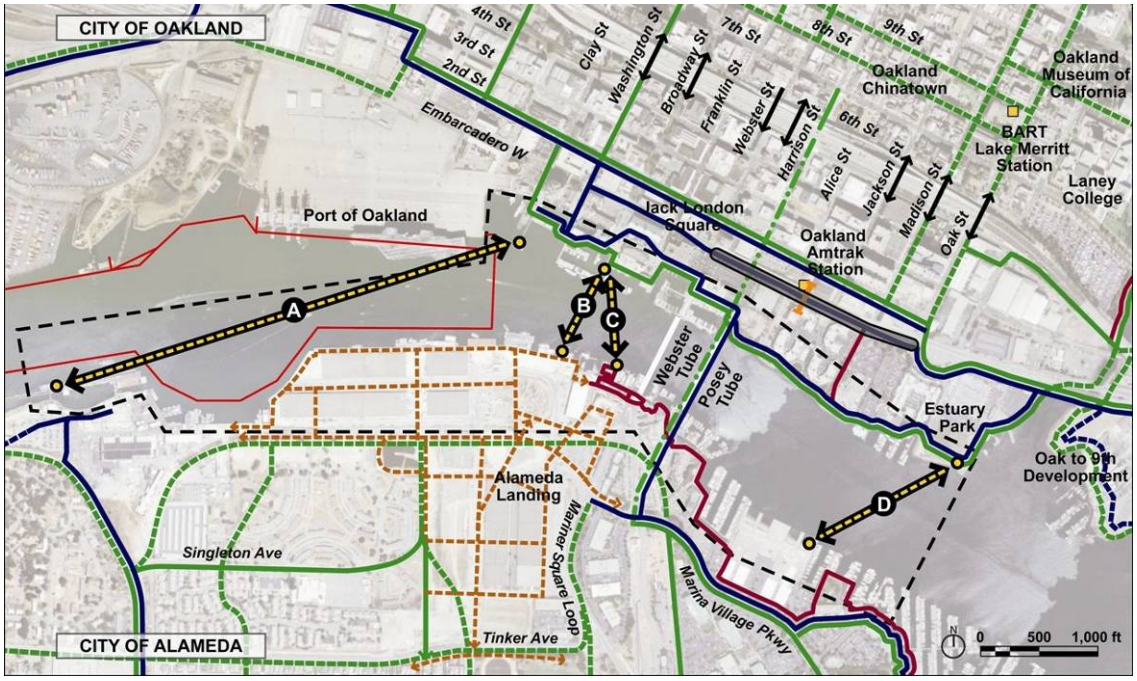
The water shuttle/taxi service will be provided between new or modified piers on the Alameda and Oakland waterfronts, with potential for additional stops on either shore. Service headways are estimated at 15 minutes. 24 hour, 7 days per week service will be provided with options for 12- and 6-hour services. The water shuttle/taxi can operate as a scheduled or on-call service.

7.2.1 Proposed Alignments

During the community workshop held in October, the proposed alignments for waterborne crossing alternatives were presented. The four proposed alignments, shown below in Figure 12, offer slightly different connections between Oakland and Alameda. The main criteria behind selecting the proposed alignments include:

- Ease of access between Oakland and Alameda
- Direct connections to major trip destinations and attractions
- Open areas where docks can be constructed

Figure 12: Proposed Waterborne Crossing Alignments



Alignment A connects Oakland and Alameda along Clay Street in Oakland to the Main Street Ferry Terminal in Alameda. Although the existing ferry terminals can be modified to accommodate the water shuttle/taxi service, the Main Street Ferry Terminal is some distance away from the current or future residential and commercial centers.

Alignment B connects Oakland and Alameda along Broadway in Oakland to Alameda Landing in Alameda. It offers a direct connection between Alameda and Jack London Square with easy access to downtown Oakland. The dock in Alameda is adjacent to the future Alameda Landing development and is consistent with the Waterfront Plaza concept shown in the Bayport/Alameda Landing Project Master Plan dated December, 2006.

Alignment C connects Oakland and Alameda along Broadway in Oakland and along the waterfront trail in front of the Pasta Pelican Restaurant in Alameda. The alignment offers the same access gateway to downtown Oakland, Oakland Chinatown and the core entryway to the heart of Alameda.

Alignment D connects Estuary Park in Oakland and Marina Village Shopping Center in Alameda. Although it is connected to a popular shopping and employment center in Alameda, the other end of the alignment is farthest from downtown Oakland.

The public response garnered from the latest community workshop indicated that the proposed alignments B and C were the preferred alignments for the waterborne crossing alternative. The proposed sites of the water shuttle/taxi stops for these two alignments are shown in Figure 13. Alignment B will benefit from a bigger population after Alameda's center of gravity is shifted further west with the construction of the planned land developments on the west end of the island.

Figure 13: Proposed Landings for Waterborne Crossings

View of Alameda site, alignment B

View of Oakland site, alignment B

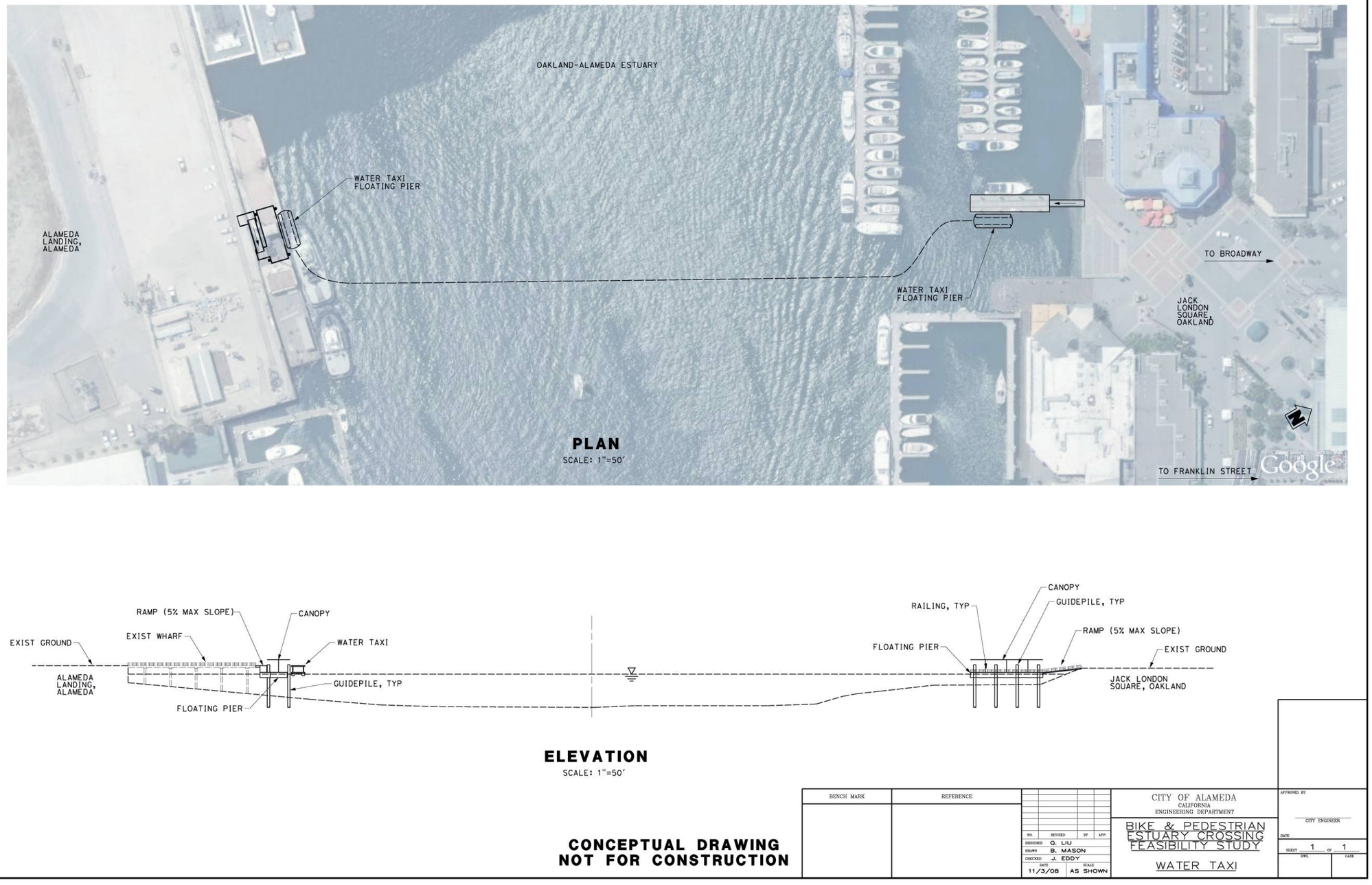
View of Alameda site, alignment C

View of Oakland site, alignment C

7.2.2 Engineering Layout/Conceptual Designs

To provide a water shuttle/taxi service across the waterway, floating piers with ADA compliant ramps are proposed on both sides of the estuary (Figure 14). A new pier adjacent to the future Alameda Landing development will be provided similar to what is proposed in the Bayport/Alameda Landing Project Master Plan dated December, 2006. The existing pier with access ramp to the Jack London Square Pavilion Plaza and Stage in Oakland will be modified for water shuttle/taxi use.

Figure 14: Conceptual Plan for Water Shuttle/Taxi



7.2.3 Cost Estimates

Order of magnitude costs are given for various items with brief explanations on the basis of the estimates.

- **Right-of-way**: None
- **Design**: The cost of design is $200,000.
- **Administration**: The budget for the administrative work is estimated to be $200,000.
- **Contingencies**: Contingencies are 25 percent of the construction cost and have been included as part of the construction cost.
- **Environmental Review**: $500,000 to $750,000 for a full environmental impact study.
- **Mitigation**: None
- **Utility**: None. Utility relocation is not anticipated.
- **Public Outreach**: $150,000 to $200,000 excluding the cost of the public outreach program that is required for the Environmental Impact Review process.
- **Construction**: $3 million including costs for water shuttle/taxi procurement and infrastructure construction (refer to Table 9 for details). Note that a new vessel recently purchased by Caltrans for the Ryer Island Ferry costs $4.3 million. It will have the capacity to carry up to 8 vehicles and 100 passengers, which is larger than the vessels expected for this water taxi service.
- **Operation and Maintenance**: $2.5 million annually if 24 hour, 7 days per week service is provided, $1.25 million if 12 hour, 7 days per week service is provided and $625,000 if 6 hour, 7 days per week service is provided (refer to Table 10 for details). The operations and maintenance costs were validated by the Ryer Island Ferry service in the Delta, which has similar parameters. It costs $2.5 million annually to operate two ferries in the Delta on a 24 hour, 7 days per week schedule. Operational challenges include the need for two employees per vessel – a Master and a crew, difficulty in finding qualified and licensed employees, complex employee scheduling issues, fuel costs and continual maintenance issues.

Table 9: Construction & Procurement Costs for Water Shuttle/Taxi Crossing

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

NAME: OAKLAND-ALAMEDA ESTUARY WATER TAXI CROSSING **RTE:** LOCAL
TYPE: MARITIME VESSEL AND PIER **CO:** ALA

LENGTH: 80.00 **WIDTH:** 20.00 **AREA (SF)=** 1,600

 # OF STRUCTURES IN PROJECT : 02 **EST. NO.**
PRICES BY : Q. LIU **COST INDEX:**
PRICES CHECKED BY : B. MADDEX **DATE:** 10/23/2008
QUANTITIES BY: Q. LIU **DATE:** 10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	FLOATING PIER		SF	1,600	$200.00	$320,000.00
2	RAMP		SF	2,560	$200.00	$512,000.00
3	WATER TAXI		EA	1	$700,000.00	$700,000.00
4	RAILING		LF	640	$200.00	$128,000.00
5	CANOPY		SF	1,600	$50.00	$80,000.00
6						
26						
27						
28						
29						
30						

SUBTOTAL		$1,740,000
TIME RELATED OVERHEAD		$174,000
MOBILIZATION (@ 10 %)		$212,667
SUBTOTAL BRIDGE ITEMS		$2,126,667
CONTINGENCIES	(@ 25%)	$531,667
TOTAL COST		$2,658,333
COST PER SQ. FOOT		$1,661.46
GRAND TOTAL		$2,658,333
BUDGET ESTIMATE AS OF		**$2,658,000**
USE		**$3,000,000**

COMMENTS:

Table 10: Annual Operation and Maintenance Costs for Water Shuttle/Taxi Crossing

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	OAKLAND-ALAMEDA ESTUARY WATER SHUTTLE/TAXI CROSSING	**RTE:**	LOCAL
TYPE:	MARITIME VESSEL AND PIER	**CO:**	ALA

LENGTH: 80.00 **WIDTH:** 20.00 **AREA (SF)=** 1,600

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	QL	**COST INDEX:**	
PRICES CHECKED BY :	BM	**DATE:**	10/23/2008
QUANTITIES BY:	QL	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	CREW		Hours	8,760	$80	$700,800
2	CAPTAIN		Hours	8,760	$120	$1,051,200
3	MECH/ELEC SERVICING & FUELING		Lump Sum	1	$20,000	$20,000
4	STRUCTURAL INSPECTION		Lump Sum	1	$20,000	$20,000
5	STRUCTURAL MAINTENANCE		Lump Sum	1	$100,000	$100,000
6						
7						
		SUBTOTAL				$1,892,000
		TIME RELATED OVERHEAD				
		MOBILIZATION				
		SUBTOTAL BRIDGE ITEMS				$1,892,000
		CONTINGENCIES	(@ 25%)			$473,000
		TOTAL COST				$2,365,000
		COST PER SQ. FOOT				$1,478.13
		GRAND TOTAL				$2,365,000
		BUDGET ESTIMATE AS OF				**$2,365,000**
		USE				**$2,500,000**

COMMENTS:

7.3 Bicycle - Pedestrian Bridge (Moveable, Low Level) **Potential Long-Term Alternative**

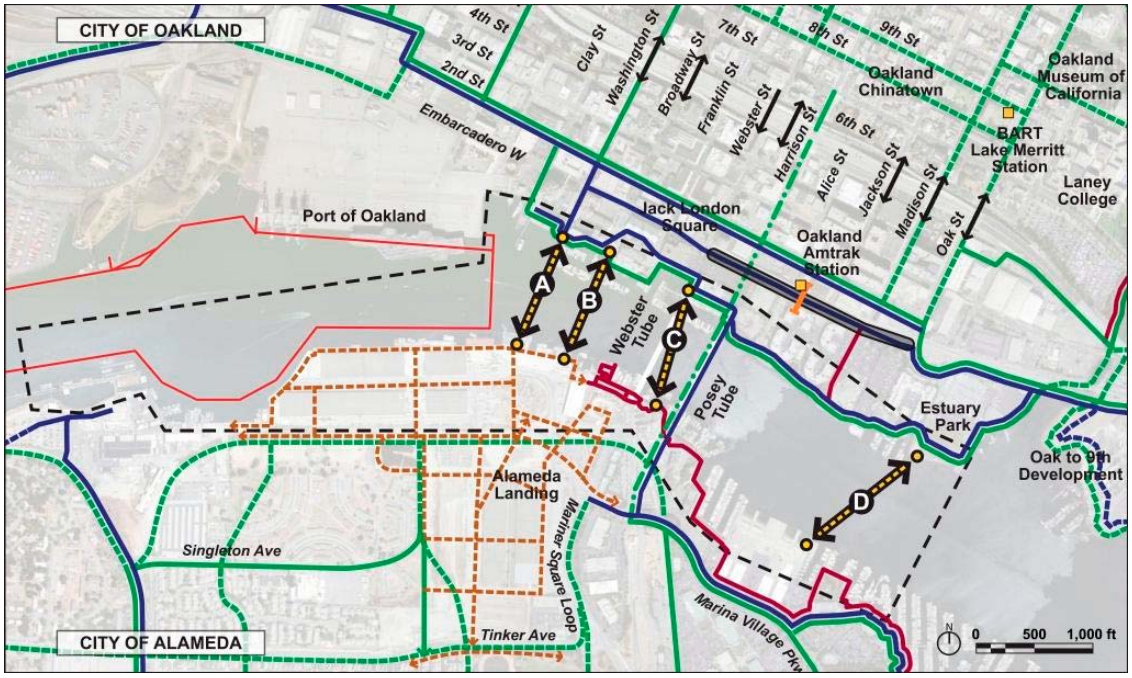
The bicycle-pedestrian bridge option will be designated for bicycle and pedestrian traffic only. The bridge will have a 600-foot moveable span that will be raised to allow passage for tall maritime vessels. During normal operation, the moveable span will be on a lower elevation to accommodate pedestrian and bicycle traffic. Users will need to ascend to the bridge deck via ramps or elevators.

