

MTI Working Paper

Research Project 2503

Collaborative Funding to Facilitate Airport Ground Access

CASE STUDY REPORT: OAKLAND INTERNATIONAL AIRPORT BART CONNECTOR

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ABSTRACT

This case study report documents the experience with collaborative funding of airport ground access involved in the development and implementation of an automated people mover link between Oakland International Airport (OAK) and the Coliseum/Oakland Airport station of the Bay Area Rapid Transit (BART) system, located about 3 miles northeast of the airport. The system, termed the Oakland Airport Connector (OAC), will replace an existing shuttle bus connection operated by the airport. As of May 2012, the 3.2-mile system is under construction and will use cable-driven vehicles running on a combination of elevated and surface guideway. The OAC is being developed by the BART District and is being constructed under a design-build contract with a consortium of three firms, operating as Flatiron/Parsons, JV. It will be operated and maintained under a separate 20 year contract with Doppelmayr Cable Car, Inc., one of the three firms building the system.

As of July 2010 the project was estimated to cost \$484 million, and the BART District had assembled a complex funding package using a combination of federal, state and local funds. Local funding sources accounted for about 57 percent of the total funding, with about 22 percent of the funding consisting of a loan from the federal Transportation Infrastructure Finance and Innovation Act (TIFIA) program. The local funding will include a \$29.3 million contribution from the Port of Oakland, the airport operator, which will be funded with revenues from Passenger Facility Charges collected from users of the airport. The BART District will contribute \$10 million from one of its reserve accounts. Other local funding sources include contributions from two regional transportation funding programs supported by bridge toll revenues and a countywide transportation funding program supported by a sales tax increment. State funding accounted for about 16 percent of the total funding, from a number of different programs, including \$5.4 million from bonds authorized to finance the California High-Speed Rail project. The only federal funding apart from the TIFIA loan is a \$25 million grant from the Federal Transit Administration under the Small Starts program.

The OAC project illustrates some of the challenges that can arise in developing and justifying an automated people mover link between an airport and an off-airport station of a regional rail transit system. The project has been under consideration for several decades and over this time the estimated costs have steadily increased. This led to a challenge to the project on the grounds that the higher fares that would be required to cover the TIFIA loan repayment and operating costs would impose an undue burden on lower-income travelers, particularly lower-income airport workers. While this challenge was ultimately dismissed, the delay that it caused resulted in the loss of \$70 million in funding under the American Recovery and Reinvestment Act that had been allocated to the project.

OAKLAND INTERNATIONAL AIRPORT BART CONNECTOR

INTRODUCTION

Oakland International Airport (OAK) is one of three primary air carrier airports in the San Francisco Bay Area located on the east side of San Francisco Bay about 8 miles southeast of downtown Oakland. The airport is owned and operated by the Port of Oakland and served 11.5 million passengers in 2008. In an effort to reduce automobile congestion in the Bay Area and provide an improved connection between the airport and the regional Bay Area Rapid Transit (BART) system, an automated guideway transit (AGT) link between OAK and the nearby Coliseum/Oakland Airport BART station has been planned since the early 1970's.

BART system currently serves the four central counties in the Bay Area (Alameda, Contra Costa, San Francisco, and the north part of San Mateo). The system has 43 stations and has an average weekday ridership of 327,629. The Coliseum/Oakland Airport station is located about 3 miles north of the airport and adjacent to the Oakland Coliseum where the Oakland Athletics Major League Baseball team and Oakland Raiders National Football League team play their home games. The station becomes heavily congested before and after games.

To access OAK by public transportation, air passengers and airport employees currently ride the AirBART shuttle bus from the Coliseum BART station or take Alameda-Contra Costa Transit District (AC Transit) bus line 73 (formerly line 58), which also serves the Coliseum station and the airport. The AirBART shuttle is operated by Oakland International Airport and transported 85,000 passengers per month in 2008. The one-way travel time varies between 12 and 30 minutes and there is a \$3 fare. The corridor between the Coliseum station and the airport, with the AirBART and bus routes, is shown in Figure 1.

The Oakland Airport Connector (OAC) is an AGT system that is being developed by the BART District to replace the AirBART shuttle bus and provide reliable and frequent service to the airport. Travel time by the OAC from the Coliseum station to the station adjacent to the airport terminal is estimated to be 15 minutes. Trains will depart for the airport every 4 minutes. By 2020, the OAC is projected to be transporting 10,000 passengers daily.

From the Coliseum station, the route of the OAC will proceed south on an elevated guideway in the median of Hegenberger Road across Interstate 880 (I-880) and continue toward the airport, as shown in Figure 2. Where it crosses I-880 the guideway will be located immediately to the west of Hegenberger Road, rather than in the median. At Pardee Drive the route will leave the median of Hegenberger Road and turn toward 98th Avenue. After crossing 98th Avenue, the guideway will descend to a tunnel under and the intersection of Doolittle Drive and Airport Drive. Emerging from the tunnel south of Doolittle Drive, the guideway will continue south at grade between Airport Drive and the Lew F. Galbraith Municipal Golf Course to the east of Airport Drive.

