Memorandum

To: Chairman and Commissioners

From: Robert I. Remen

Date: September 24, 2001

File No: BOOK ITEM 2.2b(3)
Action

Ref: **Draft Environmental Impact Report / Draft Environmental Impact Statement On the BART – Oakland International Airport Connector**

Issue

Should the Commission comment on the Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIS/DEIR) for the San Francisco Bay Area Rapid Transit District (BART) - Oakland International Airport (OAK) Connector by BART?

Recommendation

BART estimates in its DEIS/DEIR a capital cost for the Automated Guideway Transit (AGT) Alternative that ranges from $204 million (2001 dollars) for the 2-station AGT (proposed project) to $232.2 million (2001 dollars) for the 4-station AGT. Approximately $130 million (in 1998 dollars) has been committed to the project from local transportation sales tax, BART, and from the Port of Oakland. The DEIS/DEIR concludes that additional funds will be needed to fully fund the project construction, ranging from $35 to $88 million. However, measured against the estimated current costs of the two principal alternatives (i.e., $204 million and $232.2 million), the project is actually facing a shortfall ranging from $74 million to $102.2 million in current dollars, and even greater over time after escalation is taken into account. Staff recommends that the Commission, as a responsible agency under the California Environmental Quality Act (CEQA), make the following comment on the DEIS/DEIR:

- The final EIR/EIS should more accurately present the projected funding shortfall for the various project alternatives, both in terms of current cost estimates (i.e., $74 to $102.2 million, rather than $35 to $88 million), and projected **escalated** project cost estimates; and

- The BART Board should ensure that the additional funding needed to fully fund the project is obtained from potential funding sources such as STIP funding, bridge toll funds, joint public/private ventures for the intermediate stations, and local assessment district funds.

Background

BART is proposing a BART-Oakland International Airport Connector (Connector) project to improve access to the airport using direct connections to the existing BART system. The Connector would link the Oakland International Airport (OAK) and the Coliseum BART Station. The OAK is one of three primary commercial aviation airports in the San Francisco Bay Area.

The DEIS/DEIR evaluates three alternatives: (1) The No Project Alternative (maintain the current AirBART shuttle bus service), (2) The Quality Bus Alternative, and (3) The Automated Guideway Transit Alternative. Alternatives 2 and 3 are summarized below.

Quality Bus (QB) Alternative: The QB alternative proposes a larger, articulated bus system separating the transit vehicles from auto traffic, with stations physically integrated with the Coliseum BART Station and the airport to create a more efficient transit connection, and uses traffic signal management techniques along the route that provide preferential treatment for the transit vehicles on Hegenberger Road. A new bus maintenance facility would also be required.

Automated Guideway Transit (AGT) Alternative: The AGT alternative is a proposed 3.2-mile aerial guideway between the Coliseum BART Station and OAK with automated vehicles. The AGT would be composed of one or two vehicles in a train. A maintenance facility would be located at the end of the guideway in the Coliseum BART Station parking lot. The AGT alternative has three alignment options and two intermediate stop options. Depending on the alternative option selected, the estimated cost would be in the range of $204 to $232.2 million. The chart below displays the differences between the two build alternatives:

Characteristics of Connector Alternatives		
Features	***QB Alternative***	***AGT Alternative***
Vehicle Type	60-foot articulated bus	2-vehicle "trains"
Average Speed (mph)	17.5	36
Annual Ridership	2,200,950	3,993,100
Peak Period Headway (in minutes)	4	3.1
Average Wait Time (in minutes)	2	1.6
Average Trip Time Between BART & OAK (in minutes)	20.0	12.2
Maintenance Facility	Location determined if selected	At Coliseum AGT Station
Note: Total trip time includes wait/transfer time, in-vehicle travel time and walk time. The trip time presented for each alternative is an average of the range of trip times that would be expected during the peak period.		

Estimated Project Cost

The capital cost estimates for the three alternatives and AGT design options range from $0.4 to $232.2 million. The No Action alternative would have a capital cost of $0.4 million and the QB alternative would be $30.2 million. The AGT capital costs estimates range from $204 million for the 2-station AGT to $232.2 million for the 4-station AGT.

The table below lists the capital cost estimates and annual Connector operating and maintenance (O&M) costs in 2020 for each alternative. Annual Connector O&M costs in 2020 range from $2 million for the No Project alternative, to $2.4 million for the QB, and between $7.3 to 7.7 million for the 2-station and 4-station AGT scenarios respectively. The AGT design options would not have an appreciable effect on annual O&M costs. As with the current AirBART service today, anticipated fare revenues generated by the Connector in both 2005 and 2020 are projected to cover O&M expenses for all Connector alternatives.

Capital Cost and O&M Estimates of Alternatives under Consideration-2020 Expressed in millions (2001 dollars)				
Alternative	**Detail**	**Capital Cost (2001 $)(1)**	**Annual O&M Cost Year 2020 Estimates (2000 dollars)**	**TOTAL**
1. No Action	Expand AirBART to maintain current mode share	$0.4	$2.0	$2.4
2. Quality Bus	Performance enhancements; modest capital investment	$30.2	$2.4	$32.6
3. AGT	2-stations (proposed project)	$204.0	$7.3	$211.3
4. AGT	2-stations with Option D	$206.6	$7.7	$214.3
5. AGT	4-stations	$229.6	$7.7	$237.3
6. AGT	4-stations with Option D	$232.2	$7.7	$239.9
Source: BART, LEA+Elliott, and WSA (1) Does not include right of way or real estate costs for property owned by City of Oakland, Port of Oakland, or BART.				

Environmental Impacts

Attached are tables from the DEIS/DEIR Executive Summary that identify the significant impacts after mitigation for the proposed alternatives. Under CEQA, the following unavoidable significant impacts are expected to occur for the alternatives considered after mitigation:

- Significant and unavoidable visual compatibility impacts (both project and cumulative) with the AGT alternative and its Options A and B;
- Significant construction noise impacts (with or without pile-driving) on hotels, recreational areas, and other commercial uses along the project corridor with the QB alternative, and AGT alternative and its design options (except Option D);
- Ground-borne vibration impacts to building occupants from pile driving and longer-term construction activities associated with construction of the AGT guideway, stations, and ancillary facilities (AGT alternative and design options other than Option D);
- Potential vibration damage to buildings within 50 feet of pile driving activities associated with the AGT alternative and its design options (except Option D);
- Significant and unavoidable cumulative noise effects, especially on the Hegenberger Road hotels with all the alternatives;
- Significant and unavoidable impacts on electricity supply with all the alternatives;
- Significant and unavoidable cumulative effects on electricity supply with all Connector alternatives; and
- Though temporary, significant and unavoidable cumulative construction impacts due to construction traffic and construction noise for the AGT alternative.

Financial Background

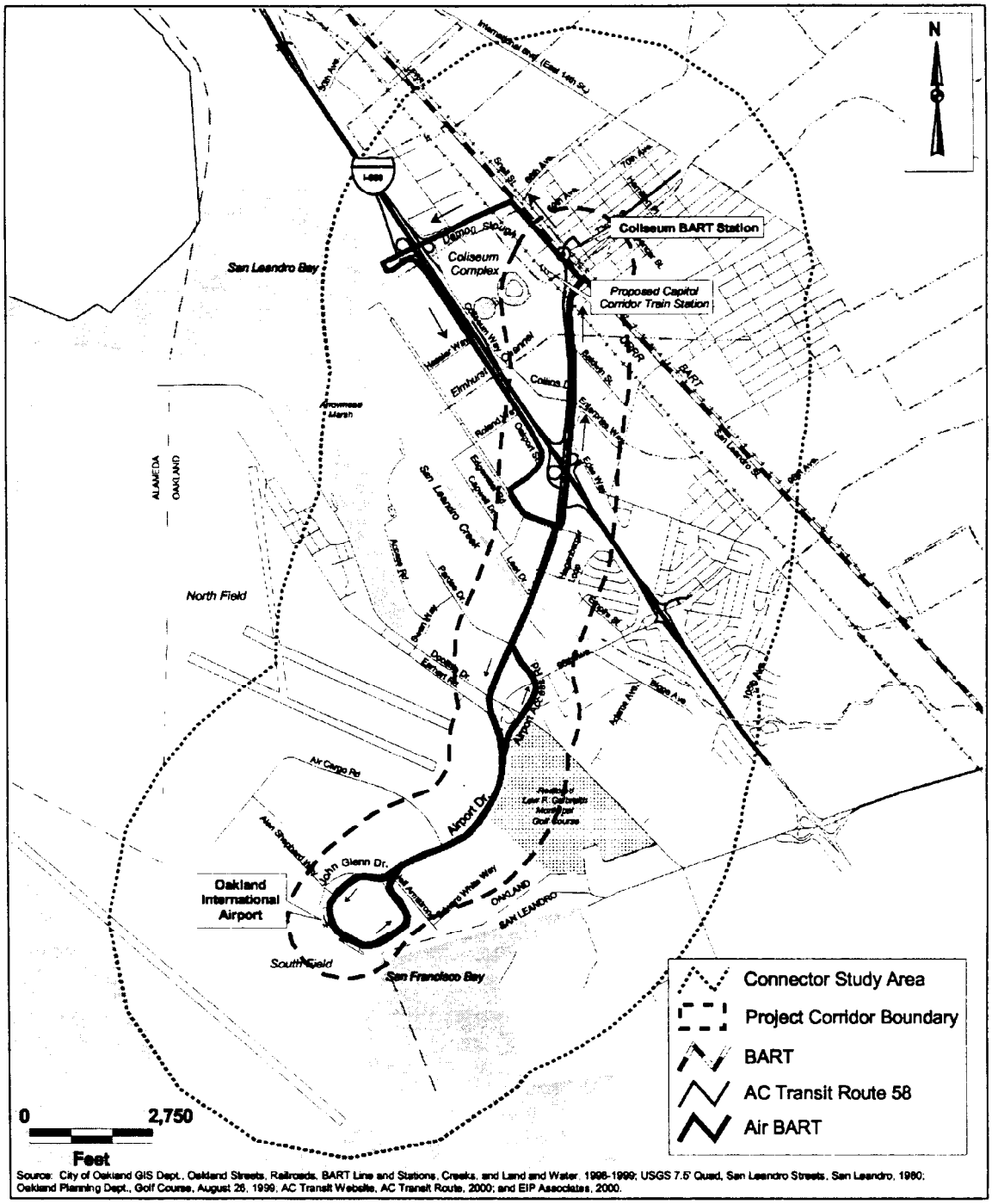
The Connector project's financial feasibility is based on existing capital revenue sources, potential capital revenue sources, and O&M revenue sources. All of the alternatives under consideration will generate new revenue through passenger fares and incidental revenues such as advertising. However, these revenues will only cover a portion of the project's total capital and operating funding.

