

DTX Operations Planning

Transbay Joint Powers Authority
Board of Directors Meeting

June 10, 2021

Context

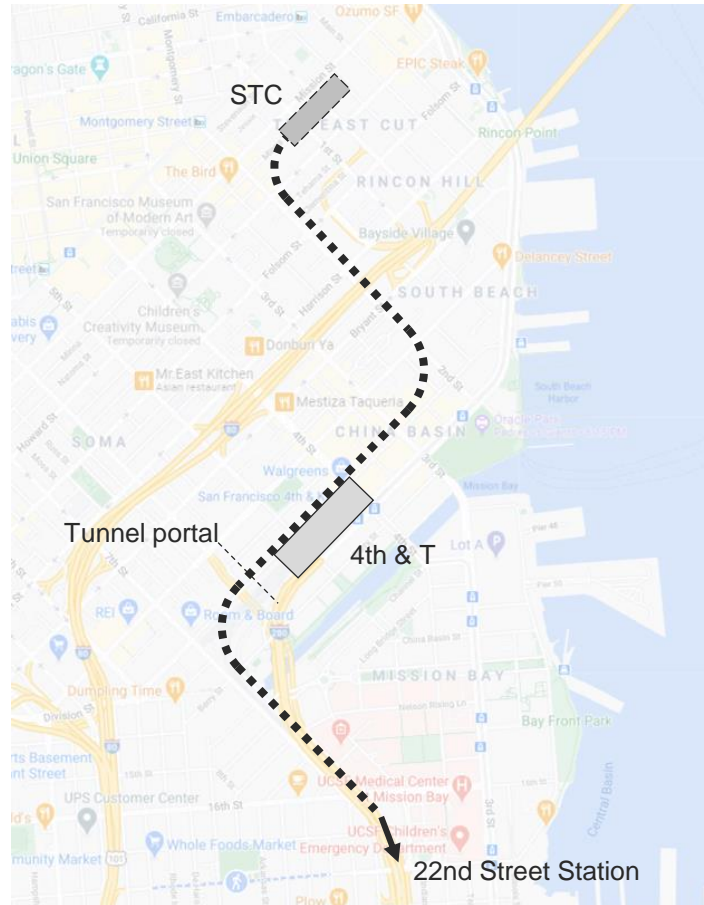
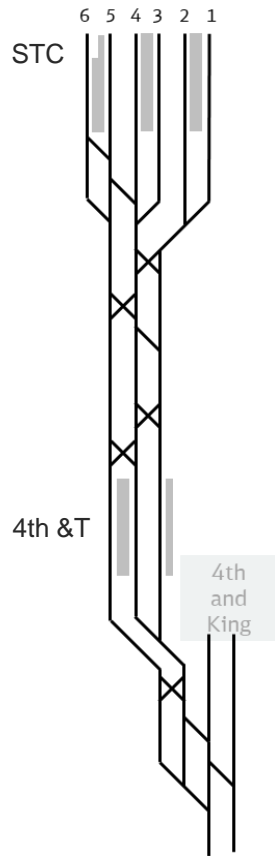
- Operations analysis is a task identified in the workplan agreed upon as part of the memorandum of understanding (MOU)
- As per the MOU, the task was led by Caltrain and the California High-Speed Rail Authority (CHSRA)
- Outputs of the analysis will be inputs into the Downtown Extension (DTX) Phasing Study currently underway

Caltrain and HSR Business Plan's provide context for service needs and phased growth.



- Caltrain's and CHSRA's business plans provide future service levels and timing/phasing. **These documents frame the DTX Operations Analysis.**
- The business plans also provide context for what is expected in the entire Peninsula corridor. **While planning for DTX and STC, we must also consider impacts to the entire system.**

The Operations Analysis identified the minimum necessary infrastructure to operate 8 Caltrain and 4 CHSRA trains per hour thru DTX and 4&T, and during any phased introduction to reach these service levels



The task: Detail the minimum infrastructure needed to support integrated CHSRA and Caltrain services up to 12 trains per hour per direction

The challenge: Optimizing service within the constraints presented by the urban environment on rail alignment, vent zones, and interlocking layout

The approach: Use a holistic planning approach to define and confirm infrastructure requirements for DTX that satisfy the railroad operators' operational needs