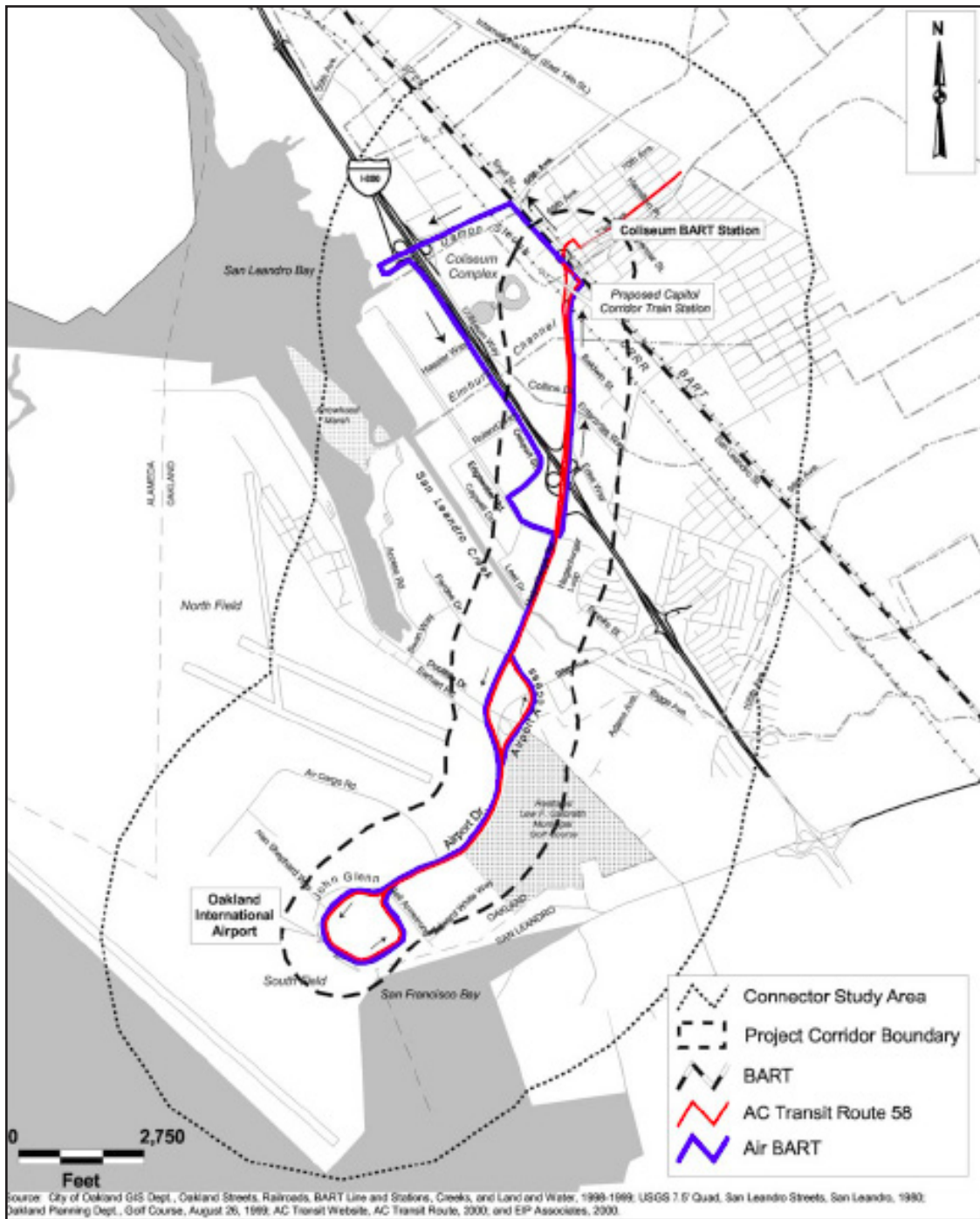


Figure 1. Proposed Oakland Airport Connector Corridor

Source: BART, *BART-Oakland International Airport Connector: FEIR/FEIS*, 2002, Figure S-2.

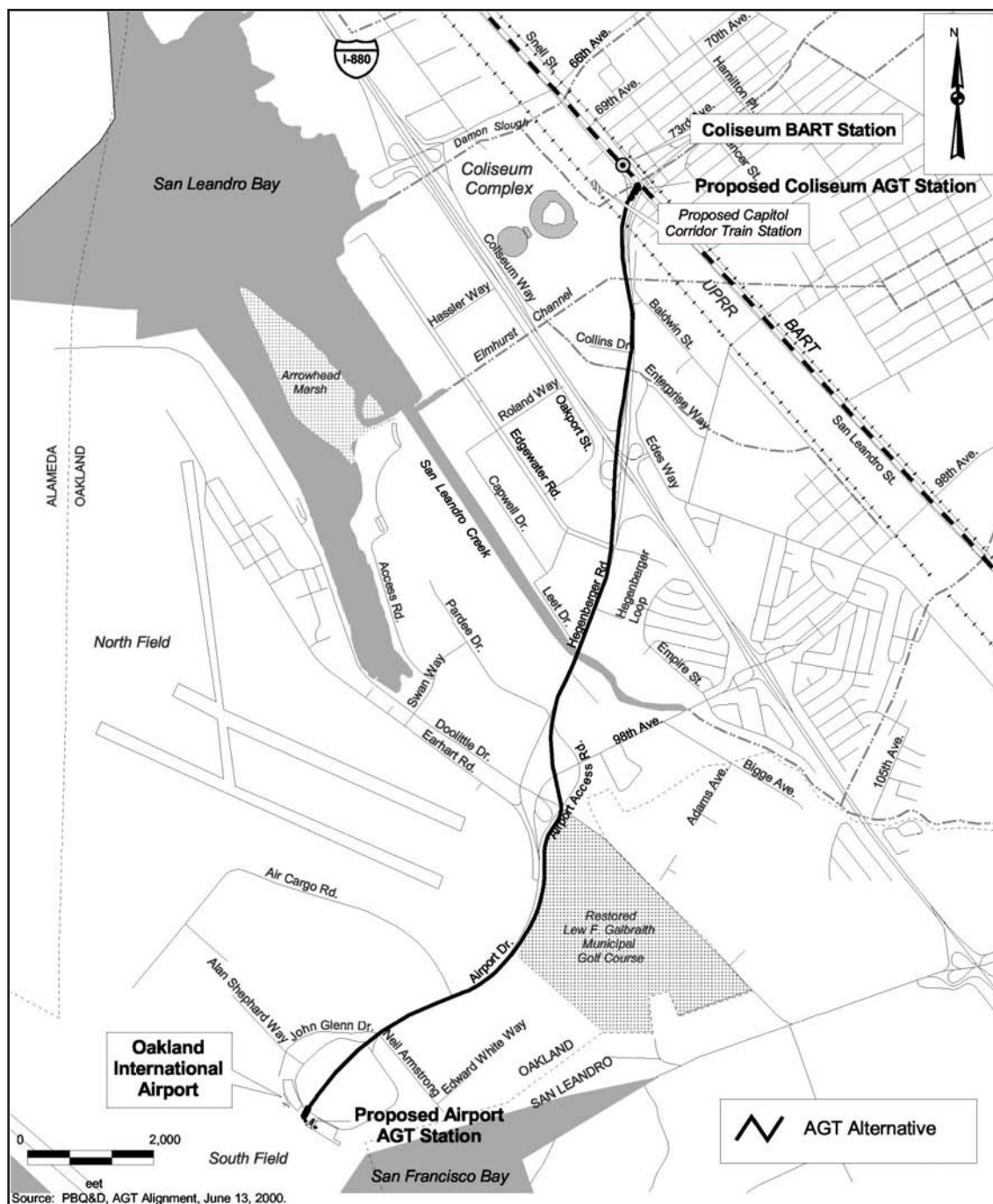


Figure 2. Planned Oakland Airport Connector Route

Source: BART, *BART-Oakland International Airport Connector: DEIR/DEIS*, 2001, Figure 2.4-2.

Approaching the airport, the OAC guideway will again be elevated to cross Neil Armstrong Way, the junction of Airport Drive and the terminal area loop roadway, and the airport parking lot, and end at a station in front of the airport passenger terminal. It should be noted that Figure 2 was prepared for the Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIR/DEIS) for the project, and there are minor differences in the detailed alignment and location of the airport station in the project that is being constructed. These differences are documented in an Addendum to the Final Environmental Impact

Report/Final Environmental Impact Statement (FEIR/FEIS) that was released in November 2006. One major difference introduced in the November 2006 Addendum is the location of an AGT vehicle maintenance and storage facility adjacent to the guideway between Hegenberger Road and 98th Avenue, as shown in Figure 3.