QB Alternative: While capital costs are relatively modest for the QB alternative, fare revenues would not be enough to cover them. No commitments have been made to fund the capital expenses of the QB alternative. Alameda County Transportation Sales Tax revenues are not included for the QB alternative in the voter-approved Expenditure Plan and would require a locally approved amendment to the plan. Alternatively, the capital expenses could possibly be met by contributions from state and regional funding sources and airport revenues.

AGT Alternative: Capital expenses for the proposed project are expected to be met by a combination of Alameda County's transportation sales tax revenues, airport revenues, and state and regional funds. Approximately $130 million (in 1998 dollars) has been committed to the project from local transportation sales tax ($73 million), BART ($32 million in state and regional funds), and from the Port of Oakland ($25 million). The Alameda County Transportation Improvement Authority is expected to provide for increased costs due to escalation and approved project scope changes or cost overruns.

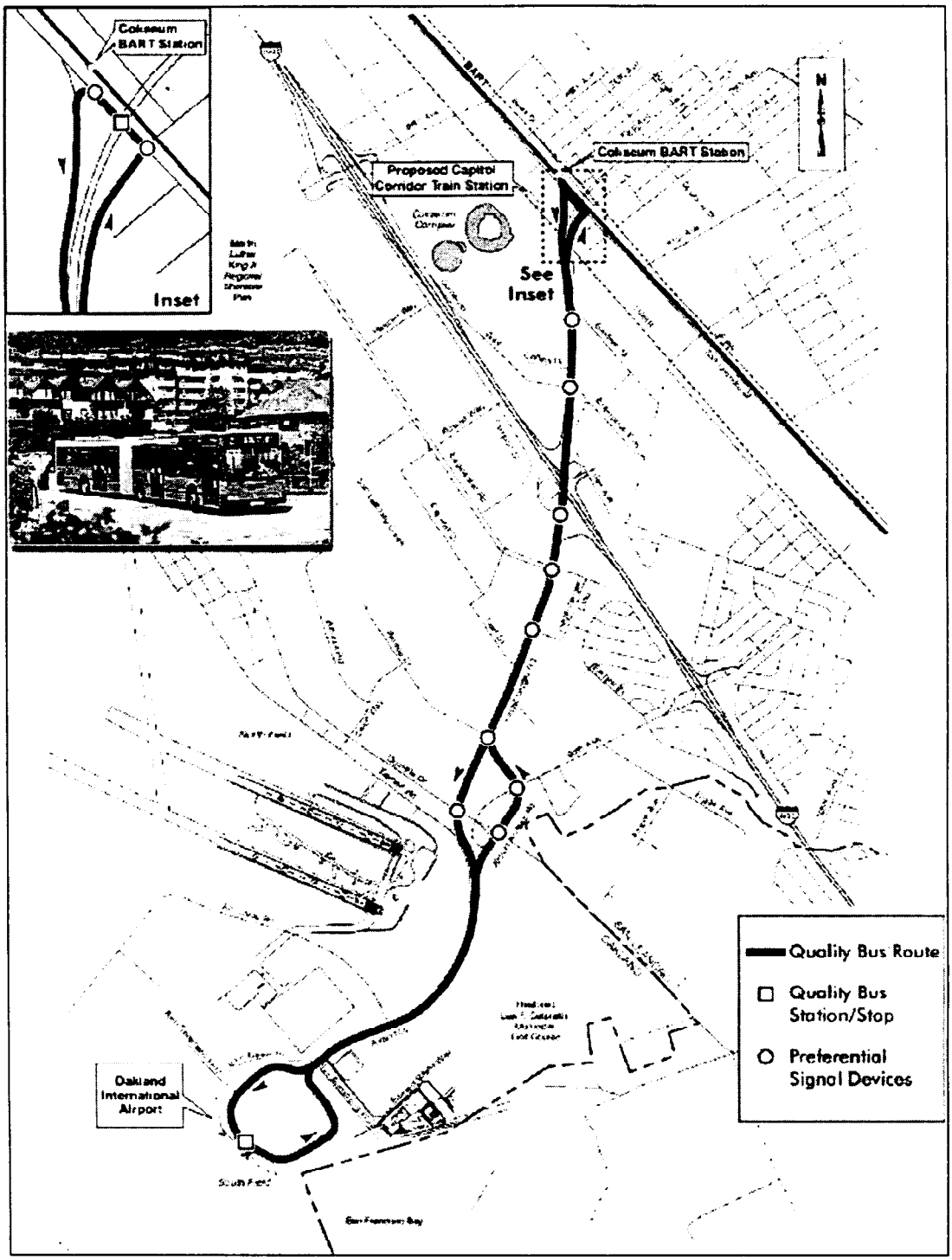
The estimated capital cost of the AGT scenarios range from $204 million (2001 dollars) for the 2-station AGT (proposed project) to $232.2 million (2001 dollars) for the 4-station AGT with Option D. The DEIS/DEIR indicates that an additional $35 to $88 million is needed along with the $130 million committed to fully fund the project. However, measured against the estimated current costs of the two principal alternatives (i.e., $204 million and $232.2 million), the project is actually facing a shortfall ranging from $74 million to $102.2 million in current dollars, and even greater over time after escalation is taken into account. BART has indicated that potential funding sources to cover the funding shortfall would come from state, regional, or Bridge Toll funds, joint public/private ventures for the intermediate stations, or business improvement district funds.

Attachments trosnow/2.2b(3) ENVIRON-BART-OIS.DOC/9/21/01



Source: City of Oakland GIS Dept., Oakland Streets, Railroads, BART Line and Stations, Creeks, and Land and Water, 1998-1999; USGS 7.5' Quad, San Leandro Streets, San Leandro, 1980; Oakland Planning Dept., Golf Course, August 26, 1999, AC Transit Website, AC Transit Route, 2000; and EIP Associates, 2000.