7.3.1 Proposed Alignments

During the community workshop held in October 2008, the proposed alignments for the crossing alternatives were presented. The four proposed alignments, shown below in Figure 8, offer slightly different connections between Oakland and Alameda. The main criteria behind selecting the proposed alignments include:

- Ease of access between Oakland and Alameda
- Direct connections to major trip destinations and attractions
- Minimum length for fixed structures
- Open areas where bridge can be constructed

Figure 8: Proposed Moveable Bicycle/Pedestrian Bridge Crossing Alignments



Alignment A connects Oakland and Alameda along Washington Street in Oakland to Alameda Landing in Alameda. Since Washington Street is a designated bikeway, this alignment will provide convenient bicycle access to downtown Oakland. The proposed landing site in Alameda is in the middle of the future Alameda Landing development.

Alignment B connects Oakland and Alameda along Franklin Street in Oakland to Alameda Landing in Alameda. In Oakland, the bridge is aligned with Broadway; however, the ramps of the current configuration align with Franklin Street, which does not connect directly to downtown. The proposed landing site on the Alameda side is also adjacent to the planned Alameda Landing development. This area is currently open and ideal for potential bridge substructures.

Alignment C connects Oakland and Alameda along Webster Street in Oakland and Mariner Square Drive in front of the abandoned Chevy Restaurant in Alameda. This alignment is the shortest crossing over the estuary among the four alignments. It is expected that the construction cost for this alignment will be the lowest. The alignment offers an access gateway to downtown Oakland, Oakland Chinatown and the core entryway to the heart of Alameda.

Alignment D connects Estuary Park in Oakland and Marina Village Shopping Center in Alameda. It is the longest crossing over the estuary. Although it is connected to a popular shopping and employment center in Alameda, the other end of the alignment is the farthest from downtown Oakland.

The public response garnered from the latest community workshop indicated that the proposed alignments B and C were the preferred alignments for the fixed crossing alternative. The proposed sites of the landings for these two alignments are shown in Figure 9. Although there is no significant operational and functional difference between the two alignments, it is believed that Alignment B will benefit a greater population after Alameda's center of gravity is shifted further west with the completion of the planned land development projects on the west end of the island.

Figure 9: Proposed Landings for Moveable Bicycle/Pedestrian Bridge Crossings

View of Alameda site, Alignment B

View of Oakland site, Alignment B

View of Alameda site, Alignment C

View of Oakland site, Alignment C

7.3.2 Engineering Layout/Conceptual Designs

To satisfy the navigational clearance required by the US Coast Guard, a vertical lift bridge is proposed to span over a 600-foot wide waterway. The horizontal clearance of 600 feet represents the current horizontal clearance of the estuary. The US Coast Guard is not recommending to reduce the clearance that they currently have. If part of the 600 feet were in waters too shallow to navigate then the US Coast Guard would consider reducing the horizontal clearance.

The vertical clearance of the bridge is 45 feet above the mean high water (MHW) at the closed position and 175 feet above MHW at the open position. The US Coast Guard determined this vertical clearance based on the vessels that currently operate in the estuary. Elevators and ramps will be provided for pedestrian access to the main span. To accommodate pedestrian and bicycle traffic, the walkway on the bridge will be at least 15 feet wide. It consists of a 5 feet wide sidewalk and a 10 feet wide bikeway. In the next phases of the proposed bridge design, a transit option will be considered along with ways to ensure that the proposed bridge can accommodate emergency vehicles and water transport after a disaster.

The access structure on the Alameda side is adjacent to the Waterfront Plaza proposed in the Bayport/Alameda Landing Project Master Plan. The access structure on the Oakland side is connected to the east of Scott's Seafood Grill & Bar Restaurant.

The moveable span of the bridge will be a steel truss structure supported by lifting towers (Figures 10 and 11). The towers will be founded on deep foundations such as drilled shafts or driven piles. Fender systems will be installed around the tower foundations to protect the structure from ship collision. If the width of the bridge is not reduced, this bridge would be one of the longest moveable bridges in the world. The Arthur Kill Vertical Lift Railroad Bridge, which connects Elizabeth, New Jersey and Staten Island, New York claims the current title at 558 feet in length for the moveable span.

Figure 10: Conceptual Plan for Bicycle-Pedestrian Bridge

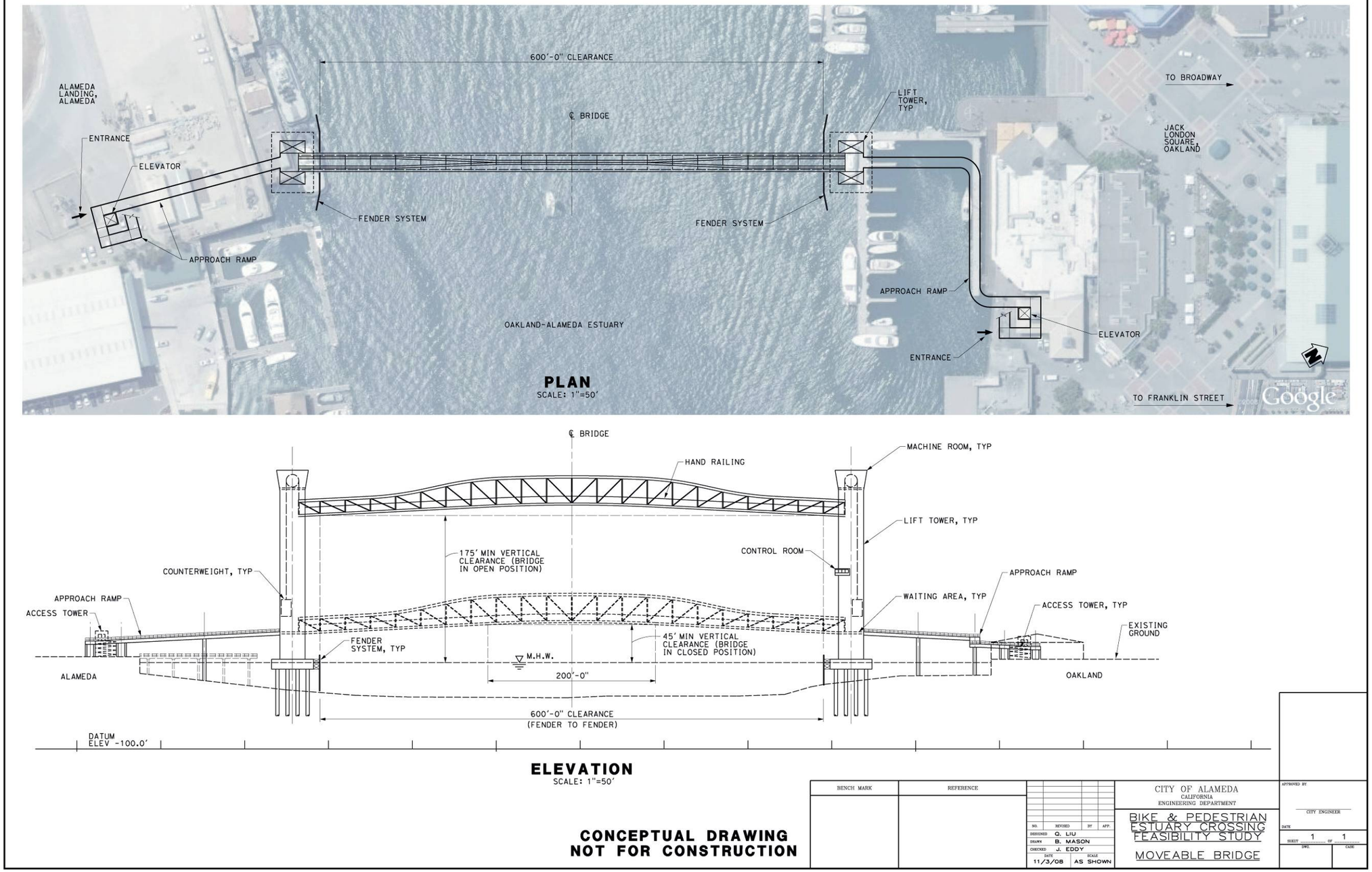
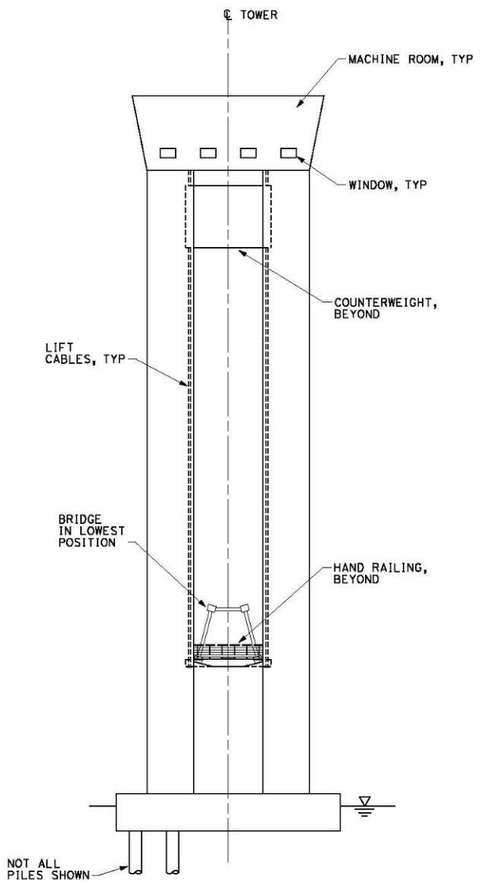
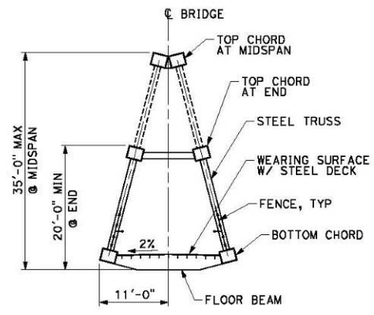


Figure 11: Detail Drawing for Bicycle-Pedestrian Bridge



LIFT TOWER ELEVATION
SCALE: 1"=20'



TYPICAL SECTION
SCALE: 1"=10'

CONCEPTUAL DRAWING NOT FOR CONSTRUCTION

BENCH MARK	REFERENCE

NO.	REVISED	BY	APP.
DESIGNED	Q. LIU		
DRAWN	B. MASON		
CHECKED	J. EDDY		
DATE	11/3/08	SCALE	AS SHOWN

CITY OF ALAMEDA
CALIFORNIA
ENGINEERING DEPARTMENT

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

MOVEABLE BRIDGE

APPROVED BY
CITY ENGINEER
DATE
SHEET 2 OF 2
DWG. CASE

7.3.3 Cost Estimates

Order of magnitude costs are given for various items with brief explanations on the basis of the estimates.

- **Right-of-way**: None. Private land acquisition is not anticipated as the structure will be situated on public access areas.
- **Design**: Approximately $8 million.
- **Administration:** The budget for the administrative work is estimated to be $5 million.
- **Contingencies**: Contingencies are 25 percent of the construction cost and have been included as part of the construction cost.
- **Environmental Review**: $500,000 to $750,000 for a full environmental impact study.
- **Mitigation:** It is estimated that $1 million will be required for mitigation of small amounts of contaminated soil. It also will take approximately $5 million to mitigate potential impact to the local businesses in Jack London Square.
- **Utility**: Based on the assumption that there is no major utility conflict at the project site, $500,000 for utility relocation.
- **Public Outreach**: $150,000 to $200,000 excluding the cost of the public outreach program that is required for the Environmental Impact Report process.
- **Construction**: $60 million including direct construction costs, time related overhead, mobilization and contingencies (refer to Table 7 for details). The construction costs are higher than originally stated in other documents including the Pedestrian Master Plan because the previous estimates were only preliminary order-of-magnitude cost estimates that did not include all the items mentioned above. This revised cost estimate is consistent with the cost estimate for the bicycle/pedestrian/transit bridge.
- **Operation and Maintenance:** $1.5 million annually if 24 hour, seven days a week service is provided (refer to Table 8 for details).

Table 7: Construction Costs for Bicycle Pedestrian Bridge

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE: OAKLAND-ALAMEDA ESTUARY PEDESTRIAN BRIDGE — **RTE:** LOCAL
TYPE: VERTICAL LIFT STEEL TRUSS BRIDGE — **CO:** ALA

LENGTH: 1,800.00 **WIDTH:** 18.00 to 15.00 **AREA (SF)=** 32,300

 # OF STRUCTURES IN PROJECT : 01 **EST. NO.**
PRICES BY : AF **COST INDEX:**
PRICES CHECKED BY : BM **DATE:** 3/30/2009
QUANTITIES BY: QL **DATE:** 3/30/2009

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	EARTHWORK		LS	1	$750,000.00	$750,000.00
2	COFFERDAM		EA	2	$1,000,000.00	$2,000,000.00
3	HANDRAILING		LF	3,600	$300.00	$1,080,000.00
4	LIGHTING		LS	1	$610,000.00	$610,000.00
5	MACHINERY		LS	1	$6,000,000.00	$6,000,000.00
6	ELEVATORS		EA	2	$500,000.00	$1,000,000.00
7	CONTROL ROOM		EA	1	$1,250,000.00	$1,250,000.00
8	MACHINE ROOM		EA	1	$800,000.00	$800,000.00
9	FURNISH STRUCTURAL STEEL BRIDGE		LB	1,300,000	$4.00	$5,200,000.00
10	ERECT STRUCTURAL STEEL BRIDGE(INCL PAINT)		LB	1,300,000	$2.50	$3,250,000.00
11	LIFT TOWER		EA	2	$4,000,000.00	$8,000,000.00
12	FENDER SYSTEM		LS	1	$450,000.00	$450,000.00
13	CIDH CONCRETE PILING		LF	2,314	$1,250.00	$2,892,500.00
14	STRUCTURAL CONCRETE, BRIDGE FOOTING		CY	3,222	$650.00	$2,094,300.00
15	BAR REINFORCING STEEL (BRIDGE)		LB	644,400	$0.90	$579,960.00
16	APPROACH SPAN		SF	18,000	$200.00	$3,600,000.00
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SUBTOTAL	$39,556,760
TIME RELATED OVERHEAD 10%	$3,955,676
MOBILIZATION 10%	$4,351,244
SUBTOTAL BRIDGE ITEMS	$47,863,680
CONTINGENCIES (@ 25%)	$11,965,920
BRIDGE TOTAL COST	$59,829,600
COST PER SQ. FOOT	$1,852.31
BRIDGE REMOVAL (CONTINGENCIES INCL.)	
WORK BY RAILROAD OR UTILITY FORCES	
GRAND TOTAL	$59,829,600
BUDGET ESTIMATE AS OF	**$59,830,000**
USE	**$60,000,000**

COMMENTS:

Table 8: Annual Operation and Maintenance Costs for Bicycle Pedestrian Bridge

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	OAKLAND-ALAMEDA ESTUARY PEDESTRIAN BRIDGE	**RTE:**	LOCAL
TYPE:	VERTICAL LIFT STEEL TRUSS BRIDGE	**CO:**	ALA

LENGTH: 1,800.00 **WIDTH:** 17.00 **AREA (SF)=** 30,600

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	Q. LIU	**COST INDEX:**	
PRICES CHECKED BY :	B. MADDEX	**DATE:**	10/23/2008
QUANTITIES BY:	Q. LIU	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	BRIDGE TENDER		HR	8,760	$80.00	$700,800.00
2	MECHANICAL AND ELECTRICAL INSPECTION		LS	1	$10,000.00	$10,000.00
3	STRUCTURAL INSPECTION		LS	1	$10,000.00	$10,000.00
4	MECH/ELEC SERVICING & FUELING		LS	1	$66,000.00	$66,000.00
5	PAINTING		LS	1	$200,000.00	$200,000.00
6						
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SUBTOTAL			$986,800
TIME RELATED OVERHEAD			
MOBILIZATION			
SUBTOTAL BRIDGE ITEMS			$986,800
CONTINGENCIES	(@ 25%)		$246,700
TOTAL COST			$1,233,500
COST PER SQ. FOOT			$40.31
GRAND TOTAL			$1,233,500
BUDGET ESTIMATE AS OF			**$1,234,000**
USE			**$1,500,000**

COMMENTS:

8 Potential Project Environmental Impacts

The preliminary major environmental constraints related to the various proposed alternatives are as follows:

- **Moveable Bridge Location and Clearance**: The proposed bridge location, clearances and operation procedures are subject to review and approval by the US Coast Guard (USCG). Communication and coordination with the USCG during the early stage of the project development is vital for the success of the project.
- **Construction:** For the bridge crossing and water shuttle/taxi alternatives, there may be concerns due to noise, vibration and air quality impacts on wildlife and adjacent residential communities during construction.
- **Earthwork:** There may be earthwork in the estuary and its shoreline, which will fall under the jurisdiction of the San Francisco Bay Conservation and Development Commission. All construction that requires moving soil in the Bay will need their approval.
- **Coastal and Flood Protection:** The US Army Corps of Engineers is responsible for the coastal and flood protection of the estuary. Permits will be required for construction that may impact the banks and the water quality.
- **Water Quality:** The Regional Water Quality Control Board will be responsible for issuing water quality permits for any new service or construction in the estuary. All impacts must comply with the California Clean Water Act.
- **Hazardous Materials:** Concerns about hazardous material may create a constraint if a fixed crossing is to be constructed. If hazardous material is encountered during excavation, the contaminated soil should be treated or removed from the site.
- **Historic Buildings:** There may be constraints associated with impacts on historic buildings listed on the National Register. Special attention will be paid to adhere to historic preservation guidelines.