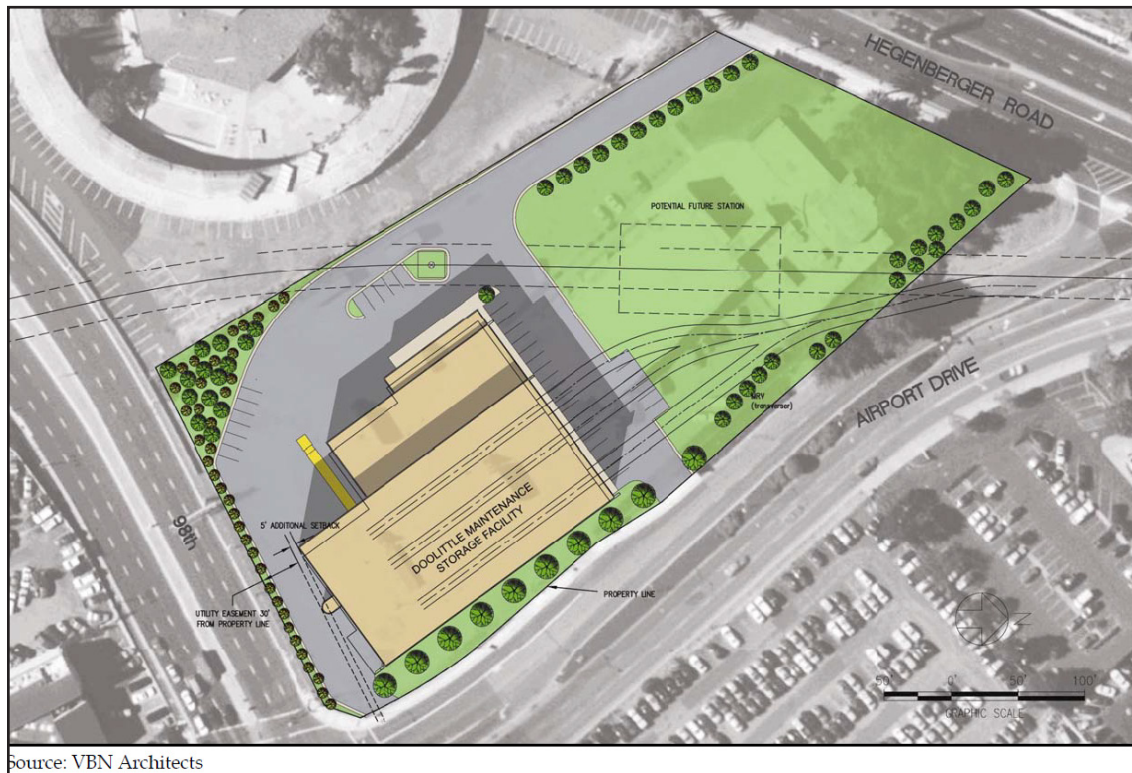


Figure 3. Planned Doolittle Maintenance Facility

Source: BART, *BART-Oakland International Airport Connector: FEIR/FEIS, Draft Addendum*, 2006, Figure 2.6.

Over much of its route, the OAC will transport passengers on an elevated guideway, as illustrated in Figure 4, allowing the system to operate free of ground traffic and signals. The OAC will initially have two stations, one located at the Coliseum BART station and one in front of the airport passenger terminal, as illustrated in Figures 5 and 6. The current project does not include any intermediate stops in the Hegenberger corridor but the project design allows for two future stations to be developed at a later time. The City of Oakland requested BART that intermediate stations be developed along the OAC route to help enhance economic activity in the Hegenberger corridor. The stops would be located on Hegenberger Road between I 880 and Edgewater Drive (shown as Edgewater Road on Figure 2) and between Hegenberger Road and 98th Avenue, adjacent to the Doolittle Maintenance Facility.



Figure 4. Rendering of OAC Guideway and Cable Car

Source: BART, "Oakland Airport Connector," www.bart.gov/about/projects/oac/index.aspx (accessed August 11, 2010).



Figure 5. Rendering of OAC Station at the Coliseum BART Station

Source: BART, "Oakland Airport Connector," www.bart.gov/about/projects/oac/index.aspx (accessed August 11, 2010).

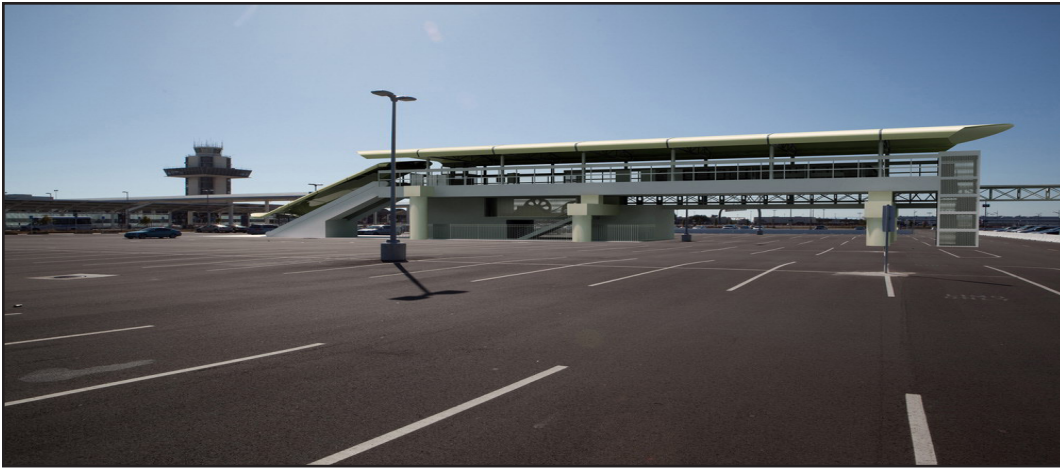


Figure 6. Rendering of OAC Station at the Airport Passenger Terminal

Source: BART, "Oakland Airport Connector," www.bart.gov/about/projects/oac/index.aspx (accessed August 11, 2010).

HISTORY OF THE PROJECT

In February 1970, BART, the City of Oakland, the County of Alameda, and the Oakland Coliseum published the results of a study to determine the viability of connecting BART to OAK with some type of automated people mover. Although the study found the project to be viable and planning for the project continued for almost 30 years through a successive series of studies, no action was taken to implement the project during this period. In October 1999, BART and the Federal Transit Administration (FTA) held a public meeting to present information on what by that point had come to be called the BART-Oakland International Airport Connector and invite public comment on the scope of environmental analysis to be undertaken during the subsequent process of preparing environmental documentation for the project. Since it was expected that the project would involve both state and federal funding, the environmental documentation needed to satisfy the requirements of both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Environmental documentation meeting CEQA requirements is termed an Environmental Impact Report, while that meeting NEPA requirements is termed an Environmental Impact Statement. As is commonly done in such situations, rather than prepare two documents, a joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was prepared.

The DEIR/DEIS was released for agency and public comment in July 2001. Following the statutory comment period and incorporation of a number of revisions, the FEIR/FEIS was certified by the BART Board on March 28, 2002. Detailed planning and preliminary design continued for the next seven years, together with efforts to line up sufficient funding for the project. In November 2006, BART released a Draft Addendum to the FEIR/FEIS that documented a number of changes in the design of the planned system. In May 2009, BART issued a Request for Proposals/Request for Qualifications for a design-build-operate-maintain contract to construct and operate the planned facility and on December 10, 2009 the BART Board voted to award a design-build contract for the construction of the OAC to the Flatiron/Parsons Joint Venture (JV) composed of Flatiron West, Inc., Parsons

Transportation Group, and Doppelmayr Cable Car, and a contract to Doppelmayr Cable Car to operate and maintain the OAC for 20 years.

The cost of the planned Oakland Airport BART connector has increased over the history of the project. In 1998, the planned AGT system had an estimated cost of \$130 million, although the 1998 design was a smaller, narrower, and lighter system than subsequent designs. By 2001, the estimated cost of the AGT had increased to \$204 million and by 2009 the project cost had increased to \$522 million. BART assembled a complex funding package of \$452 million and was hoping to get \$70 million in federal American Reinvestment Recovery Act (ARRA) funds to complete the funding and start construction. The bid from the Flatiron/Parsons JV came in slightly lower than had been estimated to construct the project, allowing BART to reduce the projected cost for constructing the OAC to \$494 million. However, a growing number of local residents and transit advocacy groups had come to oppose the project, in part from a concern that the increased fares that would be required for such an expensive project would adversely affect minority and low-income passengers. On September 3, 2009, Public Advocates, a non-profit law firm and advocacy organization, filed an administrative civil rights complaint with the FTA on behalf of three Bay Area advocacy groups charging BART with failure to comply with its responsibilities under Title VI of the Civil Rights Act of 1964.