Figure 1.2-2
Connector Study Area and Project Corridor



Source: Wilbur Smith Associates, 2000

Figure 2.3-1
Quality Bus Route and Location of Preferential Signal Devices

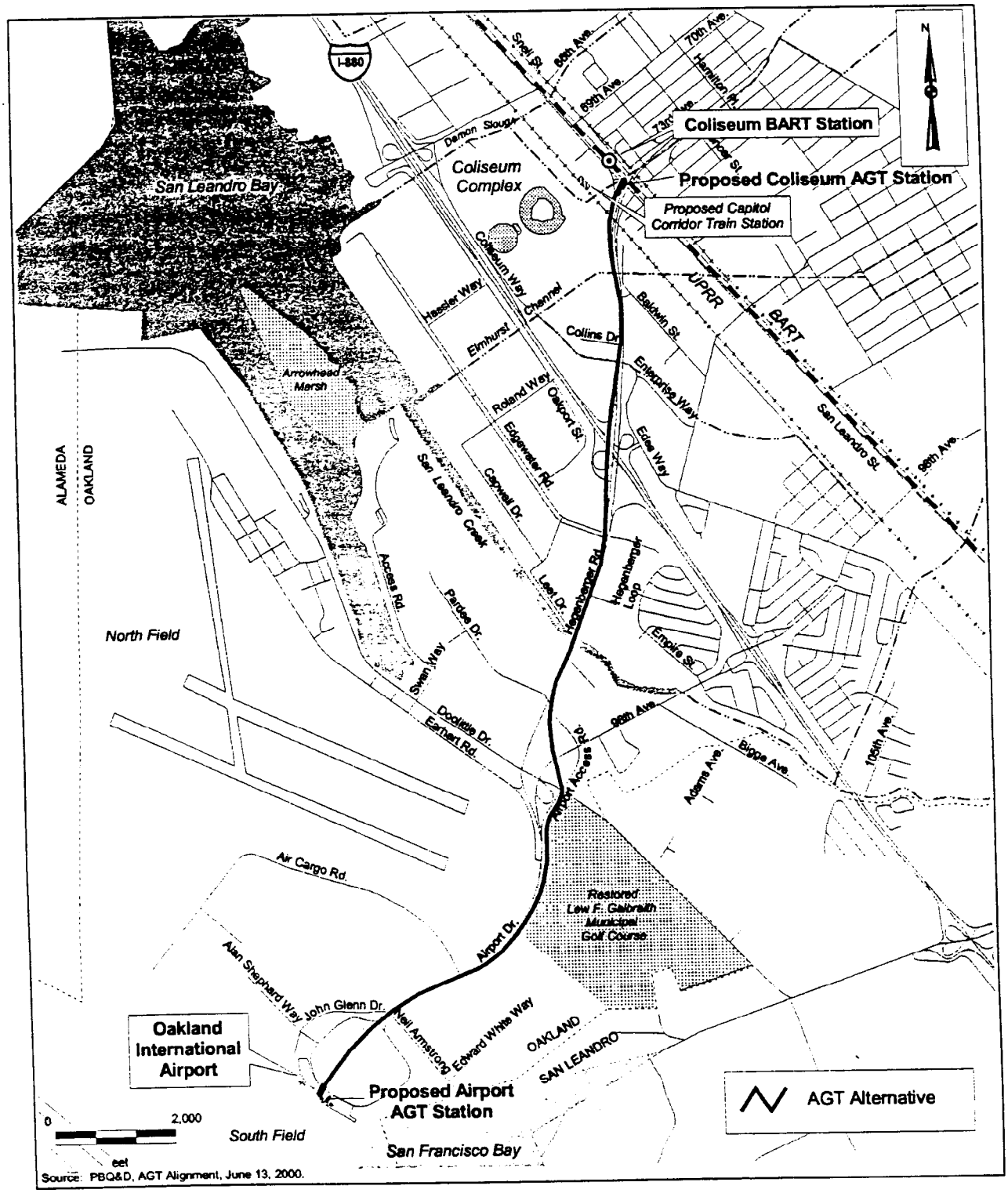


Figure 2.4-2
AGT Alternative - Route

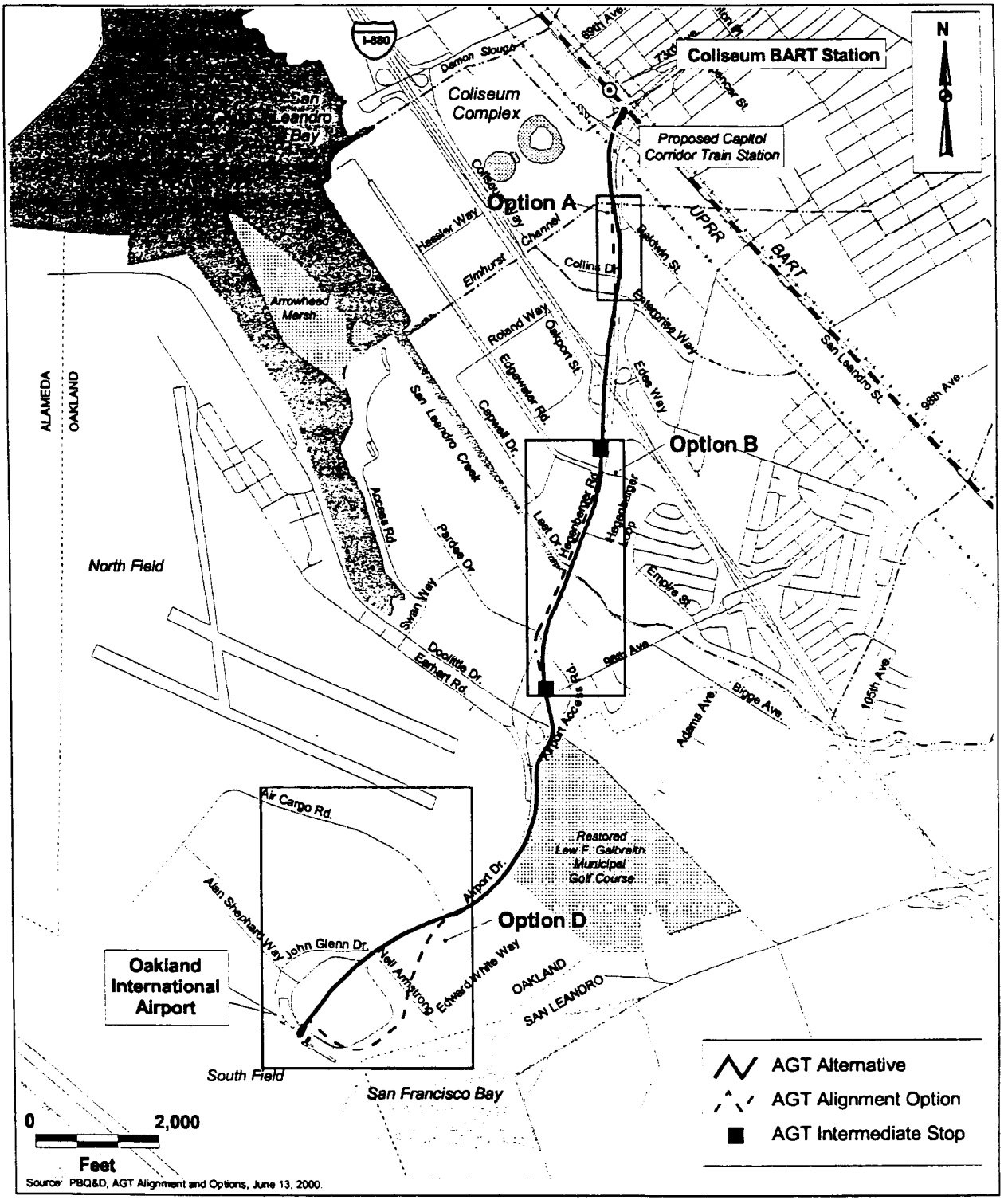


Figure 2.4-7
Location Key Map of AGT Alternative – Design Options

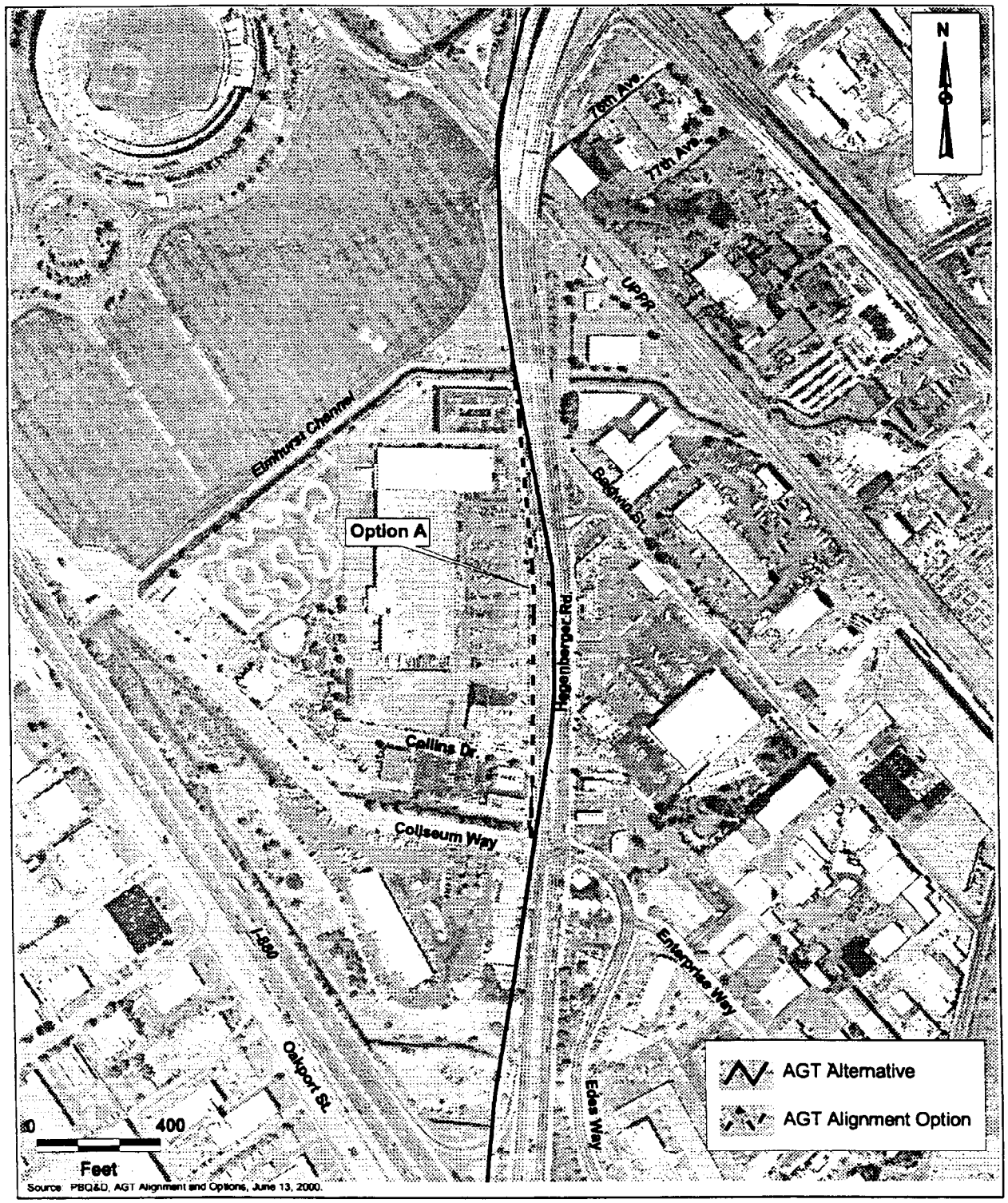


Figure 2.4-7(a)
AGT Alternative – Option A

Table S-3
Summary of Potentially Significant and Significant Operational Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
TRANSPORTATION									
Impact TR-2. Effects on left-turn movements and access to businesses in project corridor			✓	✓	✓			*TR-2(i) Accommodate any displaced left-turn movements at alternate locations (AGT, AGT A, and AGT B).* Any displaced left-turn movement shall be accommodated by providing a new left-turn lane at a new location or by providing additional capacity (with longer left-turn lane or longer green phase) at another existing left-turn lane. Provision of a new left-turn lane may require the reconstruction of the median of Hegenberger Road and possibly the provision of a new traffic signal to accommodate the relocated left-turn movement. This mitigation measure would require the cooperation and approval of the City of Oakland. BART shall be responsible for coordinating with the City of Oakland and assuring that appropriate intersection modifications are made.	Less than significant
Impact TR-4. Parking impacts		✓	✓	✓	✓			*TR-4(i) Permanent Replacement Parking Spaces for Affected Businesses (QB, AGT, AGT A, and AGT B).* BART shall provide on-site replacement parking facilities for properties that would have parking spaces permanently removed by the Connector. If on-site replacement parking facilities cannot be identified, BART shall compensate the property owners for the permanent removal of the parking spaces. *TR-4(ii) Parking Monitoring: Parking Management Program (QB, AGT):* (a) BART will institute a monitoring program on streets adjacent to the BART station. A baseline survey of parking conditions in the vicinity of the station will be conducted prior to commencement of Connector operations. The baseline survey will establish parking conditions in the vicinity of the station during weekday morning hours. Monitoring will be conducted during the first six months of operation of the Connector to verify if spillover parking is occurring. Such monitoring will be based on field surveys and any complaints received by BART and local parking authorities. After the first six months of operation of the station, BART Community Relations staff will respond to parking complaints and BART will investigate such complaints to verify parking concerns.	Less than significant

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Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
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								(b) If a parking spillover problem is confirmed by this monitoring, BART staff will assist the City of Oakland in implementing a parking management program. The program shall incorporate appropriate parking control measures based on BART's Parking Management Toolkit (attached as Appendix B). The Toolkit identifies a detailed process for understanding local parking issues, evaluating parking conflicts, and implementing specific parking control measures. These measures could include time limits and time-based restrictions, increased enforcement, or parking fees. The parking management program would be implemented by the City of Oakland. BART staff will assist the City to ensure that the parking control measures, adapted as appropriate for site-specific conditions, are implemented and are achieving the necessary effect. BART staff would also continue discussions as necessary with the City to help adjust any parking control measures in response to issues that may arise during implementation of such measures.	
SOCIOECONOMICS									
Impact SE-1. Acquisition of property			✓		✓			*SE-1(i) Relocate Displaced Facilities or Compensate (AGT and AGT B).* BART shall negotiate with the property owners of all affected parcels to minimize economic loss. For all displacement BART shall comply with the Federal Uniform Relocation Act (Public Law 91-646) and the California Relocation Act (Chapter 16, 7260 et. seq. of the Government Code) and related laws and regulations. Appropriate mitigation could involve relocating affected uses to another location on the property (several possible options are described below) or compensation for the existing property. Mitigation could also involve compensation for modification of existing property like Sam's Hofbrau, which does not involve relocation. If on-site relocation or modification of the affected uses is not feasible, BART will compensate the property owners in conformance with the state and federal relocation laws. Examples of possible on-site relocation of affected uses may include: • Chevron Gas property - relocate a portion of the canopy over the pumps. • Circle K Gas Station and Car Wash - relocate the two pumps closest to Hegenberger Road and the canopy over them to the north side.	Less than significant

