ABSTRACT

The Bay Area Rapid Transit District’s (BART) Oakland Airport Connector (OAC) project has been “in the works” for over ten years. We reported on the circuitous progress on this 3.2-mile (5 km) APM to link the BART regional rail system and the Oakland International Airport in three previous International APM Conferences: 2005 in Orlando, 2007 in Vienna, and 2009 in Atlanta. At each presentation, we fully expected the project to go forward soon, but many issues and obstacles prevented that from happening until the fall of 2010. This paper tracks the tortuous path between then and now, discusses some of the obstacles and how they were overcome, and provides a look forward to our new, but now design and implementation, challenges.

Initially this was a design-build-operate-maintain (DBOM) project for both the system and facilities combined. Six teams were qualified as part of the initial procurement process. Funding and other issues caused BART to change the approach to design-build-finance-operate (DBFO) or public private partnership (P3). These two attempts were discussed in previous ASCE APM Conference papers. Three teams responded initially to the DBFO request for proposals (RFP). Failure to come to acceptable terms with the finalist team and problems in the global financial markets resulted in this procurement being cancelled. This paper includes lessons learned about using P3 in the U.S. transit world.

BART and the other public stakeholders still supported this project. The federal government’s American Recovery and Reconstruction Act (ARRA) “stimulus package” for transportation projects breathed new life into it. BART reverted to a DBOM approach (preferred by the APM suppliers and their facilities design and construction partners) and revised the RFP again. Four teams responded. Their proposals were evaluated in the fall of 2009. The BART Board voted to select the
team of Flatiron / Parsons, a Joint Venture, with their systems subcontractor, Doppelmayr Cable Car (DCC), in December 2009. Notice to proceed was given in November 2010. Events at the local and federal levels that delayed the project for almost a year are discussed from a lessons-learned perspective.

This paper ends with a summary of the project status and the design, implementation, and technological challenges expected between now and its opening in May 2014.

Project Overview

The OAC connects the BART Coliseum Station to the Oakland Airport terminals with a potential future station located at the Doolittle Maintenance Facility site. Most of the alignment will operate along an elevated guideway with an at-grade portion along Airport Drive and a tunnel segment under Doolittle Drive to meet Federal Aviation Administration flight path requirements, as shown in Figure 1.

![Figure 1. OAC Alignment (Courtesy of L+E)](image-url)
Previous Procurement Attempts

After planning, preliminary engineering, and EIS/EIR work, BART initiated a DBOM procurement process that resulted in pre-qualifying six teams in August 2003. When the available public funds proved to be insufficient for the estimated project capital costs, due in part to the large increases in steel, concrete, and other materials, BART cancelled the DBOM procurement. BART then initiated a DBFO procurement to add private sector funding to the public funding and allow the project to move forward. BART was among the first U.S. transit agencies to use a Public-Private-Partnership (P3) project delivery approach and the Federal Transit Administration (FTA) Penta-P Program. After revising the procurement documents to include a concession agreement and a funding plan, BART issued a DBFO-based RFP. Three teams responded initially, but during proposal discussions two dropped out. Further discussions with the remaining team failed to reach an agreement acceptable to both BART and that team, so BART cancelled the procurement.

DBFO Procurement Lessons Learned

When the DBFO procurement closed only one proposer team remained. Given the downturn in the economy and problems internal to the financial industry, interest from private investors waned. Coming to an agreement on the contract price for the project did not happen as the potential costs brought to the table were unaffordable to BART. This was not a suitable platform for a sole source negotiation.

Return to DBOM Procurement

In February 2009 the OAC project was selected by the regional transportation authority, the Metropolitan Transportation Commission (MTC), to receive $70 million in ARRA funding. MTC also shifted $50 million saved from the BART seismic upgrade project to the OAC Project. This funding resulted in the project moving forward again. Due to continuing issues with the DBFO procurement – mostly in the financial markets – and the clearly stated preference of the APM suppliers and facility contractors for a DBOM project, that approach was used in this “third time’s the charm” procurement.

BART released the revised procurement documents in May 2009. As ARRA funding as filtered through the MTC required that the contract be awarded and the funds obligated by year’s end, the RFQ and RFP were combined in a single procurement document. Four teams were prequalified in July 2009:

- Flatiron / Parsons JV (Flatiron West Inc., Parsons Transportation, Doppelmayr Cable Car - DCC)
- Kiewit Pacific Company (Kiewit Pacific Company, HNTB, Bombardier)
- Shimmick Skanska Herzog JV (Shimmick, Skanska, Herzog, STV, Inc., Leitner-POMA)
- Walsh Construction Company (Walsh Construction Company, T.Y. Lin International, Mitsubishi Heavy Industries)
All four submitted proposals in September 2009. All four teams demonstrated they could meet the technical, management, and experience requirements. During the evaluation process, it was determined that one team did not provide a responsive bid and two others did not offer affordable pricing. The result was the best value selection of the Flatiron / Parsons JV.