In early 2010, the FTA found that BART had not prepared a service equity study and would only grant ARRA funds for the project if BART conducted a service equity study and achieved compliance with Title VI by September 30, 2010, the date by which all ARRA funds had to be obligated. After a brief attempt to develop a corrective action plan, it became clear that BART did not have sufficient time to produce the requested documents and the ARRA funds were dispersed to other regional transit agencies and projects. However, BART still needed to conduct a service equity analysis in order to receive any federal funding.

The service equity analysis was completed in July 2010 and concluded that proposed OAC fare increases from \$3.00 to \$4.50 or \$6.00 produced no significant adverse impacts to minority or low-income passengers. The \$1.50 or \$3.00 fare increases produced slight impacts on minority and low-income passengers but the impacts were not considered significant enough to be discriminatory. BART also prepared a public participation plan that documented over 40 meetings held in various locations in the Bay Area to communicate the project details and results of the service equity study, as well as address concerns about project alternatives, OAC fares, project cost, and funding allocations.

In response to the funding shortfall resulting from the loss of ARRA funds, BART developed a new funding package for the OAC project involving 12 different funding sources. Local and regional funding would contribute \$274.6 million, state agencies would contribute \$78.9 million, the federal government would contribute \$25 million, and BART would request a federal loan for \$105.7 million under the Transportation Infrastructure Finance and Innovation Act (TIFIA).

In September 2010, the BART Board of Directors reaffirmed their decision to award a design-build contract to construct the OAC to the Flatiron/Parsons JV and a contract to

operate and maintain the system to Doppelmayr Cable Car. As of May 2012, construction was under way with revenue operation expected to commence in spring 2014.

Project Alternatives

BART studied two main alternatives to enhance the connection between the Coliseum station and the airport, as well as a no-development alternative. The two main alternatives were an upgraded bus service, termed the Quality Bus alternative, and an AGT system. The no-development alternative assumed that AirBART would continue to operate with minor improvements.

In 2002, BART released the FEIR/FEIS documenting the details and impacts of the two alternatives for the OAC project, compared to those of the no-development alternative. The Quality Bus alternative would enhance the bus service between the Coliseum BART station and the airport through an improved transfer between BART and the buses, traffic signal preemption along the route, and a dedicated bus lane at the airport. The AGT alternative would provide trains operating mostly on an elevated track and the FEIR/FEIS considered several different design options. These included differences in the guideway alignment as well as whether to provide intermediate stations in the Hegenberger Road corridor.

Design option A would locate the guideway on the west side of Hegenberger Road rather than the median over a section of the route between the Coliseum BART station and I-880. Design option B would locate the guideway on the west side of Hegenberger Road between Edgewater Drive and Pardee Drive in the building setback between the sidewalk and the building entrances. Design option C involved an aerial segment at the Doolittle Drive crossing instead of a tunnel. However, this was found to conflict with airspace clearance restrictions on the approaches to the northern runways at the airport and was dropped from further consideration. Design option D would locate an elevated guideway to the east of the passenger terminal loop roadway and enter the parking lot in front of the passenger terminal from the east adjacent to the terminal curbfront. The AGT alternative with four stations (the end stations and two intermediate stations in the Hegenberger Road corridor), design option A, and the guideway located in the median of Hegenberger Road south of Edgewater Drive was selected as the preferred alternative.

The FEIR/FEIS presented capital cost estimates for four AGT alternatives, differing in the number of stations and the alignment design option. Only the alignment of the preferred alternative and design option D were considered, since the differences in construction costs between the preferred alternative and selecting the median option in place of design option A or selecting design option B were not considered to be significant.

Table 1 provides the capital cost of each alternative from the 2002 FEIR/FEIS. The four AGT alternatives had an estimated capital cost range of \$204 million to \$232 million in 2001 dollars. The preferred alternative would cost \$26 million more than the basic two-station alternative in 2001 dollars.

Table 1. OAC Alternatives and Cost

Capital Costs of Alternatives (2001 Dollars in Millions)		
Alternative	Detail	Capital Cost
No Action	Expand AirBART to transport current passengers	\$0.4
Quality Bus	Better bus service, minimal capital costs	\$30.2
AGT (1)	2 stations	\$204.0
AGT (2)	2 stations – design option D	\$206.6
AGT (3)	4 stations (2002 preferred alternative) ^a	\$229.6
AGT (4)	4 stations – design option D	\$232.2

Note: (a)The preferred alternative was changed to a two station configuration in the November 2006 Draft Addendum to the FEIR/FEIS.

Source: Table adapted from BART, *BART-Oakland International Airport Connector: FEIR/FEIS* (2002).

Table 2 provides the operating and maintenance cost of the alternatives in 2001 dollars. The inclusion of design option D was not considered to change the operating and maintenance costs significantly.

Table 2. OAC Alternatives Operating and Maintenance Costs

Operating and Maintenance Costs for Alternatives (2001 Dollars in Millions)		
Alternative	Detail	Annual Cost
No Action	8 peak operating vehicles: 40' standard buses	\$2.0
Quality Bus	9 peak operating vehicles: 60' articulated buses	\$2.4
AGT (1)	4 2-car trains in peak: 2 stations	\$7.3
AGT (3)	4 2-car trains in peak: 4 stations (preferred)	\$7.7

Source: Table adapted from BART, *BART-Oakland International Airport Connector: FEIR/FEIS* (2002).

An alternative plan for a bus rapid transit (BRT) link was proposed to BART in May 2009 by TransForm, an advocacy organization focusing on public transportation and pedestrian orientated cities in the Bay Area. By 2009 TransForm had become concerned about the total project cost of the OAC and the adverse impact of \$12 round trip fares on low income and minority passengers and employees. Several other organizations including the Oakland City Council Public Works Committee, and the public advocate organizations Genesis and Urban Habitat shared similar concerns that potential future OAC fares would be too expensive. Collectively, the agencies felt that a BRT alternative would lower development costs and allow more affordable transit fares. However, this proposal was not pursued by BART.

Although the preferred alternative in the 2002 FEIR/FEIS included two intermediate stations, these were dropped from the preferred alternative in a Draft Addendum to the FEIR/FEIS released in November 2006, in order to reduce costs.

Environmental Justice Challenge

In June 2009, Urban Habitat, at a meeting of the Metropolitan Transportation Commission (MTC), stated that BART had not performed a required service equity analysis of the OAC project. BART responded by stating that they had prepared a Title VI Triennial Report in 2007 but did not mention a service equity analysis. In response to BART not performing a service equity analysis of the OAC project, in September 2009, Public Advocates, on behalf of three local advocacy groups, Genesis, Urban Habitat, and TransForm, filed a civil rights complaint with the FTA under Title VI the Civil Rights Act of 1964 stating that BART did not comply with the requirements of the Act. The complaint claimed that OAC fares (\$6 one way) would be too expensive for low income passengers and the project would not bring economic benefits to the Hegenberger corridor and nearby neighborhoods now that the intermediate stations had been eliminated.

BART responded by preparing an analysis of proposed service and fare changes that stated that the OAC would not adversely impact the Hegenberger neighborhoods. If the OAC would have an adverse impact on low income and minority communities, BART would mitigate the impacts. BART claimed the OAC would benefit the Hegenberger corridor neighborhoods by reducing traffic, noise, and pollution. Transit time from the Coliseum Station to the Airport Station would be reduced from 10 minutes by AirBART to 4.5 minutes by OAC. Regarding transit fares, BART stated that the \$6 one-way fare would affect some low income and minority communities, but that the majority of potential OAC riders (95.7 percent) would be business, leisure, or student travelers, and only 4.3 percent would be low income minority passengers. BART acknowledged some of the low income and minority passengers would be airport employees who live north of the BART station. BART stated employees would not be affected by the price increase because employee public transit fares are subsidized by pre tax benefits.