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	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								▪ Sam's Hofbrau Restaurant - seal the double door entrance on Hegenberger Road and relocate entrance to the north side of the building. *SE-1(ii) Provide Replacement Parking (AGT and AGT B).* BART shall provide on-site replacement parking facilities (including fencing, as appropriate) for properties that would have parking spaces permanently removed by the proposed project. If on-site replacement parking facilities cannot be identified, BART shall compensate the property owners for the permanent take of the parking spaces in accordance with state and federal relocation laws.	
VISUAL QUALITY									
Impact VQ-1. Visual compatibility of Connector with built environment and streetscape			✓	✓	✓			*VQ-1(i) Integrate Connector Site Planning and Design Details with the Concepts and Themes Contained in the Hegenberger Road-98th Avenue Gateway Development Plan (AGT, AGT A, AGT B).* BART shall consult with the City of Oakland and Port staff and then identify site planning and design guidelines for the AGT guideway, stations, and auxiliary facilities that are consistent with the Gateway Development Plan and its objective of improving the image and function of the Gateway. *VQ-1(ii) Improve Guideway and Support Column Appearances (AGT, AGT A, AGT B).* To improve the appearance of the guideway structure and columns, and assist in visually reducing the apparent mass, bulk and overhead dominance of the guideway structure, during the design phase, BART shall incorporate design and aesthetic treatments to the extent possible. Such features may include: 1) minimizing the depth and width of the overhead guideway, 2) incorporating cast-in textures and patterns into the columns and guideway concrete surfaces to create cadence and shadow effects, and 3) maximizing the span distance between columns to achieve a more graceful structural appearance. In addition, in lieu of constructing supporting columns of uniform diameter, expanding the diameter of the columns where they join and support the bottom of the guideway would provide for a more symmetrical, balanced and visually appealing structural transition from the ground. The visual appearances of the guideway could also be enhanced by imparting the suggestion of an arched form between columns to relieve its uneventful horizontal form.	Significant and unavoidable

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								VQ-1(iii) Screen the Maintenance and Central Control Facility (AGT). BART shall establish a planting plan that will shield views of the Maintenance and Control Facility from adjacent areas. The use of evergreen (non-deciduous) trees compatible with the local climate and capable of growing no less than 40 feet high shall be located around the structure to visually screen the building. *VQ-1(iv) Relocate Proposed Plant Materials in the Gateway Design Plan that Conflict with the AGT (AGT, AGT A, AGT B).* BART in coordination with the City of Oakland and Port shall identify the planting areas that would be affected, and develop alternative planting schemes that would both accommodate the guideway and enhance appearances along the guideway route. Emphasis shall be placed on seasonal color, flowering species and textures that offer visual interest at ground and above grade level.	
Impact VQ-3. Light or glare effects			✓	✓	✓		✓	*VQ-3(i) Control Spillover from System Lighting (AGT, AGT A, AGT B, and AGT-STN).* BART shall ensure that the lighting fixtures along the alignment and at stations be designed control light intensity on adjacent land uses. BART shall incorporate specifications into its bid documents to focus illumination downward and to restrict light from extending beyond the project site or causes illumination/glow above the light fixtures. To achieve this, the light fixtures shall be fitted with lenses, hoods, and reflectors to minimize spillover light and glare while maintaining safety and security. *VQ-3(ii) Limit Intensity of AGT Vehicle Lighting (AGT).* BART shall ensure that the headlights used for the AGT vehicles shall be designed to avoid significant safety hazards for building occupants, motorists, and pedestrians. The lights used inside the AGT vehicles shall be of the necessary wattage or candlefoot power necessary for passenger safety and comfort while not affecting adjacent land uses. BART shall include this specification in its bid documents and require its contractors to comply with these lighting standards. *VQ-3(iii) Specify Material to be Used for AGT Vehicle Exterior (AGT).* BART shall ensure that materials with low reflective capabilities be chosen for the body of the AGT vehicle. BART shall	Less than significant