This section briefly analyzes the potential environmental impacts to the preferred alternatives (Table 13). The analysis will serve as a basis for a complete environmental analysis that will occur in future phases of this project. The analysis provided here is based on the Appendix G Environmental Checklist Form from the California Environmental Quality Act (CEQA) guidelines for implementation. All determinations made in the following section are preliminary, and should be noted as reference only. The final preferred alternatives will be analyzed further under a full environmental analysis as required by CEQA and the National Environmental Protection Act (NEPA).

Table 13: Potential Project Impacts

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Have a substantial adverse effect on a scenic vista?		x					x					x
Damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				x				x				x
Substantially degrade the existing visual character or quality of the site and its surroundings?			x				x				x	
Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		x					x					x
Adversely impact, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (sections 17.11 or 17.12)?	Unknown; further analysis needed				Unknown; further analysis needed							x
Have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Unknown; further analysis needed				Unknown; further analysis needed							x

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	Unknown; further analysis needed				Unknown; further analysis needed							✘
Adversely impact federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?				✘				✘				✘
Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	Unknown; further analysis needed				Unknown; further analysis needed							✘
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Unknown; further analysis needed				Unknown; further analysis needed							✘
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	Unknown; further analysis needed				Unknown; further analysis needed							✘

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Cause a substantial adverse change in the significance of a historical resource which is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources?			✘				✘				✘	
Cause a substantial adverse change in the significance of unique archaeological resources (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?	Unknown; further analysis needed							✘				✘
Disturb or destroy a unique paleontological resource or site?	Unknown; further analysis needed				Unknown; further analysis needed							✘
Disturb any human remains, including those interred outside of formal cemeteries?	Unknown; further analysis needed							✘				✘
Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?				✘				✘				✘

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				✘				✘				✘
Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	Unknown; further analysis needed							✘				✘
Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to control?	Unknown; further analysis needed							✘				✘
Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	Unknown; further analysis needed				N/A							✘
Place within a 100-year floodplain structures which would impede or redirect flood flows?	Unknown; further analysis needed					✘						✘
Physically divide an established				✘				✘				✘

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
community?												
Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				x				x				x
Conflict with any applicable habitat conservation plan or natural communities conservation plan?				x				x				x
Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			x				x					x
Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?			x					x				x
Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				x				x				x
Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle			x				x				x	

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
trips, the volume to capacity ratio on roads, or congestion at intersections)?												
Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				x				x				x
Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?			x					x				x
Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				x				x			x	
Result in inadequate emergency access?				x				x				x
Result in inadequate parking capacity?				x				x				x
Conflict with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				x				x				x
Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				x				x				x
Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could				x				x				x

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
cause significant environmental effects?												
Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✘				✘				✘
Are sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				✘				✘				✘
Has the wastewater treatment provider which serves or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✘				✘				✘
Is the project served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				✘				✘				✘

Environmental Factor	Bicycle – Pedestrian Bridge				Water Shuttle/Taxi				Tube Minor Modification			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			✘				✘					✘
Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?			✘				✘					✘
Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✘				✘					✘
Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				✘				✘				✘

9 Funding Opportunities

Listed below are funding sources that could help fund subsequent phases of the estuary crossing project. It should be noted that some funding sources have restrictions on how the monies may be spent, such as construction and implementation only funding sources that cannot be applied to planning and design. Potential funding sources include:

- Bay Trails Grant Program (Association of Bay Area Governments)
- Bicycle Facility Program (Bay Area Air Quality Management District)
- Bicycle Transportation Account (Caltrans)
- Congestion Mitigation Air Quality Program (Metropolitan Transportation Commission)
- Developer monies
- Innovative Bridge Research and Construction Program (Federal Highway Administration)
- Innovative Bridge Research and Deployment Program (Federal Highway Administration)
- Measure B funds (Alameda County Transportation Improvement Authority)
- Regional Bicycle and Pedestrian Program (Metropolitan Transportation Commission)
- State Highway Operations and Protection Program (Caltrans)
- State Transportation Improvement Program (STIP) funds (Metropolitan Transportation Commission)
- Super Urban Area Security Initiative (SUASI) Program (Department of Homeland Security)
- Surface Transportation Program (Metropolitan Transportation Commission)
- Transportation Fund for Clean Air (Bay Area Air Quality Management District)

10 Next Steps

The next step of the project development is the preparation of a Project Study Report (PSR) equivalent document for the water taxi/shuttle. A PSR equivalent is an engineering report whose purpose is to document agreement on the scope, schedule and estimated cost of a project so that the project can be considered for inclusion in a future programming document such as the State Transportation Improvement Program (STIP). It is recommended that the water taxi/shuttle be carried forward in a PSR equivalent document. ***The long-term option – bicycle/pedestrian bridge – could be moved forward to a PSR equivalent document only if this option is deemed feasible.*** The City will work with stakeholders to determine if vessel restrictions during commute hours could be possible, vertical and horizontal clearances could be reduced and funding could be obtained. This follow up with stakeholders also would allow the possibility to accommodate a transit option with the bicycle/pedestrian bridge.The City will coordinate with Caltrans on how to proceed with the Minor Modifications to the Posey Tube alternative. The City also will continue to work with AC Transit, Caltrans and the City of Oakland on other improvements such as the Webster Street SMART corridor project and improved bike racks on AC Transit buses.

Staff recommends that operational characteristics of a crossing should also be studied as part of the PSR Equivalent document. In addition the PSR should also look at the user demand, destination choices, and user catchment area, so that the recommended alternative complements the existing transportation system and would allow users to make convenient intermodal transfers.

Based on the Caltrans Guide to Capital Project Delivery Workplan Standards, Section 150, the below areas should be discussed in a PSR equivalent document.

Project Study Report Equivalent Work Scope

Task 1: Transportation Problem Definition and Site Assessment

Task 1 includes three major tasks:

- Compiling and reviewing existing background information that may impact the alternatives or the scope of the alternatives under consideration.
- Developing project constraints and information required to determine the extent of the existing issues and future needs. This task should include any necessary discussions with internal and external stakeholders.
- Analyzing the existing issues and future requirements to determine the project's need and purpose.

Task 1 End Product

- Purpose and Need Statement.
- Adequate information should exist to begin developing alternatives.

Task 2: Initial Alternatives Development

This activity includes identifying all potential alternatives and reaching consensus with internal/external stakeholders on the alternatives that will be addressed in the PSR. This activity includes establishing the study limits of the various alternatives to be analyzed in the PSR.

Task 2 End Product

General scope and study limits of the alternatives are determined to be carried forward for further study. These alternatives are ready for further analysis to determine project features, cost and cost effectiveness.

Task 3: Alternatives Analysis

This activity is required to develop the necessary scope and cost of each alternative to be presented in the PSR. Costs developed in this activity will be used for programming purposes. Consequently, the analysis should be of sufficient detail to identify all potential costs. Also included in this activity are tasks required to assess the adequacy of the alternatives to meet the project's need and purpose.

Task 3 End Product

Completion of this activity should establish project scope, cost and feasibility for presentation in the PSR and programming.

Task 4: Preliminary Environmental Analysis Report (PEAR)

The Preliminary Environmental Analysis Report (PEAR) identifies the potential environmental impacts of each alternative as well as potential mitigation costs. Although existing data will most frequently be used in the preparation of this report, project specific circumstances may indicate the need for or advisability of conducting more detailed investigations. Costs developed in this activity will be used for programming purposes. Consequently, the analysis should be of sufficient detail to identify all potential costs. For those projects where the initiation document is combined with the project report/environmental document such PSR/PR, this activity also includes those tasks required for the environmental document.

Task 4 End Product

The PEAR provides the results of project specific preliminary environmental analyses performed by an interdisciplinary team of environmental and associated specialists. It contains a bottoms up determination of projected time and an estimate of support resource needs associated with completing the environmental compliance tasks for a proposed project.

Task 5: Approved Project Study Report

This activity includes all tasks required to develop the PSR text and exhibits as well as the effort required to circulate, review and update the project initiation document (PID), which includes appropriate "constructability review." This activity also includes development and approval of any required design exceptions or a FHWA access modification request, and the development and approval of any supplemental PSRs.

Task 5 End Product

This activity is complete with the approval and distribution of the PSR.

Task 6: Required Permits during Project Initiation Documents Development

This activity includes all work, normally prior to approval of the combined PR/PSSR, required to determine what permits may or may not be required.

Task 6 End Product

- A list of what specific permits are required and from what agency.
- A memo to file of what permits were considered but not pursued and for what reason.

Task 7: Permits during Project Initiation Documents Development

All work involved in obtaining permits for combined PR/PSSR, including:

- Discussions and negotiations with the permitting agency.
- Preparation of the permit and attachments such as exhibits, maps, etc.
- Obtain funds for any required permit fee.

- Submit permit application.

Task 7 End Product

The permits from each applicable permitting agency have been received.

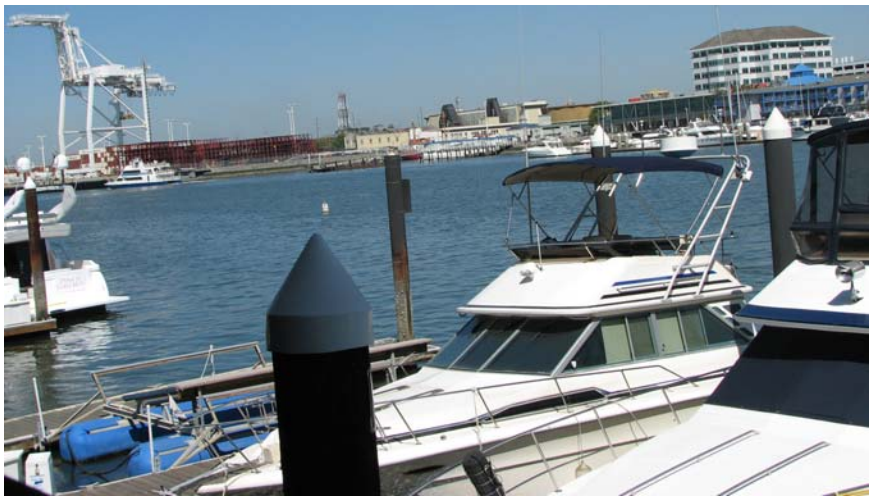
Base Maps and Plan Sheets for Project Initiation Documents.

Work involved in the preparation of exhibits, geometric base maps and functional base plan sheets required for the PSR development efforts.

Project Development Process

The PSR equivalents will be prepared by the local agency having jurisdiction on the estuary and the local streets. Caltrans review and approval is required for the Minor Modification of the Posey Tube because the Posey Tube is a State Facility. If the Caltrans project development procedures are to be followed, the final alternative(s) is usually determined through the environmental studies in the Project Report (PR) stage, which is after the PSR equivalent. During the PR stage, the potential impacts to the local communities, the stakeholders and the environment will be closely analyzed and evaluated. It is expected that the public will be able to reach consensus on the final alternative(s) at the end of this stage.

Appendix A – Outreach Reports



Phase One Workshop Report

In April 2008, the City of Alameda held the first in a series of community meetings to help identify potential alternatives for a bicycle/pedestrian estuary crossing between downtown Oakland and west Alameda.

The meetings, funded by the Alameda County Transportation Improvement Authority (ACTIA), Caltrans, the City of Alameda, and the City of Oakland, were held on Thursday, April 10 from 6 pm to 8 pm at the Oakland Asian Cultural Center in Oakland and on Saturday, April 12 from 10 am to 12 pm at Pasta Pelican Restaurant in west Alameda.

Workshop Format

At the April meetings, community members had an opportunity to assess project opportunities and challenges and weigh in on some of the alternatives being considered.

Both meetings began with a brief presentation by the project team on the project background and key issues and opportunities. Participants then had an opportunity to ask any questions they had and participate in a visioning exercise to craft a vision for the future crossing. The meetings closed with an opportunity to visit with project team members and view maps and other graphic information more closely in an open house format.

The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings, and a Cantonese interpreter was available at the Oakland meeting.

Participant Feedback Summary

- Suggested crossing alternatives included bridge, water shuttle, loaner boat fleet, and improvements to existing Posey Tube path
- Create a direct route to downtown Oakland
- Minimize air pollution of new estuary crossing
- Address all bicyclist/pedestrian types and trips and potential user conflicts
- Crossing should have a low cost to user—there are many low-income bicyclists and pedestrians
- Create a visually pleasing and pleasant crossing
- Develop a quick, reliable, safe, and convenient solution

Vision

Overall

- Aspire to become League of American Bicyclist cities
- Scenic, beautiful, inviting to bicyclists
- Family-friendly
- Moving people, not vehicles
- Make it pleasant and enjoyable!
- Inspire exercise

Design

- Elegant, simple, no cars (e.g., Bay Farm)
- Shuttle with multiple stops on both sides
- Urban setting—acknowledge and accommodate
- Paddle boat that accommodates bicycles
- Another dedicated tube ("mystery third tube")?
- Improved tube
- Lanes to calm/manage cyclists and pedestrians
- Drawbridge?
- Visual prominence and architectural significance to elevate the status of bicycling and walking
- Design is different for recreational use versus commute use—consider both.
- People movers, bike programs (such as those in Barcelona and Paris), rowboats, etc.—visionary!
- Bike shuttle
- Accommodate motor bikes

Access

- Multi-access with space
- Wheelchair access
- Accommodate people with impaired mobility
- Consider elderly and individuals with disabilities—should be accessible and meet ADA requirements.
- Elevator?
- With a ferry, there should be easy access to ferry landing

Cost

- Free
- Any shuttle should be free or very low-cost—but free may not be the right solution, either.
- If the crossing is free, it could itself become a destination

Frequency

- Quick and reliable—no waiting!
- Frequency is key—multi-stop shuttle shouldn't compromise this.
- Bridge is 24/7 option—always there

Environmental Impact

- Clean air concerns (zero emission!)
- Air quality in tube
- Option should not harm air quality

Safety/Maintenance

- Maintenance and safety are key!