However, while BART was responding to the complaint, the FTA undertook a project review that confirmed BART's failure to complete an adequate service equity analysis. In January 2010, BART and the MTC received a letter from Peter Rogoff, the FTA Administrator, stating that FTA had determined that BART was not in compliance with Title VI of the Civil Rights Act and would need to complete a service equity analysis and develop a plan to mitigate any adverse impacts before the ARRA funds could be released. The letter expressed the concern that doing so within the limited time available for allocation of the ARRA funds would be challenging. A decision on allocating the ARRA funds had to be made by March 5, 2010 and any implementation plan to mitigate non-compliance with Title VI would need to be completed before September 30, 2010, the deadline for distribution of all ARRA funds.

In spite of efforts by BART to develop a corrective action plan, on February 12, 2010, a follow-up letter from Peter Rogoff stated that the FTA was rejecting the proposed corrective action plan and would reallocate the \$70 million ARRA funds to other Bay Area transit agencies. The economic stimulus money went to 19 public transit operators in the Bay Area to repair and upgrade buses and light rail equipment. Among some of the transit operators who received a share of the economic stimulus money were AC Transit, Santa Clara Valley Transit Authority, and Caltrain. Even though BART did not receive the ARRA

funding, the agency was still required to perform a service equity study to determine if the OAC project would negatively impact minority and low-income passengers in order to be in compliance with Title VI of the Civil Rights Act.

Service Equity Study

Following the denial of the ARRA funds, BART conducted a service equity study to determine whether the increased OAC fares would adversely impact minority and low-income passengers. Currently, passengers pay \$3.00 to ride AirBART from the Coliseum Station to the airport. The OAC fares would increase to \$4.50 or \$6.00.

HDR Engineering, Inc. was retained to perform the analysis. To determine if low-income and minority passengers would be paying more than other passengers, an analysis was performed to compare average fares from different locations within the study area. The study area was determined using data from an AirBART on-board passenger survey conducted in September 2006 that found that the majority of AirBART riders had trip ends in Alameda County, Contra Costa County, and San Francisco County. The three counties were therefore defined as the study area and the analysis was performed on the basis of census tracts within the study area using data from the 2000 Census. Minority census tracts were defined as those where more than 53.3 percent of the residents were minority. In the study area 51 percent of census tracts were classified as minority census tracts. Low-income census tracts were defined as having at least 22.9 percent of their residents in households earning below 200 percent of the federal poverty level. The analysis determined that 54 percent of the study area census tracts were low-income.

HDR Engineering estimated a system-wide weighted average BART fare for all passengers, passengers from minority and low-income census tracts, and from non-minority and non-low-income census tracts in the study area. Average fares from minority and low-income census tracts were compared to those from non-minority and non-low-income census tracts to determine any discriminatory impact. The average fares were calculated by adding the BART fare from each station in the study area to the Coliseum BART station and the fare on AirBART or the OAC from the Coliseum station to the airport. The average fares to the airport using AirBART were described as the “current condition.” The “after condition” calculated the average fares to the airport with the proposed OAC fares replacing the AirBART fares.

For all passengers within the study areas, the weighted average fare before any fare increase was \$6.19. A fare increase of \$1.50 for the OAC would increase the weighted average fare for all passengers by 24 percent, while an increase of \$3.00 would increase the weighted average fare for all passengers by 48 percent.

\$1.50 increase from \$3.00 to \$4.50

If the fare for the OAC increased to \$4.50, passengers from minority census tracts would pay a slightly lower average fare than other passengers. Passengers from minority census tracts would pay an average fare of \$7.63 while other passengers would pay an average fare of \$7.77, as shown in Table 3. The percentage fare increase for passengers from

minority census tracts would be 0.52 percent more than for passengers from other census tracts. Passengers from low-income census tracts would pay an average fare of \$7.56 and passengers from other census tracts would pay an average fare of \$7.73. The percentage increase in average fare for passengers from low-income census tracts would be 0.71 percent more than for passengers from other census tracts.

Table 3. Impact of an OAC Fare Increase of \$1.50

	Average Fare Paid Before Fare Increase (BART + AirBART)	Average Fare Paid After Fare Increase (BART + AGT)	Percentage Fare Increase
All Populations in Study Area	\$6.19	\$7.69	24.23%
Minority Population	\$6.13	\$7.63	24.43%
Non-Minority Population	\$6.27	\$7.77	23.91%
Difference between Minority and Non-Minority	\$0.14	\$0.14	0.52%
Low Income Population	\$6.06	\$7.56	24.74%
Non-Low Income Population	\$6.23	\$7.73	24.03%
Difference between Low-Income and Non-Low-Income	\$0.17	\$0.17	0.71%

Source: Table adapted from HDR Engineering, 2010.

\$3.00 increase from \$3.00 to \$6.00

If the fare for the OAC increased to \$6.00, passengers from minority census tracts would pay an average fare of \$9.13 and other passengers would pay an average fare of \$9.27, as shown in Table 4. The percentage fare increase for passengers from minority census tracts would be 1.04 percent more than for passengers from other census tracts. Passengers from low-income census tracts would pay an average fare of \$9.06 and other passengers would pay an average fare of \$9.23. The percentage fare increase for passengers from low-income census tracts would be 1.41 percent more than for passengers from other census tracts.

The analysis concluded that minority and low-income passengers would be paying slightly lower average fares than non-minority and non-low income passengers, although they would experience a slightly greater percentage increase in average fare. On this basis, the analysis concluded that there would be no discriminatory impacts to minority and low-income passengers from the OAC fare increase.

Public Participation Plan

Throughout the planning for the project BART had been conducting meetings with the local communities and other stakeholders. In response to the FTA decision on the service equity complaint, BART developed a formal Public Participation Plan and undertook additional public meetings.

Table 4. Impact of an OAC Fare Increase of \$3.00

	Average Fare Paid Before Fare Increase (BART + AirBART)	Average Fare Paid After Fare Increase (BART + AGT)	Percent Fare Increase
All Populations in Study Area	\$6.19	\$9.19	48.47%
Minority Population	\$6.13	\$9.13	48.87%
Non-Minority Population	\$6.27	\$9.27	47.83%
Difference between Minority and Non-Minority	\$0.14	\$0.14	1.04%
Low Income Population	\$6.06	\$9.06	49.48%
Non-Low-Income Population	\$6.23	\$9.23	48.07%
Difference between Low-Income and Non-Low-Income	\$0.17	\$0.17	1.41%

Source: Table adapted from HDR Engineering, 2010.

To demonstrate that it had communicated with the local community and government agencies, BART prepared a Public Participation Summary Report in July 2010 that showed that between February 2009 and May 2010 it had conducted 21 public hearings in Oakland, four hearings before the Alameda County Transportation Improvement Authority, five hearings before MTC, four hearings before BART's Board of Directors, three before the Port of Oakland, and three before the Oakland City Council.