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Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								include this specification in its bid documents and require its contractor to comply with these standards to reduce glare. Measures such as tinting of glass or using a substitute material to achieve a daylight reflective factor that would not cause significant glare can be implemented by the contractor.	
COMMUNITY SERVICES									
Impact CS-1. Increased need for fire protection and emergency response during operation phase			✓	✓	✓	✓	✓	*CS-1(i) Incorporate Fire Protection Measures Into the Tunnel Under Doolittle Drive (AGT and Design Options).* Water supply, lighting, and communication systems shall be incorporated into the design of the tunnel beneath Doolittle Drive consistent with BART design criteria to ensure that the Oakland Fire Department can provide necessary fire protection and emergency response.	Less than significant
Impact CS-2. Increased need for police services during operation phase.		✓	✓				✓	*CS-2 (i) Incorporate a Full BART Police Reporting Station into the Airport Station (QB, AGT, AGT-STN).* If the Airport BART Station is under the jurisdiction of the BART Police, then provision of police reporting facilities at OIA shall be incorporated into the design of the new OIA station. This shall include a secure parking area for two BART Police vehicles at OIA. *CS-2 (ii) Improve Coliseum BART Police Reporting Station (AGT-STN).* If the Airport BART station is not under the jurisdiction of the BART Police, reporting facilities at the Coliseum BART station will be improved as necessary to accommodate the extra police activity related to the intermediate stops.	Less than significant
HYDROLOGY									
Impact HY-1. Effects of storm water pollution			✓					*HY-1(i) Prepare and Implement Storm Water Pollution Prevention Plan (AGT).* BART or its contractor shall obtain an Industrial Storm Water General Permit and prepare a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP is required by the CWA and it must be approved by the RWQCB. The SWPPP shall recommend site-specific Best Management Practices (BMPs) that reduce storm water pollution. BMPs shall include, but not be limited to, housekeeping practices intended to reduce pollutant loading at the maintenance facility, and techniques and equipment to collect and treat storm water pollution. Implementation of the adopted BMPs shall be included as a provision of the contractor.	Less than significant
BIOLOGICAL									
Impact BR-1. Disturbance to wetlands						✓		*BR-1(i) Restore Disturbed Wetland Areas (AGT D).* BART shall take the following steps in addition to any measures required by the Corps as part of the Section 404 permitting process. To	Less than significant

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Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								replace filled wetland areas, BART shall: ▪ Retain a qualified biologist with experience in wetland restoration to conduct a survey of the vegetation within the work area and the column locations. This information shall be used to design a mitigation plan that replaces vegetation with the same species and concentrations. ▪ Require the contractor to remove all soil from the construction area and stockpile it nearby for re-use during restoration activities. ▪ Require the contractor to restore the wetland to its original topographic contours with the topsoil that was removed from the area. ▪ Require that the disturbed wetland area be reseeded or revegetated with the same plant species found at the site prior to construction. ▪ Stipulate in its contract specifications that the concrete cap over the pilings shall be below original grade and covered with a minimum of 2 feet of wetland soils, as shown in the preliminary design drawings. ▪ Stipulate in its contract specifications that the soil over these pilings shall be returned to original grade and planted based on the mitigation plan developed by the qualified biologist. ▪ Throughout the construction activities, require that a qualified biologist be onsite to monitor construction activities. *BR-1(ii) Mitigate Permanent and Temporary Loss of Wetland Habitats (AGT D).* To mitigate for the permanent loss of 115 square feet and the temporary loss of potentially 0.72 acre of wetland habitat (as discussed in Section 3.16, Construction Impacts), BART shall identify and restore wetlands to conditions similar to those in the proposed alignment. The size of the area(s) to be restored shall be determined based on appropriate mitigation ratios derived in consultation with the Corps. The mitigation plan shall be prepared by a wetland biologist experienced in mitigation and restoration and implemented under the biologist's guidance. Such sites shall have similar habitat and characteristics to the filled wetland and could include the non-tidal wetlands with salt marsh vegetation at the Lew F. Galbraith Golf Course site, the fuel farm marsh, or the drainage channels just north of San Leandro Creek.	

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Summary of Potentially Significant and Significant Operational Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								Additional details regarding the plan, including criteria for monitoring the success of mitigation efforts, are indicated below: Subject to approval by the Corps, the wetland mitigation plan shall address temporary and permanent impacts. In compliance with the Corps' Habitat Mitigation and Monitoring Proposal Guidelines, effective October 1991, factors that will be considered in developing an effective mitigation plan in consultation with the Corps include: ▪ Functions and values: Wildlife species, percentage of vegetative cover and/or density, approximate plant height; plant and animal species diversity, root development, and canopy stratification; and ▪ Hydrological regime: sources of water, discharge points, areas affected by seasonal flooding, direction of flow, and size of watershed. According to Corps staff (Smith, 2001), specific measurable criteria for the above factors will be incorporated into the plan in conformance with applicable regulatory requirements and the Corps' Guidelines. However, such criteria cannot be specifically identified at this stage because a formal jurisdictional wetland delineation has not been performed yet and the Corps has not visited the site. Based on prior experience with the Corps, however, it is expected that BART will create wetland or equal wildlife habitat values at a ratio of one acre replacement to one acre disturbed for low-quality wetlands and at a ratio of three acres replacement to one acre disturbed for high-quality wetlands. Performance criteria within the restoration plan shall include: ▪ a minimum 80 percent native hydrophytic vegetation coverage in all wetland areas, ▪ inundation of the mitigation sites for a period sufficient to sustain the vegetation and meet Corps wetlands inundation criteria, ▪ replacement of sensitive plant species at a minimum of 2 installed for every one removed. Unsuccessful individuals must be replaced on an annual basis to meet minimum ratio.	

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Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								The timeframe over which the performance goals should be obtained will be specified in the wetland restoration plan, but is expected to be a minimum of 5 years. The restoration plan may specify intermediate success criteria (i.e., lower percentages of native cover) that lead up to the final 80 percent in the final year. Monitoring would be conducted at least bi-annually the first year and annually for each of the following years. Prior to any work that could affect wetlands or stream channels within the project corridor, BART shall obtain the following permits as required: • US Army Corps of Engineers – Nationwide or individual permit as required under Clean Water Act Section 404; • San Francisco Bay Conservation and Development Commission – Regionwide, minor, or major permit as required; • San Francisco Bay Regional Water Quality Control Board – Water quality certification or waiver under Clean Water Act Section 401. • California Department of Fish and Game Streambed Alteration Agreement Consultation with these agencies will govern how the loss of wetland habitats will be mitigated.	
Impact BR-2. Loss of trees			✓	✓	✓			*BR-2(i) Install Replacement Trees (AGT, AGT A, AGT B).* For removal of any California or Coast Live Oak with trunk size measuring four inches dbh or larger, or any other tree measuring nine inches dbh or larger (except Eucalyptus and Monterey Pine), BART shall require that replacement trees be planted in the project corridor. Replacement trees will belong to a native tree species (e.g., Coast Redwood, Coast Live Oak, Madrone, California Buckeye, California Bay Laurel, or other appropriate species native to Oakland). At a minimum, each removed tree meeting the above size standards will be replaced either with (i) one replacement tree of twenty four inch box size, or (ii) three replacement trees of fifteen gallon size. *BR-2(ii) Perform Preconstruction Survey for Nesting Birds (AGT, AGT A, AGT B, AGT-STN).* BART shall require that a survey be conducted prior to construction to identify potential nesting habitat.	Less than significant

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Summary of Potentially Significant and Significant Operational Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								If no nests are identified, no further mitigation is necessary. If nests are identified, construction activity shall be restricted. Mitigation Measure C-BR-3(i) defines these restrictions (see Section 3.16, Construction Impacts).	
NOISE AND VIBRATION									
Impact NV-1. Noise from vehicle passby		✓	✓	✓	✓			*NV-1(i) Mitigate Passby Noise (QB, AGT, AGT A, and AGT B).* BART shall incorporate into its contract documents a specification that the contractor reduce operational noise to or below the BART design criteria for passby noise. The thresholds can be achieved for diesel-powered equipment by incorporating engine compartment treatments with sound absorbing materials and low-noise engine mufflers, and for rail equipment by incorporating spin-slide wheel traction control, wheel truing, and rail grinding to eliminate wheel flats and rail corrugation.	Less than significant
Impact NV-2. Noise from operation of ancillary facilities			✓	✓	✓			*NV-2(i) Provide Noise Buffer or Sound Barrier between Power Substations and Noise-Sensitive Receptors (AGT, AGT A, and AGT B).* If the site(s) selected for development of AGT power substations is (are) within 250 feet of a commercial or outdoor recreational use, BART shall require that the contractor reduce operational noise to or below the BART design criteria for noise from ancillary facilities. The thresholds can be achieved by incorporating noise barriers, facility enclosures, or other noise reduction features. *NV-2(ii) Mitigate Noise from Ancillary Vehicle Washing Facility (AGT).* BART shall require that the contractor reduce noise from outdoor vehicle washing to or below the BART design criteria for noise from ancillary facilities. The thresholds can be achieved by incorporating noise barriers, facility enclosures, or other noise reduction features such as low-noise washing equipment.	Less than significant
Impact NV-3. Vibration from vehicle passby			✓	✓	✓			*NV-3(i) Mitigate Passby Vibration (AGT, AGT A, and AGT B).* BART shall require the following provisions in the contract documents: a) Vehicle interactions with the guideway and the guidance and running structures and surfaces shall be designed to minimize the transmission of vibration through the guideway structure to the surrounding buildings and terrain during the passage of AGT cars. b) System-induced vibrations shall be imperceptible at or in surrounding buildings. The threshold of perception shall be as	Less than significant