Funding Issues

While BART was working toward awarding the contract to the Flatiron / Parsons team, the project lost its $70 million of ARRA funding in February 2010 due to issues with Title VI regulations enacted in 2007, well after the completion of the environmental work and well into procurement. The FTA ruled that BART had not provided an equity analysis of potential service and fare changes for the project. This required MTC to reallocate this funding to other Bay Area projects. BART subsequently completed Title VI analysis, which showed no disparate impact on minority or low income riders.

While the Flatiron / Parsons JV price was lower than the budget, the loss of ARRA funding was a blow to the project. To award the project, a revised funding plan was needed as was additional funding to replace the $70 million loss.

The terms of the DBOM proposal required that proposers would maintain the pricing in their proposals for 120 days after the proposal due date. Due to the loss of ARRA funding and the time needed to secure additional funding, proposers were asked to extend their prices. After months of extensions at no cost, project staff studied construction indices to account for price inflation during these months. Project staff then presented to the BART Board of Directors a price adjustment for inflation to be offered to the preferred proposer. This was approved by the Board to allow for a change order after contract award.

BART worked diligently with their existing funding partners to find additional sources of funding. In July 2010, project staff returned to the BART Board of Directors and presented a revised plan that included additional $10 million in funding from the Alameda County Transportation Improvement Authority (ACTIA) and Port of Oakland and $20 million from the State Transportation Improvement Program (STIP), MTC, and BART. Project costs were reduced by $8 million by lowering the project contingency. The additional $25.4 million in state and local funding and $10 million from BART capital reserves meant that the rest of the full funding plan would be made up by increasing the debt funding from $70 million to $106 million. Additional funding for the project will be obtained either by a loan through the Transportation Infrastructure Finance and Innovation Act (TIFIA) or through some other debt sources. This funding will be secured in 2013 for use in 2013 and 2014.

The $25 Million previously granted to the project under the FTA Penta-P Program was now to be awarded under the FTA New Starts Program. While the revised
funding plan was approved, the General Manager was not authorized to award the contract until these FTA funds were in place, which occurred in September 2010.

Local Issues

There was relatively late local opposition to the project, primarily from a small local public advocate organization that proposed bus service (somewhat improved over the existing AirBART bus service) rather than an APM. The opposition took its case to the FTA by filing a Title VI action against the project. Ultimately BART was able to convince all of the agencies involved that the APM project was the most appropriate and was able to move forward politically.

There has been considerable discussion about the number of jobs to be provided by the project. Estimates are between 2500 and 5000 direct, indirect, and induced jobs will be created. BART and contractor staff are working closely with the trade unions to follow the terms of the project stabilization agreement, which set goals of 25% of the jobs to go to Oakland residents and 50% to the region. The Flatiron / Parsons JV has made a 20% commitment to the Disadvantaged Business Enterprise (DBE) program, including 30% for the design of the facilities (guideway, stations, and maintenance facility) and 20% for construction of those facilities. The total commitment is nearly $38 million.

Moving Forward

Contracts between BART and Flatiron / Parsons for the DB Contract and DCC for the O&M Contract were executed on October 1, 2010. The ceremonial groundbreaking on October 20, 2010, was attended by many local officials who were stakeholders and longtime supporters of the project.

In following the terms of the pending FTA funding grant, BART gave limited notice to proceed to the Flatiron / Parsons team on November 1, 2010. For the first four months of the project, only detailed design and other pre-construction work could be undertaken. Full NTP was issued in March 2011 allowing construction of the facilities and installation of system equipment.

To obtain the final approval of the FTA grant, thus be able to move ahead with the full contract, BART worked with the FTA and resolved all project Title VI issues by August 2010. BART also worked with the FTA Project Management Oversight Contractor (PMOC) to demonstrate the technical capacity for the project to receive the grant. The grant was received in February 2011.

Current Status

As of March 2011 BART and Contractor staff were working on facility and system designs with construction expected to start in the summer of 2011. Preconstruction work such as potholing, surveying, and geotechnical investigation has begun. Design
reviews were ongoing with weekly task force meetings focusing on different aspects (alignment, stations, guideway, etc.). The Contractor’s design was at the 65% level with pending reviews from stakeholders and authorities having jurisdiction (AHJs) including the City of Oakland, Port of Oakland, California Department of Transportation (Caltrans), and Union Pacific Railroad (UPRR). Coordination was ongoing and permits are being obtained for work within the AHJ’s rights of way. BART was obtaining permits from the Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Game.

Unique System Design

Given the length of the system, the DCC system will operate with four different ropes (cables). Each of the four trains will operate on a different rope. Using detachable grips, trains change ropes at the Doolittle maintenance facility and the end stations.