The meetings covered the history of the project, described the benefits of the OAC, and the funding status of the project. Residents of the community expressed concern about the elimination of the two OAC intermediate stations. BART responded that the two intermediate stations at Edgewater Drive and Doolittle Drive were studied in the 2002 FEIR/FEIS, but were not being implemented because the City of Oakland was responsible for funding their design and construction. BART noted that the City of Oakland decided to allow Wal-Mart to develop near the planned location of the Edgewater station, which required relocation of the OAC alignment. BART indicated that the Doolittle station could still be developed in the future. Residents also expressed concern over why the BRT alternative was not chosen over the AGT alternative. BART staff responded by stating that the BRT alternative was studied extensively in the 2002 FEIR/FEIS and it was determined that the BRT alternative would be slower and less reliable than the AGT which would have a 99.5 percent on-time performance.

PROJECT COSTS

In 1998, the proposed AGT had an estimated cost of \$130 million. The estimated cost for the basic two-stop AGT alternative increased to \$204 million in 2001. The 1998 \$130 million AGT design assumed a smaller, narrower, and lighter system. In April 2001, the Metropolitan Transportation Commission adopted the Regional Transportation Enhancement Policy (RTEP) with a four-station \$232 million AGT project. BART's 2002 FEIR/FEIS included a \$230 million, four-station AGT as the preferred alternative, with a design option (option D) estimated to cost \$232 million, although it was recognized that by the time the FEIS/

FEIR was completed that design option was no longer feasible due to changes to the airport development plans. The two intermediate stations were dropped from the preferred alternative in a Draft Addendum to the FEIR/FEIS in November 2006. By April 2009, the estimated project cost had risen to \$522 - \$552 million in spite of the elimination of the two intermediate stations. One of the original reasons to develop a four-station OAC was to bring economic benefits to the Hegenberger corridor. Local residents and transit advocates were upset about eliminating the two Hegenberger stops and pressed for reconsideration of a BRT alternative, which they believed would be less expensive and could serve stops along the corridor. However, BART continued to pursue the AGT alternative.

BART solicited bids to construct and operate the OAC in May 2009 and selected the Flatiron/Parsons JV as the winning bidder in December 2009. The bid to construct the project was somewhat lower than BART had been expecting, and the estimated cost to construct the OAC was reduced to \$492 million. By July 2010, the estimated cost to construct the project had reduced again to \$484 million, largely due to a reduction in the estimated allowance for construction contingency costs. The construction and financing costs are presented in Tables 5 and 6. As of May 2012, the current estimate for the total cost to construct the project had not been revised since July 2010.

Table 5. OAC Updated Project Construction Costs

Development and Construction Costs	\$ (millions)
BART costs spent and reimbursed to date	39.2
Capital construction and civil cost	363.9
BART delivery costs and construction contingency	73.0
Total development and construction costs	476.1

Source: Table adapted from BART, *Executive Decision Document: Re affirm Award ...* (July 2010).

Table 6. OAC Updated Financing Cost

Financing Costs	\$ (millions)
TIFIA Interest expense	0.9
Upfront financing costs and fees	5.4
Annual rating agency fees	0.1
Reserves for other financing costs	1.5
Total financing costs	8.0

Source: Table adapted from BART, *Executive Decision Document: Re affirm Award ...* (July 2010).

FUNDING SOURCES

By April 2009, BART had assembled a complex funding package from a variety of local, regional, state, and federal sources. The funding package included funding from the Alameda County Transportation Improvement Authority (ACTIA), using funds from Alameda County Measure B passed in 2000, the Port of Oakland, State Transportation Improvement Plan (STIP) funds, regional bridge tolls, State and Local Partnership Program (SLPP) funds, an FTA grant under the Public Private Partnership Pilot Program, and federal ARRA funds. BART had received funding commitments totaling \$288 million, and was waiting for approval for an additional \$140 million, including \$70 million in ARRA funds. The estimated project cost at the time was between \$522 and \$552 million and BART planned to meet the balance of the funding requirement through a TIFIA loan.

In May 2009, BART issued a Request for Proposals to construct and operate the OAC, and in December 2009 BART's Board of Directors announced the award of a design-build contract to construct the project, subject to approval of the remaining funds needed to complete the funding plan, and a second contract to operate and maintain the OAC project for 20 years. The funding plan was modified to reflect the successful bid coming in lower than projected, principally by reducing the planned use of TIFIA loan funds and adjusting the timing of the receipt of PFC funds from the Port of Oakland. In response to the loss of ARRA funding in early 2010, BART developed a revised funding plan and reaffirmed the award of the two contracts in July 2010, pending approval of \$20 million in additional state funding and obligation of a \$25 million grant from the FTA Small Starts program.

FTA Administrator Peter Rogoff sent a letter to BART General Manager Dorothy Dugger on September 15, 2010 stating that the FTA had reserved \$24.99 million in Small Starts funding for the OAC project. The letter stated that the FTA would approve release of the funds after they had determined that BART had adequately addressed all of the Title VI deficiencies for the project and completed the Title VI Corrective Action Plan approved by the FTA in April 2010.

The Joint Venture contractors had agreed to extend the validity of their project bids to September 21, 2010, but no later. On September 16, BART's Board of Directors voted to authorize BART's General Manager to execute the two contracts in anticipation of subsequent approval and commitment of the state and FTA funding. The California Transportation Commission (CTC) approved the award of the additional \$20 million in STIP funding on September 22, 2010. In January 2011, the FTA concluded that all work related to BART's Title VI Corrective Action Plan had been completed and awarded the Small Starts grant.

BART's revised funding plan for the OAC project includes a total of twelve different funding sources, five local, six state, and one federal, in addition to the TIFIA loan. Of the twelve funding sources, by July 2010 funds from six were committed, four were pending, and two were programmed. The TIFIA loan had been requested. Table 7 shows the local, regional, state, and federal funding sources, the amount funded and the status of the funds at that time.

Table 7. Updated OAC Funding Plan

OAC Funding Sources -- Status as of July 2010 \$ (millions)					
Source	Local	State	Federal	Debt Draws	Status
Alameda County Transportation Improvement Agency (ACTIA) Measure B	89.1				Committed
Port of Oakland PFC	29.3				Pending
Regional Measure 1 (1988) Bridge Toll	31.0				Committed
Regional Measure 2 (2004) Bridge Toll	115.2				Committed
BART SFO Reserve Account	10.0				Pending
State Transportation Improvement Program (STIP)		20.7			Committed
Corridor Movement Improvement Account (CMIA)/ Regional Transportation Improvement Plan (RTIP) Funding Exchange		10.0			Programmed
State Highway Operation and Protection Program (SHOPP)/ (RTIP) Funding Exchange		10.0			Programmed
Metropolitan Transportation Commission (MTC) – State-Local Partnership Program (SLPP) Proposition 1B		20.0			Committed
PTMISEA Proposition 1B		12.8			Committed
High-Speed Passenger Train Bond		5.4			Pending
Federal Transit Administration (FTA) Small Starts			25.0		Pending
TIFIA Debt Draws				105.7	Requested
Total Funding = \$484.1	274.5	78.9	25.0	105.7	

Source: Table adapted from BART, *Executive Decision Document: Re affirm Award ...* (July 2010).

The funding plan for the OAC has continued to evolve since July 2010, as discussed in the following section.

Funding Programs

The funding package assembled by BART came from multiple local, regional, state, and federal sources. As of July 2010, there were a total of 12 different funding sources, plus a TIFIA loan. Table 7 above lists the funding sources and their amounts. This section describes the funding sources in more detail and subsequent changes to the funding plan.