Table S-3
Summary of Potentially Significant and Significant Operational Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								defined by the Guide to the Evaluation of Human Exposure to Vibration in Buildings, ANSI Standard S3.29-1983.	
ENERGY									
Impact EN-2. Demand and supply of energy resources (electricity)	✓	✓	✓	✓	✓	✓	✓	Unless the electrical energy supply is increased sufficiently to accommodate additional demand in the future, any project or action that requires electric energy will have a significant impact. Since each of the alternatives requires the use of some amount of electric energy, the No Action and QB Alternatives, and the AGT Alternative (both with and without diesel buses) could all potentially have significant impact on the electrical energy supply. There are no reasonable mitigation measures other than an increase in the electric energy supply. If the supply of electric energy increases sufficiently before the alternatives begin to demand electricity, the impact would be eliminated. The availability of electric energy in the future is unknown and so the impact is potentially significant and unavoidable. BART customarily adopts energy conservation techniques such as operation of fewer cars during off-peak hours to reduce the load to be pulled by the engine, low power consuming propulsion systems, and low power consuming light bulbs. However, considering the uncertainty of electricity supplies in the coming years, these conservation measures would not be sufficient to alleviate the impact to a less-than-significant level.	Potentially significant and unavoidable

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
CONSTRUCTION									
Impact C-TR-1. Temporary effects on traffic operations		✓	✓	✓	✓	✓		*C-TR-1(i) Restripe Hegenberger Road (AGT and AGT A).* BART shall restripe Hegenberger Road where the portions of the two inside lanes along the Hegenberger Road median would be closed in order to facilitate construction of the AGT guideway columns to shift the travel lanes outward (toward the curb) and maintain the current number of travel lanes in each direction along Hegenberger Road. Although this measure would mitigate the traffic impacts associated with closing the two travel lanes on either side of the median, it would require the removal of 123 on-street parking along Hegenberger Road. The permanent removal of these 123 spaces is discussed in Section 3.1, TR-4 Parking Impacts. *C-TR-1(ii) Develop and Implement a Construction Traffic Management Plan (QB, AGT, AGT A, AGT B, and AGT D).* BART shall direct the contractor to prepare and implement a construction phasing plan and traffic management plan that defines how traffic operations would be managed and maintained during each phase of construction. The plan shall be developed with the direct participation of BART, the City of Oakland, the Airport and Caltrans. In addition, the property owners of all businesses adjacent to the construction areas shall be consulted. To the maximum practical extent, the plan shall: ▪ Detail how access will be maintained to individual businesses where construction activities may interfere with ingress and egress. Any driveway closures shall take place during non-business hours. ▪ Specify predetermined haul routes from staging areas to construction sites and to disposal areas by agreement with the City prior to construction. The routes shall follow streets and highways that provide the safest route and have the least impact on traffic. ▪ During construction, require the contractor to provide information to the public using signs, press releases, and other media tools of traffic closures, detours or temporary displacement of left-turn lanes ▪ Identify a single phone number that property owners and businesses can call for construction scheduling, phasing, and duration information, as well as for complaints. A BART	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								Connector website will contain similar information, and BART will coordinate with the Port so that all construction information will be available to the Port. • Identify construction activities that must take place during off-peak traffic hours or result in temporary road closures due to concerns regarding traffic safety or traffic congestion. Any road closures will be done at night under ordinary circumstances. If unforeseen circumstances require road closing during the day, the City of Oakland will be consulted. *C-TR-1(iii) Coordinate with ADP Construction Management Plans for Vehicular Circulation (QB and AGT).* BART shall coordinate with the OIA to assure that the traffic management plans coordinate construction of the Airport QB or AGT station with the overall construction of the ADP. If the construction of the ADP does not occur concurrently with either a QB or AGT station, then the Construction Traffic Management Plan, prepared under Mitigation Measure CTR-1(ii), shall also include measures to address construction-related impacts on traffic at OIA.	
Impact C-TR-2 Temporary effects on pedestrian and bicycle conditions		✓	✓	✓	✓	✓		*C-TR-2(i) Construct Temporary Walkways (QB, AGT, AGT A, and AGT B).* Where an existing sidewalk or pedestrian/bicycle path would be closed during construction, BART shall require the contractor to provide a temporary walkway or a clearly marked detour with appropriate markings, barriers, and signs to safely separate pedestrians from vehicular traffic. At no time shall the temporary walkway or detour be located on the west side of Airport Drive. If access to pedestrian/bicycle trails or the continuity of the trails is impacted, a properly signed and marked detour shall be provided. *C-TR-2(ii) Coordinate with ADP Construction Management Plans for Pedestrian Circulation (QB, AGT, and AGT D).* BART shall coordinate with the OIA to ensure that the pedestrian management plans for the construction of the Airport QB or AGT station is coordinated with the overall construction of the ADP. If the construction of the ADP does not occur concurrently with either a QB or AGT station, then BART shall require the Contractor to provide the temporary walkways recommended under Mitigation Measure CTR-2(i) in consultation with OIA.	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
Impact C-TR-3 Temporary effects on parking conditions		✓	✓	✓	✓	✓		*C-TR-3(i) Provide Temporary Replacement Parking for Affected Businesses (QB, AGT, AGT A, and AGT B).* BART shall provide on-site or off-site replacement parking facilities on a one space-for-one space basis for properties whose parking supply is reduced below demand by construction. If on-site or off-site replacement parking facilities cannot be identified, BART shall financially compensate the property owners for the use of the parking spaces during the period that construction activities affect on-site parking. *C-TR-3(ii) Coordinate with ADP Construction Management Plans for Parking Conditions (QB, AGT, and AGT D).* BART shall coordinate with the OIA to assure that the parking management plans coordinate the construction of the Airport QB or AGT stations with the overall construction of the ADP. Even if the ADP and the Connector facilities are not constructed concurrently, a parking plan shall be developed with the direct participation of BART and the Port and is intended to maintain parking supply equivalent to the on-airport parking supply at the time of construction, similar to the mitigation measure identified in the ADP EIR, which identified four locations where replacement parking spaces could be accommodated: the Air Cargo Road Lot, the Neil Armstrong Way Lot, the Swan Way Lot, and the New Inside Terminal Loop Lot. To provide these spaces, other temporary parking locations may need to be identified. These could include locations on Airport property that can be used temporarily for parking, off-site locations, arrangements with existing commercial parking lots, or use of the Coliseum BART Station lot. Any temporary off-airport parking will require shuttle service. BART shall pay for any shuttle service needed beyond those already necessary for the ADP construction.	Less than significant
Impact C-SE-1. Loss of access or use of property during construction			✓	✓	✓			*C-SE-1(i) Provide Replacement Parking (AGT, AGT A, and AGT B).* During construction, BART shall provide on-site replacement parking facilities (including fencing, as appropriate) for any off-street parking that is displaced as required for construction, in an amount equivalent to the parking affected. If on-site replacement parking facilities cannot be identified, BART would compensate the property owners for the use of the parking spaces during the construction period.	Less than significant
Impact C-VQ-2. Construction light and glare effects		✓	✓	✓	✓		✓	*C-VQ-2(i) Adopt Measures to Reduce Light and Glare During Construction (QB, AGT, AGT A, AGT B, and AGT-STN).* BART shall specify maximum lighting standards for staging areas and	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								construction sites. The lighting shall focus illumination downward to restrict light from extending beyond the construction boundaries. To achieve this, the light fixtures shall be fitted with lenses, hoods, and reflectors to minimize spillover light and glare. This measure shall be incorporated into the construction bid documents to ensure that the contractors conform to these lighting specifications.	
Impact C-CR-2. Disturbance to significant archaeological resources			✓	✓	✓	✓	✓	*C-CR-2(i) Conduct Subsurface Archaeological Testing/Exploration (AGT and AGT A).* If the guideway columns are sited within 500 feet of the known locations of the Nelson sites, BART shall retain a qualified archaeologist to conduct subsurface testing to characterize the subsurface archaeological deposits. The methods of archaeological testing shall be approved by the State Historic Preservation Office, and the testing shall be performed prior to construction. Should potentially significant archaeological resources be found during testing or exploration, BART shall retain a qualified archaeologist to prepare a cultural resources management plan for submittal to and approval by the State Historic Preservation Office. This plan shall address the recovery of important data from the sites prior to and during construction, and shall describe the research design, data recovery and analysis methodology, curation procedures, technical reporting requirements, and any other information deemed necessary by the State Historic Preservation Office. The plan shall also include a Native American Coordination Plan to be executed in the event of the recovery of human remains during the course of the work. *C-CR-2(ii) Conduct Spot-Checks for Archaeological Resources During Construction Activities (AGT, AGT A, AGT B, AGT D, and AGT-STN).* BART shall retain a qualified archaeologist to conduct spot-checks during ground-disturbing activities in the project corridor. The archaeologist shall have the authority to halt all construction activities in the vicinity upon the discovery of archaeological remains, pending an evaluation of the nature and significance of the materials found. If any materials found are determined to be potentially significant, the provisions of Mitigation Measure C-CR-2(i) regarding preparation of a cultural resources management plan shall apply.	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
Impact C-UT-1. Relocation of utility lines			✓	✓	✓	✓	✓	*C-UT-1(i) Minimize Interruption of Utility Services (AGT, AGT A, AGT B, AGT D, and AGT-STN).* BART shall require construction contractor to install all re-routed utility lines (drinking water, wastewater, stormwater, telephone, natural gas, electricity), and conduct tie-in activities during off-peak service periods approved by the affected utility purveyor. No stormwater piping relocation tie-ins shall be conducted during or within 24 hours of a rain event. All relocations of wastewater piping shall utilize pumps and diverted flows to maintain full service capabilities.	Less than significant