The guideway will be of an open truss design typical of the DCC systems (Figure 2). This open design provides minimal shadowing along the alignment, particularly along Hegenberger Road. It is thought to be less expensive than a typical Caltrans cast-in-place concrete structure. It will be prefabricated off-site, trucked to the site, and erected on top of cast-in-place concrete columns.

![Figure 2. DCC Open Truss Guideway along Hegenberger Road](Courtesy of BART / FPJV)

Four, three-car trains will operate on 4.5 minute headways. In-vehicle travel time will be about 8 minutes, so the average trip time will be just under 11 minutes. The system will provide a capacity of about 1500 passengers per hour per direction (pphpd) to meet the initial 1400 pphpd capacity requirement. The ultimate capacity of 1900 pphpd will be met by adding a car to each train.

As the OAC is an extension of the BART system, the fare collection system will be identical and seamless. Faregates, ticket vending machines, and add-fare machines will be located only at the Coliseum OAC station (Figure 3). Passengers from Coliseum will walk upstairs to the OAC station and enter the faregates. Passengers from the Airport will enter the BART system at the Coliseum OAC station.
Because of the FTA funding, this project must meet Buy America requirements. Over 60% of the vehicle, train control, communications, and traction power subsystem components must be manufactured in the United States. The Flatiron/Parsons/DCC team committed to this as a prerequisite to being selected. A BART/L+E Buy America audit showed that DCC had shifted manufacturing and/or assembly of key parts of the system to the US to meet this requirement.

Safety and Security Regulatory Requirements

The Safety and Security Certification Plan was approved by the California Public Utilities Commission (CPUC) in 2003. BART will self-certify this system following this plan with support from the Flatiron / Parsons team. Updates to this plan with system-specific information will be provided to the CPUC for approval.

Potential System Improvements

The DB Contract requires provisions for a third station to be located at the Doolittle site. At this time, funding is not available for this station to be built. However, two platforms will be located outside the maintenance facility on the top of the drive rooms and can be converted to become this passenger station in the future (Figure 4).
The Airport Station will be located within the Airport parking lot in front of the two terminals. Passengers will go downstairs from the station and walk across the terminal frontage road to reach the terminals. If funding is available, a pedestrian bridge to the terminals will be provided.

![Figure 5. Airport Station Configuration](Courtesy of BART / FPJV)

The Light at the End of the Guideway

Substantial Completion and the start of revenue service are anticipated to occur in May 2014, with Final Acceptance in October 2014. DCC has a 20 year O&M Contract and will provide 27 full-time staff to meet the required 99.5% availability to receive the full O&M payment.

Lessons Learned

- P3 did not work for the OAC project for several reasons including total project costs (life-cycle costs – repaying private capital funds over time) and the problems with the financial industry at the time of the P3 discussions.
- Agencies might not be able to give control of key aspects to a P3 contractor. In this case, BART is required by law to set fares, so the P3 contractor could not plan on fare adjustments in its financial plan, adding costs and contingencies.
- P3 is not a financial panacea nor is it free money. P3 project sponsors must have a very sound, long-term financial basis and the ability to allow the P3 contractor to control many risks and other project aspects.
- Federal funding comes with many requirements. All must be satisfied in a timely manner. An implementing agency’s interpretation of such requirements might not be the same as that of the funding agency.
- Opposition, from local and other sources, can happen at any time. The motivations and backgrounds for such opposition are not always clear, nor are they easily changed by the project owner. Owners must be prepared politically as well as technically to overcome such opposition.
- Technological advances can bring potentially surprises. Although many considered cable-propelled technologies to be limited in distance and
configuration, in this case, two cable-propelled APM suppliers proposed on a
3.2 mile (5 kilometer) pinched-loop system given their advancements in grips,
switches, and train control.

• Successful implementation of the OAC cable-propelled system could mean
that such systems will be more competitive with self-propelled APMs on
more complex projects in the future.

• Cable-propelled and self-propelled APMs can be cost competitive, but neither
is always less expensive.

• Engineering & environmental are necessary, but adding political and financial
make a project sufficient.

• A project that does not work financially one year might in a later year given
the global costs of steel, concrete, and other materials and the relative
strengths of different supplier’s and customer’s currencies. And vice-versa.

• Owner and Stakeholder perseverance can be very important. This project
proves the old adage: “if at first you don’t succeed, try and try again”.

Previous APM Conference Papers

As noted in the Abstract, this is the fourth paper on the OAC project to be given at
International APM Conferences. For reference, the previous papers are:

• Orlando 2005: “Oakland Airport Connector, Pushing the Design-Build
Envelope”.

• Vienna 2007: “DBOM to DBFO: the Long and Winding Road”.

• Atlanta 2009: “DBOM to DBFO: The Longer and More Winding Road”.

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