Alameda County Transportation Improvement Authority Measure B Funds

Measure B was originally approved by Alameda County voters in 1986. The ballot measure increased the county sales tax by 0.5 percent to fund transportation projects in the county. A second Measure B was approved by Alameda County voters in the November 2000 ballot and extended the sales tax increase to March 2022. The measure established the Alameda County Transportation Improvement Authority (ACTIA) to administer the funds, with capital projects receiving 40 percent of the revenue from the sales tax increase. The OAC will receive \$89.1 million from Measure B funds.

Port of Oakland PFC Funds

Passenger Facility Charges (PFCs) were approved by Congress in 1990 to fund projects to reduce noise, improve safety, security, and develop ground access projects. PFCs are administered by the FAA and allow airports to charge airlines up to \$4.50 for every enplaned passenger. To be eligible for PFCs, ground access projects must be located on airport property, operated by the airport or a regional transit agency, and cannot transport passengers not destined for the airport. PFCs are granted on a case by case basis.

The Port of Oakland agreed to contribute \$45.4 million to the OAC project from PFC revenue collected at the airport, subject to the approval of the Federal Aviation Administration (FAA) required by the PFC program regulations. As of the July 2010 funding plan, the Port of Oakland had contributed \$1.5 million and requested the FAA to approve the use of \$43.9 million in PFCs for the OAC. Of this amount, \$27.8 million would be provided during the construction phase of the project and the balance during the first two years of operational service. If the FAA did not approve the use of PFCs, the Port of Oakland funding contribution to the OAC would be eliminated, and BART would have to borrow more funds from the TIFIA program or other sources to make up the shortfall. On January 11, 2012, the FAA approved the Port's application to use \$70.259 million in PFC revenue for the OAC, based on a \$3.00 PFC effective from April 1, 2021. The requested amount comprised \$43.894 million in direct contribution and \$26.365 million in interest.

Regional Measures 1 and 2 Bridge Toll Funds

Regional Measure 1 was passed by Bay Area voters in November 1988 and increased tolls on the seven state-owned Bay Area toll bridges, primarily to pay for bridge improvement and expansion projects. In addition, 90 percent of the toll increase on automobiles on the San Francisco-Oakland Bay Bridge was set aside for a Rail Extension Reserve account managed by MTC. The OAC is one of the projects funded from this account and was allocated \$31 million by MTC.

Regional Measure 2 was passed by Bay Area voters in March 2004 and raised the tolls on the seven state-owned Bay Area toll bridges by \$1.00 to fund various transportation projects within the region with the goal of reducing congestion or making improvements to travel in the toll bridge corridors. Regional Measure 2 established the Regional Traffic Relief Plan and identified specific transit operating assistance and capital projects and programs that were eligible to receive funding. The OAC was one of the designated transit capital

projects. By July 2010, this had been allocated \$115.199 million in Regional Measure 2 funds by MTC.

State Transportation Improvement Program

The State Transportation Improvement Program funding is programmed every two years in California and helps fund transportation projects in the state. The STIP is funded from the state's Transportation Investment Fund and other sources. To receive STIP funding, local agencies work through their Regional Transportation Planning Agency (RTPA) or County Transportation Commission to propose projects to receive STIP funding. In the Bay Area, the MTC is the RTPA that programs STIP funds.

Each RTPA in California develops a Regional Transportation Improvement Plan. The RTIP includes proposed transportation projects in the region and describes project layouts, schedules, and the application process. Each RTIP is ultimately submitted to the state to develop the STIP. Regional transportation projects included in the RTIP and STIP are eligible to receive state funding. In the Bay Area, MTC works with local Congestion Management Agencies (CMAs) to develop a Bay-Area-wide RTIP. CMAs are responsible to develop a list of transportation projects for each county. The CMAs submit their projects to MTC for inclusion in the RTIP and submission to the state. Final approval of STIP funding is made by the CTC.

The OAC project had been allocated \$20.7 million in STIP funding prior to the revision to the funding plan in July 2010. BART requested additional STIP funds through the MTC to partly make up for the lost ARRA funds. These were programmed through two funding exchanges into the RTIP of \$10 million each, one from the Corridor Movement Improvement Account (CMIA) and one from the State Highway Protection and Operation Program (SHOPP). This additional funding allocation from the STIP required an amendment to the 2010 STIP to add the OAC project and approve the allocation of \$20 million in fiscal year 2010-11. The CTC approved the requested STIP amendment and funding allocation in September 2010.

Proposition 1B Transportation Bond Program

In 2006, California voters approved Proposition 1B to raise \$19.9 billion through general obligation bonds to improve transit capital projects, repair roads and highways, reduce traffic and congestion, develop a statewide carpool lane, and reduce air pollution.

The proposition developed several programs and accounts to help fund transportation related projects in the state: the CMIA, the State Route 99 Corridor Program, the Trade Corridor Improvement Fund, the Transportation Facilities Account to provide funds for STIP augmentation, the Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA), the SLPP Account, and various other accounts.

Corridor Movement Improvement Account

The CMIA was established by Proposition 1B to fund performance improvements on the state highway system or major access routes to the state highway system. Proposition 1B allocated \$4.5 billion to the CMIA for allocation by the CTC. The CMIA represented the first commitment of funds from Proposition 1B. The CTC allocated \$1.3 billion in CMIA funds to projects in the Bay Area, together with an additional \$405 million through the SHOPP program for the replacement of Doyle Drive in San Francisco. The MTC arranged to exchange \$10 million in the Bay Area CMIA allocation with the STIP in order to be able to apply those funds to the OAC, which was not eligible for CMIA funding.

Public Transportation Modernization, Improvement, and Service Enhancement Account Program

The PTMISEA was established by Proposition 1B in 2006 to increase highway safety, reduce traffic and congestion, and improve air quality. Proposition 1B allocated \$3.6 billion to PTMISEA to be distributed across the state to various transportation agencies within ten years. The funds can be used to improve and expand transit service, develop new capital projects, fund bus rapid transit improvements, improve safety, and acquire, rehabilitate or replace transit vehicles. California Senate Bill 88, Statutes of 2007, assigned to the California Department of Transportation the authority to distribute PTMISEA funds. Funds are distributed by formula, with 50 percent of the funds allocated to transit agencies depending on fare box recovery rates, and 50 percent of the funds distributed to regional agencies based on the population of the region. The MTC allocated \$12.8 million from its PTMISEA funds to the OAC and on September 22, 2010 added an additional allocation of \$5.4 million to replace funding that had been programmed from the Proposition 1A High-Speed Passenger Train Bond program, as discussed below.

State-Local Partnership Program

The SLPP Account was established by Proposition 1B to provide state matching funds for eligible transportation projects nominated by local transportation agencies. Proposition 1B allocated \$1 billion to the SLPP for distribution by the CTC. Funds are available to fund eligible transportation projects by local jurisdictions that have enacted voter-approved tolls, property or parcel taxes, or sales taxes, or imposed developer fees. The available funds in any funding cycle are allocated to qualifying jurisdictions by formula and can be used for eligible projects to match local funds on a dollar for dollar basis. Unused funds in any funding cycle roll over to subsequent funding cycles. The MTC allocated \$20 million from regional SLPP funds to the OAC.

State Highway Operation and Protection Program

The State Highway Operation and Protection Program was originally established in fiscal year 1990/91 as the Highway System Operation and Protection Plan and renamed SHOPP in 1992. The purpose of the program is to maintain and preserve the investment in the state highway system and its supporting infrastructure. The SHOPP is four-year program of projects grouped into eight categories: major damage restoration, collision

reduction, complying with mandates, bridge preservation, roadway preservation, mobility enhancement, roadside preservation, and preservation of other transportation facilities. A statewide funding level of \$6.75 billion for the 2010 SHOPP was approved by the CTC in October 2009. The MTC arranged to exchange \$10 million the Bay Area SHOPP funds with the STIP in order to be able to apply those funds to the OAC.