Impact C-GE-1. Excavation instability caused by shallow groundwater			✓					*C-GE-1(i) Dewatering and Groundwater Control in Excavations. Best Management Practices. (AGT).* BART shall require the contractor to design and implement a temporary dewatering system during excavation and construction of structures that interface with the groundwater table. In addition, the extracted groundwater may be sediment-laden or contaminated and would require mitigation under measures C-HM-1(i), and C-HM-1(ii).	Less than significant
Impact C-GE-2. Settlement due to construction-related activities			✓	✓	✓	✓	✓	C-GE-2(i) Monitor Settlement During Construction. (AGT, AGT A, AGT B, AGT D, and AGT-STN). BART shall require the contractor to implement a settlement monitoring program to detect potential construction-induced settlement at an early stage. If settlement is detected, additional support measures would be required to strengthen the affected adjacent structures. These additional measures could include shoring or grouting of affected underlying soil or strengthening of affected foundations. C-GE-2(ii) Control Groundwater During Dewatering. (AGT, AGT A, AGT B, AGT D, and AGT-STN). Settlement potentially caused by dewatering shall be controlled by installation of a cut-off wall between the area needing dewatering and potentially affected structures. The cut-off wall can be sheet piling, a grout curtain, or an injection well array that would limit the amount of dewatering that takes place beneath structures adjacent to the construction corridor. C-GE-2(iii) Limit Vibration. (AGT, AGT A, AGT B, AGT D, and AGT-STN). In areas of loose sand layers underlying adjacent structures, alternative construction methods shall be used that do not create significant vibration. For example, if pile-type foundations are selected, pre-construction design investigations will determine if loose sand layers are present beneath structures in close enough proximity to the construction corridor such that settlement could be	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								induced by vibration from pile driving equipment. If loose sand layers are present, an alternative foundation design (e.g., drilled piers) shall be used. By another example, movement of heavy equipment can cause significant vibration and cause settlement. In this case, the equipment traveling speed shall be reduced to limit vibration.	
Impact C-HY-1. Stormwater erosion			✓	✓	✓	✓		C-HY-1(i) Implement Stormwater Best Management Practices. (AGT, AGT A, AGT B, and AGT D). BART will be required by the State to implement best management practices (BMPs) under General Permit Requirements for Storm Water Discharges Associated with Construction Activities, SWRCB Water Quality Order 99-08-DWQ. BART shall require the contractor to comply with these requirements and develop an acceptable Stormwater Pollution Prevention Plan. The plan shall contain BMPs that have demonstrated effectiveness at reducing stormwater pollution. Examples of BMPs that reduce erosion include, but are not limited to, precluding grading operations during the rainy season, hydro-mulching bare ground, installing silt fences, and placing hay bales to stop entrained sediments from reaching waterways.	Less than significant
Impact C-HY-2. Discharge of construction water			✓	✓	✓	✓	✓	C-HY-2(i) Notify Treatment Plant (AGT, AGT A, AGT B, AGT D, and AGT-STN). BART shall require the contractor to coordinate and schedule discharges to the sanitary sewer with the treatment authority to prevent plant upsets. C-HY-2(ii) Control Discharges to Sanitary Sewer (AGT, AGT A, AGT B, AGT D, and AGT-STN). At the direction of the treatment plant personnel, coordination efforts would involve limiting the flow rate or total volume of groundwater discharged or allowing discharges only at times when total plant flows are large and adequate dilution of high salinity water can occur. C-HY-2(iii) Treatment Prior to Discharge (AGT, AGT A, AGT B, AGT D, and AGT-STN). If required to meet influent standards imposed by the treatment plant, BART shall require the contractor to pre-treat and test the construction water as necessary. This mitigation measure is an alternative to C-HY-2(ii). C-HY-2(iv) Discharge to waterways with RWQCB authorization (AGT, AGT A, AGT B, AGT D, and AGT-STN). Discharges can be routed to alternative areas or back into saline water bodies to	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								prevent discharges to the sanitary sewer. For construction of subsurface excavations adjacent to saline water bodies, direct discharge back to the water body shall be arranged only under special allowances from the RWQCB. In this case, the discharger is required to demonstrate to the satisfaction of the RWQCB that the discharge is not causing pollution or otherwise impacting the environment. Alternatively, groundwater could be routed to temporary percolation basins on OIA property subject to prior authorization from the Port of Oakland. Further discussion of potential impacts related to water discharges to water bodies is presented in mitigation measure C-BR-1(iii).	
Impact C-BR-1. Wetlands impacts			✓	✓	✓	✓		*C-BR-1(i) Reduce Construction Corridor to Avoid or Reduce Wetland Disturbance (AGT A, AGT B, and AGT D).* In the areas where the construction rights-of-way encroach into tidal creeks, drainages or non-tidal wetlands, BART shall require that the construction right-of-way be narrowed to the extent possible to avoid or reduce temporary construction impacts. The jurisdictional wetlands shall be staked by a qualified biologist, and the construction corridor shall be no closer than five feet from the staked wetland. To ensure that equipment and personnel do not enter the wetland, a solid fence a minimum of 4-feet tall shall be constructed a minimum of 5 feet from the edge of the wetland. The fence can be built with metal t-stakes and plywood. This fence would have the added effect of limiting intrusion by animals into the work area. In addition, a qualified biologist shall be retained by BART to monitor the site during construction to ensure implementation of Best Management Practices (see Mitigation Measure C-BR-1(ii)). This measure may involve temporary closure or narrowing lanes of Airport Drive to allow access for construction equipment and activities from the roadway side. Temporary closure or narrowing of lanes shall be coordinated with the Port of Oakland. Access to and from OIA shall be maintained at all times. *C-BR-1 (ii) Adhere to Sound General Construction Practices in Areas Adjacent to Wetlands (AGT, AGT A, AGT B, and AGT D).* BART shall require that construction contractors implement Best Management Practices to reduce construction-related impacts from sedimentation and contamination consistent with permits required as part of the project (e.g., NPDES requirements, City Creek Protection Permit, Corps 404 Permit, RWQCB 401 Certification, etc.) Best	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								Management Practices shall include, but not be limited to, the flagging of all wetland areas adjacent to construction activities and the installation of silt fencing between wetland areas and all construction activities prior to the commencement of construction activities. *C-BR-1(iii) Mitigate Discharge of Excess Water from Tunnel Construction under Doolittle Drive (AGT).* If dewatering into surface drainages is necessary, BART shall require that construction contractors use sediment basins or settling tanks located in upland habitats (avoiding all designated wetlands) immediately adjacent to the dewatered construction site but also within the designated construction right-of-way. All waters pumped from the site would first be discharged into these sediment basins/tanks, for settling of silts and sediments. Only after treatment would this cleaner surface water be discharged into surface drainages with approval of the RWQCB.	
Impact C-BR-3. Impacts to nesting birds			✓	✓	✓	✓	✓	*C-BR-3(i) Perform Preconstruction Survey for Nesting Birds (AGT, AGT A, AGT B, AGT D, AGT-STN).* If construction or tree removal is conducted outside the breeding season, generally February 1 to August 31, no action is necessary. It is not necessary to replace potential nesting habitat of common birds occurring on site because they are well adapted to nesting in developed areas. If tree removal is required during the breeding season (February 1 to August 31), a preconstruction survey shall be conducted to identify the presence, or lack thereof, of nesting bird species. Surveys shall be performed by a qualified wildlife biologist no more than two weeks prior to the start of construction. If no nests are identified in trees to be removed during the preconstruction surveys, no further mitigation is necessary. If nests are identified, all construction activity, including pile driving, within 150 feet of the active nest shall be postponed until the nest is vacated and juveniles have fledged (typically 3 to 4 weeks). *C-BR-3(ii) Perform Preconstruction Surveys of Wetlands (AGT D).* BART shall require a preconstruction survey of the wetland area to be disturbed be conducted by a qualified wildlife biologist no more than two weeks prior to the start of construction if work is to proceed during the breeding season (February 1 to August 31). If nests or	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								nesting behavior are identified, all construction activity, including pile driving, within 150 feet of the active nest shall be postponed until the nest is vacated and the juveniles have fledged. *C-BR-3(iii) Avoid Sensitive Bird Species (AGT D).* If preconstruction surveys of the wetland area result in the identification of sensitive bird species (black or clapper rail), then no work shall proceed within this area during the breeding season (February 1 to August 31). If sensitive bird species are found in or near the area to be affected by construction, BART shall initiate consultation with USFWS and the CDFG to determine if additional mitigation is required.	
Impact C-BR-5. Effect on marsh gumplant			✓	✓	✓			Marsh gumplant has been successfully restored in other locations in the San Francisco Bay Area (Reynolds, 1995; Reynolds, 1999). Compliance with Mitigation Measures C-BR-1(i), C-BR-1(ii), and C-BR-1(iii) (i.e., avoiding or reducing effects to wetlands, sound construction practices, and proper discharge of construction water), as well as BR-1(i) (Restore Disturbed Wetland Areas) and BR-1(ii) (Mitigate Permanent and Temporary Loss of Wetland Habitats), would reduce the potentially significant impact of the alignments to a less-than-significant level.	Less than significant
Impact C-NV-1. Effects of construction-related noise		✓	✓	✓	✓		✓	*C-NV-1(i) Implement Best Management Practices to Reduce Construction Noise (QB, AGT, AGT A, AGT B, and AGT-STN).* BART shall incorporate the following practices into the construction documents to be implemented by the contractor: a. Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures: ▪ provide enclosures for stationary equipment and barriers around particularly noisy areas on the site or around the entire site; ▪ use shields, impervious fences, or other physical sound barriers, to inhibit transmission of noise to sensitive receptors; and ▪ locate stationary equipment to minimize noise impacts on the community; b. Schedule construction activity that produces higher noise levels during less noise-sensitive hours (normally 7 a.m. to 7 p.m.).	Significant and unavoidable