The result: Identification of required infrastructure to meet operators' stated needs, including through five phases of service growth

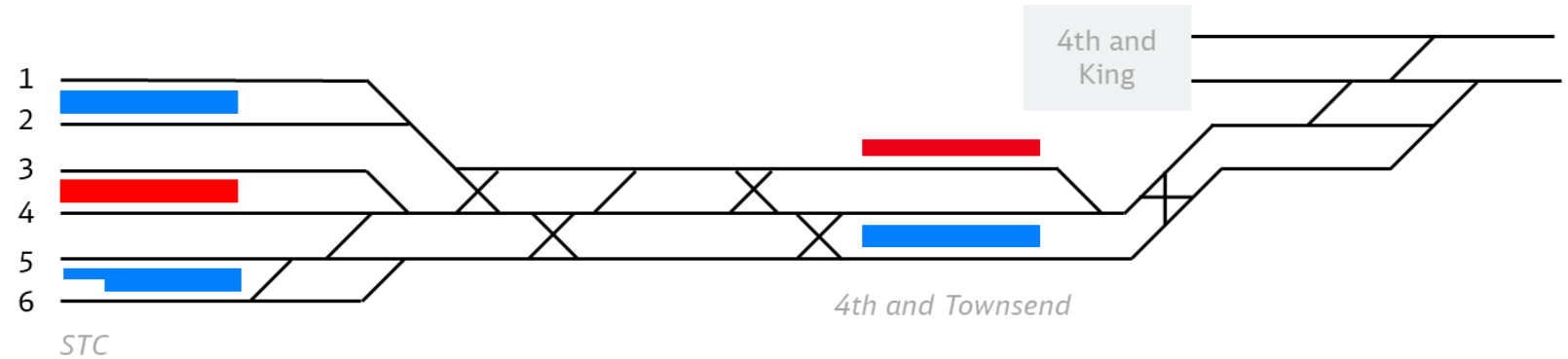
Key Findings from the Operational Analysis

- **Three tracks** at and between 4T and STC are needed for stable and compliant operation to support 12 trains per hour per direction (8 Caltrain + 4 CHSRA). This is consistent with previous analyses
- **Two layout concepts** at 4T (both with a three-tracks at and/or between 4T and STC) were found to meet the railroad operators' requirements
- Both layouts were proved (through simulation) to provide **stable operational service** with the ability to recover when delays occurred
- **Shared platforms do not provide benefit** under normal operations or under minor delay conditions. Shared platforms at STC could benefit CHSRA in the event of major disruption.
- Phasing: both layout concepts can support a **phased introduction of track and systems infrastructure** as operational service levels increase.

Two feasible concepts were developed that satisfy the operators' Board-adopted service plans

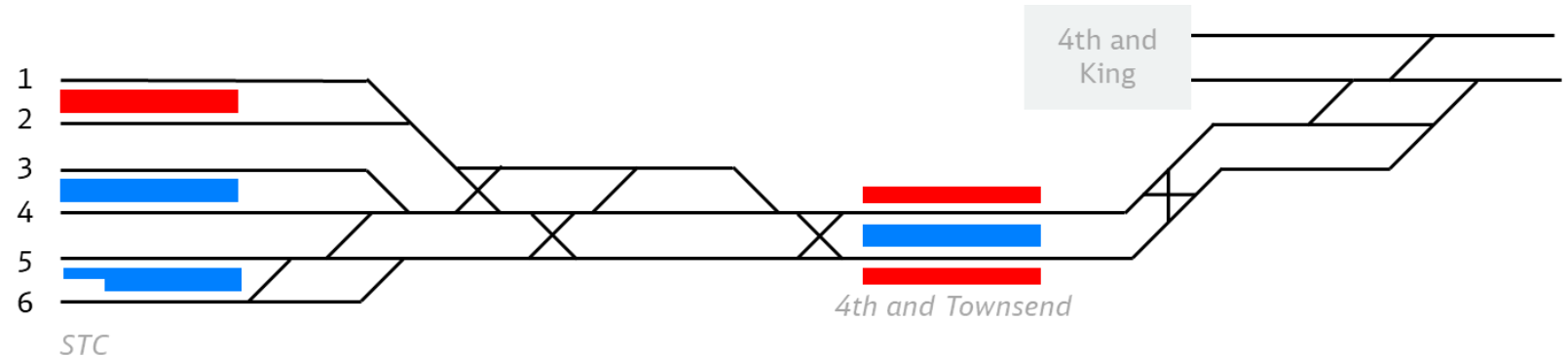
Concept A

- 4T requires 3-track/2-platform layout
- Only 2 out of 4 CHSRA trains per hour can stop at 4T
- 3-track tunnel to STC
- STC optimal platform assignments are Caltrain to use tracks 1, 2, 5, and 6 and CHSRA to use tracks 3 and 4