- Simpler is better—less maintenance

Location

- Direct connection, especially for cyclists
- Bay Trail connection
- Connect to shopping opportunities
- Route for cyclists: continuous, not circuitous, no jogs, etc.
- Need more destinations—little draws people to Jack London Square

Models

- Vancouver water taxi as a model
- Redding pedestrian/bicycle bridge as a model
- Ft. Lauderdale water shuttle

Issues to Consider

- Capitalize on existing infrastructure (e.g., Ferry Building in Oakland)
- Consider creative financing
- Consider mixed use projects nearby
- Connect highest density to highest density
- Balance negative and positive impacts for businesses along the estuary (e.g., Commodore)—get businesses behind the project!
- Crossing overhead seems infeasible—maybe underwater?
- Consider council decision making, funding, etc.—keep it practical!
- A big issue is the I-880 traffic—limited capacity!
- Consider safety—the presence of others
- How much usage will the crossing see? Consider cost versus usage, commuters versus recreational users, etc.
- Questionnaire: would you use a crossing, and for what purpose? Capture users who don't exist now!
- Consider economics
- Transit versus bike/pedestrian: need separation
- Maybe multiple modes for multiple users
- Bus/transit not always best option for cyclists with bags, etc.
- In the future, AC Transit will likely put routes where there are riders
- Suburban-to-urban transition: how to ease bikers in safely?

Questions & Answers

- What is cyclist versus pedestrian priority? They're equal.
- Will the project consider integration of existing transportation demand management (TDM) programs and funding? In the future, yes (in Alameda—not yet in Oakland).
- Does Oakland have the sense that this is an Alameda issue that Alameda should resolve? Somewhat, as evidenced by the lawsuit brought by Oakland Chinatown.

- How do you get people to the crossing? This is part of the analysis—it's a critical issue.
- What is the cost structure? Undetermined.
- What is the budget? In feasibility study now—next phase will consider budget, environmental issues, other concerns. Anything is possible for now.
- Is the Coast Guard requirement different here than at the other estuary bridge locations? Yes, boats need to be able to access the Bay quickly.
- What is the drop on the tubes, as a baseline? Possibly 45 feet.
- Do trams need operators? Not always.
- What is the next phase? Scoping, funding.
- Will project include safe routes to transit? Will acknowledge existing, but won't create new routes.

Additional Comments

- PowerPoint and committee lists are online
- Umbrella of all project options, including existing tube—will inform operation and maintenance, etc.
- Run project ads in neighborhoods, on 51 bus, and at tube
- Shuttle through tube could be an option.
- Everyone should benefit from TDM programs—new development will create congestion, affect everyone
- In short term, improve what's already there—plan should address this
- Refer to the Jack London Square BART study by MTC
- Continue discussion online
- What is the expected usage of a new crossing? Quantify why—especially with respect to improving existing tube, etc.—and cull data from bike groups, AC Transit, cities, others

Phase Two Workshop Report

In May 2008, the City of Alameda held the second in a series of community meetings to help identify potential alternatives for a bicycle/pedestrian estuary crossing between downtown Oakland and west Alameda.

The meetings, funded by the Alameda County Transportation Improvement Authority (ACTIA), Caltrans, the City of Alameda, and the City of Oakland, were held on Saturday, May 17, from 10 am to 12 pm at the Jack London Aquatic Center in Oakland and on Wednesday, May 21, from 7 pm to 9 pm at City Hall West in west Alameda. Nine participants attended the Oakland meeting and 21 participants attended the Alameda meeting.

Workshop Format

At the May meetings, community members had an opportunity to learn about and weigh in on each of the alternatives being considered.

Both meetings began with a brief presentation by the project team on the project background and potential project alternatives. Participants then had an opportunity to ask questions. The meetings closed with an opportunity to visit with project team members and view maps and other graphic information more closely in an open house format.

The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings.

Participant Feedback Summary

- Consider all user groups and types of uses when evaluating crossing alternatives
- Provide an alternative that contributes to its setting, takes environmental factors into account, and is safe and well maintained
- Connect access points to transit and circulation systems for bicyclists and pedestrians
- Frequency of service should match comparable transit systems and should be reliable
- Potential funding options and partnerships will aid in the implementation of the crossing project

Potential Project Alternative

Overall

- Important to broadly identify target audience and to not parcel out audience
- May need more than one solution to meet diverse user needs
- Should be water-oriented! Want to appreciate the waterfront
- Evaluate project in terms of entire travel time
- Contribute to natural setting and assets

Short-Term/Long-Term Options

- Consider that users may have difficulty switching from riding a bicycle to walking, and vice versa
- Build user base and infrastructure in short-term
- Short-term solution will take less time and support long-term solution
- Better predictability in short-term

- Bus with bike facilities, increased ferry service, more user-friendly Tube walkways, water shuttle, or amphibious vehicle could be good short-term solutions
- Long-term option: use Coast Guard island?

Tubes

- Tube seems dirty, it is not being cleaned temporarily
- Tube is not used
- Wall off walkway with access areas
- Open Webster Street walkway to the public
- Could make each tube walkway (Webster Street and Posey) one-way, but difficult to regulate
- Rehabbing the tube would be expensive for a small gain, but may be a good short-term solution
- If tube is ever rebuilt, add bike access
- Improve ventilation in Tube
- Need security to protect people if solution is a new tunnel

Bus Service

- Bus will still be subject to traffic congestion so it is inefficient
- Cheaper to drive than take the bus
- Bus does not allow for bicycle trailers
- Consider ultra low-floor buses for bicyclists
- AC Transit may be an unrealistic partner; may not be beneficial to have more bus service
- Consider different types of bikes, such as senior tricycles or bike trailers

Amphibious Vehicle

- Could be an issue with the Coast Guard
- Would be quicker than bus service that accesses Tubes

Bridge

- Transport bridge is not that attractive and could detract from existing estuary beauty
- Emeryville Amtrak crossing is a model

Ferry

- Increase ferry frequency as a short-term solution

Issues to Consider

User Groups

- Alameda workshop: Recreational use (eight people), commute (ten people), and both (majority)
- Oakland workshop: Recreational use (ten people including seniors), commute (two people), and both (majority)
- Bicyclists, pedestrians

Access Points

- Water's edge entrance/exit is not necessarily important

- Place in a beautiful setting such as Estuary Park
- East of 880 in Oakland
- Access adjacent to water is attractive and serves recreational purposes
- Access point at Jack London Square: frequent trains

Connections/Routes

- Need to focus on alignment with the highest potential demand
- Connect to and have access points near transit, including BART and Amtrak
- Connect to existing bikeways such as Oak Street
- Address harbor-bay connections for bicyclists
- Using Grand Street would be the shortest and cheapest crossing
- Connect to Downtown Oakland
- Consider extending 23rd or 29th Avenue—but wouldn't connect to West Alameda
- Provide easy car access/create a connection close to existing parking structures
- Parking at Amtrak or Jack London Square?
- Take advantage of TDM shuttles

Bicycle and Pedestrian Amenities

- It varies between bicyclists to have an elevator
- Crossing should provide amenities for bicyclists
- Stay near flat area to facilitate bicycling
- Edgartown Crossing in Mountain View is a model

Safety

- Should be safe, bike and pedestrian friendly!
- Concerns with encampments
- Public perception of safety is a reality!

Maintenance

- Maintain areas; keep them active
- Consider maintenance issues with elevators

Funding

- Issuing bike licenses could help to fund project
- Toll crossing to pay for maintenance, etc.?
- Need associated funding mechanism; do not rely on City funding

Frequency of Service

- 10-15 minute frequency, 20 minutes if enjoyable mode of transportation
- Match BART schedule, use suburban BART as a model for station location
- Commute hours are key, off-peak hours are less critical
- Needs to be reliable
- Could be on-demand

Environmental Elements

- Consider weather and wind when evaluating projects and entrance/exit alternatives

Affordability

- Consider that there are a diversity of income levels among users
- There is a significant low income population in Alameda yet County services are mainly off the island
- Compare costs to other modes and include the cost of parking
- Price is a motivator

Future Considerations

- Future users are not here yet!
- Future developments should contribute to building landings and parks
- Future buildout at landings
- Port of Oakland is planning to have longer and more frequent trains

Questions & Answers

- Would roads near landings be repaved? Maybe in the future, but beyond scope now.
- What roads does the feasibility study look at? Existing road networks and conditions.
- What is being considered as end points? Only conceptual, no associated designs yet.
- Is there a third tube? No.

Additional Comments

- Put case studies on website
- Bring Wind River into conversation
- As gas prices increase, people may turn to alternative transportation
- Individual boats could create legal issues

Phase Three Workshop Report

In October 2008, the City of Alameda held the third phase of community outreach to help identify potential alternatives for a bicycle/pedestrian estuary crossing between downtown Oakland and west Alameda.

A community meeting, funded by the Alameda County Transportation Improvement Authority (ACTIA), Caltrans, the City of Alameda, and the City of Oakland, was held on Saturday, October 4, from 10 am to 12 pm at the Pasta Pelican Restaurant in Alameda. Community members also had the opportunity to learn about and comment on the project at a meeting of the Oakland Bicycle/Pedestrian Advisory Committee (BPAC) in Oakland from 5:30 pm to 7:30 pm on Thursday, October 16 at Oakland City Hall. Over 90 participants attended the two meetings.

Workshop Format

The October community meeting provided an opportunity for community members from both sides of the estuary to come together to review and provide feedback on the winnowed list of estuary crossing options. For those unable to attend the community meeting, the information was presented again at the Oakland BPAC meeting.

The community meetings began with a brief overview of the project's background presentation by the study team on the project background and potential project alternatives. Participants then had an opportunity to ask questions. The meetings closed with an opportunity to visit with study team members and to view maps and other graphic information in an open house format.

The two meetings featured identical content to ensure that all participants received the same information and had the same opportunity to provide feedback. Refreshments were served at both meetings.

Participant Feedback Summary

- There is a need for both a short-term and a long-term solution.
- Residents prefer a moveable pedestrian/bicycle bridge or a water taxi service that could offer multiple stops along the estuary.
- The City should partner with AC Transit and the ferry operator to identify any interim actions that can improve the capacity and conditions of the existing estuary crossing options.
- There will continue to be a need for automobile crossings from Alameda's West End to Oakland.
- Cost is an important concern, and there may be merit to including options like transit on a fixed crossing to open up funding opportunities.

Project Alternatives

Tube Improvements

- Will tubes be replaced? No, not in the short term; they have already been retrofitted. At some point, one will be adapted to lifeline seismic standards.
- What about resurfacing the tube pathway? The City of Oakland has requested this option.
- What about the second level, and the other tube path? Tube is circular, so hard to add deck. The other path is needed by Caltrans for maintenance.
- Pedestrian and bike tube [should be] rejected for many reasons.
- Approaches to the current [tube] pathway and any second pathway need to be re-engineered. Some sections are unpaved or cannot be negotiated safely, due to the

dominance of vehicular traffic (no bike lane) and the lack of signs or recessed curbs for bicycle ramps.

- Dedicate the existing tubes to be one-way in the same direction as traffic. This would be difficult to enforce but with signs posted, notices placed in the local papers and word of mouth this solution could go a long way to resolving the problem of head-on bicyclists with minimal cost. I would dedicate some funds to clean the tubes more frequently (at least on the side where bicyclists ride) and promote this to the Alameda community.
- I believe the adaptation [of the Posey tube] should be given serious thought, since it is the most economical. Retain the original tube crossing for Oakland-bound commuters. Open the second tube for Alameda-bound cyclists and pedestrians. It will also prevent the dangerous situation of individuals attempting to cross heavy traffic exiting the Posey Tube in their attempt to reach the tube from the Oakland side. If, with the one-way traffic, the paths are still considered to be too narrow, same may be widened through a cantilevered construction, which would not impede traffic, but would require clear marking/lights. Perhaps another six inches will be sufficient. I have no trouble negotiating the present width, as long as there is no opposing traffic. Tunnel walls...should be pressure washed at least once every year to remove diesel- and exhaust particulates.

Bus Service Improvements

- Why is the bus service improvement option so costly? Over time, operating costs increase. Existing AC Transit fleet is optimized, so it does not have extra capacity now.
- Would lightweight vehicles work? Yes.
- Do bus improvements include fare reduction? No; that would increase cost.
- Are shuttles petroleum-fueled? Not necessarily!
- What about free shuttle? This is included under modified bus service.
- Challenge: does this really encourage more biking/walking?
- AC Transit and paratransit are both important.
- What about short-term bus solutions (e.g., reduced estuary crossing fare, etc.)? These ideas are being passed on to AC Transit, others.
- I am strongly against any buses on Grand Street.
- I am not at all enamored of ideas that enhance existing bus service to accommodate bikes. If I am going to wait for a bus, I'll just take the bus and walk from end point to end point, not throw my bike on the bus.
- I would possibly throw my bike on a bus if it were free just to get my bike through the tube and if I could easily catch it at Atlantic and get off at 8th. But if this were the case, I would much prefer a water shuttle to a bus through the tube.
- I suggested seeing if AC Transit would be able to assist in some immediate stop-gap program. AC Transit could issue special Tube/Tunnel Only Pass (T.O.P.) tickets. People would present the ticket for transportation so that the driver can turn it in so that AC Transit has a method for measuring (counting) its use.
- Long range I would suggest a special shuttle that simply loops [from downtown Oakland to Alameda]. Such a shuttle could include an additional bicycle cart that could handle more than two bicycles per trip. I would suggest only one dollar (maybe fifty cents for students and senior citizens) to ride on that shuttle.

- [Consider a] dedicated bike shuttle, similar to the van with bike trailer that crosses the Bay Bridge during commute hours, that makes continuous circles through the tube, particularly at commute times.
- [Consider] a free electric or alternate fuel bus that accommodates bicycles, such as an Emery Go Round type shuttle, that makes a continuous circuit [through Oakland and Alameda]. Not only would this address the estuary crossing, but ideally it would cut down on vehicle miles traveled, allowing people to take the shuttle rather than their cars for a trip to the library, etc. One route could even go to Towne Centre (paid for by businesses).

Bridge

- What about the old bridge structure [that predated the Tubes, and was acceptable to the Coast Guard]? The Coast Guard considers conditions today and in the future—not conditions in the past.
- Can we challenge Coast Guard's 175' height requirement? Can have dialogue, but requires a lot of political will.
- What would the ramps look like? For fixed bridge, long ramps; for moveable, close to edge. Also explored spiral and elevator.
- Are ramps ADA-accessible? Yes! They will have a five percent grade.
- Fixed crossing with elevator could work.
- Pursue water taxi and moveable bridge—there's a need for both!
- I think the best option is a bicycle/walking bridge.
- The bridge is the only option that truly accommodates cyclists and pedestrians.
- I prefer bicycle/walking pedestrian bridge.
- Fixed or moveable bridge or overhead tram are unrealistic. Excessive cost per user aside, they would be rejected as unsafe and unusable in a disaster.
- We absolutely need a safe and appealing way to cross the estuary on bicycle or foot. I know that I would ride my bike to Oakland (I live in Alameda) quite often if there was a bicycle/walking/pedestrian bridge.
- We feel very uncomfortable [with] the proposal because it only benefits a few people and its cost is unusually high. What we need is a comprehensive bridge that includes cars, bikes, and pedestrians. Undoubtedly, the cost of building a comprehensive bridge that is for cars, bikes, and pedestrians is higher than the cost of building a bicycle bridge, but it can be justified if [it has] significant economic impacts.
- We are homeowners near Wind River, and often use the public bike path by the estuary with our two kids. We would love to have a way to ride our bikes over to Jack London Square, via a new bridge.
- Consider Santa Cruz as model!
- I prefer a bike/ped bridge.
- By far, my preferred alternative for the estuary crossing would be a moveable bridge.
- We need a moveable bridge with pedestrian and bicycle access (Bay Farm bicycle bridge is great). [It should be] open 24 hours a day; no wait (except for boats); free; uses human power, not gas, etc., to be a local attraction for visitors; extension of water promenade for both sides; a boon to business on both sides of estuary. Needs to tie into easy public transit access (BART, buses, train).

