



Memorandum

Date: April 2, 2018
To: Transportation Authority Board
From: Eric Cordoba – Deputy Director for Capital Projects
Subject: 04/10/18 Board Meeting: Caltrain Downtown Extension Operations Peer Review and Tunnel Options Study Update

<p>RECOMMENDATION <input checked="" type="checkbox"/> Information <input type="checkbox"/> Action</p> <p>None. This is an information item.</p> <p>SUMMARY</p> <p>At the direction of the Transportation Authority Board, we assembled a panel to conduct a peer review of three operational analyses related to the Caltrain Downtown Extension (DTX) The driver of the peer review was to determine whether the DTX should have two or three tracks as it approaches the Salesforce Transit Center. At the Board meeting we will present the peer review panel’s findings and provide an update on phase two of the Tunnel Options Study, which expands on the most promising aspects of the initial study to minimize cut-and-cover along the DTX alignment.</p>	<p><input type="checkbox"/> Fund Allocation</p> <p><input type="checkbox"/> Fund Programming</p> <p><input type="checkbox"/> Policy/Legislation</p> <p><input type="checkbox"/> Plan/Study</p> <p><input checked="" type="checkbox"/> Capital Project Oversight/Delivery</p> <p><input type="checkbox"/> Budget/Finance</p> <p><input type="checkbox"/> Contract/Agreement</p> <p><input type="checkbox"/> Other:</p> <p>_____</p>
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DISCUSSION

Background.

Over the past several years there have been multiple independent studies and operating simulation models developed for the DTX. As operating plans become clear through their concept models, and as Caltrain and the California High Speed Rail Authority (CHSRA) consider the challenges of operating in the same corridor with both terminating at the Salesforce Transit Center, the question of two-track versus three-track alignment for the DTX appeared to be contested between various expert studies. The peer review panel was asked to review those studies, consider the underlying assumptions and modeling parameters, and to opine on the conclusions drawn in each study/model. Although the driver of the review was the question of two versus three tracks, the panel considered all operational aspects of the project and associated facilities. However, it is important to note that there are other studies, such as the Planning Department’s Railyard Alternatives and I-280 Boulevard Feasibility Study (RAB), that are considering opportunities and tradeoffs regarding transit-oriented development on all or part of the 4th and King railyard.

The operations studies included:

- “Transbay Transit Center – San Francisco DTX – Value Engineering Study”, prepared for Birmingham Properties by SENER, September 2017

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- “Train Operations Analysis of Two Versus Three Mainline Tracks for the San Francisco Downtown Rail Extension”, prepared for the Transbay Joint Powers Authority (TJPA) by Parsons and Carl Wood, October 31, 2017
- RAB Study Conceptual Planning Analysis developed on behalf of the San Francisco Planning Department by CH2M and SMA+, June 19, 2017

The peer review panel consists of the following professionals, chosen for their extensive expertise and experience in rail design and operations:

- John Flint – Senior Vice President, Managing Director of Lines of Business for T Y Lin International
- Les Elliott – President, The Elliott Group
- David Nelson – Director of Transit for Jacobs
- Gene Skoropowski – Staff Consultant for T Y Lin International, former Senior Vice President for Rail Operations, All Aboard Florida

After reviewing the three reports and associated documents, the peer review panel convened three workshops. At the first, with the participation of TJPA, Caltrain, CHSRA, and their consultants, the peer review panel further familiarized itself with the current state of the Salesforce Transit Center, previously known as the Transbay Transit Center and DTX projects, to understand the operating plans, physical features and potential risks associated with each of the operators, and to understand the level of collaboration taking place in planning for a blended service at the Salesforce Transit Center.

The second day-long session consisted of presentations by the stakeholders and their consultants who prepared the three studies. Caltrain and CHSRA representatives were also present. The analyses by the three different teams were reviewed and discussed. Each team started with similar, but not identical, assumptions and methods. All used sketch-planning tools, and all limited their inquiry to the north end of the San Francisco–San Jose corridor over which Caltrain and the CHSRA plan to offer blended services. One study was conducted with only publicly available information, and without the benefit of preliminary plans for the Salesforce Transit Center. The other two studies were conducted with full knowledge of the project’s history and its current status. Only the TJPA study was developed with the full participation of, and input from, Caltrain and CHSRA.

All of the studies concluded that, if all of the trains planned for berthing at the Salesforce Transit Center operated reliably (defined as within two minutes of scheduled arrival/departure), two tracks in the DTX tunnel would be sufficient to operate the train movements. However, the assumption of no operating delays is not realistic. Only one of the studies, completed by Parsons and Carl Wood for TJPA, performed a detailed service perturbation analysis. It shows that if there is a delay or track blockage in the tracks leading to the “throat” of the terminal, then three tracks are required to support reliable train service and to facilitate recovery from operational delays.

The draft report was developed and distributed to all the stakeholders prior to a third workshop, which was held for the stakeholders to provide and discuss their comments. The findings and observations below represent a general consensus of the peer review panel and stakeholders.