Concept B

- 4T requires 2-track/3-platform layout
- All CHSRA trains can stop at 4T
- 3-track tunnel to STC
- STC optimal platform assignments are Caltrain to use tracks 3, 4, 5, and 6 and CHSRA to use tracks 1 and 2

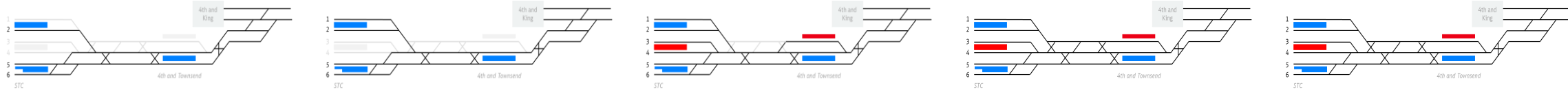


Different service levels require different minimum track and system configurations

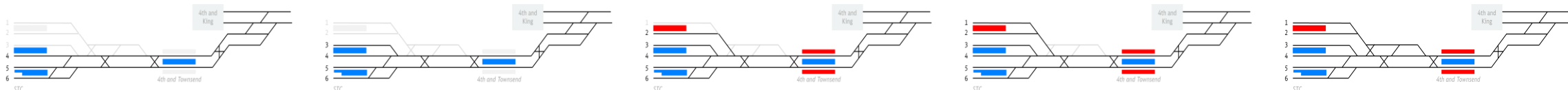
Concept A

Concept B

6 Caltrain / 0 CHSRA	8 Caltrain / 0 CHSRA	6 Caltrain / 2 CHSRA	6 Caltrain / 4 CHSRA	8 Caltrain / 2 or 4 CHSRA
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STC Platform Tracks: 3	4	6	6	6
Tunnel Tracks: 2	2	2	3	3
4T Platform Tracks: 2	2	3	3	3



STC Platform Tracks: 3	4	5	6	6
Tunnel Tracks: 2	2	2	2	3
4T Platform Tracks: 2	2	2	2	2

Simulation and contingency planning shows a stable system

Testing the Plan

Dynamic
Simulation

Static Planning:
Contingency
Planning

Confirming Requirements

- Both concept A and B surpass the operator requirement of 95% on-time* performance when simulated with minor service disruptions.
- Both concepts provide the ability to recover to on-time operations when larger entry are delays introduced from Peninsula rail corridor.
- Concept A performs better when long delay occurs at 4T and with major disruptions at STC where trains are forced to turn at 4T; Concept B performs better with loss of a third track in tunnel.
- Loss of one track (out of 3) between STC and 4T causes delay and requires changes to operating parameters.
- Loss of one track (out of 2) between 4T and connection to Caltrain network results in major disruption in service.

* on-time is defined as arrivals within 6 mins of scheduled time

Next Steps – Run Through Analysis

- *A “Run Through” Analysis was included as part of the original scope of work for the operations analysis. This analysis would broadly consider the implications of having a through-running station at STC connecting to a future Transbay tube*
- *The Link21 project is in very early conceptual stages and any assumptions about connections and through-running of services at STC are highly speculative at this time. Any operational analysis of run through operations done at this time would be largely reflective of the specific assumptions made and could be subject to significant change as the Link21 project advances*
- *Discussions between the IPMT and Link21 yielded concerns regarding the detailed assumptions that would need to be made to develop any operational analysis of a through-running station – including assumptions related to both alignment and engineering choices as well as future service and operations implications in both the East-Bay and San Francisco.*
- *Caltrain and CHSRA are seeking direction from the ESC as to whether and how to proceed with the run through analysis and how to engage with the Link21 team on this topic*

QUESTIONS?