- I like the idea of a moveable bike bridge like the bike bridge across to Harbor Bay.
- What about floating bridge? Hard to move out of way, but included in "moveable."
- The moveable bike bridge sounds great! (With or without electric vehicle access.)
- The moveable bicycle/pedestrian bridge (like Alameda Bay Farm bicycle/ped bridge) seems the best long-term FIXED solution. Tie-ins to transit and commerce is crucial for commuters/pleasure/hard-core cyclists, pedestrians, strollers/wheelchair users alike.
- I see the economy of combining ped/bicycle/AC Transit on one structural crossing.
- I think that the best option is a bridge that is always there and available for use, whether early in the morning (4:00am) or later in the evening, and is not dependent upon a schedule. I sincerely hope we get this much-needed bridge SOON!
- Long term, there needs to be a solution which gets vehicle traffic (both personal and transit) across the estuary which will accommodate the significant increase in traffic from the various West End projects that are either approved or in the works, and that solution can and should include better bicycle and pedestrian access.
- Where would we get the most bang for our buck? The moveable bicycle-pedestrian bridge actually comes out to be the most efficient use of money, with its stated capacity of 8000 passengers per hour and net present value of $54M. It appears to be by far a more efficient use of money than the water shuttle/taxi option. However I also note that the moveable bicycle-pedestrian bridge with a transit lane is also less per passenger per hour than [most other options].
- If we're going to go to the effort of building a bridge over the estuary, there is a good case for expanding it to include transit (either just bus or full multi vehicle transit, similar to other three existing bridges that reach Alameda from Oakland). There are also other funding possibilities for vehicular/bicycle bridges...such that the residents of Oakland/Alameda may not have to shoulder the entire cost. I believe it would be far thinking and a good option for the majority of Alameda residents, including those who don't bike.
- As a long-term strategy, a permanent bridge, new tunnel, or direct access to 880 from the West End of the island should be considered negotiating points for community benefits in the development of Alameda Point.
- There could be a solution between bike and bike/NEV bridge options.
- I agree with the highlighted priorities in the assessment: 1) bus service improvement, 2) water shuttle/taxi, and 3) permanent moveable bridge.
- Our household strongly supports a pedestrian/bicycle bridge. We love the pedestrian/bicycle bascule bridge that already exists between Alameda island and Bay Farm. While we appreciate and regularly use AC Transit buses (relatively inexpensive transportation), the Alameda ferries (we use these much less now due to increased ticket costs and relative expense compared to AC Transit) and the Posey Tube for car), when walking and cycling, we like the bridge best.
- A separate pedestrian/handicapped/cyclist bridge that keeps people using these modes of transportation separate from cars, is ideal. We believe that such a bridge would also minimize pollution compared to the other alternatives, such as increased ferries, etc. to traverse the estuary.
- Consider "transporter bridge."

Ferry & Water Taxi

- Ferry terminal in San Francisco is an essential structure; Alameda/Oakland terminals are not!
- What about a barge shuttle using existing infrastructure? Ferry terminal may need seismic upgrade.
- What about multi-access shuttle stops? Multiple stops are included.
- Small ferry(s) [would be the best option]; a fixed bridge [is the second choice].
- What happened to old taxi? Don't know what happened to the boat; service ended for political reasons.
- How many bikes would [water] taxi take? How often would it run? 24-hour, 15-minute headways, 5-10 bikes, 80 people.
- Consider that small boats can have tide issues.
- Consider future ferry routes.
- Do we have to tie into existing ferry? No! Can explore new options.
- Do not forget the value of the gondola or the water taxi as a tourist attraction.
- I would prefer smaller boats with more frequent service.
- I believe that the [existing] Oakland/Alameda ferry system can provide part of the answer for little or no additional cost, and in fact, with only a slight change in the ferry schedule. If the ferries would stop at both Alameda and Oakland on every trip down the estuary, they could provide transportation to those who just want to go back and forth to the mainland from Alameda, or to the island from Oakland.
- Consider an exclusive ferry company [for cars and people]. [It could go] to Yerba Buena, or to SF and coordinate with AC transit stops/schedule. I see possibilities with [water] route B and C.
- A small flat barge with benches, a canopy and bike racks [would be ideal]. It could be operated by private operators who provide the barge and staff. Cities provide non-exclusive ADA-accessible docks. It would not be for cars. It could have multiple stops, maybe, and make this the "Venice of the West."
- For the short-term: a local bike ferry (not the existing ferries; the capacity for multiple bikers is not there and the terminal is too far out of the way).
- Water taxi is a good alternative for those not capable of walking/biking/traveling independently. Needs to access public transportation easily.
- The water taxi/shuttle program could be short and long term (lifeline).
- Re-evaluate ferry improvement costs. Why is the ferry so expensive?
- Explore impact on existing ferry ridership.
- I would be very excited about scalable alternatives such as water taxis and ferries. The service could expand and contract to meet demand and could respond quickly to the needs of the community.
- The interim solution should be low-cost and not involve significant infrastructure. So solutions such as a water taxi or small ferry are, in my mind, better solutions than a bridge, tube or barge, because they are simpler and easier to implement, and easier to change once a long-term solution is agreed upon.

- The “near term” solution has to be a boat shuttle (barge, etc.) of a type big enough to carry bikes.
- I propose a ferry featuring fast food and other franchises on board.
- Please do not have anything ridiculous like the gondola proposal.
- A car/bicycle/bus ferry is desperately needed for Alameda. It would have great appeal to all residents, serve the most people, as well as being the most practical. Also, it likely would be the one-and-only means of transportation during a severe earthquake.
- [My second choice option would be] a ferry/water taxi would come next. I have taken several times AC transit at rush hour to go through the tube with my bike on the front rack, but found this means of transportation fairly slow for the price. In terms of place for crossing, I would prefer options B and C.
- I really like the idea of a water taxi since this could be used by both pedestrians and bicyclists as well as the infrequent tourist. The taxis should be low-cost (potentially subsidized), frequent and have more taxis available during commute hours. Departures could be Alameda Point and Grand Avenue in Alameda and Jack London and near West Oakland BART in Oakland.

Demand & Users

- What is expected peak demand? Can’t say. It’s 70-100 today, but nothing exists and West Alameda is not yet built out. There are 200+ crossings of tube plus High/Park bridges; the numbers include AC Transit bikes.
- Is Suncal development considered? Yes.
- Does “bicycles” include motorbikes? No, only non-motorized vehicles are allowed on bike paths.
- Was Cybertran considered? Yes, that’s an NEV [neighborhood electric vehicle].
- Consider whether NEVs are compatible with bikes.
- Conduct survey on demand!
- Consider recreational versus commuter use.
- I don’t think I would often use a crossing except to make a circle ride at Jack London to get back to my parked car in Alameda.

Frequency

- Why 24-hour service? AC Transit is 24 hours now. Wanted to evaluate equally.
- Waiting15 to 30 minutes is about the maximum, and [a fare of] one or two dollars per trip is about the maximum.
- Please don’t let having something available 24/7 get in the way of implementing something quickly.

Financing and Cost

- Fundraisers could work!
- What are moveable bridge costs for? Average costs; they can’t be refined without further Coast Guard input.
- Could the numbers include net present value per person?
- Are transportation demand management and other revenue sources identified? Not yet; this is the next step.

- How realistic/expensive is it?
- Could cost less to consider [cars] now.
- Has having a fare for crossing been explored? Yes, but not factored into cost yet.
- Be ready when transportation money for infrastructure projects of environmentally friendly modes are available and critically necessary!
- Financial projections at 30-year mark [should consider] sea-level rise, carbon footprint, demographic projections.
- [Consider] what is reasonable, available now, and most of all with little or no cost.

Location

- There's a disconnect between touchdowns and main Alameda area. Connections to street grid were considered; could explore additional connections.
- What were criteria for locations? Picked strategically, but not vetted legally.
- Remember that there are bikers from East Alameda too. On east side in Oakland, there is no bus connection to Alameda.
- Old ferry landed near Chevy's; is this a possibility?
- Have it as close to the access points of the Webster Street and Posey Tubes as possible.
- I also really like the idea of something to Union Point, but that is a distant priority and luxury that should only be considered after the immediate need of West end bike and ped access is addressed.
- The logical place [for a new crossing] would be by the west end but the Port of Oakland will never let you do it.

Wisdom of a New Estuary Crossing

- I would vote against [having an estuary crossing]. The main reason is that the fewer connections we have with Oakland, the lower the expected crime rate. I am not interested in paying any more taxes [to finance a crossing].
- The overhead solutions (bridges, etc.) seem like overkill for a pedestrian and bike only conveyance.
- Because I do NOT want to use the Posey Tube to get to Oakland on foot or bike, I always drive. I am convinced that there are many others like me.
- Cooperation with BART to enhance its bicycle facilities at Lake Merritt, in conjunction with a new bridge/water taxi, would definitely help alleviate traffic through the tube, and reduce vehicle traffic in general.
- I would not support building another tube or bridge, which would be expensive, time-consuming, and fixed in the amount of traffic it could support.
- The time has come to be visionary about the future, based on people's needs and desires today. Many, many people, young and middle-aged would commute by bicycle with a little support and encouragement. But the infrastructure needs to be in place. We are looking for leadership from City Hall, we are counting on you to lead us into a better, more environmentally-friendly, healthy lifestyle.
- I am an Alameda resident who moved to Alameda expressly because it is a bike and pedestrian-friendly environment. An estuary crossing would considerably increase the number of trips per week that I take by bike.

Other Alternatives to Explore

- What about underwater cable crossing? Will explore, but many risks.
- Connect to BART!
- What about bike boats? Safety concern for public agency.
- Can cars be accommodated? There's a lot of congestion!
- There will be] thousands more cars. Consider including vehicles. This is not the charge of study; developers and the city need to create this plan.
- Consider filling the estuary in.
- If only Option A or D [from the meeting presentation] works, it's still better than nothing!
- We need another tube to 880! Has anyone tried getting through the Webster Street Tube on a weekday morning lately? It's getting better now as everyone is losing their jobs but that's temporary and not a good plan toward growth. At the rate buildings are built/proposed for the west end we're setting up gridlock in the near future. The new tubes need to include pedestrian and bicycles in the design.
- What about a "rent-a-bike" business on both sides of estuary like in Copenhagen and Amsterdam?
- Consider an auto-accessible causeway.

Additional Questions & Comments

- We need both shorter and longer term plans.
- What is the construction timeline? Not even in scoping yet. Much more to come
- Where would transit lane go? Just to [downtown] Oakland.
- How were shaded items chosen? It is weighted: some factors are dealbreakers, etc.
- Postcards should be mailed earlier! Three days' notice is not enough.
- Excellent presentation.
- Why are there signs on the bridges that forbid bikes [on sidewalks]?
- I did not see anyone in their early twenties at the meeting. Where is their voice in this project? Many young people who commute by bicycle work more than one minimum-paying job, and therefore have little time to attend meetings.

Next Steps

- How will study be released? Online.
- Is there a document with all the background? Yes; check website in early December!
- Need time to review: at least 30 days!
- Future plans for the estuary will include this study.

Appendix B – Bicycle/Pedestrian/Transit Bridge Alternative

Bicycle - Pedestrian Bridge (Moveable, Low Level) with Transit Lanes

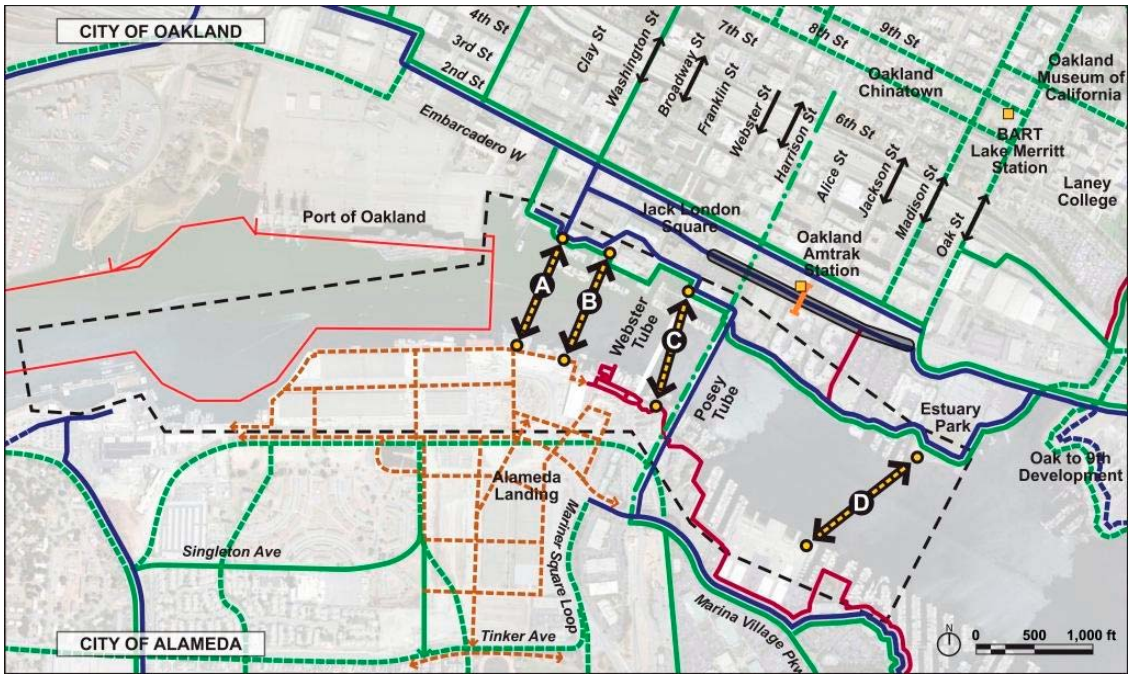
The bicycle-pedestrian-transit bridge option will be designated for bicycle, pedestrian and transit traffic only. The bridge will have a 600-foot moveable span that will be raised to allow passage for tall maritime vessels. During normal operation, the moveable span will be on a lower elevation to accommodate pedestrian, bicycle and transit traffic. Users will need to ascend to the bridge deck via road, ramps or elevators.

The Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Transit Lanes was recommended to move forward by the City of Alameda City Council, if stakeholders' support could be ascertained.The study team does not list it as a preferred alternative because the key stakeholders – City of Oakland and AC Transit – do not favor pursuing it at this time. There are significant unknowns with this alternative because it was not studied at a level of detail that is comparable to its complexity. At this time, it is unknown if such a bridge would provide transit operations with run-time or reliability advantages over the Posey and Webster Street Tubes. A moveable bridge plus the railroad crossing at Embarcadero pose significant challenges to transit operations. It is also unknown how this alternative would spatially and visually affect Jack London Square.

Proposed Alignments

The four proposed alignments for the bicycle/pedestrian/transit bridge, shown below in Figure 16, offer slightly different connections between Oakland and Alameda. No alignment is preferred at this time because analysis still needs to be done on the bridge touchdowns, ramping and transit travel times.

Figure 16: Proposed Crossing Alignments for Bicycle/Pedestrian/Transit Bridge



Alignment A connects Oakland and Alameda along Washington Street in Oakland to Alameda Landing in Alameda. Since Washington Street is a designated bikeway, this alignment will provide convenient bicycle access to the west of downtown Oakland. The proposed landing site in Alameda is in the middle of the future Alameda Landing development.

Alignment B connects Oakland and Alameda along Broadway in Oakland to Alameda Landing in Alameda. It offers a direct connection between Alameda and Jack London Square with easy access to downtown Oakland. The proposed landing site on the Alameda side is also adjacent to the planned Alameda Landing development. This area is currently open and ideal for potential bridge substructures.