High Speed Passenger Train Bond

In November 2008, California voters approved Proposition 1A to provide partial funding to develop a high speed train from Southern California to Northern California. The bond will provide \$9.95 billion to develop the project. Part of the funding from the bonds is dedicated to local transit projects that help provide interconnectivity with the high speed rail. Select local transportation projects across the state will receive \$950 million to increase safety, provide more capacity, and interconnect with the high speed rail system.

On March 11, 2010, the BART Board of Directors approved transferring \$5.4 million in the list of projects for the BART allocation of the High-Speed Passenger Train Bond Program from the Traction Power/Train Control Reliability Improvements line item to the OAC for consideration for programming by the CTC. However, by September 2010 this had been replaced by the same amount of funding from the PTMISEA program.

FTA Small Starts Grant

FTA New Starts grants provide funds for new fixed guideway transit projects, projects to improve bus corridors, and transit extensions. The New Starts funding program usually provides larger sums of money towards major capital transit projects. Since the OAC project requested a smaller amount of funding, the request was exempt from the usual New Starts criteria and would not need to be evaluated or rated by the FTA. Ratings and evaluations as usually performed each year through the annual report on funding recommendations submitted to Congress. Projects requesting larger sums of money are evaluated to approve the project engineering and project design before funds are released for construction. The OAC received a \$25 million Small Starts grant as discussed above.

Transportation Infrastructure Finance and Innovation Act

The TIFIA program provides federal loans and lines of credit to ground transportation projects. TIFIA loans usually have better credit terms and are more flexible than private capital lines of credit. As of July 2010, the proposed TIFIA loan for the BART OAC project was assumed to have a 4.13 percent interest rate, although this would depend on the prevailing rate when the loan is approved. Principal and interest payments would not be made until 11 years after the project has been completed. The estimated date to start repaying the loan was 2024. Principal and interest payments would be deferred for the first 11 years of operation to allow time for ridership and fare revenues to increase. Debt service payments would start at \$6.1 million annually and increase by 1.5 percent per year. At this rate, the loan would be repaid by the 35th year after the OAC starts operation. Fare revenues during the 11th year of operation were estimated to be \$13.9 million which will cover the expected operating costs (\$10.5 million) but not the full debt service

payment. Fare revenues are not expected to be able to cover both the operating costs and debt service until 2034, the 21st year of operation. BART's general fund will subsidize the OAC's debt service payments until the fare revenues are large enough to cover the debt service and operating costs. The general fund was projected to need to provide a maximum cumulative subsidy over the life of the project of \$23.5 million to repay the TIFIA debt draws and accumulated interest.

In November 2010 BART learned that its request for TIFIA funds was not among the projects selected for loans in fiscal year 2010/11. In January 2011, a memo to the BART Board of Directors from the Controller-Treasurer indicated that if BART failed to be awarded a TIFIA loan, the alternative debt financing plan would increase the maximum cumulative subsidy required from the general fund over the life of the project to \$46 million. The memo indicated that this estimate was based on the use of Sales Tax Bonds. The memo also noted that of December 2010 the TIFIA interest rate had increased to 4.46 percent, which if in effect when a TIFIA loan is finalized would increase the maximum cumulative subsidy required from the general fund over the life of the project to \$29 million.

SUMMARY AND CONCLUSIONS

The Oakland Airport Connector is an automated people mover that will link Oakland International Airport with the Coliseum/Oakland Airport station of the BART system, located about 3 miles north of the airport. The system will replace an existing shuttle bus connection operated by the airport. As of May 2012, the system is under construction and will use cable-drawn vehicles running on a combination of elevated and surface guideway, with a short section in tunnel. The 3.2-mile system is being developed by the BART District and is being constructed under a design-build contract by a consortium of three firms. It will be operated and maintained under a separate 20 year contract with one of the three firms building the system.

As of July 2010 the project was estimated to cost \$484 million, and the BART District had assembled a complex funding package using a combination of federal, state and local funds. Local funding sources accounted for about 57 percent of the total funding, with about 22 percent of the funding consisting of a loan from the federal Transportation Infrastructure Finance and Innovation Act program, which of course eventually has to be repaid.

The OAC project illustrates some of the challenges that can arise in developing an automated people mover link between an airport and an off-airport station of a regional rail transit system. The project has been under consideration for several decades and over this time the estimated costs have steadily increased. This led to a challenge to the project on grounds that the higher fares that would be required to cover the TIFIA loan repayment and operating costs would impose an undue burden on lower-income travelers, particularly lower-income airport workers. While this challenge was ultimately dismissed, the delay that it caused resulted in the loss of \$70 million in funding under the American Recovery and Reinvestment Act that had been allocated to the project.

Beyond these concerns over future fare levels, the escalating costs of the project raise questions about whether the travel time benefits provided by the project, which are likely to be fairly small compared to continued use of the current AirBART bus service that links the airport to the Coliseum/Oakland Airport BART station, justify this level of capital investment.

Technically the project is fairly straightforward, using a well-established people mover technology, with the majority of the guideway between the station and the airport on an elevated structure in the median of Hegengerger Road, one of the two major access arterials between the Interstate 880 freeway and the airport. For many years it was planned that the system would include two stations serving the area between I-880 and the airport, thereby taking advantage of the investment in the project to improve transit accessibility to anticipated development in the Hegenberger Road corridor. However, these stations have since been dropped from the final design. While this avoids the cost and visual intrusion of locating stations on the elevated guideway in the Hegenberger Road corridor, as well as reducing travel times between the BART station and the airport, it also sacrifices the synergies that could have been obtained from using the project to support transit oriented development in the corridor.

ABBREVIATIONS AND ACRONYMS

AC Transit	Alameda-Contra Costa Transit District
ACTIA	Alameda County Transportation Improvement Authority
AGT	Automated guideway transit
AirBART	Shuttle bus system between Oakland International Airport and the Coliseum/Oakland Airport BART station
ARRA	American Recovery and Reinvestment Act
BART	Bay Area Rapid Transit
BATA	Bay Area Toll Authority
BRT	Bus rapid transit
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMA	Congestion Management Agency
CMIA	Corridor Movement Improvement Account (California program)
CTC	California Transportation Commission
DEIR	Draft Environmental Impact Report (California document)
DEIS	Draft Environmental Impact Statement
EIR	Environmental Impact Report (California document)
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report (California document)
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
JV	Joint Venture
MTC	Metropolitan Transportation Commission (San Francisco Bay Area)
MTI	Mineta Transportation Institute
NEPA	National Environmental Policy Act
OAC	Oakland Airport Connector
OAK	Oakland International Airport (airport code)

PFC	Passenger Facility Charge
PTMISEA	Public Transportation Modernization, Improvement, and Service Enhancement Account (California program)
RTIP	Regional Transportation Improvement Program
RTPA	Regional Transportation Planning Agency
SHOPP	State Highway Operation and Protection Program (California program)
SLPP	State-Local Partnership Program (California transportation program)
STIP	State Transportation Improvement Program
TIFIA	Transportation Infrastructure Finance and Innovation Act

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PEER REVIEW

San José State University, of the California State University system, and the MTI Board of Trustees have agreed upon a peer review process required for all research published by MTI. The purpose of the review process is to ensure that the results presented are based upon a professionally acceptable research protocol.

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