Major Findings.

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1. Three tunnel tracks are required to provide reliable and dependable service into the Salesforce Transit Center.
2. The Salesforce Transit Center capacity plan of four high-speed trains and six Caltrain trains per peak hour cannot be assured unless both services can use all platforms.
3. The structural column configuration in the built Salesforce Transit Center limits the flexibility for changing the track geometry within the train box and at the throat leading into the terminal, but options that entail adjustments to track design criteria at the throat to minimize right-of-way impacts should be explored with CHSRA, TJPA, Caltrain and SENER.

Additional Findings and Observations.

1. The Salesforce Transit Center will be operating at, or near, capacity when the Service Program of turning six Caltrain and four CHSRA trains per hour is fully implemented.
2. The new underground station at 4th/Townsend is likely to have strategic and tactical significance for rail operations.
3. The overall utility of the new station at 4th/Townsend might be improved with platform faces on all three tracks and reconfiguration of the switch plant providing access to all station tracks from the north and south.
4. There is significant residual operational value at Caltrain's terminal and yard at Fourth and King for staging, servicing and storing Caltrain and CAHSR trains. The RAB Study is exploring options for the use of this yard.
5. A consistent base DTX track configuration should be used at the outset for all future modeling and simulation studies prepared by all parties.
6. All the simulation results considered by the peer review panel assumed a high-performance train control system that safely provided very short times between train movements through the DTX. The interlocking and train control software and hardware must be designed and implemented to minimize the times between when one route through the interlocking is cleared and when a conflicting route through the interlocking can be ready for the next occupancy.

Immediate Action Items (Next Steps).

1. The operators need to finalize a workable "Blended Service Plan" for the harmonious joint operation of the shared line and terminal including: train schedules, required enhancements to the infrastructure south of the study area, and plans for vehicle servicing and storage. The plan should be reviewed, tested and verified with a proven and widely accepted railway simulation tool.
2. The two operators and TJPA need to identify and select a mutually acceptable and workable set of rolling stock and platform adaptations that will allow both services to berth at all platforms.
3. Properly evaluating the potential right of way impacts of constructing the DTX project is a critically important task in this phase of project development. Based on suggestions from SENER Engineering, the two operators and TJPA need to carefully review possible tradeoffs between track and switch design standards and practical limits for low-speed terminal operations, including the associated potential right-of-way impacts of constructing the DTX tunnel. The goal should be to provide a transit project that maximizes public benefit, while minimizing environmental and community impacts.

4. The two operators and TJPA need to revisit the operational program and design for 4th and Townsend station to improve the utility and flexibility of the station and associated switch plant.
5. Once the Blended Service plan is prepared and improved, the operators and TJPA need to identify an operating plan and design footprint for a storage and servicing facility on the existing 4th and King Caltrain parcel to identify which portions of the parcel can be released for non-railroad use.¹
6. The peer review panel observed that simulations reviewed were lacking in coordinated assumptions, likely due to a lack of collaboration between the parties. Operators, TJPA, the Planning Department and other interested parties should build on the open communications facilitated by the SFCTA during the review effort, and regularly meet with SFCTA to report and discuss progress on the Immediate Action Items above and to sustain momentum and cooperation toward the construction and operation of the proposed facilities.

Tunnel Options Study Update.

At the request of the Transportation Authority Board, the TJPA, with the participation of the Transportation Authority staff and its consultants, conducted a study during the second and third quarters of 2017 to address the impacts resulting from the planned cut-and-cover construction along the DTX alignment. The goals were to minimize surface disruption and reduce cut-and-cover by identifying feasible mined-tunnel construction methods that could be implemented to achieve them.

On September 26, 2017, the TJPA presented the preliminary findings to the Transportation Authority Board. Among others, the preliminary findings concluded that cut-and-cover on Townsend Street can be eliminated up to the east end of the Fourth and Townsend Street Station at a reasonable cost, that reducing cut-and-cover at the throat structure is feasible albeit costly, and that proposed tunneling options can be accomplished without significant impacts to the project schedule.

The Board agreed with TJPA that further study was needed to advance these new promising aspects of the study. Phase 2 of the study consisted of:

- Further development of mined options at the Howard Street crossing
- Refinement of constructability and schedule for the options
- Confirmation of ventilation requirements
- Review and refinement of the configuration of the tunnel boring machine + sequential excavation mining (TBM + SEM) tunneling option

At the April 10, 2018 Board meeting, TJPA staff will present the results of this effort.

FINANCIAL IMPACT

None. This is an information item.

CAC POSITION

The CAC will be briefed on this information item at its April 25 meeting.

¹There are other studies, such as the Planning Department's Railyard Alternatives and I-280 Boulevard Feasibility Study (RAB), that are considering opportunities and tradeoffs regarding transit-oriented development on all or part of the 4th and King railyard.

SUPPLEMENTAL MATERIALS

Enclosure - Peer Review Panel Report on Findings – Review of Three Operational Studies for the Design of the Caltrain Downtown Extension (DTX)