Alignment C connects Oakland and Alameda along Webster Street in Oakland and Mariner Square Drive in front of the abandoned Chevy Restaurant in Alameda. Although this is the shortest crossing over the estuary among the four alignments, there is not enough space for a bridge landing on the Oakland side.

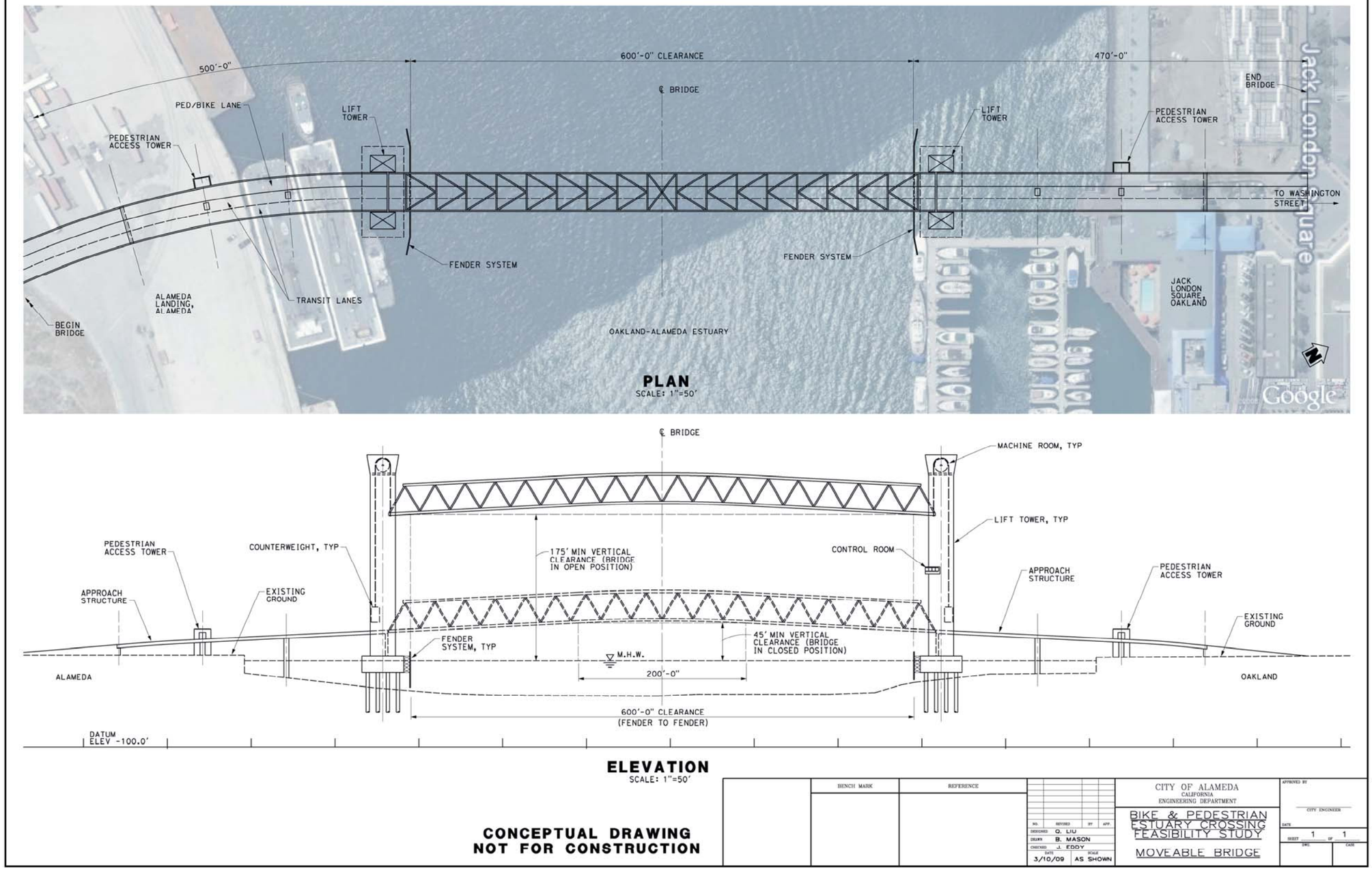
Alignment D connects Estuary Park in Oakland and Marina Village Shopping Center in Alameda. It is the longest crossing over the estuary. Although it is connected to a popular shopping and employment center in Alameda, the other end of the alignment is the farthest from downtown Oakland.

Engineering Layout/Conceptual Designs

To satisfy the navigational clearance required by the US Coast Guard, a vertical lift bridge is proposed to span over a 600-foot wide waterway (Figure 17). The vertical clearance of the bridge will be 45 feet above mean high water (MHW) at the closed position and 175 feet above MHW at the open position. Elevators and ramps will be provided for access to the main span. To accommodate pedestrian, bicycle and transit traffic, the bridge will be at least 43 feet wide. It consists of a 5-foot wide sidewalk, a 10-foot wide bikeway and two 14-foot wide transit lanes.

The moveable span of the bridge will be a steel truss structure supported by lifting towers. The towers will be founded on deep foundations such as drilled shafts or driven piles. Fender systems will be installed around the tower foundations to protect the structure from ship collision. This bridge would be one of the longest moveable bridges in the world. The Arthur Kill Vertical Lift Railroad Bridge, which connects Elizabeth, New Jersey and Staten Island, New York claims the current title at 558 feet in length for the moveable span.

Figure 17: Conceptual Plan for Bicycle-Pedestrian Bridge w/ Transit Lanes



Cost Estimates

Order of magnitude costs are given for various items with brief explanations on the basis of the estimates.

- **Right-of-way**: None. Private land acquisition is not anticipated as the structure will be situated on public access areas.
- **Design**: Approximately $20 million.
- **Administration:** The budget for the administrative work is estimated to be $10 million.
- **Contingencies**: Contingencies are 25 percent of the construction cost and have been included as part of the construction cost.
- **Environmental Review**: $1 million for a full environmental impact study.
- **Mitigation:** It is estimated that $3 million will be required for mitigation of contaminated soil. It will take approximately $10 million for potential impact to the local businesses in Jack London Square.
- **Utility**: Based on the assumption that there is no major utility conflict at the project site, $1,000,000 for utility relocation.
- **Public Outreach**: $500,000 excluding the cost of the public outreach program that is required for the Environmental Impact Report process.
- **Construction**: $125 million including direct construction cost, time related overhead, mobilization and contingencies (refer to Table 14 for details).
- **Operation and Maintenance:** $2 million annually if 24 hour, 7 days per week service is provided (refer to Table 15 for details).

Table 14: Construction Costs for Bicycle Pedestrian Bridge w/ Transit Lanes

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	OAKLAND-ALAMEDA ESTUARY PED BRIDGE W/ TRANSIT LANES	**RTE:**	LOCAL
TYPE:	VERTICAL LIFT STEEL TRUSS BRIDGE	**CO:**	ALA

LENGTH: 1,520.00 **WIDTH:** 43.00 **AREA (SF)=** 65,360

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	AF	**COST INDEX:**	
PRICES CHECKED BY :	BM	**DATE:**	3/30/2009
QUANTITIES BY:	QL	**DATE:**	3/30/2009

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	EARTHWORK		LS	1	$1,500,000.00	$1,500,000.00
2	COFFERDAM		EA	2	$1,750,000.00	$3,500,000.00
3	HANDRAILING		LF	3,040	$300.00	$912,000.00
4	LIGHTING		LS	1	$1,193,000.00	$1,193,000.00
5	MACHINERY		LS	1	$14,000,000.00	$14,000,000.00
6	ELEVATORS		EA	2	$500,000.00	$1,000,000.00
7	CONTROL ROOM		LS	1	$2,000,000.00	$2,000,000.00
8	MACHINE ROOM		LS	1	$1,000,000.00	$1,000,000.00
9	FURNISH STRUCTURAL STEEL		LB	2,872,000	$4.00	$11,488,000.00
10	ERECT STRUCTURAL STEEL (INCL PAINT)		LB	2,872,000	$2.50	$7,180,000.00
11	LIFT TOWER		EA	2	$8,500,000.00	$17,000,000.00
12	FENDER SYSTEM		LS	1	$800,000.00	$800,000.00
13	CIDH CONCRETE PILING		LF	4,320	$1,250	$5,400,000.00
14	STRUCTURAL CONCRETE, BRIDGE FOOTING		CY	8,000	$650.00	$5,200,000.00
15	STRUCTURAL CONCRETE BRIDGE DECK		CY	560	$950.00	$532,000.00
16	BAR REINFORCING STEEL (BRIDGE)		LB	1,600,000	$0.90	$1,440,000.00
17	APPROACH SPAN		SF	39,903	$200.00	$7,980,600.00
18	CONCRETE BARRIER (TYPE 27)		LF	1,520	$130.00	$197,600.00
19						
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22						
23						
24						
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26						
27						
28						
29						
30						

SUBTOTAL	$82,323,200
TIME RELATED OVERHEAD 10%	$8,232,320
MOBILIZATION 10%	$9,055,552
SUBTOTAL BRIDGE ITEMS	$99,611,072
CONTINGENCIES (@ 25%)	$24,902,768
BRIDGE TOTAL COST	$124,513,840
COST PER SQ. FOOT	$1,905.05
BRIDGE REMOVAL (CONTINGENCIES INCL.)	
WORK BY RAILROAD OR UTILITY FORCES	
GRAND TOTAL	$124,513,840
BUDGET ESTIMATE AS OF	**$124,514,000**
USE	**$125,000,000**

COMMENTS:

Table 15: Annual Operation and Maintenance Costs for Bicycle Pedestrian Bridge w/ Transit Lanes

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	OAKLAND-ALAMEDA ESTUARY PEDESTRIAN BRIDGE W/ TRANSIT LANES	**RTE:**	LOCAL
TYPE:	VERTICAL LIFT STEEL TRUSS BRIDGE	**CO:**	ALA

LENGTH: 1,530.00 **WIDTH:** 45.00 **AREA (SF)=** 68,850

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	Q. LIU	**COST INDEX:**	
PRICES CHECKED BY :	B. MADDEX	**DATE:**	10/23/2008
QUANTITIES BY:	Q. LIU	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	BRIDGE TENDER		HR	8,760	$80.00	$700,800.00
2	MECHANICAL AND ELECTRICAL INSPECTION		LS	1	$20,000.00	$20,000.00
3	STRUCTURAL INSPECTION		LS	1	$30,000.00	$30,000.00
4	MECH/ELEC SERVICING & FUELING		LS	1	$130,000.00	$130,000.00
5	PAINTING		LS	1	$570,000.00	$570,000.00
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SUBTOTAL			$1,450,800
TIME RELATED OVERHEAD			
MOBILIZATION			
SUBTOTAL BRIDGE ITEMS			$1,450,800
CONTINGENCIES	(@ 25%)		$362,700
TOTAL COST			$1,813,500
COST PER SQ. FOOT			$26.34
GRAND TOTAL			$1,813,500
BUDGET ESTIMATE AS OF			**$1,814,000**
USE			**$2,000,000**

COMMENTS:

Potential Project Environmental Impacts

The preliminary major environmental constraints related to the bicycle/pedestrian/transit bridge alternative are as follows:

- **Moveable Bridge Location and Clearance**: The proposed bridge location, clearances and operation procedures are subject to review and approval by the US Coast Guard (USCG). Communication and coordination with the USCG during the early stage of the project development is vital for the success of the project.
- **Construction:** There may be concerns due to noise, vibration and air quality impacts on wildlife and adjacent residential communities during construction.
- **Earthwork:** There may be earthwork in the estuary and its shoreline, which will fall under the jurisdiction of the San Francisco Bay Conservation and Development Commission. All construction that requires moving soil in the Bay will need their approval.
- **Coastal and Flood Protection:** The US Army Corps of Engineers is responsible for the coastal and flood protection of the estuary. Permits will be required for construction that may impact the banks and the water quality.
- **Water Quality:** The Regional Water Quality Control Board will be responsible for issuing water quality permits for any new service or construction in the estuary. All impacts must comply with the California Clean Water Act.
- **Hazardous Materials:** Concerns about hazardous material may create a constraint if a fixed crossing is to be constructed. If hazardous material is encountered during excavation, the contaminated soil should be treated or removed from the site.
- **Historic Buildings:** There may be constraints associated with impacts on historic buildings listed on the National Register. Special attention will be paid to adhere to historic preservation guidelines.

This section briefly analyzes the potential environmental impacts for the bicycle/pedestrian/transit bridge alternative (Table 16). The analysis provided here is based on the Appendix G Environmental Checklist Form from the California Environmental Quality Act (CEQA) guidelines for implementation. All determinations made in the following section are preliminary, and should be noted as reference only. The final preferred alternatives would need to be analyzed further under a full environmental analysis as required by CEQA and the National Environmental Protection Act (NEPA).

Table 16: Potential Project Impacts – Bicycle/Pedestrian/Transit Bridge

Environmental Factor	Bicycle – Ped Bridge w/ Transit Lanes			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
AESTHETICS				
Have a substantial adverse effect on a scenic vista?		✗		
Damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				✗
Substantially degrade the existing visual character or quality of the site and its surroundings?			✗	
Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		✗		
BIOLOGICAL RESOURCES				
Adversely impact, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (sections 17.11 or 17.12)?	Unknown; further analysis needed			
Have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Unknown; further analysis needed			
Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	Unknown; further analysis needed			
Adversely impact federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?				✗
Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	Unknown; further analysis needed			

Environmental Factor	Bicycle – Ped Bridge w/ Transit Lanes			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Unknown; further analysis needed			
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	Unknown; further analysis needed			
CULTURAL RESOURCES				
Cause a substantial adverse change in the significance of a historical resource which is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources?			✘	
Cause a substantial adverse change in the significance of unique archaeological resources (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?	Unknown; further analysis needed			
Disturb or destroy a unique paleontological resource or site?	Unknown; further analysis needed			
Disturb any human remains, including those interred outside of formal cemeteries?	Unknown; further analysis needed			
HYDROLOGY AND WATER QUALITY				
Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?				✘
Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				✘
Substantially alter the existing drainage pattern of the site or area, including through the alteration of	Unknown; further analysis needed			

Environmental Factor	Bicycle – Ped Bridge w/ Transit Lanes			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				
Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to control?	Unknown; further analysis needed			
Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	Unknown; further analysis needed			
Place within a 100-year floodplain structures which would impede or redirect flood flows?	Unknown; further analysis needed			
LAND USE AND PLANNING				
Physically divide an established community?				✘
Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				✘
Conflict with any applicable habitat conservation plan or natural communities conservation plan?				✘
POPULATION AND HOUSING				
Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			✘	
Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?			✘	
Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✘
TRANSPORTATION/TRAFFIC				
Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at			✘	

Environmental Factor	Bicycle – Ped Bridge w/ Transit Lanes			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
intersections)?				
Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				✘
Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?			✘	
Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				✘
Result in inadequate emergency access?				✘
Result in inadequate parking capacity?				✘
Conflict with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				✘
UTILITIES AND SERVICE SYSTEMS				
Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				✘
Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✘
Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✘
Are sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				✘
Has the wastewater treatment provider which serves or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✘
Is the project served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				✘

Environmental Factor	Bicycle – Ped Bridge w/ Transit Lanes			
	Potentially Significant Impact	Less than Significant w/ mitigation incorporation	Less than significant impact	No Impact
MANDATORY FINDINGS OF SIGNFICANCE				
Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			✘	
Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?			✘	
Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✘	
Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				✘

Appendix C – Full Posey Tube Modifications Alternative

Appendix C considers the recommended minor modifications to Posey Tube along with opening the maintenance path on the west side and face-mounted railings on the existing path. Thus, the potential improvements considered in Appendix C are as follows:

- Posey Tube Public Path (east path): Installing face-mounted railing, replacing existing plate covers, filling in grooves on the concrete path, and establishing a regular maintenance program.
- Posey Tube Maintenance Path (west path): The path that is used for maintenance access will be converted into a pedestrian/bicycle path.