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								Minimize noise intrusive impacts during the most noise-sensitive hours (normally 7 p.m. to 7 a.m.) by planning noisier operations during times of highest ambient noise levels. Sheet pile driving will be restricted to daylight hours under ordinary circumstances. Should unforeseen circumstances require sheet pile driving at night, BART will advise the immediate neighbors. c. Select haul routes for removal of excavation materials in conjunction with the City of Oakland such that noise-sensitive areas, including residences, hotels, and outdoor recreation areas, are avoided as much as possible. *C-NV-1(ii) Provide Noise Buffer or Sound Barrier between Construction Activities and Noise-Sensitive Receptors (AGT, AGT A, AGT B, and AGT-STN).* If the construction right-of-way is within 700 feet of a residential area, 400 feet of a hotel, or 220 feet of another commercial use, BART shall require that the contractor reduce construction noise to or below BART's construction noise thresholds. The thresholds can be achieved by enclosing noisy equipment or constructing temporary noise barriers to the appropriate height(s) (approximately 8 to 12 feet). *C-NV-1(iii) Reduce Noise from Pile Driving (AGT, AGT A, AGT B, and AGT-STN).* If pile driving is planned within 1,200 feet of residences, or within 650 feet of hotels or in-use outdoor recreation areas, the following technologies shall be used as an alternative to meet BART's noise and vibration criteria: cast-in-drilled-hole (CIDH) piles, pre-drilled piles, soil-mix wall technology, shielded pile drivers, or vibratory pile drivers. This measure will either eliminate the need to drive piles, or reduce the force and duration necessary to install piles. Shielded pile drivers or vibratory pile drivers shall be used only where geotechnical conditions allow.	
Impact C-NV-2. Construction-related vibration annoyance			✓	✓	✓	✓	✓	*C-NV-2(i). Mitigate Construction Vibration Effects on Occupants of Nearby Land Uses (AGT, AGT A, AGT B, and AGT-STN).* If pile driving is planned within 400 feet of hotels, office buildings, or restaurants, the following technologies shall be used as an alternative to meet BART's noise and vibration criteria: cast-in-drilled-hole (CIDH) piles, pre-drilled piles, soil-mix wall technology, shielded pile drivers, or vibratory pile drivers.	Significant and unavoidable

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
Impact C-NV-3. Construction-related vibration structural damage			✓	✓	✓		✓	*C-NV-3(i) Reduce Construction Vibration Effects on Structures (AGT, AGT A, AGT B, and AGT-STN).* BART shall conduct a pre-construction survey of existing conditions. The survey shall include buildings and other infrastructure, including, but not limited to, roadway support structures, utility lines, or the OIA airport instrumentation lighting system. If recommended by the geotechnical engineer, for structures or facilities within 50 feet of pile driving, BART shall require ground-borne vibration monitoring of vibration-intensive activities.	Significant and unavoidable
Impact C-AQ-1. Temporary air emissions		✓	✓	✓	✓	✓	✓	*C-AQ-1(i) Implement Best Management Practices to Reduce Construction-Related Air Emissions. (QB, AGT, AGT A, AGT B, AGT D, and AGT-STN)* BART shall require that its contractor implement the following practices during the construction of the Connector and related facilities. ▪ Watering all active construction areas twice daily. ▪ Covering all trucks hauling soil, sand, and other loose materials or requiring all trucks to maintain at least two feet of freeboard ▪ Applying water three times daily to paved or applying non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at the construction site. ▪ Sweeping all paved access roads, parking areas, and staging areas, at construction sites, daily with water sweepers. ▪ Sweep adjacent public streets daily with water sweepers if visible soil material is carried onto them. The Port requires the following measures be included within the plans and specifications for construction projects at the Airport. These additional mitigation measures will further ensure that PM10 impacts remain less than significant at construction sites. ▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles. ▪ Install hay bales, sandbags, or other erosion control measures to prevent silt runoff to public roadways and wetlands. ▪ Require that the construction contractor use California regulated diesel fuel for all diesel powered equipment. ▪ Require that the construction contractor use construction equipment that is properly tuned and maintained in accordance with manufacturer specifications.	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
Impact C-EN-1. Consumption of energy		✓	✓	✓	✓	✓	✓	*C-EN-1(i) Develop and Implement Construction Energy Conservation Plan (QB, AGT, AGT A, AGT B, AGT D, and AGT-STN).* BART shall require the contractors to adopt the construction energy conservation measures including, but not limited to, those listed below: ▪ use energy-efficient equipment and incorporate energy-saving techniques in the construction of the Connector; ▪ avoid unnecessary idling of construction equipment; ▪ consolidate material delivery as much as possible in order to ensure efficient vehicle utilization; ▪ schedule delivery of materials during non-rush hours to maximize vehicle fuel efficiency; ▪ encourage car-pooling by construction workers; and ▪ maintain equipment and machinery, especially those using gasoline and diesel, in good working condition.	Less than significant
Impact C-HM-1. Exposure to known contaminated sites or to accidental releases of hazardous materials		✓	✓	✓	✓		✓	*C-HM-1 (i) Conduct a Phase I Environmental Site Assessment (QB, AGT, AGT A, AGT B, and AGT-STN).* BART shall require that a Phase I Environmental Site Assessment be prepared for the selected alignment and final station locations, according to established ASTM guidelines. As necessary, BART will require the development and implementation of a soil and groundwater characterization program at all excavation locations in proximity to listed hazardous waste sites identified in the Phase I Site Assessment. The soil and groundwater characterization program shall identify those excavation areas that will require development and implementation of appropriate remediation measures. The mitigation measures described below apply only to areas where contact with contaminated soil or groundwater is suspected. *C-HM-1 (ii) Prepare and Implement a Worker Health and Safety Plan Prior to Start of Construction Activities (QB, AGT, AGT A, AGT B, and AGT-STN).* The Health and Safety Plan shall, at a minimum, identify: ▪ all contaminants that could be encountered during excavation activities; ▪ all appropriate worker, public health, and environmental	Less than significant

Table S-4
Summary of Potentially Significant and Significant Construction Impacts

Topic/Impact Subject	Applicable Alternative							Mitigation Measures	Impact Significance after Mitigation
	NA	QB	AGT	AGT A	AGT B	AGT D	AGT STN		
								protection equipment and procedures; ▪ emergency response procedures; ▪ the most direct route to a hospital; and ▪ the site Safety Officer. The plan shall require documentation that all workers have reviewed and signed the plan. The plan shall be prepared by the contractor. *C-HM-1 (iii) Prepare and Implement a Soil Management Plan (QB, AGT, AGT A, AGT B, and AGT-STN).* The Soil Management Plan shall identify the soil sampling and handling procedures necessary to avoid or minimize worker and public exposure and to avoid or minimize the potential for off-site migration of contaminants. The Soil Management Plan shall also identify the range of pre-determined soil disposition options (reuse, landfill disposal, etc.) according to the concentrations of contaminants in the excavated soil. The Soil Management Plan shall also identify the construction procedures to be implemented that will minimize the excavation and excess handling of contaminated soil. The Soil Management Plan shall be prepared by the contractor for submittal, review, and approval by the RWQCB. *C-HM-1 (iv) Prepare and Implement an Excavation Water Treatment and Handling Plan (QB, AGT, AGT A, AGT B, and AGT-STN).* The Water Treatment and Handling Plan shall present an engineering design for an on-site excavation water treatment system, designed to reduce contaminant concentrations in excavation water to levels acceptable for permitted discharge. The treated water can be discharged to either the stormwater system or the sanitary sewer system, as long as all the appropriate permits are obtained by the contractor. The Water Treatment and Handling Plan shall be prepared by the contractor for submittal, review, and approval by either the RWQCB (for stormwater discharge) or by EBMUD (for sanitary sewer discharge).	