Auto traffic will not permanently be affected by the modifications. Modifications to Posey Tube are subject to review by the State Office of Historic Preservation since the Posey Tube is listed on the register for historic structures in California.

Proposed Alignments

The following two options were compared to determine the most cost-effective alternative.

1. Modifications to the Posey Tube: The existing public and maintenance paths inside the Posey Tube could be modified to better accommodate pedestrian and bicycle traffic.
2. Modifications to the Posey and Webster Street Tubes: The existing path in the Posey Tube and the maintenance path in the Webster Street Tube could be modified to better accommodate pedestrian and bicycle traffic.

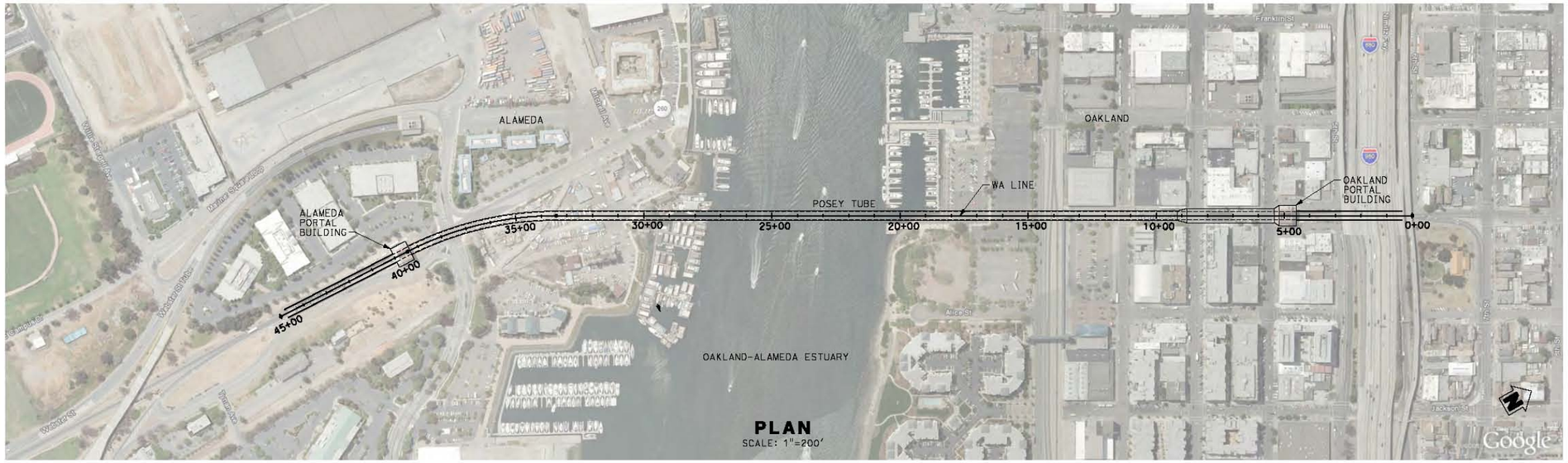
The first approach – Modifications to the Posey Tube – is adopted because of the following reasons:

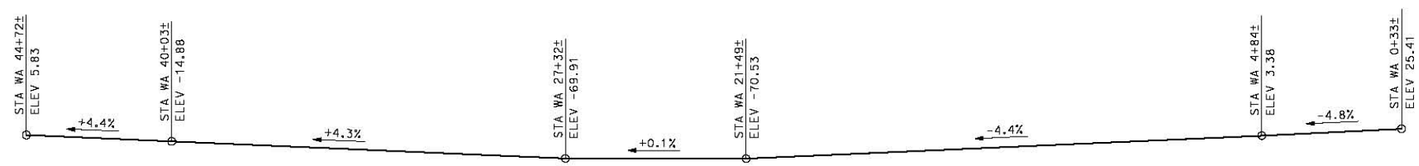
- Based on the "Project Plans for Construction on State Highway in Alameda County in Alameda and Oakland at Webster Street Tube and Posey Tube" dated September 17, 2001, the pathway width is approximately 3 feet 8 inches for the Posey Tube and approximately 3 feet 3 inches for the Webster Street Tube. Even though there is a 4-inch water main on the existing maintenance pathway in the Posey Tube, the clear width of this pathway is wider than the one in the Webster Street Tube.
- The pathway inside the Webster Street Tube is not connected to any local street in Oakland. Since the pathway is on the right side of southbound traffic, pedestrians/bicyclists will have to cross the busy 5th Street tube entrance to travel to downtown Oakland. To solve this problem, a new pedestrian ramp will be required to connect the existing pathway to the end of 5th Street.
- On the Oakland side, the retaining wall of the Webster Street Tube adjacent to the 5th Street on-ramp will need to be demolished and reconstructed with a wider pathway. On the Alameda side, the retaining wall of the Webster Street Tube will need to be reconstructed to include stairs leading to Mariner Square Loop. The reconstruction of these retaining walls probably will cost more than the relocation of the water main in the Posey Tube.

Engineering Layout/Conceptual Designs

The Posey Tube will be modified to accommodate two-way pedestrian/bicyclist traffic between Alameda and Oakland (Figures 18 and 19). The sidewalk that is used for maintenance access will be converted into a pedestrian/bicycle path. The existing communication boxes, signs and water main along the maintenance sidewalk will be relocated to provide bigger clearance for pedestrian and bicycle traffic. To provide wider walkways inside the tube, all the original tubular railings will be replaced with face-mounted railings along both sidewalks.

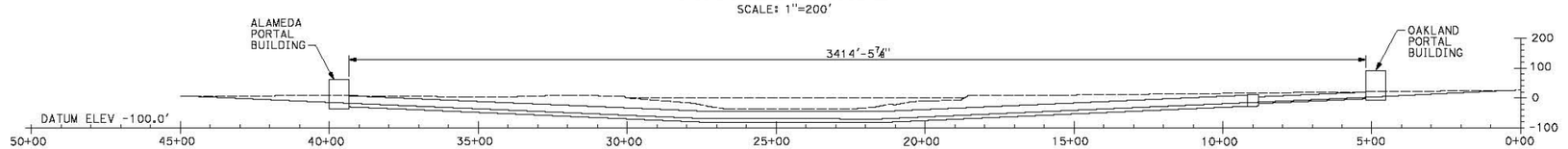
Figure 18: Conceptual Plan for Posey Tube Modifications





PROFILE GRADE
SCALE: 1"=200'

NOTE:
ELEVATIONS ARE PER DESIGN DRAWINGS PREPARED FOR CALTRANS SEISMIC RETROFIT PROJECT NO. 722



ELEVATION
SCALE: 1"=200'

CONCEPTUAL DRAWING
NOT FOR CONSTRUCTION

BENCH MARK	REFERENCE

NO.	REVISED	BY	APP.
DESIGNED	Q. LIU		
DRAWN	B. MASON		
CHECKED	J. EDDY		
DATE	11/3/05	SCALE	AS SHOWN

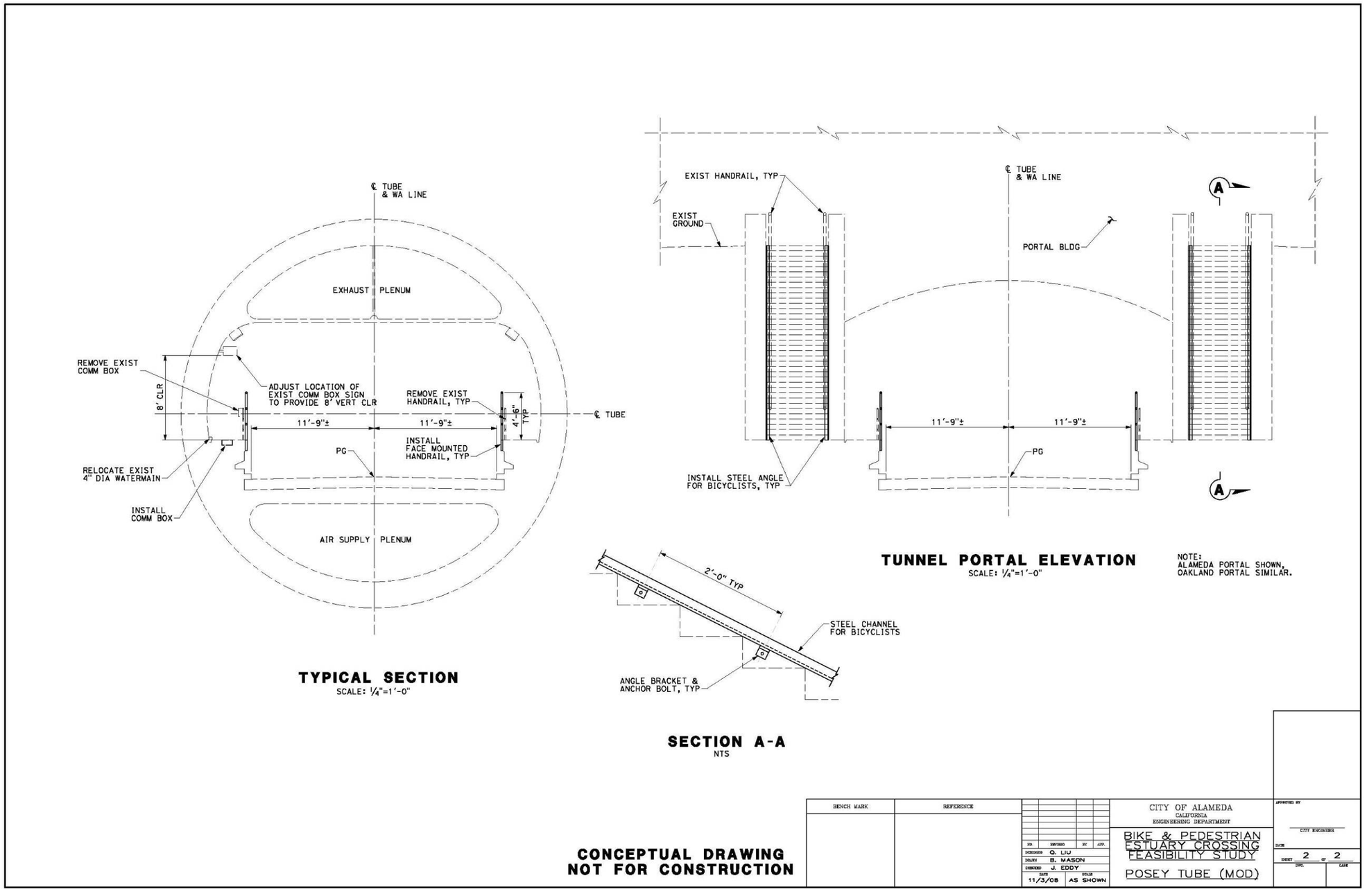
CITY OF ALAMEDA
CALIFORNIA
ENGINEERING DEPARTMENT

BIKE & PEDESTRIAN
ESTUARY CROSSING
FEASIBILITY STUDY

POSEY TUBE (MOD)

APPROVED BY
CITY ENGINEER
DATE
SHEET 1 OF 2
DWG. | CLAS

Figure 19: Detail Drawing for Posey Tube Modifications



Cost Estimates for Minor Modifications to Posey Tube

Order of magnitude costs are given for various items with brief explanations on the basis of the estimates.

- **Right-of-way**: None. Right-of-way acquisition is not anticipated as no construction is required outside of the tube.
- **Design**: The cost of the design is about $700,000.
- **Administration**: $700,000 is anticipated for the administrative task performed by the government agencies.
- **Contingencies**: Contingencies are 25 percent of the construction cost and have been included as part of the construction cost.
- **Environmental Review**: $100,000 based on the assumption that a negative declaration is anticipated.
- **Mitigation**: None.
- **Utility**: Relocation of the 4-inch water main in the tube will be required. The cost is about $300,000 and has been included as part of the construction cost below.
- **Public Outreach**: None.
- **Construction**: $7 million including direct construction cost, time related overhead, mobilization and contingencies (refer to Table 17 for details).
- **Operation and Maintenance**: $50,000. Posey Tube will be maintained by Caltrans as it is within Caltrans right-of-way (refer to Table 18 for details).

Table 17: Construction Costs for Posey Tube Modifications

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	POSEY TUBE (MOD)	**RTE:**	LOCAL
TYPE:	IMMERSED CONCRETE TUNNEL	**CO:**	ALA

LENGTH: 4,465.00 **WIDTH:** 22.00 **AREA (SF)=** 98,230

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	Q. LIU	**COST INDEX:**	
PRICES CHECKED BY :	B. MADDEX	**DATE:**	10/23/2008
QUANTITIES BY:	Q. LIU	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	TUBULAR HANDRAILING (FACE MOUNTED)		LF	8,878	$300.00	$2,663,400.00
2	RELOCATE 4" WATER MAIN		LF	3,394	$75.00	$254,550.00
3	RELOCATE COMMUNICATION BOX		LS	1	$48,000.00	$48,000.00
4	SEAL CONCRETE SURFACE		SF	12,532	$10.00	$125,320.00
5	MISCELLANEOUS METAL (BRIDGE)		LB	4,795	$4.00	$19,180.00
6	DRILL AND EPOXY ANCHOR		EA	4,745	$300.00	$1,423,500.00
7	TRAFFIC HANDLING		LS	1	$10,000.00	$10,000.00
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SUBTOTAL		$4,543,950
TIME RELATED OVERHEAD		$454,395
MOBILIZATION (@ 10 %)		$555,372
SUBTOTAL BRIDGE ITEMS		$5,553,717
CONTINGENCIES	(@ 25%)	$1,388,429
BRIDGE TOTAL COST		$6,942,146
COST PER SQ. FOOT		$70.67
GRAND TOTAL		$6,942,146
BUDGET ESTIMATE AS OF		**$6,942,000**
USE		**$7,000,000**

COMMENTS:

Table 18: Annual Operation and Maintenance Costs for Posey Tube Modifications

BIKE & PEDESTRIAN ESTUARY CROSSING FEASIBILITY STUDY

BRIDGE:	POSEY TUBE (MOD)	**RTE:**	LOCAL
TYPE:	IMMERSED CONCRETE TUNNEL	**CO:**	ALA

LENGTH: 4,465.00 **WIDTH:** 22.00 **AREA (SF)=** 98,230

# OF STRUCTURES IN PROJECT :	01	**EST. NO.**	
PRICES BY :	Q. LIU	**COST INDEX:**	
PRICES CHECKED BY :	B. MADDEX	**DATE:**	10/23/2008
QUANTITIES BY:	Q. LIU	**DATE:**	10/23/2008

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
1	CLEANING		HR	576	$50.00	$28,800.00
2	MACHINE RENTAL & FUEL		LS	1	$3,000.00	$3,000.00
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SUBTOTAL		$31,800
TIME RELATED OVERHEAD		
MOBILIZATION (@ 10 %)		
SUBTOTAL BRIDGE ITEMS		$31,800
CONTINGENCIES	(@ 25%)	$7,950
TOTAL COST		$39,750
COST PER SQ. FOOT		$0.40
GRAND TOTAL		$39,750
BUDGET ESTIMATE AS OF		**$40,000**
USE		**$50,000**

COMMENTS:

Appendix D – Draft Feasibility Report Public Comments and Responses

Comment	Recommendation	Action
Transportation Commission Meeting (March 25, 2009)		
State why the study did not mention installing **plexiglass by the pathway** to reduce air pollution (Krueger).	Mention it in the minor modifications to the tube section (6.1.4.) and in the project alternative description section (7.3).	Done
Did the study consider **potential high speed rail** operations in the corridor? (Krueger)	Done - proposed alignment is through San Francisco/San Jose/Gilroy not Oakland	Done
The **operations/maintenance cost** estimates seem high (White)	Revise to no longer state as 30 year horizon for operating costs.	Done
Mentioned **Baltimore water taxi/shuttle** as an example. (Waterfront Access)		Done
Want to have the water **taxi/shuttle as a green system** using renewable energy (Spangler).	State "Use of small and potentially alternative fuel vessels will reduce these impacts." in 6.2.2 under Environmental Impacts	Done
Lifeline issues are important (Spangler/Moehring).	Mention in section 7.1.2 "In the next phases of the proposed bridge design, a transit option will be considered along with ways to ensure that the proposed bridge can accommodate emergency vehicles after a disaster."	Done
Revise **operational cost data for water taxi/**shuttle (Lucy Gigli)	Revise operational cost data, check all the operational costs. Revise spreadsheet.	Done
Army Corps of Engineers needs to be involved (Strelow).	Add Army Corps of Engineer outreach explanations to Chapter 2.	Done
Include the **boat traffic** and times needed to open/close existing bridges (Strelow).	Include boat traffic data - show in Section 3.4.4	Done
Include **height of Coast Guard boats w/antenna** (Strelow).	Asked Coast Guard on 4/10: David Sulouff at 437-3516; National Security Cutter dimensions from web site: Navigational draft = 30 feet; length = 418 feet; Beam = 54 feet and speed = 28 knots; left follow-up mes on 4/17	Done
Need to articulate better the **land use** benefits that would occur with a transit bridge and the negatives of having the footprint of a bridge (Krueger).	Include in bridge sections: "This alternative has the most potential to benefit adjacent land uses; however, the footprint of the transit bridge and the related congestion could be seen to outweigh the benefits."	Done

Comment	Recommendation	Action
Review the **ridership estimate** (White).	Review ridership estimate. Compared to the mode split for bicycling and walking and the City of Portland bridge improvements.	Done
Remove Transit/Traffic Management project from the study. (White)	Delete as preferred alternative	Deleted
Need to mention whether the bridge could remain in **closed position during the commute hours** like the existing bridges do (White).	The restrictions on opening the bridges along the estuary occur to ensure that back-ups on I-880 do not occur.	Done - shown in 3.4.4
What is the **cost** of the **bike/ped/transit bridge**? (Krueger)	Ensure that the appendix reflects the expected cost of the bike/ped/transit bridge.	Done
Table 6.4 - column "Typical capacity per hour"		Done
Public Comment Period (March 15 to April 10, 2009)		
A bike/ped bridge potentially would draw "more business to the areas on both sides of the bridge. However, I think it is critical that the crossing be limited to non-motorized traffic in order to retain the appeal" (Carney).	Ensure business development opportunities are mentioned adequately.	Done
Please do not make me spend more tax money. (Tom Brody, PhD)	Comment noted	No changes
The elevated bridge will not be useful during a major earthquake. A ferry that transports CARS and people in them would be the most useful. (Geri Kaman)	A bridge would be built to Lifeline standards so would be expected to be usable after a major earthquake.	No changes
seems to be little data that I can find that really correlates with the little dots on the chart. For example, **water shuttle/taxi(6) has a safety of 'neutral' and yet the bike shuttle (1) has a 'very poor'.** How are these two different in a safety aspect? (Gigli)	Change the bike shuttle to better reflect the evaluation criterion for safety.	Done

Comment	Recommendation	Action
I also dislike the term **'environmental impact',** because it is not the environmental impact (like air quality or water quality) of the quality of the solution to the problem, but instead it is the level of the impact that the solution will have on its environment. For example, a bridge over the estuary will change the environment where the bridge is built quite a bit, but the bike shuttle changes will not change the environment very much. However, the bridge solution, once built will have little to no air quality or water quality negative impact, but a bike shuttle will have air quality impacts. (Gigli)	Comment noted	NA
I am very **disappointed** to hear that you voted to not approve the feasibility study for improving the transportation options on our community. This is exactly the type of infrastructure investment that our island needs and it is tremendously shortsighted to not fully develop and plan for improvements in our transportation capabilities. (Jason Freeman)	Comment noted	NA
As City staffers, you did an **amazing job** of compiling and evaluating a comprehensive list of alternatives and costs. And although the focus of my comments was on the study's shortcomings, those are always easier to see from the outside once a project is completed. I am well aware that you completed that report while juggling lots of other priorities and projects, which is never an easy task. (Spangler)	Comment noted	NA
this issue is too important for the document to not move from draft to final format, and ultimately get approved. I'm hoping that city staff/consultants are planning to answer the questions raised so that the study is finally approved by TC and Council, even if specific recommendations may not be seen as reasonable to some (in which case comments should be attached accordingly). (Johnson)	Comment noted	NA
BikeAlameda response - Jeff Cambra (April 8, 2009)		
Direct staff to follow up and get answers to questions brought up in the Transportation Commission meeting and by the public.	In process	Done
Correct any inconsistencies, add in the responses to the questions posed by the TC and the public and return the corrected study to the Commission for comment, discussion and acceptance of a final study.	In process	Done
Include the public comments as an appendix to the study.	Include this table in appendix.	Done

Comment	Recommendation	Action
Move the approved study with TC recommendations on to the City Council for further review, comment, and to provide a clear direction to staff on the alternative the Council wants the City to pursue.	In process	in process
City of Oakland Comments (April 8, 2009)		
Study Purpose and Objectives (page 1): Include the goals/vision statement that was developed by this process. As written, this section makes no mention of pedestrian and bicyclist access.	Include estuary crossing goal and opportunities section from memos.	Done
Next Steps (page 6): The schedule on this page does not match the schedule presented on page 82.	Revised schedule in Executive Summary to match the one in the Next Steps chapter (page 82).	Done
Summary of Preliminary Assessment (pages 50-51): In the summary table, all **bridge options have the same overall evaluation**. Some explanation is needed on how the preferred alternative was chosen. Clearly, there is some additional consideration that isn't captured in the "overall" rating as it's currently presented.	In Section 6.4, change the overall ranking of the transporter bridge to "Poor" due to its high cost. State the following in Section 7: "Note that the Bicycle-Pedestrian Bridge (Moveable, Low Level Option) with Neighborhood Electric Vehicle Lanes is a variation of the bicycle/pedestrian bridge with transit lanes."	Done
Preferred Alternatives (page 52): We appreciate the explicit statement that the City of Oakland and AC Transit do not favor the transit/pedestrian/bicycle bridge alternative at this time. Please provide a discussion in Appendix B as to why this is the case. A brief summary of the key points should also be included on page 52. There are significant unknowns with this alternative because it was not studied at a level of detail that is comparable to its complexity. At this time, it is unknown if such a bridge would provide transit operations with run-time or reliability advantages over the Posey and Webster Tubes. A moveable bridge plus the railroad crossing at Embarcadero pose significant challenges to transit operations. It is also unknown how the alternative would spatially and visually affect Jack London Square.	Provide explanation in Chapter 7 and in Appendix B.	Done
Bicycle-Pedestrian Bridge, Alignment B (page 53): Note that the bridge itself would be aligned with Broadway (in Oakland) but the ramps would lead to Franklin St.	In 7.1.1, stated "In Oakland, the bridge is aligned with Broadway; however, the ramps of the current configuration align with Franklin Street, which does not connect directly to downtown."	Done

Comment	Recommendation	Action
Water Shuttle/Taxi (pages 60-65): Please consider a **water taxi option with reduced hours of operation**. If such an option is not feasible, include an explanation as to why. This additional discussion is needed to give credibility to the current proposal for 24-hour service. The primary cost component is operations, and thus the need to consider alternatives with reduced service hours.	Provide breakdown when obtain the revised operational costs.	Done
Water Shuttle/Taxi, Alignment B (page 60): Note that this alignment does provide direct access to Broadway, unlike Alignment B for the bicycle-pedestrian bridge.	Comment noted	No change needed.
Minor Modifications to Posey Tube, Proposed Alignments, first bullet: The report has a typo – the water main is a four-inch pipe, not a four-foot pipe.	Change "foot" to "inch"	Done
Bicycle/Pedestrian/Transit Bridge Alternative, page 101: Add a paragraph explaining that no particular alignment is preferred at this time because there is no analysis of the bridge touchdowns, ramping, and transit travel times.	Add text to support a need to provide more analyses.	Done in Appendix B - Proposed Alignment
Bicycle/Pedestrian/Transit Bridge Alternative, page 101: Include a dimensioned cross section for this bridge and a diagram showing the point at which the Oakland-side ramp returns to grade.	Not part of the work scope.	No change - not part of the work scope.
Bike Alameda response - Lucy Gigli (April 9, 2009)		
Why was the Army Corps of Engineers part of the policy or technical teams?	State that "In lieu of being a member on an advisory committee, the U.S. Army Corps of Engineers staff requested the study team present the project at a U.S. Army Corps of Engineers Interagency meeting."	Done in Chapter 2
Page 15 , ' bi-directional path on each side of the vehicular bridge' should be 'sidewalks on each side of the vehicular bridge'.	The area for pedestrians and bicyclists is a path not a sidewalk. Paths are separated by some type of barrier such as a fence. Sidewalks are between the adjacent property and the street, and have curb and gutter.	No change
I understand that the separated barrier for the Posey tube walkway was considered, but dropped. Please explain.	Mention it in the minor modifications to the tube Section 6.1.4. and in the project alternative description Section 7.3.	Done
What are the **operational costs for the water shuttle** ($3 million annually (page 68/63) or $5 million (page 10/5, or page 70/65)?	Checked w/Ryer Island Ferry in Delta and revised to $3 million for 24/7 service	Done

Comment	Recommendation	Action
Include **comparison of operational costs to the Sacramento delta ferries** (such as the Ryer Island ferry) currently in operation and other small shuttle ferries. Do not compare this shuttle's operational costs with the current Alameda/Oakland or HB ferries, since those are much larger.	Checked w/Ryer Island Ferry in Delta and revised to $3 million for 24/7 service	Done
Page 38 mentioned that prior ferry service was unsuccessful because of low ridership. This is not true and should be removed. a. The prior bike/ped shuttle service was in operation for two weeks, hardly enough time to gauge potential ridership fairly. b. the water taxi had a $5 fee, which is too much for a short trip across the estuary. The reason why the shuttle was unsuccessful was not because of lack of ridership.	Delete this sentence	Deleted
On page 38 it says that 24 hour service is not assumed. Which is it? It would be ideal to see **water shuttle operational costs broken down** into three categories, all with 15-minute headways: 1. 24-hour service, 2. 12-hour service, 3. commute time (4 hours am/pm) service only.	Provide breakdown when obtain revised operational cost numbers.	Done
For bridge operational costs: include a comparison for the annual costs of running Alameda's current bridges.	Add to the moveable bridge sections in chapter 6 - 6.3.2, 6.3.3, 6.3.4 and 6.3.5. "The existing bridges in the estuary have operating and maintenance costs between $500,000 and $750,000 annually. The proposed bridge is expected to be bigger and have more usage so will be more expensive to maintain."	Done
Please explain why the **length and height of the moveable bridge** (proposed to be the longest moveable bridge in the world) does not eliminate it, since this would seem to imply that the engineering would be too advanced to make it feasible.	State the following in section 7.1.2: "The horizontal clearance of 600 feet represents the current horizontal clearance of the estuary. The US Coast Guard is unwilling to reduce the clearance that they currently have. If part of the 600 feet were in waters too shallow to navigate then the US Coast Guard would consider reducing the horizontal clearance."	Done
Be more specific for how much longer or taller the bridge would be than the longest moveable bridge in the world.	Mention in Section 7.1.2 and Appendix B: "This bridge will be one of the longest moveable bridges in the world. The Arthur Kill Vertical Lift Railroad Bridge, which connects Elizabeth, New Jersey and Staten Island, claims the current title at 558 feet in length for the moveable span."	Done

Comment	Recommendation	Action
This alternative does not benefit bicyclists or pedestrians as stated on page 35 ‘Does not directly serve the needs of pedestrians and cyclists. Does not address the lack of pedestrian and bicycle infrastructure. Does not provide for additional connections to new and future bicycle and pedestrian networks. Improvements can be set for 24-hour service. Does not interfere with water navigation. This should not be listed as an alternative. (page 5)	Delete as a preferred alternative	Done
When something is listed as comparable to existing services, then the evaluation should be ' neutral', not 'very poor'. Example, the 'bike shuttle capacity improvements' (page 33) 'Daily transit service safety is comparable to existing transit service in the area.' Seems that the evaluation should be 'neutral'.	Change the bike shuttle to better reflect the evaluation criterion for safety.	Done
For functionality: This scoring should be equivalent to a water shuttle. It is the same kind of service. Or perhaps one below, since it might not allow for various kinds of bike attachments.	The functionality of the bike shuttle is not as good as the amphibious bus because it would be subject to delays from congestion.	No change
Page 36: For functionality of Tube modifications; • ‘Provides an improvement over the existing tube access that will attract new users, and addresses the attractiveness of the pedestrian and bicycle environment. There is no impact on waterborne traffic. 24-hour service is available. ‘ This does not fit with the actual modifications, that would have minimal possibility to attract new riders. ‘ • Should be clear for what aspects of tube riding this would and would not improve.	State that "Users are still exposed to high noise levels and air emissions from vehicles so there would be low potential to attract new users."	Done
Amphibious vehicles rank high, why not include as an alternative with the water shuttle? Please elaborate.	The water taxi ranks higher because it is a tested vessel for commuting purposes and better fits the needs of bicyclists and pedestrians who mainly want to cross the estuary.	Done
Is the first proposed alternative ‘bus service improvements’ or ‘bike shuttle’? There is no mention of bus service improvements in the document.	Revise the name of alternative 6.1.3 to state "Bus Service Improvements"	Done
Page 65: This lists 17,520 for quantity of captain and crew. What is this value?	Obtain assumptions = Hours; already shown in unit column as "HR"	Done; shown in section 7.2.3

Comment	Recommendation	Action
Page 72: This project is not a bike/ped improvement and should be removed. No bike/ped funding should be used for this improvement.	Delete this option as a preferred alternative	Deleted
Ricardo Pedevilla Comments Received (April 10, 2009)		
Flaws: Some of the costs described and how they were determined		Done
Flaws: Some of the counts that were done	Provided further validation in section 3.4.5	Done
Issues concerning the perspective of the Coast Guard	Add Coast Guard section (3.5.4)	Done
The report should be made into a finished product that can give us a good foundation to lead us to the next steps and an eventual resolution.		Done
The Draft Feasibility Study Report has flaws. Demand that it be fixed. Then let us move forward. A final solution will take much time, much money, and much fortitude. But the need for a resolution for ourselves and future generations is great. Please ensure that we do all that we can with whatever it takes to continue with a positive view on the path to a final solution for all of our benefit.		Done
City Staff Feedback Based on Comments Received (after April 10, 2009)		
State that "The bridge could be a long term viable solution if the following constraints are addressed first: Coast Guard allows the bridge to remain close during peak times, span of the bridge is reduced to a workable width for the water traffic, the height of the bridge is reduced to a level that does not require significant closing and opening times, and the cost of the construction could be justified for regional funding support."	Recommend in section 7 and exec summary	Done
"Water shuttle should be the preferred alternative for bike and ped. crossing until the bridge or some other crossing becomes feasible by addressing the above constraints."	Recommend in section 7 and exec summary	Done
Confirm opening closing time estimate on the basis of real world data.	Research opening and closing times	Done
Provide an appendix that list all alternatives that were originally considered and then were dropped. Include a brief reason for dropping each.	Mention barrier in tube as infeasible in the minor modifications to the tube section (6.1.4.) and in the project alternative description section (7.3). No other options exist that were left out of the study.	Done

Comment	Recommendation	Action
Transit option should be considered as part of the future crossing. Transit option should also be studied as part of Transit Plan update.	Add to 7.1.2: "In the next phases of the proposed bridge design, a transit option will be considered..."	Done
Delete full upgrade of the Posey Tube walkways that includes relocation of the pipe and the face mounted railings on the existing pathway.	Need to revise cost estimates. Place full Posey Tube minor modification analysis in Appendix C.	Done
Change utility costs	As follows: "Utility: Based on the assumption that there is no major utility conflict at the project site, $500,000 for the utility relocation."	Done
Need revised cost estimates for the bike/ped bridge and the bike/ped/transit bridge for capital costs	Replace the existing capital cost spreadsheets for these two options.	Done